Reporting on AT
beyond stereotypes ▸

A Guide for Journalists

Booklet 2: Assitive Technology (AT)

REPORTING ON
Disability

Contents

"What the eye doesn't see and the mind doesn't know, doesn't exist", even if it does!

...DH Lawrence

Preface

MEDIA is the "mirror" of modern society. Being a critical link between policy makers and community, it is an incredible tool of advocacy, capable of creating and shaping public opinion, strengthening societal voice and bringing policy dialogues. Nevertheless, it would not be out of place to say that, tough far and few, media reporting on disability and rehabilitation are there, reporting on Assistive Technology (AT) are rare though they are the final account of rehabilitative efforts. In addition to the weak voices of AT Users, lack of quality information on AT had been considered a major handicap with the media personnel, justifying the famous quote of DH Lawrence, *"What the eye doesn't see and the mind doesn't know, doesn't exist"*, *even if it does!* In this booklet, the emphasis is on sharing information and various aspects of AT associated with our lives, to enable them having enough background information to produce quality reporting.

In order to have qualitative media reporting on Assistive Technology (AT), Trust Cradle, with technical support of WHO SEARO, has developed a Training Programme on AT for Media Personnel' having normative guidelines/information on following:

▶ What are ATs, and who are in need of them?

▶ How are the AT products and devices help improving functionality, mobility, education, employment and productivity of persons with disabilities, including older people and people having NCDs (Non-Communicable Diseases)?

▶ How ATs are the Game changers for rehabilitative processes; instead of a hollow rhetoric, how are they the edifice of rehabilitation efforts?

▶ What are the fields where policy initiatives need to be undertaken by the member states for improving access to ATs?

▶ What are the challenges of production and provisioning of AT to the persons in need?

▶ What are international and national covenants and recommendations for improving accessibility of assistive technologies?

▶ How the media can play a crucial role in organizing regional and country workshops, meetings and seminars to promote and facilitate access to assistive devices and technologies?

▶ How can concerted media reporting push the development of national policies and programmes on assistive devices and technologies with a focus on human resource development?

▶ What is the status of a country-specific database on availability of appropriate assistive devices and technologies, and why the statistics are crucial for policy formulation?

▶ Some tools and techniques for the media persons for better reporting and stories.

We are sure the Media can play a vital role in improving the access to assistive technology, products and devices for everyone, everywhere.

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AT is a generic term that includes assistive, adaptive, and rehabilitative devices, products, tools and equipment that help them improving their functionality at home, work or social interactions.

Introduction

Assistive Technology (AT) is a generic term that includes assistive, adaptive, and rehabilitative devices, products, tools and equipment that help them improving their functionality at home, work or social interactions. As estimated, the world has more than 1 billion people who need one or more kinds of assistive devices and technology. Moreover, with rise in ageing populations and incidences of noncommunicable diseases, the number of persons in need for assistive devices would go over 2 billion by 2050. However, at present, owing to high costs and a lack of financing, availability, awareness and trained personnel only 1 in 10 people in need have access to assistive products. Still, the statistics of rural areas is more dismal.

The WHO South-East Asia Region comprises of 11 low- and middle-income countries and having a population of nearly 2 billion. Due to low income, industrialization, education and awareness in the member states, the percentage of population having access to assistive products are much lower than the global average. Further, as majority of the efforts, Governmental or Civil Societal, are located in urban areas, the people in rural areas have even lesser AT facilities. For example, 8.3% Indian households have disabled persons, but 69% such population lives in rural areas, who have nil or minimal access to any kind of assistive products . Similarly, in Nepal and Bhutan, owing to difficult terrain and low indigenous production, only a few have regular access to assistive devices.

This training material aims to find out the opportunities and challenges to improve accessibility of AT in the region as per the WHO's GATE Initiatives. The information are based on widespread explorations and discussions held with stakeholders-policy makers, experts and institutions, manufacturers, users and their family members, caregivers, self-help groups, DPOs, NGOs etc in regard to the existing policies and programmes on AT. Since the inception of GATE, the challenges for making access to AT universal have remained the same such as lack of understanding of the need for and benefit of AT; limited funding for development and production; weak or non-existent procurement systems; inadequate servicing and user training; lack of needs assessment, inappropriate design and fitting; failure of a service infrastructure to produce and maintain devices, absence of a properly trained workforce and lack of information about what AT devices are available.

The major shortfalls, however, found with the Member States in the region are prevalence of nil or notional AT policies, limited capacity for scale of production, and distribution system rudimentary or ad-hoc in nature, and no mechanism to ensure peoples' participation in policy making. The major reason for dismal situation was not the dearth of resources and skills, but the political apathy, poor perception of disability and rehabilitation amongst policy makers, non-assessment of economic impact of AT as tool to enhance employment and productivity.

Key solutions, therefore, do not require additional funding and resources but a strong, effective and sustained advocacy for creating political will and priority, sensitization and training to bureaucracy for effective execution and fund utilization allocated to programmes for AT and rehabilitation, institutionalization of community participation and involvement of Civil society to work as last mile connectivity between government services and community in need.

Having opportunity and access to both, political leadership and community, with equal ease, Media Personnel can play a meaningful buzz for AT for the people in need.

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Areas where media can play a role of change makers

Challenges and opportunities

The challenges before the WHO and Governments of member states are many which, in brief, are as follows:

1. **Demand -Production-Supply Triad:** Media may play a multiplier role in making the Demand-Supply-Use Triad of AT understood well by the community and policymakers together. As the AT products improve functionality of persons in need, community should be made aware that they help improving their mobility, and prospect of education, employability and productivity. The policy makers should also be sensitized and educated that the AT products are not a simple welfare measures, but a crucial investment in leveraging the lives of PWDs and making them productive. Therefore, it is not only the production which needs to be increased but also the demand for use and supply at the community level.

2. **Advocacy:** The region comprises of low- and middle-income countries, and hence there is constant resource-crisis with member states. At the same time, the region lacks strong and sustained advocacy for raising the awareness among political leadership, creating priorities with government, educating bureaucracy and community about the existence of affordable assistive products, and that their use can be a cost-effective intervention to reduce disease and disability burden.

   For developing a pragmatic AT policy, manufacturing of affordable products and its distribution at the doorstep of users, the crucial roles are played by four stakeholders: the policy makers particularly the political leadership, the bureaucracy, manufacturers and Civil Societies (DPOs, NGOs and caregivers). Every stakeholder has its own challenges and needs to be addressed with constant advocacy.

3. **Policy for AT:** The policies on AT available with Member States are ad hoc in nature, do not ensure universal accessibility, having inadequate resources allocation, non-uniform production standards, non-institutional distribution system (camp system of distribution) and no human resource skill/capacity for maintenance and follow up. A separate policy on AT with provision of institutional distribution system can make the products reach to all who need, particularly in rural areas.

Several gaps exist crucial for policy development in the Member States:

a. Policy Awareness Gap, where policy makers knew little about disability-specific policy instruments (e.g., CRPD), AT related WHOs Iinitiatives like APL, GATE and GREAT, and disability representatives knew little about the policy instruments used in mainstream international development.

b. Policy Process Gap, even where there was consultation with AT Users, Disabled Peoples Organizations (DPOs), the final version of documents rarely reflected their primary concerns.

c. Policy Implementation-Monitoring Gap was also noted, where there were a lack of explicit indicators for monitoring and evaluation, that were disaggregated by disability, or had disability specific concerns.

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4. **WCO Desk on AT:** The region houses one fourth of population (2 billion approx.) of world and similar tune of disability and rehabilitation burden, but all countries of WHO (WCOs) do not have a regular desk or focal on disability and rehabilitation. Resultantly, no meaningful work on WHO programmes on disability and rehabilitation are undertaken on sustained basis. For example, India having 17% of world population and similar burden of disability, but since last many years there is no focal or desk on disability, and therefore, having no agenda on disability issues. Obviously, Assistive Technology is not a live agenda with majority of WCOs in the region.

5. **AT under Universal Health Coverage:** Majority of Member States in the region cater the issue of disability, rehabilitation and AT through social welfare ministries where they have other concerns on priorities, and AT products are considered a non-essential welfare issue. While the assessment and recommendation for an AT product is essentially done by the medical team, the responsibility of provision are vested in welfare or revenue department. This situation makes a long circuit for the users and difficult to justify the recommendation of medical team before other agency responsible for supply. Member States need to encourage the integration of assistive products into services at the district, subdistrict and primary health care levels as a move towards universal health coverage.

6. The political leadership, responsible for setting the priority, policies and programmes, and fund allocation need awareness on the socio-economic value of AT products. Besides the benefits of health and well-being to individual users and their family, it reduces direct health and welfare costs (such as hospital admissions etc). They also need to understand that it has far reaching economic benefits, helping education and employment, creating more productive labour force, and stimulating economic growth. Moreover, ss the people with disabilities are the poorest among poor, AT are the **cheapest and most effective tool for the rehabilitatio**n and welfare.

7. The bureaucracy is responsible for converting nations' policies and programmes into reality. Their understanding and attitude towards disability, rehabilitation and AT are paramount for success and sustainability of the programmes. However, due to lack of sensitization and training on disability and rehabilitation, they perceive the issue as per their whims and fancy, and therefore execution lacks force and consistency. A chapter and workshop on disability, rehabilitation and AT during their **training curriculum** -basic and refresher course- would inculcate among them the desired sensitivity, drive and responsibility towards the issue.

8. The corporate world does understand the prospect of manufacturing such products, and their crucial role in making affordable and high-quality products. But, as they face the problem of standardization, finance and erratic procurement policy of government, the scale of production does not reach the desired level. The Priority Public Funding, Bulk Public Procurement Policy and Insurance Policy may solve the 'chicken and egg' problem of the manufacturers and users.

9. Many a Member States like Nepal, Bhutan and Timor-Leste have limited production capacity due to low

industrialization, while production potential existed within the region. The **intra-regional technical cooperation** through exchanges and information dissemination may augment the capacity of such countries.

10. The Distribution System for AT products and services in the region has never been institutionalised. The products are distributed in ad-hoc manner with camp approach, neither the need assessment can be done in a meaningful way nor there can be follow up for the maintenance or repair. The practice is not only urban centre, but highly unscientific and wasteful and very arduous for the person in need to travel and receive from distant places. Establishing an institution of distribution with the help of Civil Societies can be a meaningful and cost-saving step, which can cater the need of rural and urban both in a sustained manner. The same has been envisioned in SDG as well.

11. **Civil Societies** (DPOs, NGOs and caregivers) have traditionally played a major role in production and distribution of AT in this part of world. However, it is being done at a local and traditional level, oblivious to the recent development in the sector. Their capacity building with scientific and industrial inputs, and bringing them into the legal framework by assigning them the role of distribution centres may improve their working and also alleviate the burden of Governments from reaching to rural areas.

12. **Statistics:** The data on disability, rehabilitation and AT in the region is unreliable. Since majority of countries do not have exclusive mechanism to assess the need, they gather data related to disability and rehabilitation majorly through national Censuses, which has

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several limitations as such exercises do not go beyond identifying the people with disabilities and their percentage in population. Unless, there is assessment degree of disability, need including provision of AT and their cost, the exercise is worthless from the perspective of rehabilitation and AT. The implementation of modern tools developed by WHO, such as Model Disability Survey and Rehabilitation 2030, may resolve the issue as they are exclusively designed scientific tool to fathom the gravity and severity of the problems. Only a few countries have implemented these tools in this region, and that is also only in pilot project mode.

13. **Enabling Environment:** The physical environment is also playing a negative role, making AT products useless and withered easily. The public spaces and buildings, schools, hospitals, workplaces, transport system etc are yet not made accessible, even with

the help of assistive products, for users which are a great deterrent discouraging use of ATs. Accessible India like national campaigns in every member state may alleviate the situation to a great extent.

14. Accessible Information: IT world is overflowing with technologies which can potentially be of immense use to persons with disabilities. Standards exist for websites (WCAG 2.0), electronic documents and publications (EPUB 3.0) and other forms of technology, multi-media, and content which may make it easy for the person in need to access the product and services of governments from home and for the developer to create accessibility products and reach to the needy online. Unfortunately, little has been thought and done to enhance digital accessibility. The market also, however, fails to realise that there is a huge business case in tapping the market of persons with disabilities.

15. Due to illiteracy, the community is ridden with stigma and prejudices towards capacity of people with disabilities. A mass awareness campaign, including school curriculum, may create a positive environment towards the persons in need of AT, and their acceptance as productive work force.

The media plays a major role in creating public awareness, political will, and information dissemination in this part of world. They can also play a crucial role in dispelling prejudices and stigma towards disability. However, so far, Disability, Rehabilitation and Assistive Technology have never gained their focus and attention. Developing good Samaritans and champions among Media Personnel would be a meaningful step to create a sustained movement for the promotion of AT.

Interventions that media can undertake

Based on the potentials and challenges of the region, certain interventions are required where media can play a major role for improving accessibility of Assistive Technology and products for the region.

1. **Identify Health Ministry in each member state as Lead Agency responsible for promotion of AT.** The need assessment, production and distribution, and human resource development for AT are multisectoral and interdependent task and need fine coordination among stakeholder ministries and institutions. Nevertheless, health ministry plays a major role in identifying the disabilities and their needs. Therefore, it would be appropriate to assign the role of AT promotion to Ministry of Health in all member states. Such arrangement shall also ease out the role of WCOs as they usually interact with Health Ministry of the country for all of its activities and have a well-established channel of communication.

2. **Create an Advocacy Group of Parliamentarians in each member state.** As the Member States of WHO SEA Region are low- and middle-income group countries, having more pressing priorities for resource allocation than DPR. However, certain lobbies (Legislative Bodies) for farmers, weavers, industrialists etc get their due regularly in spite of the resource constraints. The people in need for AT (persons with disabilities, NCDs and old age) make 15% of population and is good enough force for lobbyism for their causes. A group of Parliamentarians at country level and of Legislative Members at province level should be developed as Advocacy Group, who can leverage the necessary support and resources to AT from withing the parliament/assemblies, and may generate a popular support for AT in the communities with help of civil societies.

3. **Create a Desk on DPR at each WCO with uniform mandate and agenda.** The Desk/focal at WHO Country offices should work as nodal agency to coordinate with responsible ministries of Member States for implementation and monitoring of programmes and activities instituted by WHO HQ/SEARO. They can also work as rallying point for advocacy and worthy DPOs and NGOs who can engaged for need assessment and distribution of AT products.

4. **Create a group of Good-Samaritans among Media Personalities.** As the media plays a major role in creating

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public awareness, political will, and information dissemination, and also plays a crucial role in dispelling prejudices and stigma towards disability and AT, a group of media persons may come forward to augment and highlight the efforts of WHO, Ministries and Advocacy Group for promotion of AT. They can also influence the political decisions in favour of DPR.

5. **Policy: Assistive Technology Policy Framework:**

   a. **Policy Dialogues:** The focal at WCOs and Lead Agency in the Member States should jointly initiate national policy dialogues to develop national assistive technology programmes to find mode of financing for production, and mechanisms for provisioning, personnel training for production and maintenance. Once the framework is ready, the Advocacy group of Parliamentarians can raise the issue in parliament and Good Samaritans in media can augment the efforts from outside with the help of civil societies.

   b. **Formation of Joint Working Group:** The role of various ministries for production and supply of assistive products are diverse but complementary and needs huge financial and technical support. Any decision in isolation may prove counterproductive or incompatible to other ministry. Hence, the Lead Agency should form a Joint Working Group (JWG) of Joint Secretaries (Health, Social Justice and Empowerment, Science n Technology, Industries, Skill Development, Finance) start the action in concerted manner right from beginning.

   c. **Strategic Document dedicated to AT:** Presently, all Member States have multiple schemes and programmes for benefits of elders, PWDs, NCDs and other such people, being implemented by different ministries and agencies. JWG should come up with a comprehensive policy framework and a 3 Year Action Plan to start with.

6. **Production: A Business Model**

   As estimated, approximately 250 million people in SEA Region are in need of assistive products of one or other kind. This is a huge magnitude to cater and need to start mass production and to meet the gap of demand and supply. As majority of the products are labour intensive and involve low or middle technology, it is a huge opportunity for skill development and employment for the masses as well. All Member States should start production on their own, for example under *Make in India* Campaign, or through regional cooperation and technology exchange. However, few obstacles still exist for mass production, and need to be addressed by member states:

   a. **Standardization of Specification and Design:** For getting high-quality products at affordable prices needs mass production, which in turn, requires standardization of specification and design. However, SEA region has no such standards putting a hurdle on manufacturers from mass production, and on users from getting spares etc. WHO SEEARO should engage an agency in the region for developing such regional standards, as it will also pave the road for regional cooperation on production and research. In addition, the step would also streamline the matters

related to material used, costing, and training of manpower for production and maintenance.

b. **Innovative Public Procurement Policy for ASSURED products:** Governments had been largest (sometimes sole) buyers of AT products in the region. However, the public procurements have several handicaps such as opting for Lowest cost, low-risk solutions, low margin local players and mature technology, which discourages mass production and mass production. Instead, the Member States should adopt an innovative Public procurement Policy where in the Government should act as 'First Buyer' and Early User' for small, innovative firms and manage the consequent risk in initial days. This will ensure a mass production which will be equitable in all respect; quality, cost, location and distribution and insure products to be ASSURED (Affordable, Scalable, sustainable, Universal, Rapid, Excellent, and Distinctive).

c. **Create National Fund for AT Production:** As the production, storage and delivery of assistive products requires a huge financial resource, and also for want of assured private buying due to poverty among buyers, private sector is hesitant forthwith. Also, majority of assistive products are made locally and in small scale/micro industries which need financial support to start. Therefore, the Member States should create a dedicated fund and provide the initial funding and seed money to attract young and new entrepreneurs.

d. **Create Public Private Partnership (PPP):** Besides the central production of assistive products by Govt through PSUs, a large number of small-scale productions are also going on by Small Scale Industries, NGOs and DPOs, care givers at local level. Capacity building of such small enterprises through PPP model will not only enhance their scale of production but also improve the quality and reduce the cost on distribution, making them more affordable and accessible.

e. **Assistive Technology Park within Special Economic Zones:** To attract entrepreneurs for investment and production of devices, the Member States should carve out AT Park within their SEZs and provide incentives for productions such as priority loans, differential rates of taxations etc. It will impart specialization in production and attract ancillary industries.

f. **Apex Institution for regional R&D and local innovations:** The APL List produced by WHO is basically generic and indicative in nature. Every country, however, has its own context as per the economic development, infrastructure, and the public awareness and utilisation. WHO SEARO should nominate an apex institution which should have its own research and development unit for making the design and production contextually correct and products user-friendly as per the infrastructure. The institution would also be able to initiate technology transfer on regional level to stabilize cost of production in the region.

g. Differential Taxation and other incentives: As the products are used by weaker section of society who are poorest of the poor-PWDs, older persons, the profit-margin for the manufacturers are very thin, making investment difficult. To encourage investment in the sector, Governments may consider differential taxation and other incentives such as tax holidays, priority loans etc.

7. Provision: Assistive Products Service Delivery Model

Availability of Assistive Products withing reasonable distance of person in need is the most crucial area where Member States must concentrate. As such overall accessibility is 6% of needy population in region. The condition in rural areas are even poorer. The factors such as physical barriers of mobility, urban location of manufacturers and distributors, no need-assessment in rural areas etc have posed more hurdles to accessibility in rural areas, where majority of needy population (for example 69% in India) in need live. To enable people to access assistive products for all functional needs, the Member States should consider:

a. Establishment of **District Products Delivery Centres** with the help of Civil Societies (NGOs) as single window accessible point to provide a range of basic assistive products, having a network of primary health care or community level health care.

b. To make the service delivery of assistive products an integral part of universal health care, and a network of specialist referral centres connected to primary health care.

c. Provision of **Insurance Coverage for APL**: To reduce state dependability, APL should be covered under medical insurance policies to encourage people for private buying.

8. Personnel: Assistive Products Training:

A large number of human resource and know-how is required for manufacturing and maintenance of products, and for service provision which includes four essential steps: assessment, fitting, training, follow-up and repair. Needless to emphasize, this is a huge employment opportunity for skilled and semi-skilled labour force, having job opportunity everywhere. Even a large number of youths with disabilities can be employed in the sector. Therefore, the concerned ministry of Member States should consider to:

a. develop an **Assistive Products Training Package** for improving the capacity of health workers

b. create Basic and Advanced **Training Modules** to add and improve the skills of health and rehabilitation personnel

c. design **Protocol for care** to the people in need, including the training of formal and informal caregivers

d. Explore possibilities for increasing local or regional capacity for specialised training.

9. **Place and Enabling Environment:**
Owing to low- and middle-income of the countries of the region, places and environment (public spaces, building and transport as well as the workplace) are often in-accessible in which assistive products are used. For example, as estimated during Accessible India Campaign, only 11% of Indian spaces and environment were accessible for the AT Users. Sociocultural barriers also play a critical context contexts of AT use in region. Therefore, the products need to be developed for users taking into account their contextual situation and functional needs, which may be heavily dependent on the physical and cultural environment they live in.

10. **Mass Awareness:**

a. Launch a Mass Awareness Campaign: Every member state in coordination with NGOs and DPOs should come up with a mass awareness campaign for use and production of ATs. As the numbers of people with disabilities and NCDs, and older people are too high in region, the regional market for AT would be too large and lucrative for investment, production and skill development. It is great opportunity for employment generation and export as well. It will also give a boost to schemes like Make in India, Accessibility India and Smart Cities etc in other countries as well. The user should also be made aware of the importance of assistive products for making them employable, productive and independent.

b. Media Awareness: Media houses should be involved to creating Mass Awareness material/contents / concepts (write-ups, audio-visual) for promoting use and maintenance of AT among persons with disabilities, NCDs and older people.

c. **Kiosk for Assistive Products Technology:** Display of products and technology is utmost important for educating the users for its proper use and maintenance, for understanding its utility for making life healthy, interdependent, productive and dignified. Such kiosks are also helpful in attracting the attention of manufacturing community for production. Govt should install them at public places such as major hospitals, shopping complexes, places of entertainment etc.

d. **Brand Ambassadorship for Disability & AT:** The outcome of engaging religious/spiritual leaders in Polio Eradication Programme had been phenomenal. Besides, promoting Brand-ambassadorship from among the persons of eminence from amongst PWDs, region should also consider roping in spiritual leaders. They may also be very helpful as brand ambassadors for dispelling the stigma attached with disabilities.

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Information useful for the better reporting

What is AT & Who need it

Assistive Technology (AT) is a generic term that includes assistive, adaptive, and rehabilitative devices, products, tools and equipment that help them improving their functionality at home, work or social interactions. They enable and promote inclusion and participation, especially of people with disability, aging populations, and people with non-communicable diseases. The primary purpose of assistive products is to maintain or improve an individual's functionality and independence, thereby promoting their well-being. People with disabilities often have difficulties in performing daily activities independently or even with assistance like; toileting, mobility, eating, bathing, dressing, grooming and personal device are etc. They enable people to live healthy, productive, independent and dignified lives, and to participate in education, employment and civic life. They can also help prevent impairments and secondary health conditions.

One billion people need assistive products today and more than two billion people around the world are expected to need at least one assistive product by 2030. While anyone may need an assistive product at some time in their life, they are most often required by adult and children with disability, older people and people with chronic health conditions such as diabetes and dementia.

Examples of assistive products include Hearing Aids, Wheelchairs, Walkers, Spectacles, Prostheses, Specialized Computer Software, devices that supports memory, Hardware to increase Mobility, Hearing, Vision or Communication capabilities among many others. While supporting independence and well-being, these products can also help to prevent or reduce the effects of secondary health conditions, such as lower limb amputation in people with diabetes. They can also reduce the need and impact on care-givers and mitigate the need for formal health and support services. Moreover, access to appropriate assistive products can have a tremendous impact on community development and economic growth.

Despite the global need and recognized benefits of assistive products, access to assistive products remains limited. Addressing this unmet need is essential to progress towards the achievement of the Sustainable Development Goals and realizing the Convention of the Rights of Persons with Disabilities.

Need of Assistive Technologies

Assistive technology reduces the need for formal health and support services, long-term care and the work of caregivers. Without assistive technology, people are often excluded, isolated, and locked into poverty, thereby increasing the impact of disease and disability on a person, their family, and society.

People who most need assistive technology include:

- ▶ people with disabilities
- ▶ older people
- ▶ people with noncommunicable diseases such as diabetes and stroke
- ▶ people with mental health conditions including dementia and autism
- ▶ people with gradual functional decline.

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What conditions may benefit from assistive devices?

Some disabilities are quite visible, while others are "hidden." Most disabilities can be grouped into the following categories:

▶ **Physical disability:** paralysis, difficulties with walking or other movement, inability to use a computer mouse, slow response time, difficulty controlling movement

▶ **Visual disability:** blindness, low vision, color blindness

▶ **Hearing disability:** hearing loss or impaired hearing

▶ **Mental conditions:** post-traumatic stress disorder, anxiety disorders, mood disorders, eating disorders, psychosis

▶ **Cognitive disability:** intellectual and learning disabilities/ disorders, distractibility, reading disorders, inability to remember or focus on large amounts of information

Hidden disabilities are those that might not be immediately apparent when you look at someone. They can include visual impairments, movement problems, hearing impairments, and mental health conditions.

▶ Some medical conditions may also contribute to disabilities or may be categorized as hidden disabilities under the Americans with Disabilities Act (ADA). For example, epilepsy; diabetes; sickle cell conditions; HIV/ AIDS; cystic fibrosis; cancer; and heart, liver, or kidney problems may lead to problems with mobility or daily function, and may be viewed as disabilities under the law. The conditions may be short term or long term; stable or progressive; constant or unpredictable; and changing, treatable, or untreatable. Many people with hidden disabilities can benefit from assistive technologies for certain activities or during certain stages of their diseases or conditions.

▶ People who have spinal cord injuries, traumatic brain injury, cerebral palsy, muscular dystrophy, spina bifida, osteogenesis imperfecta, multiple sclerosis, demyelinating diseases, myelopathy, progressive muscular atrophy, amputations, or paralysis often benefit from complex rehabilitative technology. The assistive devices are individually configured to help each person with his or her own unique disability.

How does rehabilitative technology benefit people with disabilities?

Rehabilitative technology can help restore or improve function in people who have developed a disability due to disease, injury, or aging. Appropriate assistive technology often helps people with disabilities compensate, at least in part, for a limitation.

Rehabilitative and assistive technology can enable individuals to health, well-being and socioeconomic benefits in following ways:

▶ Care for themselves and their families

▶ Learn in typical school environments and other educational institutions

▶ Work, employment and productivity

▶ Access information through computers and reading

▶ Enjoy music, sports, travel, and the arts

▶ Participate fully in community life

Assistive technology also benefits employers, teachers, family members, and everyone who interacts with people who use the technology.

The person with a disability, along with his or her caregivers and a team of professionals and consultants, usually decide which type of rehabilitative or assistive technology would be most helpful. The team is trained to match particular technologies to specific needs to help the person function better or more independently. The team may include family doctors, regular and special education teachers, speech-language pathologists, rehabilitation engineers, occupational therapists, and other specialists, including representatives from companies that manufacture assistive technology.

Assistive devices are external
devices that are designed,
made, or adapted to assist
a person to perform a
particular task.

Some light on assistive devices available

Assistive devices are external devices that are designed, made, or adapted to assist a person to perform a particular task. Many people with disabilities depend on assistive devices to enable them to carry out daily activities and participate actively and productively in community life.

1. Mobility Impairments

▶ **Wheelchairs:** Wheelchairs are devices that can be manually propelled or electrically propelled, and that include a seating system and are designed to be a substitute for the normal mobility that most people have. Wheelchairs and other mobility devices allow people to perform mobility-related activities of daily living which include feeding, toileting, dressing, grooming, and bathing. The devices come in a number of variations where they can be propelled either by hand or by motors where the occupant uses electrical controls to manage motors and seating control actuators through a joystick, sip-and-puff control, head switches or other input devices. Often there are handles behind the seat for someone else to do the pushing or input devices for caregivers.

▶ **Transfer Devices:** Patient transfer devices generally allow patients with impaired mobility to be moved by caregivers between beds, wheelchairs, commodes, toilets, chairs, stretchers, shower benches, automobiles, swimming pools, and other patient support systems (i.e., radiology, surgical, or examining tables). The most common devices are Patient lifts (for vertical transfer), Transfer benches, stretcher or convertible chairs (for lateral, supine transfer), sit-to-stand lifts (for moving patients from one seated position to another i.e., from wheelchairs to commodes), air bearing inflatable mattresses (for supine transfer i.e., transfer from a gurney to an operating room table), and sliding boards (usually used for transfer from a bed to a wheelchair).

▶ **Walkers:** A walker or walking frame or Rollator is a tool for disabled people who need additional support to maintain balance or stability while walking. It consists of a frame that is about waist high, approximately twelve inches deep and slightly wider than the user. Walkers are also available in other sizes, such as for children, or for heavy people. Modern walkers are height-adjustable. The front two legs of the walker may or may not have wheels attached depending on the strength and abilities of the person using it.

▶ **Prosthesis:** A prosthesis, prosthetic, or prosthetic limb is a device that replaces a missing body part. It is part of the field of biomechatronics, the science of using mechanical devices with human muscle, skeleton, and nervous systems to assist or enhance motor control lost by trauma, disease, or defect. Prostheses are typically used to replace parts lost by injury (traumatic) or missing from birth (congenital) or to supplement defective body parts. Inside the body, artificial heart valves are in common use with artificial hearts and lungs seeing less common use but under active technology development. Other medical devices and aids that can be considered prosthetics include hearing aids, artificial eyes, palatal obturator, gastric bands, and dentures.

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- **Exoskeletons:** A powered exoskeleton is a wearable mobile machine that is powered by a system of electric motors, pneumatics, levers, hydraulics, or a combination of technologies that allow for limb movement with increased strength and endurance. Its design aims to provide back support, sense the user's motion, and send a signal to motors which manage the gears. The exoskeleton supports the shoulder, waist and thigh, and assists movement for lifting and holding heavy items, while lowering back stress.

- **Adaptive Seating and Positioning:** People with balance and motor function challenges often need specialized equipment to sit or stand safely and securely. This equipment is frequently specialized for specific settings such as in a classroom or nursing home. Positioning is often important in seating arrangements to ensure that user's body pressure is distributed equally without inhibiting movement in a desired way.

2. Visual Impairments

- **Screen Readers:** Screen readers are used to help the visually impaired to easily access electronic information. These software programs run on a computer in order to convey the displayed information through voice (text-to-speech) or braille (refreshable braille displays) in combination with magnification for low vision users in some cases. There are a variety of platforms and applications available for a variety of costs with differing feature sets.

- Some example of screen readers are Apple VoiceOver, Google TalkBack and Microsoft Narrator. Apple VoiceOver includes the option to magnify the screen, control the keyboard, and provide verbal descriptions to describe what is happening on the screen. There are thirty languages to select from. It also has the capacity to read aloud file content, as well as web pages, E-mail messages, and word processing files.

- **Braille and Braille Embossers:** Braille is, a system of raised dots formed into units called braille cells. A full braille cell is made up of six dots, with two parallel rows of three dots, but other combinations and quantities of dots represent other letters, numbers, punctuation marks, or words. People can then use their fingers to read the code of raised dots.

- A Braille Embosser is, simply put, a printer for braille. Instead of a standard printer adding ink onto a page, the braille embosser imprints the raised dots of braille onto a page. Some braille embossers combine both braille and ink so the documents can be read with either sight or touch.

- **Refreshable Braille Display:** A refreshable braille display or braille terminal is an electro-mechanical device for displaying braille characters, usually by means of round-tipped pins raised through holes in a flat surface. Computer users who cannot use a computer monitor use it to read a braille output version of the displayed text.

- **Desktop Video Magnifier:** Desktop video magnifiers are electronic devices that use a camera and a display screen to perform digital magnification of printed materials. They enlarge printed pages for those with low vision. A camera connects to a monitor that displays real-time images, and the user can control settings such as magnification, focus, contrast, underlining, highlighting, and other screen preferences. They come

in a variety of sizes and styles; some are small and portable with handheld cameras, while others are much larger and mounted on a fixed stand.

▶ **Screen Magnification Software:** A screen magnifier is software that interfaces with a computer's graphical output to present enlarged screen content. It allows users to enlarge the texts and graphics on their computer screens for easier viewing. Similar to desktop video magnifiers, this technology assists people with low vision. After the user loads the software into their computer's memory, it serves as a kind of "computer magnifying glass." Wherever the computer cursor moves, it enlarges the area around it. This allows greater computer accessibility for a wide range of visual abilities.

▶ **Large-print and Tactile Keyboards:** A large-print keyboard has large letters printed on the keys. On the keyboard shown, the round buttons at the top control software which can magnify the screen (zoom in), change the background color of the screen, or make the mouse cursor on the screen larger. The "bump dots" on the keys, installed in this case by the organization using the keyboards, help the user find the right keys in a tactile way.

▶ **Navigation Assistance:** Assistive technology for navigation has exploded on the IEEE Xplore database since 2000, with over 7,500 engineering articles written on assistive technologies and visual impairment in the past 25 years, and over 1,300 articles on solving the problem of navigation for people who are blind or visually impaired. As well, over 600 articles on augmented reality and visual impairment have appeared in the engineering literature since 2000.

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Most of these articles were published within the past 5 years, and the number of articles in this area is increasing every year. GPS, accelerometers, gyroscopes, and cameras can pinpoint the exact location of the user and provide information on what's in the immediate vicinity, and assistance in getting to a destination.

▶ **Wearable Technology:** Wearable technology are smart electronic devices that can be worn on the body as an implant or an accessory. New technologies are exploring how the visually impaired can receive visual information through wearable devices.

Some wearable devices for visual impairment include:

▷ OrCam device

▷ eSight

▷ Brainport

3. Hearing Impairments

Hearing Aids: A hearing aid or deaf aid is an electro-acoustic device which is designed to amplify sound for the wearer, usually with the aim of making speech more intelligible, and to correct impaired hearing as measured by audiometry. This type of assistive technology helps people with hearing loss participate more fully in their hearing communities by allowing them to hear more clearly. They amplify any and all sound waves through use of a microphone, amplifier, and speaker. There is a wide variety of hearing aids available, including digital, in-the-ear, in-the-canal, behind-the-ear, and on-the-body aids.

Assistive Listening Devices: Assistive listening devices include FM, infrared, and loop assistive listening devices. This type of technology allows people with hearing difficulties to focus on a speaker or

subject by getting rid of extra background noises and distractions, making places like auditoriums, classrooms, and meetings much easier to participate in. The assistive listening device usually uses a microphone to capture an audio source near to its origin and broadcast it wirelessly over an FM (Frequency Modulation) transmission, IR (Infra-Red) transmission, IL (Induction Loop) transmission, or other transmission methods. The person who is listening may use an FM/ IR/ IL Receiver to tune into the signal and listen at his/ her preferred volume.

Amplified Telephone Equipment: This type of assistive technology allows users to amplify the volume and clarity of their phone calls so that they can easily partake in this medium of communication. There are also options to adjust the frequency and tone of a call to suit their individual hearing needs. Additionally, there is a wide variety of amplified telephones to choose from, with different degrees of amplification. For example, a phone with 26 to 40 decibels is generally sufficient for mild hearing loss, while a phone with 71 to 90 decibels is better for more severe hearing loss.

Augmentative and alternative communication

Augmentative and alternative communication (AAC) is an umbrella term that encompasses methods of communication for those with impairments or restrictions on the production or comprehension of spoken or written language. AAC systems are extremely diverse and depend on the capabilities of the user. They may be as basic as pictures on a board that are used to request food, drink, or other care; or they can be advanced speech generating devices, based on speech synthesis, that are capable of storing hundreds of phrases and words.

4. Cognitive Impairments

Memory Aids: Memory aids are any type of assistive technology that helps a user learn and remember certain information. Many memory aids are used for cognitive impairments such as reading, writing, or organizational difficulties. For example, a Smartpen records handwritten notes by creating both a digital copy and an audio recording of the text. Users simply tap certain parts of their notes, the pen saves it, and reads it back to them. From there, the user can also download their notes onto a computer for increased accessibility. Digital voice recorders are also used to record "in the moment" information for fast and easy recall at a later time.

Educational Software: Educational software is software that assists people with reading, learning, comprehension, and organizational difficulties. Any accommodation software such as text readers, notetakers, text enlargers, organization tools, word predictions, and talking word processors falls under the category of educational software.

5. Eating Impairments

Adaptive eating devices include items commonly used by the general population like spoons and forks and plates. However, they become assistive technology when they are modified to accommodate the needs of people who have difficulty using standard cutlery due to a disabling condition. Common modifications include increasing the size of the utensil handle to make it easier to grasp. Plates and bowls may have a guard on the edge that stops food being pushed off of the dish when it is being scooped. More sophisticated equipment for eating includes manual and powered feeding devices. These devices support those who have little or no hand and arm function and enable them to eat independently.

6. Personal Emergency Response Systems

Personal emergency response systems (PERS), or Telecare (UK term), are a particular sort of assistive technology that use electronic sensors connected to an alarm system to help caregivers manage risk and help vulnerable people stay independent at home longer. An example would be the systems being put in place for senior people such as fall detectors, thermometers (for hypothermia risk), flooding and unlit gas sensors (for people with mild dementia). Notably, these alerts can be customized to the particular person's risks. When the alert is triggered, a message is sent to a caregiver or contact center who can respond appropriately.

7. Accessibility Software

In human–computer interaction, computer accessibility (also known as accessible computing) refers to the accessibility of a computer system to all people, regardless of disability or severity of impairment, examples include web accessibility guidelines. Another approach is for the user to present a token to the computer terminal, such as a smart card, that has configuration information to adjust the computer speed, text size, etc. to their particular needs. This is useful where users want to access public computer-based terminals in Libraries, ATM, Information kiosks etc. The concept is encompassed by the CEN EN 1332-4 Identification Card Systems – Man-Machine Interface. This development of this standard has been supported in Europe by SNAPI and has been successfully incorporated into the Lasseo specifications, but with limited success due to the lack of interest from public computer terminal suppliers.

The national censuses are the tool through which the data on disabilities are collected which is erroneous from both perspectives: quantity as well as quality.

Status of data & statistics on AT

To find a right solution for an issue, it is very essential to know its quantum. But the approach of Member States is contrary to it. The national censuses are the tool through which the data on disabilities are collected which is erroneous from both perspectives: quantity as well as quality. The Census has primitive questionnaire on disability, and the response of Census officials is also not encouraging for lack of specific guidelines and transparent definitions of disability. They mainly depend upon the possession of disability certificates for identifying them as disable. It is everyman's guess that how many of disables do obtain such certificates. On the other hand, persons with disabilities and their family member invariably try to conceal their disability due to social stigma, and also due to psyche of getting nothing by declaring their impairments. Resultantly, the data on disability is not the data of prevalence of disability, but, in fact, it is data on prevalence of disability certificates.

2ndly, while the Censuses or survey may identify, to some extent, the people with disability , but it is beyond their domain to assess the disability burden from rehabilitation perspective as it cannot have the assessment of degree of disability, and cause and age factor which are crucial for need assessment.

3rdly, such mode of data collection does not have consideration for the environmental or place factor, social or physical barrier, cultural or contextual factors converting impairment into disability.

As per WHO, about 15% of world's population live with one or other forms of disabilities. The developed nations too have shown high percentage of disability,

such as 20% in Australia, 19.4% in USA and 18.5% in Canada. All the factors causing disabilities such as malnutrition, intra-uterine & post-birth chronic infections, accidents and industrial hazards are much more prevalent in India than these nations. Yet, the census of India shows only 2.3% of Indian population having disabilities which is unbelievably low. Obviously, this is a consequence of erroneous, narrow and highly restrictive parameters for collecting statistics on disability.

The training material intends to make Media Personnel realize that without correct assessment of its magnitude, appropriate approach for its solution wouldn't come. Need is to broaden and rationalize the parameters, and also to create a specialized agency to gather statistics. We motivate persons with disabilities too for coming forward during such survey. The cradle has undertaken a pilot project for collection of statistics on disability to illustrate the ground reality.

It is proposed that Member States must launch the WHO specific tools, at least on PILOT MODE, for need assessment. Such tools specialized tools of WHO are Model Disability Survey, Rehabilitation 2030 and SDGs. With the help of technical support from WHO and field resources of NGOs and DPOs, such projects can be implemented in certain districts on pilot mode. Such tools are may prove most suitable kit for effective policymaking as they are designed to collect reliable and detailed data on all aspects of disability – impairments, activity limitations, participation restrictions, related health conditions, environmental factors etc.

Reporting on **Disability**

For creating an inclusive policy for assistive technology, it is essential to connect different stakeholders of assistive technology and products, to encourage exchange of experiences and best practices, and to simply become aware of stakeholders already working in this field.

Policy framework and challenges

The WHO SEA Region comprises of 11 low-and middle-income group countries, having relatively low education and awareness, high unemployment and low budget allocation for rehabilitation. Generally, the political drive for production and provision of assistive products is low with poorly structured systems in place to aid service delivery.

Based on the GATE workplan, there are four overarching, interlinked solutions for countries to improve access to assistive technologies:

▶ A national policy framework for assistive technology is needed, with adequate funding support and a focal unit to promote intersectoral actions.

▶ Product development by research and development partners should be encouraged through incentive schemes that support and promote affordable assistive products.

▶ Capacity-building of personnel is needed, through undergraduate and in-service training, as well as training of formal and informal caregivers.

▶ Provision needs to be enhanced, especially through integration of services with the health system.

For creating an inclusive policy for assistive technology, it is essential to connect different stakeholders of assistive technology and products, to encourage exchange of experiences and best practices, and to simply become aware of stakeholders already working in this field such international organizations, governments, academics, data experts, standardization bodies and of course civil society organizations. There are very different ways to build this community,

and the community will be strongest if a thorough mapping process to establish existing formats, technologies and stakeholders is undertaken. Stakeholders who are often overlooked in these processes may include self-advocates for the independent-living movement, Indigenous peoples in countries where their inclusion is often marginalized, rural people in poorly resourced settings, people with intellectual disabilities for whom assistive technology may be especially beneficial for community living.

1. **Policy Steps:** Presently the Member States have multiple schemes and programmes separately for benefits of elders, PWDs, NCDs and other such people, being implemented by different ministries and agencies. Instead, they should come up with a comprehensive policy for production and delivery of assistive products to all of citizens who are in need- persons with disabilities, persons with NCDs and older persons. The products should be high quality and affordable, and contextually correct in size and technology.

2. The production and distribution of assistive products involves various ministries who have diverse but complementary role to each other. Any decision in isolation may prove counterproductive or incompatible to other ministry. Hence, Member States should identify the lead agency on AT and develop a 3Yr Plan of Action, incorporating the role of various ministries such as Ministries of Health, Social Justice and Empowerment, Science n Technology, Industries, Skill Development, Finance etc. They should

form a Joint Working Group(JWG) of Joint Secretaries of all stakeholder ministries (Health, Social Justice and Empowerment, Science n Technology, Industries, Skill Development, Finance) immediately to start the action in concerted manner right from beginning and to achieve universal access within stipulated time.

3. The Joint Working Group should consider-

   i. Assessment/ Mapping of current policies and service delivery framework for assistive products and technology in member states.

   ii. Review of current status of accessibility of assistive devices and technology for persons with disability, NCDs and older persons.

   iii. Identify constraints in production and supply to the users, and their solutions.

   iv. Suggest modalities to strengthen multi-sectoral collaboration mechanisms and resource mobilization at the national and sub-national levels for improving access to assistive devices to everyone, everywhere.

   v. Development of National Assistive Technology Policies and Programmes, as an integral component of universal health coverage.

   vi. Prevalence Assessment of need / supply of Assistive Products in community.

   vii. Gathering of Contextual Factors/ inputs from community and environment for suggesting frugal innovations design of Assistive Products.

viii. Identification of best practices and processes for improving access to assistive technology for everyone and everywhere

The JWG should also derive ways to finalise the country specific APL (Assistive Priority List) with the help of lead technical agencies as it has been done by ICMR in India.

4. **Policy Gaps:** Different types of gaps exist in several areas relevant to policy development in this region. This includes, the identification of short and long-term evidence that would be useful for policy making, the use of existing data and information within policy, fostering policy development in an inclusive manner, the evaluation of existing policy according to human rights and social inclusion criteria, the implementation of policy, and its monitoring and evaluation by an appropriate range of stakeholders, especially the consumers and users of such technology. Very often policy-makers – including in the health and welfare sectors – are not familiar with disability, impairment or assistive technology issues, and are, therefore, not aware of some of the policy challenges in this area, including the significant challenge of cross-sectoral working. It is often found that policy development excludes its intended beneficiaries and are undertaken by consultants unfamiliar with the ground realities, cultural or economic contexts. The Region faces all types of policy gaps and challenges, such as:

   i. **Policy Awareness Gap,** where policy makers are unaware of nuances of disability, rehabilitation and disability-specific policy instruments (e.g., CRPD), and disability representatives knew little about the policy instruments,

which is the result of nil or low training inputs to the policy makers and low literacy among users and community. Govt's policies and programmes are made and steered through its official. Their approach and attitude towards the issue are paramount in framing and execution of the programmes. There are training institutes for the bureaucracy in each Member States where officials are imparted training as per their service requirement. But, none of the training institutes have any curriculum on disability for their training. Officials perceive the issue as per their upbringing, and therefore there is no consistency in execution of the policies.

Most importantly, it is the prevailing suspicion among authorities regarding ability of the persons with disabilities. Resultantly, neither they are aware with the enormity of the situation, nor they become sensitive to the disables. The social stigma they carry as member of society towards the disables is also not moderated in light of scientific training. They remain equally sceptical about the ability of the disables. Such mindset of the govt officials needs to be rectified during basic training as they are the future pillars of all govt programmes and policies for the disables. Therefore, the study proposes that the member states should incorporate a module on disability in their basic or refresher course curriculum.

ii. **Policy Process Gap,** where policy documents rarely reflect the primary concerns of user communities, even where there was consultation with Disabled Peoples Organizations (DPOs). Usually, there is no mechanism to consult community on policy matters. Legislations are made on the basis of feedback given by parliamentarians and legislative members, who themselves are neither much aware by the ground reality nor they carry the same zeal and enthusiasm for people with disability. In few cases, consultation did happen but due to poor priority and commitment, the voices from the ground are not heeded while policy is framed. Therefore, the study proposes that the Member States should develop a group of parliamentarians and legislators who would be able to raise the community voice in parliament where the policy framework is laid.

Resource Allocation also requires constant lobbyism before political leadership, which requires a strong advocacy. A group of parliamentarians from within and a group of media persons from outside the parliament (law making body of nation) are necessary the needed for sustained and effective advocacy for policy framework and fund allocation.

iii. **Policy Implementation-Monitoring Gap,** where there was a lack of explicit indicators for monitoring and evaluation, that were disaggregated by disability, or had disability specific concerns. In absence of reliable data on disabilities, it is very difficult assess the need, met or unmet, erroneous to derive mechanism for implementation, and impossible to find a way for monitoring. For example, the Govt of India has an ADIP scheme, wherein the people with disability gets financial assistance for buying assistive devices. But, due to lack of data of

It improves functioning and mobility which has numerous economic benefits such as improved health outcomes and quality of life, better education and employment outcomes, and higher productivity. These benefits could translate into a reduction in the health and social care costs associated with impaired functioning. Evidence also shows slower functional decline and higher likelihood of maintaining independence among older people living with a disability who received assistive products and home modification; positive health and social effects from an accessible home environment among people with functional limitation; as well as positive impacts of assistive products on children with physical impairments and their caregivers. The improved health outcomes could reduce healthcare and social care costs as well.

More broadly, the benefits of assistive technology may also extend to a stronger labour supply and industry development, which would benefit the economy. The provision of assistive technology could confer positive impacts on existing and future workforce. The impact could be as direct and immediate as returning a person to work by providing a prosthetic limb and rehabilitation; or improving the vision of workers by providing corrective lenses. For example, workers with poor vision, not wearing glasses, are three times more likely to be asked by supervisors to repeat their work, than after receiving and wearing glasses. Importantly, assistive technology also helps with laying the foundation for a stronger future workforce through increasing levels of education and better education outcomes. Earlier fitting of hearing aids contributes to

district, the assistance is granted on first come first basis, breeding the ground for mishandling, misuse and non-monitoring, the officials have no clue how to select the most needy on priority, and ho to monitor the outcome.

5. **Policy Triggers: The economic case for assistive technology.**

The use of assistive technology has wide ranging positive economic impacts on individuals and society.

better language, academic and social outcomes in children. In India, the provision of free glasses to children with short-sightedness was found to improve their performance on mathematics test to a statistically significant degree.

The cost of retaining an employee who acquires a disability is considerably less than the cost of hiring and training new employees. These are important mediators for building skills for the future workforce. Often neglected aspect of assistive technology economics is that many types of assistive products can help increase productivity for those that are not living with a disability - leading to wider application of current technologies and, therefore, increasing economic benefits. Indeed, mainstreaming accessibility and various forms of assistive technology within existing products is a key focus for many of the leading technology companies today. So for instance Apple's development of Siri or Microsoft's eye-gaze technology are examples of assistive technologies that have gone mainstream and can contribute to everybody's productivity and quality of life.

While the CRPD and other international policies may well set the context for a discussion on assistive technology policy; such instruments on their own are rarely enough to propel government towards policy work. Evidence concerning the social, economic and wellbeing benefits, and impact, of assistive technology, may be especially persuasive. The widespread fragmented delivery of services, which are often mainly reactive, with many silos, and often with many specialists in the "supply chain", is a very costly way to provide a service. Thus, arguments addressing the need for improved efficiency may be relevant. With the increasingly emphasis on person-centeredness, on co-design and on user-led initiatives; it may also be argued that the ethos of the assistive technology sector, is out of kilter with government policy else- where, and, therefore, serves to diminish its coherence and overall effectiveness.

6. **Policy Challenges:** It is also crucial not to underestimate the challenges of producing good policy in this domain. For instance, policy must be across all sectors, in the same way that people live across all sectors. It also needs to consider the whole-life-span approach to people's lives. These are both difficult for government, requiring cross-ministerial work and for government to commit to long term planning, which may not be expedient for shorter-term political gain.

More generally, for governments to have a policy on AT, it has to be made clear that it is all AT i.e., everything from walking sticks to digital health; and this also fits in with holistic and person-centred care and support. However, policy is often most influenced by financial rewards for doing something, or financial penalties (through prosecution or reputational damage) for not doing something. The economic case for assistive technology, therefore, needs to be strengthened and is perhaps one of the most important change factors for improving assistive technology systems. The economic case will be made most emphatically when there is evidence of the effectiveness of assistive technology at the individual, community and Sate/national levels; and so research, monitoring and evaluation has to target these different levels in ways that allows for the findings to be integrated meaningfully.

The World Health Assembly Resolution WHA71.8 urges WHO Member States to promote investment in research and development, innovation and product design, in order to make existing assistive products affordable.

Demand-production-supply triad

Media may play a multiplier role in making the Demand-Supply-Use Triad of AT understood well by the community and policymakers together. As the AT products improve functionality of persons in need, community should be made aware that they help improving their mobility, and prospect of education, employability and productivity. The policy makers should also be sensitized and educated that the AT products are not a simple welfare measures, but a crucial investment in leveraging the lives of PWDs and making them productive. Therefore, it is not only the production which needs to be increased but also the demand for use and supply at the community level.

i. **Increasing awareness and demand:** In the World Health Assembly Resolution WHA71.8, Member States are urged to develop a national list of priority assistive products that are affordable, cost effective and meet quality and safety standards, based on the Priority assistive products list. It is anticipated that national lists will trigger awareness among health-care providers, especially if governments also commit to allocating adequate funding to improve delivery systems and training of health workforces. In turn, health awareness among professionals, and improved availability of these priority assistive devices, should gradually increase public awareness and demand.

ii. **Product development and adoption:** WHO initiated GATE as a platform for international collaboration across governments, United Nations agencies and civil society groups, to incentivize the development of products that are affordable for adoption in developing countries. The Priority assistive products list should stimulate interest in improved product designs that take into account user-defined needs to facilitate wider adoption and use. Promoting low-cost locally produced items, raising awareness and fostering targeted research will improve access.

iii. **Financing and delivery:** In the context of the SDGs and universal health coverage and the adoption of World Health Assembly Resolution WHA71.8, governments need to embed assistive technologies and associated services in health and community services, and subsidize the provision of assistive devices and services such that they are free of charge. Government subsidies for assistive technologies are required, as household out-of-pocket payment for these services can be a major barrier to access. In-service training of existing cadres of health personnel can be rapidly scaled up to support the initiation or strengthening of service provision. This should run in parallel with a long-term plan for undergraduate curriculum development and training. Focus should be on improving the economies of scale in manufacturing and assembling products locally, and reducing or exempting import duties, especially where importing countries do not have local production capacities. Appropriate products should be made available and properly prescribed and fitted; users should receive proper training with appropriate follow-up; and societal and environmental barriers should be removed.

iv. **Multisectoral action:** Effective multisectoral collaborations contribute to a holistic approach to fostering functional capability and autonomy among all potential beneficiaries of assistive devices. This requires a whole-of-government approach. Universal designs for assistive technologies, buildings, transport, and information and communication technologies require multisectoral actions across government and business sectors. Multisectoral involvement, especially of governments, manufacturers, users and consumers, can be embedded in the national assistive technology policy framework. For example, in a project in Thailand, architects and engineers supported design and housing modifications to enable independent living by people with disabilities, with community involvement and funding support from local government. Government agencies, industries and research groups demonstrated successful innovation in assistive technology through coordinated knowledge transfer, partnerships and focused funding that support training, local research and development, and manufacture of high-quality solutions, with involvement and active participation by people with disabilities. Effective governance of multisectoral action requires leadership capacity across sectors and levels of government and cultivation of champions in different sectors who can agree on common objectives.

v. **Closing the evidence gap:** Regular surveys of needs and unmet needs for assistive technologies are critical for public monitoring of progress and holding governments accountable.

This evidence should be made public and used to ensure accountability, especially regarding commitments to the CRPD and SDGs. Data on unmet needs have been collected in high-income counties and also in low- and middle-income countries. Culturally relevant assistive technologies for specific subpopulation groups also help to minimize unmet needs.

The World Health Assembly Resolution WHA71.8 urges WHO Member States to promote investment in research and development, innovation and product design, in order to make existing assistive products affordable and to develop a new generation of products, including high-end or advanced assistive technology. This can be done by taking advantage of universal design and new evidence-based technologies, in partnership with academia; civil society organizations, in particular with people with disabilities and older persons and their representative organizations; and the private sector.

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The assistive product market is set to greatly expand in the near future, fuelled by population growth and increased longevity, as well as advances in technology.

Production & supply challenges

Production: possibilities & challenges

1. As per the WHO estimates 15% of population of a country falls in the category who require assistive products for education, employment, daily living and mobility. Even by a modest estimate, 250 million people need these products in SEA Region itself. This is a huge magnitude to cater and need to start mass production of assistive devices full-fill the gap of demand & supply, lest the import may fil the gap. At the same time, it is a huge opportunity to for production, skill development and employment generation.

2. The assistive product market is set to greatly expand in the near future, fuelled by population growth and increased longevity, as well as advances in technology. For example, the global market for assistive products for the elderly and people with disability was valued at US$14.1 billion in 2015. By 2024, the market is estimated to reach US$26.0 billion, corresponding to a compound annual growth rate of 7.4% between 2016 and 2024.

3. In many countries, domestic markets for assistive products and related industries are relatively new and awaiting further development. Developing local industry could not only serve to meet the local demand at an affordable cost, but also to provide opportunities for job creation through enhancing local technical capability and innovation. Furthermore, like other industries, the benefits would have positive spill over effects to the broader economy along

the value chain of the primary (raw materials), secondary (manufacturing) and tertiary (service) sectors. The potential of the sector has been noted by some governments and has been incorporated into their economic development plan. For example, the State Council of the People's Republic of China has issued a plan to foster "innovation capability, industry upgrade, effective market supply and a favourable market environment, to enhance industry development", with a view to generating outputs of more than ¥700 billion (US$103.3 billion) from the rehabilitation and assistive products industry. Other examples include the emerging hearing device manufacturing sector in a number of countries, including India and Thailand.

4. The argument for the growth of the assistive technology industry within countries may be persuasive for policymakers, and in capturing parliamentary interest. At the First Global Assistive Technology Conference in Beijing 2014, the Heads of State from China and Germany were present to testify their country's support for and interest in assistive technology; this was also clearly demonstrated by the strong presence of manufactures form both countries at the accompanying EXPO trade fair. The Second Global Assistive Technology Conference, Beijing 2017 explicitly linked assistive technology to China's ambitious "Belt and Road" initiative; for increasing its trade and cultural links with Asia, Africa and Europe. Such initiatives have high- lighted the importance of policy addressing market shaping. Market shaping in the assistive technology

context refers to engaging market factors with social equity; balancing these to allow genuine need due to impairment to develop into reliable demand for assistive products, and for affordable and quality sup- ply to embrace social gain, as well as financial profitability.

5. Another relevant policy issue is that many assistive technology products are viewed by States as medical devices and are subject to rigorous legislative requirements or subject to particular standards (for instance, as approved by the International Standards Organization, ISO). Whilst this may be appropriate in many circumstances, it can be restrictive for access in other contexts, where in particular some lower-tech solutions may be more realistic, more affordable and more likely to be effectively maintained. Standards may, therefore, need to be more dimensional than absolute, with of course minimum standards to ensure safety and the prevention of harm to users. Onerous legislative requirements also drive up cost, time to development and can be off putting to investment by innovators and industry; thus, reducing availability and affordability.

6. Barring a few products, majority of products require low or middle level technology, making it suitable for both at mass production or local production, a well-deserving prospect for Make in India like campaign in the region. It is also a fact that, traditionally, the devices are manufactured and distributed to users by a large number of foundations and organisations run by civil societies, for example Jaipur foot etc. Such organisations, given adequate technical support, can prove a great network of production and to a large extent also help creating a delivery service network.

Challenges of production:

It is well established fact that it is the mass-production of assistive products which can ensure quality products at affordable price. But owing to economic situation in the SEA Region, production of assistive products faces following major challenges and needs to be solved to reach the desire level of production.

1. **Lack of Standards and Design:** Lack of Standard Specification and Universal Design for the products creates hurdle for manufacturers and users both. The manufacturer fears for going its products outdated very fast and unpredictability of its demand. The users, on the other hand, face great difficulties for maintenance and spare parts. The mass production cannot be undertaken in absence of specific standards, measurements and specification of material used for the products. Similarly, it is equally essential that the design of a product be universally applicable. It is therefore desired that the WHO SEARO should select a lead agency in the region for deriving standards and design. In addition, matters related to standardization of manufacturing processes, costing, and training are also required to be settled.

2. **Lack of Funding for Production:** Capital is an essential means for mass production. It requires huge financial investments either from public or private sources. It has also been understood that the production of assistive devices are not very profitable for want of purchasing capacity of users being disables or old age, so attracts least of private funding. On the other hand, as nations are low- or middle-income countries, public finance is also not readily available.

Solution lies in arranging funds from the CSR Funding. The Public Sector Undertakings (PSU) are mandated for certain portion of their profit to be spent on social causes. This makes a huge pile up of money and they are not able to spend their full funds (Corporate Social Responsibility Fund) for want of worthy activities proposed by reliable agencies. From the discussions with competent authorities at PSUs, it has been reliably learnt that they would be happy to spend their CSR funds, given WCOs make suitable proposals to them. With well-meaning efforts, such funds can be easily tapped for steering some flagship agenda of AT production in the region as they are also in search of worthy institutions and initiatives to spend on.

3. **Public Procurement Policy:** Low and erratic demand cycle is a big impediment on private production of assistive devices. Solution lies in aggressive demand side initiatives wherein, with large size procurement budgets, the Government of Member States can not only be the biggest, but also the most influential and demanding customer.

The public procurement policy for AT products should be based on three pillars:

i. Governments could act as the 'first buyer' and an 'early user' for small, innovative productions and manage the consequent risks, thus providing the initial revenue and customer feedback they need to survive and refine their products and services so that they can later compete effectively in global market. Interestingly, based on 1100 new firms in Germany, it was found that public procurement wa especially effective for smaller enterprises.

ii. Government can set up regulations that can successfully drive such productions either indirectly through alerting market structure and affecting the funds available for investment, or directly through boosting or limiting demand for particular products.

iii. Government can set standards that can create market power by generating demand for a particular innovation. Agreed standards will ensure that the risk taken by producer is lower, thus increasing investment in innovation.

4. **Differential Taxation and other incentives:** As the products are used by weaker section of society who are poorest of the poor-PWDs, older persons, the profit-margin for the manufacturers are very thin, making investment difficult. To encourage investment in the sector, Govt may consider differential taxation and other incentives such as tax holidays, priority loans etc.

5. **Public Private Partnership (PPP):** Besides the central production of assistive products by Govt through PSUs, a large number of small-scale productions are also going on by SS Industries, NGOs and DPOs, care givers at local level. Capacity building of such small enterprises through PPP model will not only enhance their scale of production but also improve the quality and reduce the cost, making them more affordable.

6. **Assistive Technology Park within Special Economic Zones:** To attract entrepreneurs for investment and production of devices, the Govt should carve out AT Park within its SEZs and provide incentives for productions such priority loans, differential

Reporting on **Disability**

rates of taxations etc. It will impart specialization in production and attract ancillary industries.

7. **Task for R&D and local innovations:** The APL List produced by WHO is basically generic and indicative in nature. Every country, however, has its own context as per the economic development, infrastructure, and the public awareness and utilisation. Member States should have their own research and development for making the design and production contextually correct and products user-friendly as per the infrastructure and job requirement.

Delivery services & distribution network

1. The Delivery System for AT products and services in the region has never been institutionalised. The products are distributed in ad-hoc manner with camp approach, neither the need assessment can be done in a meaningful way nor there can be follow up for the maintenance or repair. The practice is not only urban centre, but highly unscientific and wasteful and very arduous for the person in need to travel and receive from distant places. Establishing an institution of distribution with the help of Civil Societies can be a meaningful and cost-saving step, which can cater the need of rural and urban both in a sustained manner. The same has been envisioned in SDG as well.

2. Due to physical impairments, social and physical barrier, people in need of assistive products face numerus hurdles in getting the products. The Member States should consider to :

i. develop a products service delivery model to provide them from a single accessible point,

ii. make the service delivery of assistive products an integral part of universal health care, and a network of specialist referral centres connected to primary health care,

iii. set in order to provide a range of basic assistive products at the primary health care or community level

iv. explore possibility of Insurance for universal coverage/supply of APL.

3. To create an institutional delivery system near to the user community, a distribution network of NGOs is suggested. Traditionally, many NGOs are working meaningfully for the welfare of disables and old age in the region. They are willing to render their services as well. One such unit can be considered for a general population of 0.5 to 1 million, and an area of 500 Sq Kms, ie. a district in India. The District Administration should select a lead NGO and hand over the responsibility of door-step delivery to them. Such chance interaction can also be an opportunity for need assessment and maintenance of the devices.

4. It is also important to smoothen out the problems of prescription and delivery. Usually, the devices are advised as medical prescription by doctor (Health Department), but the provision of the devices are made by the social welfare centres (Social Welfare Department). This creates a huge difficulty for the user as he has no opportunity to bring together both the authorities, in case of neglect and apathy which are very often in this part of world due to population

pressure. The brunt of inter-disciplinary rivalry is born by the poor user. To rid out the perpetual misery, the region should take an unanimous decision to assign the role of prescription and provision to health department. For such kind of decisions, a regional assembly of health Ministers may be appropriate to discuss.

5. Finance and Insurance: It is also true that it is not all who need assistive products depend upon government supply, but they choose to buy and use. Moreover, to augment such tendency in community, Member States should consider to develop:

   i.   A model financial support system for users and manufacturing sectors;

   ii. Institutional finance for bringing the APL at par with WHO Model List Of Essential Medicines

   iii. Assessment of Financial implications of delivery of assistive products becomes as an integral part of the health/social welfare system of member states.

   iv. To explore possibility of Insurance for universal covering/supply of APL.

   v.   CSR mandate may also be consider for making suitable provision for financing manufacturing and services.

Human resource development

A large number of human resource and know-how is required for manufacturing and maintenance of products, and for service provision which includes four essential steps: assessment, fitting, training, follow-up and repair. Needless to emphasize, this is a huge employment opportunity for skilled and semi-skilled

labour force, having job opportunity everywhere. Even a good number of youths with disabilities can be employed in the sector.

The member states should consider to:

i.   develop an assistive products training package for improving the capacity of health workers

ii. devise basic and advanced training modules to add and improve the skills of health and rehabilitation personnel

iii. designing protocol for care to the people in need, including the training of formal and informal caregivers

iv. explore possibilities for increasing local or regional capacity for specialised training.

Community awareness

1. **Role of Community**

   i.   The full and active participation of civil society, in particular DPOs as organizations representing a diversity of users of assistive technology, is important in order to authenticate the policy process. We highlight three issues where civil society has an especially important role. Access to relevant information for all social actors in a timely and accurate way is crucial. In particular, about persons with disabilities, it is necessary to ensure that information can be provided in accessible and alternative formats, in order to promote the full and effective participation of this group. Civil society is often the provider of accessible formats, such as through screen readers, screen magnifiers, or text to speech devices; but also formats not necessarily provided by technology, such as Easyread or Sign Language.

ii. Capacity building programs in areas such as human rights advocacy, leadership and awareness raising, designed for and usually run by civil society organizations, are critical in enabling people with disabilities, DPOs and NGOs, to claim rights and develop focused campaigns on achieving them. Policy needs to identify channels for how this activity can contribute to policy development and implementation. Without providing such channels, and legitimizing this activity, rights claimers are placed on the 'outside', and can be seen as negative and critical of government, when in fact they are advocating for internationally agreed human rights principles. Creating a space for meaningful participation – including DPOs and NGOs as representative organizations – is also about ensuring the conditions for meaningful participation are created, in terms of staff sensitized, accessibility of venues and accessible information and communication. There is thus a corresponding need to heighten awareness within policy-making domains that those on the 'outside' share many of the same goals as policy makers. It may well be that important lessons can be learned from the experience of other marginalized groups (such as women and girls, ethnic minorities and older people) to influence mainstream policy.

iii. Once completed, these first steps can lead to civil society representatives being empowered; this may include forming national coalitions, meeting government officials to review, monitor and oversee national policies. It may also involve people with disability securing leading roles in government, business, education, in fact, in any area of life. An important role of civil society is also to highlight the intersectionality of disability and assistive technology needs. For instance, people with impairments come from all walks of life and age; they may be men or women; members of indigenous society, who may themselves be marginalized; they may live in isolated rural areas, or urban slums. To ensure that policy becomes fully inclusive, these intersectional forms of marginalization have to be recognized and taken into account, preventing different forms of marginalization multiplying disadvantage. For instance, the use of assistive technology is associated with inclusion and wellbeing even among marginalized groups in very difficult circumstances; such as children with amputations in Gaza. However, we recognize that there are often greater barriers for those with a weaker voice, such as people with intellectual dis- ability, who also have much to benefit from initiatives such as GATE and so greater efforts need to be made to address these barriers.

iv. The International Disability Alliance brings together over 1100 organizations of persons with disabilities and their families; from across eight global and six regional networks, and will continue to advocate the global community to create the conditions for the effective realization of the rights enshrined in the CRPD at country level. This implies systematic and

meaningful consultation with persons with disabilities (including assistive technology users) and their representative organizations to guide the definition, monitoring and evaluation of assistive technology policies (in line with CRPD Article 4.3). IDA and its members are an important conduit for mobilizing the diversity of users, including most marginalized groups such as persons with intellectual disabilities, persons with psychosocial disabilities, persons with deaf-blindness or indigenous persons with disabilities; bringing the perspective of users of assistive technology, in all service research, procurement and delivery. IDA, with its Members, is particularly concerned by the need to frame assistive technology policies that truly respond to the rights of all persons with disabilities, in particular in low and middle income countries, to access quality assistive technology, at an affordable cost, as close as possible to where people live. This includes influencing assistive technology policies, public procurement policies as well as ensuring that accessibility and reasonable accommodation, including assistive technology, is included and properly resourced in all concerned public policies.

v. While civil society has a critical representational and advocating role – and, in some cases, is a major service provider – it is also important to ensure that policy cultivates the expectation of civil duty being shared among all of us. It is, therefore, crucial that such duty is not partitioned or separated; not a "them" or "us"; but rather a shared responsibility to be addressed through acknowledging ownership of the challenges of promoting equitable assistive technology systems and working through engagement with people as working as a sustainable community of practice.

vi. The world is rapidly changing due to the digital revolution. It is changing not only the way people live, learn, produce and even think, but also changing decision-making processes, the way information is delivered, problems are solved, and policies are developed. This also makes the distinction between high- and low-tech assistive products increasingly blurred and has the potential to reduce price barriers to high tech solutions. From a systems perspective the digital revolution should be seen as a resource for AT user empowerment and participation in reaching the SDGs, whilst also being careful to avoid the risk of a wider digital and technological divide by not incorporating these opportunities systemically.

2. **Empowering People**

i. While it is people who empower people, assistive technology can contribute to creating the conditions where this is possible. The CRPD promotes the rights and perspectives of people to be central to policy development. A critical route to empowerment is the establishment, by States, of mechanisms for DPO (Disabled People's Organisations) engagement in policy development, monitoring and evaluation. Articles 4–3 of the CRPD obligate State to actively

consult with DPOs in decision-making. DPOs can help orient priorities, provide inputs on what works and what does not, and suggest and provide strategies to reach out to persons with disabilities. This is critical to ensure the view of users is considered and that the assistive technology policy is grounded in a rights-based approach that truly empowers them.

ii. In addition to Articles contained within the CRPD, research suggests that around a third of assistive products that are provided may go unused, providing a powerful pragmatic and economic argument for AT user involvement and training. In other contexts, this perspective, most recently referred to as PPI ("public and patient involvement") recognizes that public participation enhances the design and delivery of better services. Research also indicates that the greater the extent to which such participation is formalized in established structures, the more satisfactory are the results .

iii. This presents policy makers with an intriguing contradiction. If policy development or reform is to effectively address the needs of those who have been marginalized by mainstream society (and previous policy), then such processes need to be explicitly disruptive – meaning they need to explicitly change the structures that oppress and marginalize. Structures in the process of policy reform need to be established to "institutionalize disruption". This may mean, for instance, re-imagining systems for the delivery of assistive products, it may mean the development of a

new cadre working across a range of assistive products; it may mean self-assessment for some assistive products. Stronger user involvement in the policy process also presents the opportunity to potentially uproot and transform prevailing power structures that may be perpetuating a lack of access to assistive products.

Advocacy

Policy needs political engagement

For policy formulation and legislation, political will and attention is essential in this part of world owing to limited resources and technology. It needs high level of political engagement through strong advocacy. Many of those who are evidence-producers (researchers, practitioners, users) are often unsure how, or simply unwilling, to undertake effective political engagement. At other times, advocates are frustrated by the difficulty of getting assistive technology on the political agenda. People may talk of political engagement wistfully; in opaque terms, as a factor outside their control; or in negative terms, as a vaguely dirty business that is necessary evil. The reality of the demands on policy makers is that direct and persistent engagement is required to hold their attention, particularly on new ideas that may initially appear as yet another demand.

Effective political engagement is a critical success factor in a number of areas where assistive technology is salient – health, education, employment. To be realistic about developing policy on assistive technology systems, it is likely that a country will need several assistive technology leaders, or champions, who can understand the political landscape in which they work, translate technical

content into compelling material to engage politicians, network and interact with key stakeholders; in short, to become policy entrepreneurs. Some elements of this work will require such advocates to be supported by, or undertake, a detailed political economy analysis of factors likely to propel change in the desired direction, and those likely to impede it.

Scaling good practices

National Assistive Technology policies should recognize the potential of small-scale good practices to be scaled in a variety of ways. This is particularly important in resource poor contexts, where a range of different service providers (including different civil society organizations) may have developed small-scale but innovative projects; that lack the infrastructure to be brought to the next stage. The value of adopting a systematic approach to scaling, such as Expandnet (which chimes with a human rights perspective and with the presence of civil society actors), is a principle that should be anticipated in policy. Such scaling may require action at the structural level (scaling-up) as well as replication (scaling-out) of existing good practices. Examples of structural change that promote some aspects of the CRPD have been reported in various countries by the UNPRPD Programme; although none of these projects has as yet focused on scaling assistive technology initiatives other groups are working towards this.

Assistive technology within universal health coverage

The 2030 Agenda for Sustainable Development places good health and well-being at the center of a new development vision. It emphasizes universal health coverage (UHC) to ensure a sustainable development for all, so that everyone everywhere can access the

health services needed without facing financial hardship. Universal Health Coverage can be advanced inclusively only if people are able to access quality assistive products when and where they need them. Addressing the unmet need of assistive products is crucial to achieve the Sustainable Development Goals, to provide UHC, and to implement the UN Convention on the Rights of Persons with Disabilities, ratified by 177 countries. 'Leaving no one behind' means ensuring the people with disabilities, the older population and those affected by chronic diseases are included in society and enabled to live a healthy and dignified life.

Modern aids and Assistive Devices & Commencement of New Schemes under Government

In India, various schemes have been initiated and came under act for people with disabilities. Like, under ADIP (Assistance to Disabled Persons for Purchase/ Fitting of Aids /Appliances) Scheme. Scheme for Implementation of Persons with Disabilities Act, 1995 (SIPDA), Indian Sign Language Research and Training Centre (ISLRTC), State Spinal Injury Center, Center for Disability Sports, Directory of Aids & Assistive Devices, Rights of Person with Disabilities, District Disability Rehabilitation Centers (DDRCs), Deendayal Disabled Rehabilitation Schemes (DDRS). These agencies have been implemented to assist the needy in procuring durable, sophisticated and scientifically manufactured modern, standard aids and appliances to promote physical social and psychological rehabilitation.

Ministry of Information and Technology in Thailand have also issued a series of national plans on the "Quality of Life for Persons with Disabilities." One major

impact has also been made under the initiative of Her Royal Highness Princess Maha Chakri Sirindhorn aiming to enhance quality of life, education and increase in employment opportunities.

With Sri Lanka, the 60% of the need for devices are met locally by specialized governmental organizations, private sectors, donations through NGOs, Social Service Ministry and relatives of person living abroad. The rest 40% is imported from other countries, India being the primary exporter.

In Indonesia, the import of several assistive devices happens from China, Germany, Japan, United Kingdom and United States of America.

Reporting on Disability

Based on WHO's expertise and experience, one of the cornerstones of Universal Health Coverage is access to essential medicines and technologies – all health technologies, including Assistive Health Technology (AHT).

International agencies on assistive technology

1. The United Nations Convention on the Rights of Persons with Disabilities (CRPD) identifies access to mobility aids, assistive devices and technologies as a human rights obligation that every Member State must fulfil and the importance of international cooperation to improve access (article 32). Further, WHO (GATE Initiative) soon realized that there was an urgent need to redefine the whole sector on a broader basis taking into consideration its wider roles and needs, going beyond the common traditional perception that 'assistive devices are only for people with disabilities', and proposed a paradigm shift- redefining assistive technology as Assistive Health Technology (AHT) and assistive products as Assistive Health Products (AHP) based on the International Classification of Functioning, Disability and Health (ICF). Those who most need assistive technology include, among others: people with disability, older people, people with noncommunicable diseases, people with mental health conditions including dementia and autism, and people with gradual functional decline.

2. Based on WHO's expertise and experience, one of the cornerstones of Universal Health Coverage is access to essential medicines and technologies – all health technologies, including AHT. As the current definition of assistive products and technology merely sustained this perception, WHO proposed a paradigm shift- redefining assistive technology as Assistive Health Technology (AHT) and assistive products as Assistive Health Products (AHP) based on the International Classification of Functioning, Disability and Health (ICF). WHO envisages GATE to be a merger of expertise, competence and entrepreneurial ingenuity and dynamism aimed at innovation, development, production, distribution and financing solutions designed to meet the crucial and ever-increasing need to secure access to Assistive Health Technology (AHT) for all people in need across the globe.

3. WHO decided to develop a new global initiative, Global Cooperation on Assistive Health Technology (GATE), with following core functions:

   i. Engaging in partnerships to promote AHT and providing leadership

   ii. Stimulating the generation, translation and dissemination of valuable knowledge related to AHT

   iii. Articulating ethical and evidence-based Policies/Norms/Guidelines/Best practices through an impartial global knowledge hub

   iv. Setting policy, norms and standards and promoting and monitoring their implementation

   v. Shaping the research agenda and promoting research initiatives

   vi. Encouraging innovation in developing high-quality affordable AHP

   vii. Providing technical support, catalysing change, and building sustainable institutional capacity in the field of AHT.

4. Under GATE (Global Cooperation on Assistive Technology) Initiative, WHO

conducted a global survey from the stakeholders-users and their family members, care givers, self- help groups, NGOs, experts etc to ascertain the priority of Assistive Products and Devices. Selected on the basis of their needs and impact on persons' lives, WHO has come-up with a Priority Assistive Products List (APL), which includes 50 high quality, affordable assistive devices, with an aim to provide a model framework to Member States from which they can develop their own APL as per their national needs, priority and resources.

5. WHO further suggests that, in order to have maximum impact, the APL needs to be supported with additional policy and legislation, resources, and skill development/training of personnel working with health services and social welfare. Hence, WHO is in the process of developing tools and mechanisms:

   a. To assist Member States to develop national assistive technology policies and programmes, as an integral component of universal health coverage, and

   b. To help Member States for creating Mass awareness for use, standardization for production, policy formulation for universal supply, Personnel training, and costing, financing and insurance.

6. Our overarching schematic of the strategic issues for assistive technology systems depicts the interlocking areas of People, Place, Personnel, Products, Provision and Policy.

7. WHO further envisions that APL (Assistive Product List) should aspire to follow the footsteps of WHO Model List of Essential Medicine, coverage and should be used to create public awareness, mobilize resources, and

to guide product development, production, service delivery, market shaping, procurement, reimbursement and insurance policies, so much so that it is made integral part of Universal Health Coverage. However, even in countries like India, in spite of campaign like Make in India, Accessible India, Smart Cities, Skill India, the Govts' attention on assistive products and technology remains to be very low. The policy framework, standardization for production and provisioning & financing framework are yet not being deliberated at any forum, whereas, many countries in developing world as taken a lead.

8. Assistive technology was first introduced in international policies through the Standard Rules on the Equalization of Opportunities for Persons with Disabilities and was further entrenched into international policies with the advent of the Convention on the Rights of Persons with Disabilities (CRPD). The Incheon Strategy "Make the right real" is an example of a strategy that includes the provision of assistive technology as an important means to achieve disability-inclusive development. The World Report on Disability further highlighted the need for action to improve the provision of assistive technology globally, and this has been reiterated in the Global Disability Action Plan 2014–2021. Similarly, the Global Strategy and Action Plan on Ageing and Health 2016–2020, recognizes the vital role of assistive technology.

9. In the Standard Rules, one of the four rules on preconditions for equal participation requires Member States to ensure the development and supply of assistive products to assist people with disabilities to increase their level of independence and to

exercise their rights. As important measures to achieve the equalization of opportunities, Member States should ensure the provision of assistive products according to the need. Besides supporting the development, production, distribution and servicing of assistive products, Member States are to support the dissemination of knowledge about them. States should also recognize that all who need these products should have access to them, which includes financial accessibility. Assistive products should be provided free of charge or at such a low price that people requiring AT or their families can afford them. Moreover, Member States should also consider requirements male and female in respect to design, durability and age-appropriateness of assistive products.

10. In contrast to the general approach of the Standard Rules, the CRPD is more selective in mentioning assistive technology as a measure that member States should take to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms. However, assistive technology measures are not included – at least not explicitly – in all relevant CRPD articles. Despite this limitation, the principles of Article 3 on non-discrimination, equality of opportunity, and equality between men and women, as well as Article 5 on elimination of discrimination on the basis of disability, infer that States are to ensure that all people, irrespective of disability, gender and age, have access to affordable assistive products.

11. It is also important to note that accessibility (of which access to assistive technology is a part) is a precondition to the enjoyment of other rights. The CRPD Committee's second General Comment was on

Article 9: Accessibility. It stresses the inter- relation of this right with other rights and articles (e.g., Articles 9, 19, 21, 28.2a, 26.3). The Comment asserts that "Accessibility" is related to groups, whereas reasonable accommodation is related to individuals. This means that the duty to provide accessibility is an "ex-ante" duty; meaning that it must be provided before the fact of it becoming a problem – States must ensure accessibility, 'up front' as it were.

12. The recent Report of the Special Rapporteur on the rights of persons with disabilities (2017), while broader than assistive technology, also describes how to provide rights-based support and assistance to persons with disabilities, in consultation with them. The CRPD also indicates that rehabilitation services (including assistive technology) should be provided as close as possible to where people live (Articles 26.1b, 25c). This is important for smaller countries, particularly small island countries, which may not have assistive technology production capacity. In such situations, other mechanisms need to ensure adequate procurement sources. Finally, it is important to note that the responsibility of States that have ratified the CRPD to ensure affordable provision of assistive technology is not limited by country borders. Through Article 32 on international cooperation, States commit to both technical and economic cooperation on assistive technology.

13. It is important to position assistive technology policy within the broader context of international development generally as well as more specific policy innovations, and conventions should be directly relevant to people with a range of impairments, including the aging population, who may benefit

from the use of assistive products. The Sustainable Development Goals is a set of 17 goals, internationally agreed-upon, that will guide international efforts across all countries to target their development efforts to ensure that "nobody is left behind". The achievement of each of these 17 goals can be facilitated through the incorporation of assistive technology, at the population level, when planning to reach these goals. Assistive products can be conceived as both mediators of social change (i.e., as a mechanism social change works through) and as moderators of that change (as a factor that determines the extent of the change, particularly whether it reaches the more marginalized and vulnerable groups in society).

14. Considering the global awareness of the need for quality, affordable, and reliable assistive products, the World Health Organization (WHO) has coordinated a collaborative effort through the Global Collaboration on Assistive Technology (GATE) to maintain Assistive Technology at the fore- front of global and sustainable developments. The remit of GATE necessitates that it is relevant to all people who experience impairments in whatever realm and at any age: this includes, for example, people with non-communicable diseases, injury, visual or hearing loss, mental health conditions including dementia and autism, gradual functional decline, or frailty. As such, assistive technology has an important role to play in promoting access to education, employment, justice, health and wellbeing; as well as to the broader cross-cutting values of promoting social inclusion and participation, independence and autonomy (or chosen inter- dependence) and leading a dignified and consequential life. Assistive technology cuts across all sectors and ages, and it is paramount that policy initiatives recognize and reflect this, rather than seeking to silo it. This presents policy makers with the significant challenge of providing a fully integrated system that is capable of delivering at the population level, while at the same time providing specific assistive technology that matches to the particular needs of individual users (namely the Matching Person and Technology (MPT) Model or the Human Activity Assistive Technology Model.

A. Assistive Devices/Technologies: What WHO is doing?

In many low-income and middle-income countries, only 5%-15% of people who require assistive devices and technologies have access to them. Production is low and often of limited quality. There is a scarcity of personnel trained to manage the provision of such devices and technologies, especially at provincial and district levels. In many settings where access might be possible, costs are prohibitive.

The Convention on the Rights of Persons with Disabilities (Articles 20 and 26), the World Health Assembly resolution WHA58.23 and the United Nations Standard Rules on the Equalization of Opportunities for Persons with Disabilities all highlight the importance of assistive devices. States are requested to promote access to assistive devices and technologies at an affordable cost and facilitate training for people with disabilities and professionals and staff working in habilitation and rehabilitation services.

WHO, in partnership with collaborating centers and partners, is assisting these efforts by:

- ▶ Developing normative guidelines
- ▶ Organizing regional and country workshops, meetings and seminars to promote and facilitate access to assistive devices
- ▶ Providing assistance for the development of national policies and programmes on assistive devices and technologies with a focus on human resource development
- ▶ Creating a database on availability of appropriate assistive devices and technologies

WHO partners and collaborating centers:

- ▶ International Society for Prosthetics and Orthotics (ISPO), Copenhagen, Denmark
- ▶ Swedish Institute of Assistive Technology, Vällingby, Sweden
- ▶ Tanzania Training Centre for Orthopaedic Technologists (TATCOT), Dar es Salaam, Tanzania
- ▶ Department of Prosthetics and Orthotics, University Don Bosco, Venecia, Soyapango, El Salvador
- ▶ National Centre for Prosthetics and Orthotics, University of Strathclyde, Glasgow, UK
- ▶ Sirindhorn National Medical Rehabilitation Centre, Nontharuri, Thailand

B. GATE (Global Cooperation on Assistive Technology)

Assistive technology is the tool, and often the first step for any next steps to ensure people with disabilities are equal beneficiaries of, and contributors to any development process. However, today only 5–15% (approximately 1 in 10 persons)

of the population in need globally have access to assistive products and the problem is more acute in low- and middle-income countries. As early as 1990, the UN Standard Rules identified access to assistive products as a precondition for equal rights and opportunities and urged Member States to take affirmative actions to make these devices available at an affordable cost. The Convention on the Rights of Persons with Disabilities has now recognized access to assistive technology as a human right and has called for international cooperation to improve its access (Article 32).

- ▶ Recalling the Article 32 of the Convention on the Rights of Persons with Disabilities related to International Cooperation on Assistive Technology
- ▶ Noting the urgent need to implement the WHO global disability action plan 2014–2021: Better health for all people with disability
- ▶ Affirming our commitment to support the Member States to improve access to affordable assistive technology

WHO has launched a flagship programme – **Global Cooperation on Assistive Technology (GATE)** – in partnership with UN Agencies, international organizations, donor agencies, professional organizations, academia, and organizations of/for persons with disabilities.

Mission: To assist Member States to improve access to assistive technology as a part of Universal Health Coverage.

Vision: A world where everyone in need has access to high-quality, affordable assistive products to lead a healthy, productive and dignified life.

GATE will open the doors for children with disabilities to access education and adults to earn a living, overcome poverty,

participate in all societal activities, and live with dignity, which are some of the key objectives of the global development goals. Assistive Technology, Information and Communication Technology (ICT), Accessible Technology, Universal Design, Accessible or Enabling Environment are all interlinked and are preconditions for mainstreaming disability in development priorities. Investment in technology to make it available and affordable is definitely a practical step to establish the "Promise of Technology to Achieve Sustainable Development for All."

C. GREAT (Global Report on Effective Access to Assistive Technology)

The resolution WHA71.8 - Improving access to assistive technology calls upon WHO to prepare a global report on effective access to assistive technology by 2021. Objectives of this Global Report include highlighting the current need, demand and supply of assistive technology, as well as outlining good practices for innovation and recommendations to improve access.

The development of the Global Report will be led by the WHO Secretariat, the Global Cooperation on Assistive Technology (GATE) and an ad-hoc Advisory Group of Experts in collaboration with international experts and stakeholders in AT. WHO will also identify key contributions from different backgrounds and countries to ensure that the Global Report will cover a range of cultural contexts and different approaches, which are based on background papers supported by the best available evidence.

The GReAT Consultation 2019 was held in Geneva on 22 and 23 August 2019 and brought academics, practitioners, policy makers, and assistive technology users together to guide the content development of the Global Report. A total of 85 contributions were presented throughout the 2-day programme. A Report of the Consultation outcomes and other key documents will be available shortly on the website.

D. Ad-hoc Advisory Group of Experts on Assistive Technology

WHO has conveyed an ad hoc Advisory Group of Experts on Assistive Technology. The first in person meeting of the Advisory Group (AG) was held on 21 August 2019 In Geneva. The primary function of the AG is to provide high-level advice and oversight to the development of the Global Report, in particular towards:

▶ Methods to assess current and future need/ unmet need of Assistive Technologies;

▶ Methods for evidence review of best practice across all aspects of Assistive Technologies, including products, policy, personnel and provision;

▶ Development of recommendations which support sustainable and integrated access to Assistive Technologies as an indispensable element for Universal Health Coverage and the achievement of related Sustainable Development Goals;

▶ Strategic priorities in research and innovation for improving access to Assistive Technologies across the world, based on the findings of the Global Report.

E. rATA (The rapid Assistive Technology Assessment)

WHO has developed a questionnaire, rATA, for assessments of the need, the unmet

need and the barriers to access AT in a population. It was developed to:

▶ obtain data and evidence on access to Assistive Technologies;

▶ advocate and raise awareness to governments and civil society about the importance of Assistive Technologies;

▶ advance research and development in Assistive Technologies and

▶ support in design, planning or prioritizing Assistive Technology programmes or interventions at global and country levels.

rATA is an interviewer-administered questionnaire, either used stand-alone or to be incorporated into broader population or household surveys or national censuses. It is simple to administer and non-technical, so it can be used by enumerators from varied backgrounds and experiences and across cultures and contexts. A mobile data collection tool for mobile devices (smart phones, tablets) is freely available to support stand-alone rATA field data collection. Both the paper-based questionnaire and the mobile data collection tool are available in Arabic, Chinese, English, French, Spanish, Portuguese and Russian. Training material for rATA enumerators is available.

F. Global call for data in measuring access to Assistive Technology

In 2020, WHO launched an initiative to support Member States in measuring access to Assistive Technologies through national representative household surveys using the rATA. In response to the request of the international Assistive Technology community, WHO extends this initiative and calls for engagement from all Assistive Technology's stakeholders in this global data collection campaign to contribute to the GReAT and make an impact in improving access to Assistive Technologies.

Objective: This global call aims to select the best proposals for rATA survey implementation led by research institutes, national or international development agencies, NGOs, Assistive Technology user groups and other civil society organizations.

Requirements: The key indicator of the survey is the prevalence of access to Assistive Technologies in the target population. The proposal should include three parts: **survey methodology, data management and analysis plan, and deployment plan with budget estimate.**

The following key elements should be detailed in the **survey methodology** and meet the requirements:

▶ **Survey method:** explain if rATA will be implemented stand-alone or integrated in other surveys. In case of the latter method, explain any adaptation to the rATA questionnaire.

▶ **Target population:** whole population of one or more sub-national administrative areas (e.g. provinces, municipalities, cities); one or more sub-groups of the national or sub-national population defined by age (e.g. children under 5 years old, older adults above 65 years old) or living environments (e.g. rural or urban, informal settlements, emergency settings); one or more sub-groups of population with health conditions (e.g. patients in rehabilitation, people with sensory function impairment).

▶ **Sample size estimation:** required sample size for estimating the key indicator with 95% confidence of precision level equal or smaller than 25%.

- Sampling strategy: sampling design and justification on design effect.

- Survey language or translation (if needed).

The following key elements should be detailed in the **data management and analysis plan** and meet the requirements:

- Data collection methods: explain the data collection method, if not with the WHO developed paper-based questionnaire or mobile data collection tool.

- Data management and storage: explain where and how the collected survey data will be stored;

- Data analysis plan: explain the indicator(s) to be extracted from the survey.

The following key elements should be detailed in the **deployment plan** and meet the requirements:

- Enumeration team: explain structure and composite of the enumeration team.

- Enumerator training and field testing: explain the training materials and process, if not using the WHO developed rATA enumerator training materials.

- Quality control in the field data collection.

- Survey implementation time plan (until submission of final report).

- Details of budget required from WHO contribution.

The organizations/ institutes to submit proposals should meet the following requirements:

- The proposal can be submitted by a single organization/ institute or by

a group of organizations/ institutes. In the latter case, one organization/ institute needs to be the coordinator for the proposal.

- Experience in design and implementation of surveys in access to AT or other health products, disability, rehabilitation or other health topics.

- Experience in survey data management, analysis and reporting.

- Capacity and experience in enumerator recruitment and training.

- Capacity and experience in obtaining relevant ethical approval for survey implementation and publication.

- Has no conflict of interest in conducting the survey.

- Allow that the results of the survey will be reported and acknowledged in GReAT and sign a confidentiality agreement for GReAT development (if applicable).

G. Assistive Products List (APL)

Based on a global survey of AT Needs, WHO has launched a **Priority Assistive Products List**, which is the first step of WHO's GATE initiative towards improving global access to assistive products for everyone, everywhere. WHO proposes that every country should have their own priority assistive product list as per their context, and the items on the list should be made available to everyone under the Universal Health Coverage.

The APL includes 50 priority assistive products, selected on the basis of widespread need and impact on a person's life. The list will not be restrictive; the aim is to provide Member States with a model from which to develop a national priority assistive products list according to national need and available resources.

Like the WHO Model List of Essential Medicines, the APL can also be used to guide product development, production, service delivery, market shaping, procurement, and reimbursement policies (including insurance coverage).

The assistive products industry is currently limited and extremely specialized, primarily serving the requirements of high-income settings. There is a general lack of state funding, nationwide service delivery systems, user-centered research and development, procurement systems, quality and safety standards, and context-appropriate product design.

Trained personnel are essential for the proper prescription, fitting, user training, follow-up and maintenance of assistive products. Without these key steps, assistive products are often abandoned, of little benefit or harmful, all of which result in extra health care/ welfare costs. By supporting coherent, prioritized national assistive technology policies and programmes, the APL is a potential game-changer in improving access to assistive products globally.

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In many countries, access to assistive products in the public sector is particularly poor or non-existent, leading to high out-of-pocket payments that are a burden for users and their families.

Challenges in accessing assistive technologies in low-and middle-income countries

In 2011, the World Report on Disability collated evidence for the global unmet need for assistive products of all kinds. We now know that many people have little or no access to basic assistive products, even in some high-income countries. Today, few countries have national assistive technology policies or programmes. As a result, access to assistive products is far from universal: the majority are left behind.

In many countries, access to assistive products in the public sector is particularly poor or non-existent, leading to high out-of-pocket payments that are a burden for users and their families. People from the poorer sectors of society frequently rely on donations or charitable services, which often focus on provision of large quantities of substandard or used products. These are often not appropriate for the user or the context, and may even cause secondary health complications or premature death. Similar scenarios are common in emergency response programmes, where the need for assistive products is high but often neglected.

Affordable and appropriate access requires government commitment to adequate and sustained financing, including efficient procurement of appropriate assistive products and delivery systems. In many high-income countries, people are able to access assistive products via health or welfare systems. Where services exist, they are often stand-alone and fragmented. People must often attend multiple appointments at different locations, which are costly and add to the burden on users and caregivers, as well as on health and welfare budgets.

1. **Gaps in the need and demand for assistive technologies:** It is well recognized that the need for assistive technologies is high but demand is low, and supply is even lower, especially in low- and middle-income countries. This mismatch between need and demand itself presents a challenge to improving access, and is the result of many factors, not least a widespread lack of awareness among potential beneficiaries, their caregivers, and their health-care providers. Only 10% of potential beneficiaries have access to assistive products, owing to factors such as high costs and lack of financing, availability, awareness and trained personnel. For example, 70 million people need a wheelchair but only 5–15% have access to one, and production of hearing aids meets only 10% of global need and 3% of the need in low- and middle-income countries. Moreover, 200 million people with low vision do not have access to spectacles or other low-vision devices. A survey of the needs of older people living with disabilities in six countries in the WHO Western Pacific Region found they gave higher priority to functional daily living than to social activities. The top four functional activities that could be facilitated by assistive technologies were: eating and drinking as independently as possible; transferring to or from a bed or a chair; being able to be clean and hygienic; and being able to hear and communicate with others.

There is also a significant unmet need for assistive technologies in the prevention and management of ill

health and injury – again, this high level of need does not translate into a high demand. For example, falls are an important external cause of unintentional injury and disability that increase in frequency with age and frailty, yet they remain a neglected public health problem in low- and middle-income countries.

2. **Gaps in research, product design and technology transfer:** As noted earlier, despite high levels of need in low- and middle-income countries, lack of awareness of assistive technologies results in a lack of demand, which in turn impedes their development and adoption. For those who are aware of these technologies, as is more common in high-income settings, use is further hindered by concerns about their effectiveness and suitability; social stigma and privacy; usability and computer literacy; and affordability. Research, development and design processes have yet to include consultations with users and caregivers to develop products to best suit their physical and social environments and preferences. Although computer and information technologies hold promise in applications to boost the functions of existing assistive technologies, product designers have yet to consult and accommodate the different preferences and needs of older people with disabilities. Challenges associated with usability often relate to screen design, input device design, complex commands and operating procedures.

With respect to low- and middle-income countries, international cooperation and global health actors championing assistive technologies have yet to lead to increased support for technology innovation or transfer of technologies and expertise. Thus, in these settings, where imported products are unaffordable, there may be limited capacities to produce assistive technologies locally. In addition, lack of affordability means that many of the high-technology devices created for low-resource settings are actually only affordable in more affluent emerging economies. There is also concern that these technologies are developed without taking into consideration the true environmental, social and resource factors that impede the adoption of technology in low-resource settings.

3. **Gaps in access to assistive technologies:** Challenges to improving access to assistive technologies in low- and middle-income countries stem from low production and limited quality; financial barriers; and lack of government funding, provisions and human resources. There is a scarcity of personnel trained to provide these technologies, especially at provincial

and district levels. In many settings where access might be possible, the costs are prohibitive.

Even in high-income settings, such as the USA, access to these technologies and qualified providers is frequently limited and varies considerably across states and districts, as well as urban and rural areas. Factors such as culture and language, expectations, legal constraints, stereotyping, autonomy and dignity also hamper access to assistive technologies. A systematic review of barriers to adoption of assistive technologies by older people found that privacy was their top concern, followed by worries about trust, functionality and added value. Other key barriers were cost and affordability; ease of use and suitability for daily use; perception of "no need"; stigma; fear of dependence; and lack of training.

As discussed earlier, demand-side barriers contribute significantly to the gaps in access to and use of these technologies. At all levels – policy-makers, care providers and potential beneficiaries – there is a lack of understanding about the benefits of assistive technologies and a lack of information about what devices are available. It is critically important to understand and address the mismatches between high need and low demand, to devise policies to improve access to and use of assistive technologies.

4. **Gaps in the evidence:** There is a significant lack of data overall on the size of unmet need in this area. For example, accessibility in individual countries can be difficult to estimate, since the CRPD States Parties' reports provide only the number of people with disabilities who have access to these

technologies but not the total number of people with disabilities who need them, so the proportions whose needs are being met and unmet are unknown.

Furthermore, although it is acknowledged that there is a large and growing need for assistive technologies within low- and middle-income countries, there is a lack of research in these settings, which hinders the development of evidence-informed policy and practice. A scoping review of research on assistive technologies from low- and middle-income countries and other research-limited settings from 2000 to 2016 aimed to characterize the evidence available. The review found that, of the 252 studies included, over 80% focused on types of assistive technology addressing mobility (45.2%) and vision (35.5%) needs, with spectacles and prosthetics accounting for over 50% of all publications. The review found that evidence was most lacking on assistive technologies to address hearing, communication and cognition needs.

Unsurprisingly, most research assessing the effectiveness of various types of assistive technologies is from high-income settings. Several reviews summarizing findings to date have highlighted the lack of high-quality, well-designed research in this area. The absence of reliable information on effectiveness is a gap that urgently needs to be addressed. This is critical not only for informing more rational use of resources in the high-income settings where such technologies are available, but also to allow evidence-informed decisions in lower-income settings. In assessing the impact of assistive technologies, the outcome measurement should be relevant not only to the target populations, but also, importantly, to families and caregivers.

Lack of reliable research hinders the development and implementation of effective rehabilitation policies and programmes.

Expanding research and evidence-based practice

Some aspects of rehabilitation have benefited from significant research, but others have received little attention. Validated research on specific rehabilitation interventions and programmes for people with disabilities – including medical, therapeutic, assistive, and community-based rehabilitation – is limited. Rehabilitation lacks randomized controlled trials – widely recognized as the most rigorous method of testing interventions efficacy.

Lack of reliable research hinders the development and implementation of effective rehabilitation policies and programmes. More research on rehabilitation in different contexts is needed, particularly on:

· the link between rehabilitation needs, receipt of services, health outcomes (functioning and quality of life), and costs;

· access barriers and facilitators for rehabilitation, models of service provision, approaches to human resource development, financing modalities, among others;

· cost–effectiveness and sustainability of rehabilitation measures, including community-based rehabilitation programmes.

Obstacles to strengthening research capacity include insufficient rehabilitation researchers, inadequate infrastructure to train and mentor researchers, and the absence of partnerships between relevant disciplines and organizations representing persons with disabilities.

Research on rehabilitation has several characteristics that differ fundamentally from biomedical research, and which can make the research difficult:

· There is no common taxonomy of rehabilitation measures.

· Rehabilitation outcomes can be difficult to characterize and study given the breadth and complexity of measures.

· Rehabilitation often employs several measures simultaneously, and involves workers from different disciplines. This can often make it difficult to measure changes resulting from interventions, such as the specific outcomes from therapy compared to an assistive device where the two are used concurrently.

· Few valid outcome measures for activity limitations and participation restrictions can be reliably scored by different health professionals within a multidisciplinary team.

· Sample sizes are often too small. The range of disabilities is extremely large, and conditions diverse. Rehabilitation measures are highly individualized and based on health condition, impairments, and contextual factors, and often the numbers of people within homogeneous groups that can be included in research studies are small. This may preclude the use of controlled trials.

· The need to allow for participation of people with disabilities – in decision-making through the process of rehabilitation – requires research designs and methods that may not be considered rigorous under current grading systems.

· Research-controlled trials, which require blinding and placebo controls, may not be feasible or ethical if services are denied for control groups.

A broad approach is required as benefits of rehabilitation often accrue to a different government budget line from that funding rehabilitation.

Research, data, and information

Better data are needed on service provision, service outcomes, and the economic benefits of rehabilitation. Evidence for the effectiveness of interventions and programmes is extremely beneficial to:

· guide policy-makers in developing appropriate services

· allow rehabilitation workers to employ appropriate interventions

· support people with disabilities in decision-making.

Long-term longitudinal studies are needed to ascertain if expenditure for health and health-related services decreases if rehabilitation services are provided. Research is also needed on the effect rehabilitation has on families and communities, for example, the benefits accrued when caregivers return to paid work, when support services or ongoing long-term care costs are reduced, and when persons with disabilities and their families feel less isolated. A broad approach is required as benefits of rehabilitation often accrue to a different government budget line from that funding rehabilitation.

Relevant strategies for addressing barriers in research include the following:

· Involve end-users in planning and research, including people with disabilities and rehabilitation workers, to increase the probability that the research will be useful.

· Use the ICF framework to help develop a global common language and assist with global comparisons.

· Use a range of methodologies. More research such as that by the Cochrane

Collaboration (Rehabilitation and Related Therapies) is needed when feasible. Alternative, rigorous research methodologies are indicated, including qualitative research, prospective observational cohort design, or high-quality, quasi-experimental designs that suit the research questions, including research studies on CBR.

· Systematically disseminate results so that: policy across government reflects research findings, clinical practice can be evidence-based, and people with disabilities and their families can influence the use of research.

· Enhance the clinical and research environment. Providing international learning and research opportunities will often involve linking universities in developing countries with those in high-income and middle-income countries. Countries in a particular region, such as South-East Asia, can also collaborate on research projects.

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Good rehabilitation practice uses research evidence and is derived from various studies, or systematic reviews of studies, and provides the best available research on techniques, effectiveness, cost–benefits, and consumer perspectives.

Information and good practice guidelines

Information to guide good practice is essential for building capacity, strengthening rehabilitation systems, and producing cost-effective services and better outcomes.

Good rehabilitation practice uses research evidence. It is derived not from single studies, but from an interpretation of one or more studies, or systematic reviews of studies, and provides the best available research on techniques, effectiveness, cost–benefits, and consumer perspectives.

Rehabilitation professionals can obtain information on good practices through:

- Guidelines that apply research knowledge, usually on a specific health condition, to actual practice for clinicians.

- An independent search for specific interventions.

- Continuing professional education.

- Clinical guidance notes on good practice from employers and health organizations.

- Discipline-specific Internet databases that appraise the research for clinicians. A wide variety of sources, including general bibliographic databases and databases specializing in rehabilitation research, are available on the Internet. Most of these databases have already evaluated the research for quality, provided ratings of research studies, and summarized the evidence.

Evidence-based practice attempts to apply the most recent, appropriate, and effective rehabilitation interventions. Barriers to the development of guidelines and to the integration of evidence into practice include:

lack of professional time and skills, limited access to evidence (including language barriers), difficulty in arriving at a consensus, and adapting existing guidelines to local contexts. These issues are particularly relevant to developing countries.

Where evidence is lacking, the expertise of clinicians and consumers could be used to develop consensus-based practice guidance. For instance, a "consensus conference" laid the foundation for WHO guidelines on the provision of manual wheelchairs in less-resourced settings. The guidelines were developed in partnership with the International Society for Prosthetics and Orthotics and the US Agency for International Development.

New Zealand's pioneering Autistic Spectrum Disorder Guidelines, developed in response to gaps in service, provide a good example of the evidence-based approach. The guidelines cover identification and diagnosis of conditions, and discuss access to interventions and services. A wide range of stakeholders were involved in developing the guidelines, including people with autism, parents of children with autism, medical, educational, and community providers, and researchers from New Zealand and elsewhere, with particular attention to the perspectives and experiences of Māori and Pacific people. As a result of these guidelines, proven programmes have been scaled-up, increasing numbers of people trained in assessment and diagnosis of autism, and increasing numbers of people enquiring about and receiving information on the condition. A range of programmes to help support families of people with disabilities have also been started. Guidelines developed for one setting may need adaptation for implementation in another setting.

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Conclusion

The potential beneficiaries of assistive technologies include not only people with disabilities but also the increasing numbers of those living longer, those with noncommunicable diseases, and those requiring rehabilitation. Despite this large and increasing need, assistive technologies can have low rates of adoption and use, resulting from low levels of awareness and, consequently, demand. There are also gaps between product designs and user preferences and needs, including those of caregivers and health-care providers. Affordability is a major barrier in low- and middle-income countries where governments do not invest adequately in-service provision and training of human resources. There is limited evidence to show that assistive technologies improve the functioning of users. This requires action by the scientific community, research and development agencies, and the manufacturing sector, to fill these gaps through consultation with potential beneficiaries and, as appropriate, their caregivers.

Various global frameworks such as the CRPD and SDGs support governments in improving access to these technologies, although progress is often impeded by a low level of country capacity, and inadequate fiscal space and financial commitment to embed assistive technologies into service provision. Global collaboration, in parallel with national-level multisectoral actions, is essential to enhance access to these technologies, to mitigate the effects of impairment and empower users through greater autonomy.

Based on the stakeholders feedback and practice in vogue for production and distribution of assistive technology and products in the SEA Region, this study identifies major hurdles in achieving full accessibility to AT and demonstrates that it is not the financial resources and technology which creates hurdle but it is the lack political will and priority which poses the obstacle. The community is ignorant of their right and complexity involved in generating policy towards sustainable assistive technology provision.

The major challenge is to derive an AT Policy in the region. Earlier, AT was part of Disability. But, as the disability is

largely dealt for the rehabilitation and welfare, AT was a neglected issue. Work, however, is currently underway on the development of a Framework to guide and evaluate assistive technology policy; and many of the propositions in this report may shape framework. It is needed to evaluate the extent to which policies, strategies and action plans related to AT, incorporates principles of human rights and enable equitable access in practice. Fundamentally, we need to make a leap forward to user-centered systems, reaching to the inaccessible rural areas too.

The WHO have shown a commitment to highlighting the importance of providing appropriate assistive technology to those who need it, especially through GATE. While raising awareness about assistive technology and the broad range of people it may be crucially important for, generating an in-depth understanding of the issues and need for context specific policy remains a huge challenge. The identification of examples of good practice in terms of assistive technology systems-thinking and its applications might be useful.

National assistive technology policy should aim to provide a national system with oversight to ensure sustainable, efficient and effective monitoring, supply and servicing of assistive technology, which appropriately meet peoples' ever-changing needs across the life course. A National institute or committee, regulatory body, or similar structure should be representative of people with a variety of assistive technology needs. Such a body should be charged with specifying exactly how the State, as the primary duty bearer, will fulfil its obligations and embrace its responsibilities from a human rights, justice and equality of opportunity perspective.

This training material has not been attempted to be either comprehensive or exhaustive, but rather to highlight some of the key policy challenges on which media can play a distinctive role.

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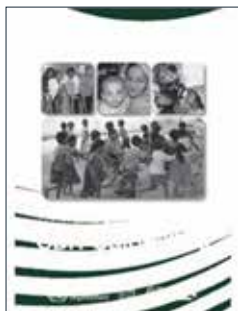# Relevant sources and resources
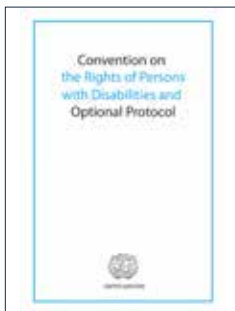

[World Report on Disability](#)

[WHO Global Disability Action Plan 2014-2021](#)

[International Labour Organization: Reporting on Disability](#)

[Community-based Rehabilitation: CBR Guidelines](#)

[Convention on the Rights of Persons with Disabilities and Optional Protocol](#)

[Monitoring Progress on Universal Health Coverage and the Health-related Sustainable Development Goals in South-East Asia Region](#)

Other relevant sources:

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A Guide for Journalists

Booklet 2: Assitive Technology

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