MINISTRY OF HEALTH
Republic of Liberia

Liberia National Priority Assistive Products List (APL)

First Edition | December 2021

Purpose of Document

Liberia's first **National Priority Assistive Products List (APL)** is evidence of the Government of Liberia's commitment to increasing access to assistive technology (AT) through strengthening governance and coordination in the sector. The APL is intended to guide the AT sector in procurement, donation, service provider training, development of technical standards and service delivery guidelines, and broader advocacy and resource mobilization efforts. The document is intended to focus and prioritize resources and efforts toward products that are the most impactful and context-relevant to the country. Development of the Liberia National Priority APL was made possible by strong collaboration and in-depth consultation between government and non-government partners and stakeholders[1,2], including Liberia's organizations of people with disabilities (OPWDs) who shared their lived experiences and meaningful inputs throughout the process, and is the product of valuable contributions from members of the AT Technical Working Group.

[1] Ministry of Health (Non-Communicable Diseases and Injuries (NCDI) Division and National Eye Health Program); National Commission on Disabilities; Monrovia Rehabilitation Center at the John F Kennedy Medical Center; Ministry of Education; Ministry of Gender, Children, and Social Protection; the complete stakeholders list can be found in Annex 1.

[2] Lead technical support was provided by the World Health Organization (WHO) and Clinton Health Access Initiative (CHAI) under the AT2030 program's Country Investment Fund, which is funded by UK Aid from the UK government and led by the Global Disability Innovation Hub.

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Abbreviations

APL	Assistive Products List
AT	Assistive Technology
ATA-C	Assistive Technology Assessment-Capacity
CAB	Christian Association of the Blind
CCA	Country Capacity Assessment
CHAI	Clinton Health Access Initiative
CRPD	Convention on the Rights of Persons with Disabilities
GATE	Global Cooperation on Assistive Technology
GOL	Government of Liberia
HMIS	Health Management Information System
JFKMC	John F. Kennedy Medical Center
LISGIS	Liberia Institute of Statistics and Geo-information Services
LMDC	Liberia Medical and Dental Council
LMHRA	Liberia Medicines and Health Products Regulatory Authority
LMICs	Low and Middle Income Countries
MGCSP	Ministry Gender, Children and Social Protection
MOE	Ministry of Education
MOH	Ministry of Health
MRC	Monrovia Rehabilitation Center
NAP	National Action Plan for the Inclusion of Persons with Disabilities in Liberia
NCD	National Commission on Disabilities
NCDI	Non-communicable Diseases and Injuries
NEHP	National Eye Health Program
NGO	Non-Government Organizations
NUOD	National Union of Organizations of the Disabled
OPWD	Organization of People with Disabilities
P&O	Prosthetics and Orthopedics
PWDs	Persons with Disabilities
UHC	Universal Health Coverage
WHO	World Health Organization

Introduction

What is assistive technology?

The World Health Organization (WHO) defines assistive technology (AT) as the umbrella term for "*systems and services used to deliver assistive products [also known as assistive devices] that maintain or improve a person's functioning and independence*".

WHO further refers to assistive products as devices, equipment, instruments, software such as wheelchairs, hearing aids, spectacles, prostheses, etc., that are external to the body, that help to maintain or improve a person's functioning and independence.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD), Article 32, recognizes AT access as a fundamental human right. In recent years, the World Health General Assembly Resolution (WHA71.8), various international health strategies, and calls for action have also recognized AT access as integral to the achievement of Universal Health Coverage (UHC).

Who needs assistive products?

Populations that commonly require AT include people with disabilities, older people, people with gradual functional decline, people with non-communicable diseases such as diabetes and stroke, and people with mental health conditions including dementia and autism (WHO, 2016; WHO, 2018). Globally, one billion people need AT but only 1 in 10 have access; access is a particular challenge in low and middle-income countries (LMICs) due to a lack of financial and human resources, coupled with weak governance and coordination mechanisms. The global need for AT is expected to increase to two billion by 2050, partly driven by an aging global population and rise in NCDs, which will also primarily occur in LMICs. It is thus an urgent imperative that AT systems are built and strengthened now.

Key definitions*

*As defined by WHO

- **Assistive technology**: The application of organized knowledge and skills related to assistive products, including systems and services. Assistive technology is a subset of health technology.
- **Assistive products:** Any external product (including devices, equipment, instruments, or software), especially produced or generally available, the primary purpose of which is to maintain or improve an individual's functioning and independence, and thereby promote their well-being. Assistive products are also used to prevent impairments and secondary health conditions.
- **Priority assistive products:** Those products that are highly needed, an absolute necessity to maintain or improve an individual's functioning and which need to be available at a price the community/state can afford.

At the user level, accelerating access to AT can improve user well-being by enabling users to live healthy, productive, and independent lives where they can fully participate in education, the labour market, civic life, and community life. At the societal level, availability of and access to AT can reduce hospitalization rates, avoid loss of productivity, and reduce long-term healthcare and welfare costs (UNDESA, 2019)[i].

Disability prevalence & AT availability in Liberia

The Ministry of Health (MOH) and Liberia Institute of Statistics & Geo-Information Services (LISGIS) undertook a rapid assistive technology assessment (rATA) in early 2021 to understand the need, unmet need, and barriers to accessing AT in Liberia. Liberia deployed the rATA household survey tool developed by the WHO using the LISGIS survey sampling frame, to ensure that data are obtained from a nationally representative sample; data collection took place in 2021. Results from the Liberia rATA can be obtained from the joint team of MOH, LISGIS, and WHO.

What is a Priority Assistive Products List?

In 2016, the WHO published a reference Priority Assistive Products List (APL) that includes 50 priority products selected on the basis of widespread need and impact on a person's life (WHO, 2016). Similar in purpose to the WHO Model List of Essential Medicines, the WHO APL provides Member States with a model to develop national APLs based on national context, as one of the key first steps to catalyzing access to high-quality, affordable assistive products in all countries.

The Liberia National Priority Assistive Products List (APL) is a critical document that stakeholders identified as a key activity in the 2019/2020 Liberia AT Country Capacity Assessment. In alignment with the GATE framework of the 4Ps (policy, products, personnel, and provision), the Liberia APL will guide the prioritized products that should be the focus of the following key AT scale-up interventions:

- ❑ Development of technical standards to regulate AT imports
- ❑ Development of quality checklists and AT service delivery guidelines
- ❑ Advocacy for AT funding and prioritization of products for procurement or donation
- ❑ Training of health and non-health service providers on AT service provision
- ❑ Improving AT data coverage
- ❑ Advocacy for AT inclusion in other national guidelines and policies

Methodology

Between February and June 2021, the MOH, National Commission on Disabilities (NCD), and the Ministry of Gender, Children and Social Protection (MGCSP) – with technical support from the WHO and the Clinton Health Access Initiative (CHAI) – convened a series of stakeholder consultation workshops (see Annex 1 for list of participants) to develop and validate a national APL for Liberia.

A technical prioritization process using explicit prioritization criteria was used, to ensure that priorities were set in a transparent, accountable manner that was in the best interest of population health (i.e., reflected domestic needs as well as technical, political, and economic considerations). The full process is detailed below.

Local definition of a priority product

Stakeholders agreed on the following as the local definition for 'priority assistive products':

> *Priority assistive products are those products that are an absolute necessity to maintain or improve an individual's functioning and which need to be available based on the context and need in the country and the country capacity to effectively govern and provide the services needed.*

Thresholds and maximum number of products

As the Priority APL serves a purpose similar to that of the Essential Medicines List (EML), Liberia looked to EML development processes for inspiration for the APL process. APLs and EMLs require a method to prioritize *and* a method to eliminate products on the list. Based on the purpose and use of the APL as described above, a 'fit-for-purpose' approach was used, and stakeholders decided that a range of 25-40 products would suit the government's capacity to govern, train, and regulate, though not necessarily finance. A range, instead of a single number, was used to allow for flexibility should many products score the same with the prioritization criteria.

Adaptation of the WHO model list to local context

Using the WHO Model APL, a half-day stakeholder workshop was held where the 50 products on the list were reviewed for initial adaptation to the Liberia context. Stakeholders worked in small groups divided by functional domain (vision; mobility & self-care; hearing, communication, & cognition) to review a subset of products, and were asked to provide a Yes/No response to the following questions:

1) Have we ever seen the product in Liberia?
2) Is this product suitable for use in Liberia?[3]

If an assistive product received a 'No' consensus from the group for both of these questions, the product was removed from further considerations.[4] Each group was also asked to add any additional products that are currently in use/could be suitable for use in Liberia but was not on the WHO list, for consideration for the Liberia APL.[5] In the end, three products were included for further consideration and scoring.

Prioritization criteria & weighting

Stakeholders built consensus on the list of criteria to be used to prioritize assistive products, as well as on the weight of each criterion. The final list of criteria and weights, as well as data sources to inform scoring, were:

Prioritization criteria	Considerations	Weight	Data source to guide scoring
Impact on quality of life	○ How a particular product improves an individual's life (both user and caregiver)	3x	Local expert opinion
Total need	○ Total population that requires a particular product	3x	rATA survey data
Operational feasibility	○ For the user: how easy or difficult it is to use, maintain, or repair a particular product; is the product acceptable to the population ○ For the system: the ability for the health and greater social system to produce, provide, maintain/repair, and train on use of a particular product	2x	Local expert opinion
Cost	○ Cost of a particular product from the most feasible procurement source	2x	Cost data from global suppliers
Unmet need	○ Total population that requires a particular product, but does not currently have access to, or use, the product	1x	rATA survey data

[3] Suitability was used as an elimination criterion, defined as "being right or appropriate for a particular purpose or situation". This is different from the 'operational feasibility' used as a prioritization criterion, defined as being "possible to do easily or conveniently"
[4] Stakeholders removed the following products: digital magnifiers, electrically-powered wheelchairs, time management products
[5] Stakeholders added the following products: liquid-level indicator, temperature indicator, and upper-limb prostheses

Based on the list of products established after the first stakeholder consultation, additional consultations were held to score each of those products based on the prioritization criteria shown in the table above, on a scale of 1 to 5 (see Annex 2 and 3 provide details on the scoring rubric for each criteria and the scorecard template, respectively).

Final number of products and validation

Stakeholders validated the final consolidated scoring for products during an AT Technical Working Group meeting in December 2021, and agreed that within the range of 25-40 products, the top 33 products would be included in the national APL. These products are further detailed in the next section.

Ensuring Use of the Liberia Priority APL

Dissemination

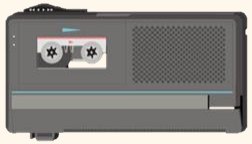
Dissemination of the APL should be conducted at the central, county, district, facility, and community levels. Government agencies, public and private service delivery points, donors, and implementing partners working in the AT and disability space should be oriented to the Liberia APL and should reference this as a key document to inform the implementation of AT interventions.

Review & update

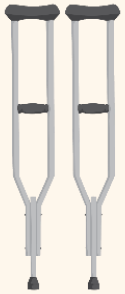
This first edition of the Liberia APL should be reviewed and updated in two (2) years, or earlier if needed (e.g., if the situation analysis drastically changes and prioritization factors should be re-evaluated). Stakeholders who form part of the national AT Technical Working Group should be consulted for any review or update; they should be led and coordinated by the MOH, WHO, and NCD.

Priority Assistive Products List for Liberia

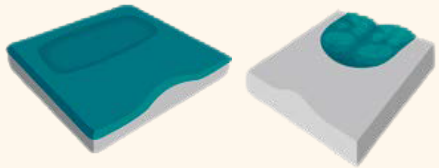
Stakeholders identified and validated the following 33 assistive products for inclusion on this version of the Liberia APL.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Cognition / Communication		
Personal emergency detectors (Personal emergency alarm systems / Fall detectors) ISO 22 27 18 Personal emergency alarm systems		Devices that include personal emergency alarm systems and fall alarms. Personal emergency alarm systems are operated either by the user or automatically activated in case of emergency, to notify the user or obtain help from others. Fall detectors enable rapid detection and interventions for persons who have experienced a fall. This helps to reduce physical and mental damage caused by the fall as well as recovery time after a fall.
Simplified mobile phones ISO 22 24 06 Telephones for mobile networks		Simple to use mobile phones with features such as easy user interface, large buttons to facilitate calling or texting.
Travel aids, portable ISO 12 39 06 Assistive products for electronic orientation		Products that support users to travel from one location to another, providing information about the route, public transportation availability, payments, and outdoor navigation data.
Personal digital assistant (PDA) ISO 22 33 06 Portable computers and PDA		Portable electronic devices powered by battery that can be used anywhere, including mobile phones such as smartphones and tablets.
Recorders / Transcribers ISO 22 18 03 Sound recording and playing devices		Recorders are portable devices that can record, store, and play audio to facilitate the recall of information such as facts, appointments. Transcribers are devices that can change audio (voice) into written formats.

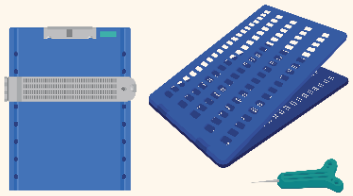
Name of product and ISO 9999:2016 code	General description, features, and intended use	
Hearing		
Alarm signalers with light/ sound/ vibration ISO 22 27 04 Signaling devices ISO 22 27 21 Environmental emergency alarm systems		Devices that gives a warning signal using a vibration, flash light, or loud sound to alert children and adults in case of imminent danger (e.g., fire alarm) or for everyday events (e.g., baby crying, doorbell ringing).
Hearing aids (digital) and batteries ISO 22 06 15 Behind-the-ear hearing aids ISO 22 06 12 In the ear or in the canal hearing aids ISO 22 06 27 Accessories for assistive products for hearing		Devices for persons who have difficulty hearing; worn either inside or behind a person's ear to increase the volume of sounds and reduce unwanted noises.
Hearing loops/FM systems ISO 22 18 24 Radio frequency transmission systems ISO 22 18 30 Induction loop devices		Wireless sound systems used to enhance assistive hearing devices such as hearing aids, cochlear implants, and to assist persons who may not use hearing aids, particularly over distance and in noisy environments. These systems allow sounds to be transmitted to people with greater clarity and reduced background noise.
Mobility		
Canes/Sticks ISO 12 03 03 Walking sticks and canes ISO 12 03 16 Multi-tip walking sticks and canes *This ISO code includes:* • Walking sticks • Tripods/quadripods		Walking sticks, tripods and quadripods are walking aids with a handgrip and single height-adjustable shaft with one, three or four ends fitted with tips (ferrules). They are intended for use by children and adults to support balance or weight-bearing through the leg(s).

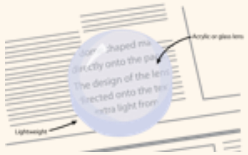
Name of product and ISO 9999:2016 code	General description, features, and intended use	
Clubfoot Brace *No ISO code*		A clubfoot brace is comprised of two boots that attach to a bar. The boots attach to the bar with a clip or screw and hold the feet in abduction (apart), dorsiflexion (up), and external rotation (rotated outward). All boots have a heel cup or well-rounded heel counter. Boot fastenings may be straps and buckles, hook-and-loop (Velcro) or laces. Clubfoot braces are used as part of the management of infants and children born with congenital talipes equinovarus (CTEV, idiopathic clubfoot) in one or both feet. The braces position the child's feet to maintain a position after the use of a series of plaster casts to correct the foot. Clubfoot braces are worn almost all the time in infants. Once the child is of walking age, clubfoot braces are generally used overnight until the condition is resolved.
Crutches, elbow/forearm/axillary ISO 12 03 06 Elbow crutches ISO 12 03 09 Forearm crutches ISO 12 03 12 Axilla crutches	 *elbow crutches*  *axilla crutches*  *forearm crutches*	Crutches are walking aids with elbow, underarm or forearm support, and height-adjustable shaft fitted with a tip (ferrule). A single crutch or pair of crutches is intended for use by children and adults to support balance or weight-bearing through the leg(s), to help the person to stand and walk.

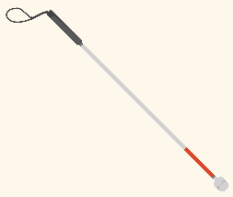
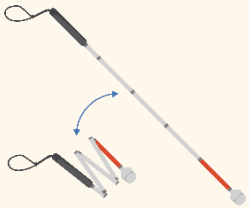
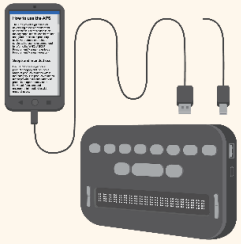
Name of product and ISO 9999:2016 code	General description, features, and intended use	
Orthoses, lower-limb (all sub-types) ISO 06 12 Lower limb orthoses		Orthoses are externally applied devices used to modify the structural and functional characteristics of the neuromuscular and skeletal systems. Orthoses can improve the mobility, dexterity or functioning of the user: alleviate pain; protect joints and tissues; manage deformities and abnormal neuromuscular functions; and prevent secondary impairments. Orthoses typically have 4 components: (i) Interface components (such as shells, pads, straps, foot orthoses, and shoes) (ii) Articulating components (the orthotic joints) (iii) Structural components (which connect the interface and articulating component) (iv) Cosmetic components (which provide shape color and texture) Orthoses are intended for use by children and adults whose muscles, tendons, ligaments, joints, and/or bones could use support to be in an optimal functional position. Lower-limb orthoses are those that encompass body segments such as foot, ankle, knee, and/or hip.
Orthoses, spinal ISO 06 03 09 Thoraco-lumbo-sacral orthoses ISO 06 03 12 Cervical orthoses		*See above for additional descriptions of orthoses.* Spinal orthoses are those that encompass either the whole or part of the thoracic, lumar, and sacro-iliac areas of the trunk as well as orthosis that supports the whole or part of the cervical spine.
Orthoses, upper limb (all subtypes) ISO 06 06 Upper limb orthoses		*See above for additional descriptions of orthoses.* Upper-limb orthoses are those that encompass the fingers, the wrist joint, and sometimes part of the hand and elbow.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Pressure relief cushions ISO 04 33 03 Seat cushions and underlays for tissue integrity *This ISO code includes:* • Comfort cushions • Postural support cushions • Pressure redistribution wheelchair seat cushions		Special cushions for sitting which helps to prevent skin damage and pressure sores for persons who sit for a long period of time (for example, persons who use a wheelchair) and has poor sensation. They provide postural support, redistribute pressure to protect skin and soft tissue, improve sitting comfort, and reduce the heat and moisture generated when the user is sitting on the cushion.
Pressure relief mattresses ISO 04 33 06 Assistive products for tissue integrity when lying down		Special mattresses that prevent injuries by dispersing pressure away from bone protrusions.
Prostheses, lower limb (all subtypes) ISO 06 24 Lower limb prostheses		Prostheses are externally applied devices which replaces wholly or partly an absent or deficient limb segment. Lower-limb prosthetic devices are divided into several types, including: transfemoral (TF) or above-knee prostheses, transtibial (TT) or below-knee prostheses, and partial foot and toe prostheses that are used for amputations of the toe and foot.
Prostheses, upper limb (all subtypes) ISO 06 18 Upper limb prostheses		Prostheses are externally applied devices which replaces wholly or partly an absent or deficient limb segment. Upper-limb prosthetic devices include those for the shoulder, transhumeral (TH) or above elbow prostheses, transradial (TR) or below elbow prostheses.
Therapeutic footwear ISO 09 03 42 Shoes and boots ISO 09 06 21 Assistive products for heel protection, toe protection or foot protection		Special shoes which protect a person's toes or soles of the feet by relieving pressure, absorbing shock, and helping to prevent skin damage to persons who have feet deformities or sensory loss.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Walking frames ISO 12 06 03 Walking frames		Walking frames has two hand-grips and four height-adjustable shafts that end in four tips (ferrules). A variety of tips and wheels are available for different products and terrains. They are intended for use by children and adults to support balance or stability.
Walker ISO 12 06 03 Walking frames		Walkers are walking frames that has two hand-grips and four height-adjustable shafts that end in two tips (ferrules) and two small wheels (castors). A variety of tips and wheels are available for different products and terrains. They are intended for use by children and adults to support balance or stability.
Wheelchairs, manual (including for active use and assistant-controlled) ISO 12 22 03 Bimanual handrim-drive wheelchairs ISO 12 22 06 Bimanual lever-drive wheelchairs ISO 12 22 09 Single-side manual drive wheelchairs ISO 12 22 15 Foot-propelled wheelchairs ISO 12 22 18 Push wheelchairs ISO 12 27 04 Transportation chairs ISO 12 27 07 Prams and buggies ISO 18 09 39 Modular seating systems		Wheelchairs provide wheeled mobility with an appropriate seating system and rely on the user or an assistant to move around. A wheelchair usually has three or four wheels with rear wheel locks or brakes for parking, footrests, seat and backrest, armrests, and clothing guards. It has push rims or levers for self-propelling and may have push-handles for assistant-propelling. It can be foldable or can be dismantled into smaller, separate parts for transportation and storage. A wheelchair can be used with a range of add-on mobility components for achieving its full function. Wheelchairs for active use involves the person using the wheelchair to push the wheels forward by themselves. Assistant-controlled wheelchairs involve a second person who pushes the chair by using the handles attached to the back support. Wheelchairs are intended for children and adults with limited mobility.
Wheelchairs, manual with postural support ISO 12 22 03 Bimanual handrim-drive wheelchairs		Manual wheelchairs with postural support are those that can be adjusted to the individual user's needs with additional postural support.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Vision		
Audio players with DAISY capability ISO 22 18 03 Sound recording and playing devices		Devices that are able to read contents out-loud, such as a MP3 player or an audio book, which help persons with low vision or blindness understand contents such as written words or music.
Braille displays (note-takers) ISO 22.39.05 Tactile computer displays		Devices used by persons with low vision or blindness to read and write. The device displays braille characters, usually by means of round-tipped pins raised through holes in a flat surface.
Braille writing equipment / Braillers ISO 22 12 12 Manual Braille writing equipment *This ISO code includes:* • Braille slates/frames • Interline Braille writing slates/frames • Interpoint Braille writing slates/frames • Small pocket frames • Stylus of different types ISO 22 12 15 Typewriters	 *Braille slate/frame*  *Braille typewriter*	Braille writing equipment and braillers are used to either manually (the former) or mechanically (the latter) produce embossed Braille characters on paper. Braille writing equipment and braillers have different features. • The equipment consists of a manually operated slate or frame with Braille cells and a special-tipped object called a stylus. The slate or frame has two plates hinged together to hold papers for writing Braille. The stylus is a short rod with a blunted point and is used to emboss the Braille dot into the page by hand. • A Brailler has a hard casing and a keypad. Braille letters are indented into Braille paper by pressing on one of the six Braille keys. They are intended to support communication for children and adults with blindness or low vision and for Braille transcribers to write in Braille.
Gesture to voice technology *No ISO code*		Technology that converts speech into sign language, and vice-versa.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Liquid level indicator *No ISO code*		Devices used by persons who are visually impaired to monitor the amount or level of liquid in a cup or glass, by sounding a tone or vibrating (or both) when the liquid level touches the tip of the device's prongs as the container becomes full or nearly full.
Magnifiers, handheld/optical ISO 22 03 09 Magnifier glasses, lenses and lens systems for magnification *This ISO code includes:* • Handheld, stand magnifiers, pocket, dome, sheet, spectacle and other portable magnifiers • Magnifiers with or without illumination	 *Hand-held magnifier*  *Stand magnifier*  *Dome magnifier*	Optical magnifiers are lenses that can produce enlarged images of close objects and print. An optical magnifier uses positive power lens to produce a magnifying effect. It comprises a single lens or more than one lens (called a lens system). The range of magnifying power (magnification) is measured in dioptres (D). Magnifiers most commonly have a lens power range from +4D to +76D. Some magnifiers include a built-in light source and are called “illuminated magnifiers”. Magnifiers can be held in a person’s hand, stand on its own, or be worn in front of a person’s eyes. They are intended for use by children and adults with low vision that cannot be fully corrected with spectacles or other treatment such as surgery.
Spectacles ISO 22 03 03 Light filters (absorption filters) ISO 22 03 06 Spectacles and contact lenses *This ISO code includes:* • Low vision spectacles • Short distance spectacles • Long distance spectacles • Eye protection		Spectacles, also commonly referred to as glasses or reading glasses, are lenses mounted into a spectacle frame. They are placed in front of a person’s eyes to help a person see things that are close by or far away more clearly. Spectacles for nearsightedness (myopia) and presbyopia have negative-powered (concave) lenses: spectacles for farsightedness (hyperopia) have positive-powered (convex) lenses; spectacles for astigmatism have a special cylindrical lens; and spectacles for low vision can include telescopic or magnifying components. Frames are available in a variety of sizes, styles, materials, and colors. Spectacles are intended for use by adults and children with myopia, presbyopia, hyperopia, and astigmatism. Filters, commonly called sunglasses, are glare control lenses that absorb ultraviolet (UV) light and enhance contrast. They are intended for use by children and adults with various ocular conditions that cause visual impairment.

Name of product and ISO 9999:2016 code	General description, features, and intended use	
Watches, talking/touching ISO 22 27 12 Clocks and timepieces	 *talking watch*  *touching watch*	A timepiece either carried or worn at the wrist, which allows persons with low vision or blindness to hear or feel the time.
White canes ISO 12 39 03 Tactile sticks or white canes *This ISO code includes:* • Straight canes • Angular canes • Folding white canes	 *Straight white cane*  *Angular white cane*  *Folding white cane*	White canes are long sticks with a handle on one end and a tip or roller on the other. The handle may have a wrist loop to hang the cane up when not in use. The body of the white cane is covered with reflective tape to make the user visible. Some white canes have a section of red or yellow paint or reflective tape at the tip to indicate the user is blind. Some canes have alternating colors of white and red indicating both vision and hearing loss. The devices give users information about the environment they are moving through, such as obstacles in their path, stairs they are coming to, curb edges they are approaching, and various other aspects of their environment. The device also helps to tell others that the user has low vision or is blind. White canes are intended for use by children and adults with low vision or blindness to help with walking.
Deafblind communicators *No ISO code*		Devices that help deaf-blind persons to communicate. The devices consist of Braille keys and a refreshable Braille display. Braille keystrokes are transmitted to a smartphone where they are displayed as text, and text entered into the smartphone is displayed as Braille on the communicator.

Annex

Annex 1. List of participants in Liberia APL workshops

Organization type	Organization	Name	Position
GOL - Partner Body	National Commission on Disabilities	Archibald Masaley	Aid
		Ricardia B. Dennis	Executive Director
		D. Charles Saypahn	Planning & Research
		Rose B. Daigbeh	Executive Secretary
		Mohammed Sackor	Technical Assistant
		Matthew T. Bobowke Jr.	SA / DD / Sign Language Interpreter
		Moses G. Tarnue	Procurement Officer
		Hannah J. Watson	HR
	Ministry of Education - Special & Inclusive Education Division	Theresa W. Garwo	Director
		Alexander M. Nakamu Jr.	Program Officer
	LBNM	Jemina W. Toe	Mental Health Officer
	LMHRA	James D.K. Goteh	Director of Pharmacovigilance
	MGCSP	S. Monah Forh	Psychosocial Counseling Supervisor
GOL - Public Provider	JFK-Monrovia Rehabilitation Center (MRC)	Dorbor M. Akoi, Sr.	Project Manager
		Forkpa L. Flomo	Orthopedic Technician
		Morris B. Freeman	Mobility Aid Technician
		Samuel S. Hennings	Physiotherapist
Private Provider	New Sight Eye Center	Dr. Catherine S. Gaisie	Optometrist
GOL/MOH - Lead Unit	MOH National Eye Health Program	Joseph L. Kerkula, MD	Program Manager
	MOH Non-Communicable Diseases and Injuries (NCDI) Unit	Anthony Tucker, MD	Director
		Dennis A. Kamba	Coordinator
		Nancy Kanneh Saydee	Coordinator
		Zoe Taylor Doe	Deputy Program Director
		Wahdae-Mai Harmon Gray, MD	Public Health Specialist
GOL/MOH - Support Unit	MOH Supply Chain Management Unit (SCMU)	Arthur Loryoun	Deputy Director for Supply Chain Management
	MOH Healthcare Technology Management Unit (HTMU)	Wymah S. Youyoubon	Director
NGO	AIFO	Luther S. Mendin	Communication & Program Officer
	Lions Clubs of Liberia	Mildred Dean	Zone Chair Executive
	Clinton Health Access Initiative (CHAI)	Moses Massaquoi, MD	Country Director
		Lily Lu	Program Manager
		Mia Lei	Assistive Technologies Associate
	World Health Organization	Barkon Dwah	NCD Focal Point
OPWD	Florence A. Tolbert and the Disabled Advocates (FATDA)	Samuel Dean	Principal
	Salayea Agriculture Project (SAPRO)	Melvin L Harding	Executive Director / Chairperson
	African Youth with Disability Network	William. M. Yarsiah	Country Coordinator
	Group of 77	Isaacfor P. Dennis	Senior Program Specialist
	HIGAB	Jochebad Morweh	Member / Security
	Liberia School for the Deaf	Andrew Tuqbek	Dean / Interpreter
	Christian Association of the Blind (CAB)	Celio M. George	Project Coordinator
		Boalquoi Mi Massequoi	Assistant Project Coordinator
		Kenny V Zangor	Lead Teacher
	MSD	Joshua CV Birr	Sign Language Interpretation
		Kallah Karblah	Business Manager
	National Union of Organizations of the Disabled (NUOD)	Alonzo Dorion Dixon	Secretary General
		Naomi B. Harris	President
		Peter BK Flomo	National VP for Administration
		Daniel Dagbe	VP
		Lahai Gotolo	Youth Coordinator

Annex 2. Liberia APL scoring rubric

Products were scored on the prioritization criteria using the following rubric. Stakeholders used the guiding considerations to score Impact on Quality of Life and Operational Feasibility, and the method described was used to translate data to scores for Total Need, Unmet Need, and Cost.

Prioritization Criteria	1	2	3	4	5	Guiding Considerations
Impact on Quality of Life	This product has a **low** impact on quality of life	-	This product has a **medium** impact on quality of life	-	This product has a **high** impact on quality of life	This criterion was scored by stakeholders, guided by the following questions: 1. What is the severity of the functional impairment? 2. How much of that impairment is mitigated by the product? 3. What is the impact on both the user and their caregiver(s)?
Operational Feasibility in the Local Setting	It will be **difficult** for this product to be used in Liberia	-	**Some constraints hinder use** of this product in Liberia, but it will **still be operationally feasible**	-	It will be **easy** for this product to be used in Liberia	This criterion was scored by stakeholders, guided by the following questions: 1. For the user: is the product easy to use and maintain? is the product acceptable to the population? 2. For the system: does the system have capacity to train, govern, provide, produce, maintain, and repair (including availability of spare parts)? Do the structural factors (geographic, sociocultural, etc.) support use of this product?
Total Need	Products in this domain meet the needs of **1%** of the national population	Products in this domain meet the needs of **5.3%** of the national population	Products in this domain meet the needs of **9.6%** of the national population	Products in this domain meet the needs of **13.9%** of the national population	Products in this domain meet the needs of **18.2%** of the national population	The Total Need, Unmet Need, and Cost criteria were all scored from available quantitative data. For these three criteria, data were translated with the same methodology: the most positive data point was scored 5, the least positive data point was scored 1, and for all scores in between, the data were divided up proportionately.
Unmet Need	**15.5%** of people who need products in this functional domain are using it	**12.4%** of people who need products in this functional domain are using it	**9.3%** of people who need products in this functional domain are using it	**6.3%** of people who need products in this functional domain are using it	**3.2%** of people who need products in this functional domain are using it	
Cost	This product will cost **$4200**	This product will cost **$3150**	This product will cost **$2101**	This product will cost **$1051**	This product will cost **$1**	

Annex 3. Liberia APL scorecard template

Below is the scorecard template that was used to evaluate each product on each criterion. Stakeholders used the template to score the two qualitative criteria (impact on quality of life; operational feasibility). Quantitative data were used to score Total Need, Unmet Need, and Cost. The specific data that informed scoring and individual scores can be obtained from MOH-NCDI upon request.

Functional domain	Product	Impact on Quality of Life (x3)	Operational Feasibility (x2)	Cost (x2)	Total Need (x3)	Unmet Need (x1)	Summary score
Vision	Audio players with DAISY capability						
	Braille displays (notetakers)						
	Braille writing equipment/ braillers						
	Deafblind communicators						
	GPS locators						
	Gesture to voice technology						
	Magnifiers, digital (remove)						
	Magnifiers, hand-held optical						
	Spectacles: low vision, short distance, long distance, filters and protection						
	Watches, talking/touching						
	White canes						
	Liquid level indicator						
	Temperature indicator						
Hearing, Communications, Cognition	Personal emergency detectors (Personal emergency alarm systems / Fall detectors)						
	Personal digital assistant (PDA)						
	Pill organizers						
	Recorders / Transcribers						
	Simplified mobile phones						
	Travel aids, portable						
	Communication boards/books/cards						
	Communication software						
	Alarm signalers with light/ sound/ vibration						
	Closed captioning displays						
	Hearing aids (digital) and batteries						
	Hearing loops/FM systems						
	Video communication devices						

Functional domain	Product	Impact on Quality of Life (x3)	Operational Feasibility (x2)	Cost (x2)	Total Need (x3)	Unmet Need (x1)	Summary score
Mobility	Canes/sticks						
	Clubfoot braces						
	Crutches, axillary/elbow						
	Orthoses, lower-limb (foot, ankle-foot, knee-ankle-foot, and hip-knee)						
	Orthoses, spinal						
	Orthoses, upper limb (wrist-hand-finger, elbow-wrist-hand, shoulder-elbow-wrist-hand)						
	Pressure relief cushions						
	Pressure relief mattresses						
	Prostheses, lower limb (below-knee, above-knee)						
	Prostheses, upper limb (above-elbow, below-elbow, shoulder)						
	Rollators						
	Standing frames, adjustable						
	Therapeutic footwear: diabetic, neuropathic, orthopedic						
	Tricycles						
	Walking frames (can sit; foldable)						
	Walker						
	Wheelchairs, manual						
	Wheelchairs, manual with postural support						
Self-care	Chairs for shower/ bath/ toilet						
	Incontinence products, absorbent						
	Ramps, portable						
	Screen readers						
	Hand rails / grab bars						
	Keyboard and mouse emulation software						

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