Assistive Technology Country Capacity Assessment

LIBERIA'S AT CAPACITY REPORT

Developed by:
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Abbreviations and Acronyms

APL	Assistive Products List
AT	Assistive Technology
ATA-C	Assistive Technology Assessment-Capacity
CAM	Christian Aid Ministries
CAB	Christian Association of the Blind
CBR	Community-Based Rehabilitation
CHA	Community Health Assistants
CHAI	Clinton Health Access Initiative
CHW	Community Health Workers
CRPD	Convention on the Rights of Persons with Disabilities
DALYs	Disability Adjusted Life Years
DPOs	Disabled Peoples' Organization
EIS	Employee Injury Scheme
FATDA	Florence A. Tolbert & the Disabled Advocates
GATE	Global Cooperation on Assistive Technology
gCHV	General Community Health Volunteers
GOL	Government of Liberia
HMIS	Health Management Information System
IE	Inclusive Education
JFKMC	John F. Kennedy Medical Center
LCPS	Liberia College of Physicians and Surgeons
LDHS	Liberia Demographic and Health Survey
LDS	Jesus Christ of the Latter Day Saints
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
LVPEI	L V Prasad Eye Institute
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
NASSCORP	National Social Security and Welfare Corporation
NCD	National Commission on Disabilities
NCDI	Non-communicable Diseases and Injuries
NEHP	National Eye Health Program
NGO	Non-Government Organizations
NPS	National Pension Scheme
NUOD	National Union of Organizations of the Disabled
P&O	Prosthetics and Orthopedics
PWDs	Persons with Disabilities
SARA	Service Availability and Readiness Assessment

SSI	SightSavers International
UHC	Universal Health Coverage
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Executive Summary

Assistive technology (AT) such as wheelchairs, hearing aids, spectacles, prostheses, etc. help to maintain or improve a person's functioning and independence. Persons with disabilities (PWDs) and the aging population make up a significant portion of those who require AT to support them in living healthy, productive, and independent lives. Without AT, PWDs as an already vulnerable population could further suffer from isolation, marginalization, and poverty. As such, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) recognizes access AT as a fundamental human right.

According to the last population census conducted (post-war, 2008), Liberia has a disability prevalence of 3.17%. Of the disabled population, the majority experience visual impairments (34%), followed by mobility impairments (25%), hearing impairments (11%), communication impairments (4%), and cognitive impairments (4%). However, these figures are widely regarded to be a significant underestimation of disabilities in Liberia, considering that nearly one-third of the population fought in the civil wars, with countless more being impacted. Currently, Liberia has a population of 4.9 million people, and recent estimates show that the prevalence of non-communicable diseases and injuries (NCDIs) are on the rise, which will also lead to an increase in persons who require AT. Access to AT is particularly a challenge in low income countries, where absence of policies and service delivery guidance, lack of financial & human resources, limited user and provider awareness, and fragmented coordination among stakeholders hamper the delivery of quality and appropriate AT services. In order to identify barriers to AT availability and access, and to devise tailored and effective solutions to facilitate greater and equitable access to AT, a country-specific understanding of the context, structures, and enabling environment for AT is essential.

To that end, the Global Disability Innovation Hub contracted the Clinton Health Access Initiative (CHAI) to conduct an Assistive Technology Country Capacity Assessment in Liberia to understand the country's current systems capacity to provide AT. The findings are intended to increase awareness and knowledge of AT among partners; and to identify gaps that would benefit from increased and coordinated investments. A mix of desk literature review and stakeholder interviews were used to collect quantitative and qualitative information, guided by the World Health Organization's AT Assessment-Capacity (ATA-C) Tool. Relevant stakeholders across government ministries and agencies, civil society organizations, non-government organizations and UN agencies, disabled people's organizations (DPOs), public and private health/rehabilitation facilities were interviewed. Following data collection, a consultative stakeholder workshop was held to share and validate the findings, as well as develop and build consensus on recommendations to accelerate AT access in Liberia. This assessment collated and analyzed its findings across the domains of stakeholder landscape, policy & financing, product & procurement, human resources, AT provision, and data & information systems. Key findings and recommendations under each domain are highlighted below.

Stakeholder Landscape

Key line ministries within the Government of Liberia (GOL) with mandates to support disability and AT-related issues include the Ministry of Health (MOH), Ministry of Gender, Children and Social Protection (MGCSP), and Ministry of Education (MOE). In addition, through the enactment of the National Commission on Disability (NCD) Establishment Act in 2005, the NCD was formed to coordinate, supervise and monitor CRPD implementation, and to mainstream disability matters in national programs. Thus, programs relating to PWDs and AT are statutorily assigned, at varying degrees, to the abovementioned agencies. Through its various departments and service delivery points, the GOL plays a lead or supporting role in functions such as policymaking, advocacy, regulation, distribution and service provision in AT. However, since the roles and responsibilities of various government entities substantially overlap in theory, there is some inter-ministerial and inter-sectorial confusion surrounding implementation of AT activities, and results in fragmentation with no mechanism for coordination. There are also non-government and civil society partners supporting AT-related activities, though the issue of coordination extends here as well. Key non-government partners play a lead or supporting role in policymaking, advocacy, procurement, distribution, service provision, and financing. Non-government partners run the majority of AT programs in the country, and finances the majority of assistive products. Amongst non-government partners, efforts are often fragmented, and there is little knowledge-sharing or collaboration between stakeholders.

Policy & Financing

Liberia ratified the CRPD in 2012; however, the ratification did not include the Convention's optional protocol. Other than the original Act establishing the NCD, no other national laws have been enacted to facilitate CRPD implementation. No national policy or strategic plan exists for AT. In 2018, the GOL validated the National Action Plan for the Inclusion of Persons with Disabilities (NAP), within which there are two performance indicators for AT; however, the relevant activities outlined do not provide a clear roadmap for increasing AT access. The GOL administers a number of health and social welfare schemes that aim to increase access to basic health and social services, though none of the current schemes explicitly provide AT coverage, nor is coverage national (i.e. schemes do not cover all Liberians). For example, the National Social Security and Welfare Corporation (NASSCORP) administers the Employee Injury Scheme (EIS) and National Pension Scheme (NPS), both of which do not explicitly cover AT. Furthermore, the EIS and NPS are only available as contributory schemes to those formally employed by an organization registered with NASSCORP. Within the health sector, the Essential Package of Health Services outlines essential services that should be provided free-of-charge to all patients within the country's health facilities. However, these provisions exclude AT and face consistent challenges in sustainable financing. Other financing schemes that were active include the NCD's quarterly subsidies for DPOs, and the MGSCP's social cash transfer program to vulnerable populations; however, funding ended in 2017 and discussions are ongoing with donors for their continuation. Financing for AT in Liberia is largely supported by non-government partners and donors, whose funding is used to procure assistive products for mass distribution, or to be provided through public and private sector service delivery points (rehabilitation centers).

Products & Procurement

Various categories of assistive products are available in Liberia, mainly through donations from non-government partners and are provided through donor-funded rehabilitation centers or organizations. However, existing regulatory mechanisms in the country for health products do not include AT, thus products that enter the country are unregulated in terms of quality standards or suitability. There is no national priority assistive products list. The government's procurement system does not currently include AT due to lack of prioritization and resources; nor does the government play a role in coordinating AT procurement by its donors and rehabilitation centers.

Human Resources

The absence of a fit-for-purpose workforce (health, social welfare, education) for the provision of AT and rehabilitation services in Liberia is a major challenge. Investments in the general health workforce have not considered how they could be leveraged to provide AT, though some programs have begun to explore task-shifting AT provision to existing cadres (e.g. nurses, physician assistants [PA]). Still, there remains a significant shortage of human resources for AT fitting, provision, repair and replacement. Few specialist doctors and AT professionals are available across the public and private sector. There is also little to no in-country training of AT-related workforce in Liberia. The development of cadres such as physiotherapists, mobility orientation technicians, P&O technicians, speech therapists, community-based rehabilitation workers continue to be under-funded and deprioritized. The majority of training of the AT workforce have been provided by non-government organizations, with little integration into existing health training programs and institutions. Currently, most health training institutions in Liberia do not have degree/certificate programs or even courses on rehabilitation science or AT provision.

AT Provision

AT provision occurs in both the public and private sector, with very few facilities currently providing AT. In the public sector, JFK Medical Center's Monrovia Rehabilitation Center and Liberia Eye Center are the key service delivery points, and serves patients from all around the country free-of-charge (or at a low subsidized cost). There are enormous gaps between AT service delivery points and the population that requires AT. Among existing service delivery points, there are no formal referral mechanisms to connect patients/users to facilities, nor to connect providers and AT specialists from each other.

Data & Information Systems

While there are some data on disability prevalence and AT, data are out-dated and generally incomplete and/or inaccurate. Data that provide information on PWDs and AT access in Liberia have mostly been generated from surveys. The most recent

population-based survey with data on these topics was the 2008 population census. Other national surveys with related data include a needs assessment conducted by the MOH in 2009, and the Labour Force Survey conducted by the Ministry of Labour in 2010. Currently, there is no routine data collection system on PWDs and access to AT in Liberia. The health management information system used by the MOH does not currently collect data on disabilities/functional limitations or AT service volume in health and rehabilitation facilities, and there is also very limited data on NCDIs. In the few facilities that currently provide AT and rehabilitation services), patient records provide data on impairment diagnoses and AT provision. The lack of routine data capture as it relates to disabilities and AT poses a serious barrier to real-time understanding of the needs and demands of potential AT users in Liberia, and an absence of evidence is available to inform AT policymaking and programming.

Overall, when considering various the criteria for success across the domains discussed above, Liberia's systems capacity to provide AT and related services is lacking. Key recommended actions to strengthen the country's health and social welfare systems in order to accelerate AT access include:

Policy, Program, and Financing for AT

- Strengthen national legislations related to PWDs and access to AT
- Establish a coordinated national effort for increased access to AT, including formation of a cross-sectoral technical working group and development of a national AT policy and strategy
- Build the government's capacity to implement programs for AT, across areas of standards / regulations, procurement and supply chain, workforce, provision, data systems, etc.
- Advocate for and sustain availability of financial resources to support AT, such as inclusion of AT into existing or planned national health insurance or social welfare schemes or programs

Products & Procurement Systems

- Develop national assistive products list (APL) as well as technical specifications and other regulatory mechanisms for manufacturing, importing, and procurement of assistive products
- Integrate a government procurement system for AT into the existing supply chain and procurement system, and ensure non-government procurement of AT is coordinated with key government agencies
- Develop capacity for high-quality local AT production (either parts or complete products)

Human Resources

- Increase the quantity, quality, and skill diversity of the public sector workforce (both health and non-health) as related to AT service delivery
- Establish and strengthen structures for developing an AT workforce, including development of pre-service and in-service training programs, and integration of courses AT and rehabilitation sciences into existing training programs

Provision of AT

- Develop national guidelines and service standards to guide high-quality and safe provision of AT
- Increase the provision of AT in public sector facilities through integration into routine service delivery and decentralization of services
- Strengthen person-centeredness within AT service provision that considers user satisfaction and impact data, including establishing programs for peer-to-peer training and support
- Develop a well-connected and coordinated AT provision system, inclusive of a formal referral mechanism to link patients/clients to facilities, and to connect facilities

Data and Information Systems

- Conduct nation-wide survey on disabilities, functional limitations, AT use and access
- Establish or strengthen health information systems for data coverage on health conditions and functional limitations that require AT, and on AT provision and utilization
- Promote utilization of data for evidence-based decisions in AT programming

Introduction

What is assistive technology?

The World Health Organization (WHO) defines assistive technology (AT) [also known as assistive devices; assistive products] as the umbrella term for "systems and services used to deliver assistive products 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. 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, 2018).

Availability of and access to AT can potentially help to reduce hospitalization rates, avoid loss of productivity, and reduce long-term healthcare and welfare costs; this in turn allows disabled persons to minimized direct health and welfare costs and engage into productive and economic activities (UNDESA, 2019). Accelerating access to AT for people with disabilities (PWDs), the aging population and those affected by chronic health conditions can improve their well-being by enabling them to live healthy, productive and independent lives where they can fully participate in education, the labour market and community life. Without assistive products, PWDs as an already vulnerable population could further suffer from isolation, marginalization, and poverty. Based on recent research, lack of access to quality assistive products often leads to poorer health outcomes for PWDs, including premature death, deteriorating mental health and chronic secondary health complications such as postural effects and injuries (Liberia NCDI Poverty Commission, 2018; WHO & The World Bank, 2011; WHO, 2018). As such, the United Nations Convention on the Rights of Persons with Disabilities (CRPD), Article 32, recognizes access AT as a fundamental human right. In recent years, the World Health General Assembly Resolution (WHA71.8) and various international health strategies and call for action have also recognized AT access as being integral to the achievement of Universal Health Coverage (UHC).

Demand for AT

Globally, approximately one billion people live with varying forms of disabilities, with 80% of them living in developing countries; by 2050, this number is expected to double due to an ageing population and rising burden of non-communicable diseases and injuries (NCDIs) (UNDESA, 2019; WHO, 2017). However, 90% of disabled persons do not have access to any AT or services to enhance their independence, daily functions and enable them to participate in education, work, politics and community activities and lead more engaging and dignified lives. For example, the World Report on Disability (WHO, 2011) estimated that over 200 million people with low vision do not have access to assistive products such as spectacles, and of the 75 million people in need of wheelchairs worldwide, only 5-15% has access to quality wheelchairs. Out of the 466 million people experiencing hearing loss, only 10% has been reached with the needed hearing aids and even among those who have access to these devices, the abandonment rate of products due to changes in user need can be as high as 78% (Petrie et al., 2018).

Furthermore, the world's population is aging. Older people are at higher risk of disabilities due to an accumulation of health issues and injuries, and the development of chronic illnesses; thus they are more likely to require AT to support their independence and to perform activities that might otherwise be difficult or impossible. It is expected that the global population aged 60 years or over will double by 2050, when it is projected to reach nearly 2.1 billion (UNDESA, 2017). Notably, two-thirds of the world's older persons live in developing countries, and their numbers are expected to grow even faster than in developed countries (UNDESA, 2017). It is estimated that nearly 8 in 10 of the world's older persons will be living in the developing regions by 2050, with disability prevalence in older populations is higher in low-income countries than in high-income countries (UNDESA, 2017; WHO & The World Bank, 2011).

Access to AT

Access to assistive products and rehabilitation services are particularly a challenge in low-and-middle income countries (LMICs), where systemic and institutional barriers such as absence of relevant policies and service delivery guidance, lack of financial & human resources, limited user and provider awareness, and fragmented coordination mechanisms hamper the ability to deliver quality and appropriate AT services for those in need. From a user's perspective, commonly reported barriers to rehabilitation services in LMICs include logistical factors such as distance to services and lack of transportation; affordability of services; lack of perceived need and awareness of services; discrimination from health providers; and communication barriers (Bright et al., 2018). Although most LMICs including Liberia have ratified and adapted the CRPD and Resolution WHA71.8, implementation of these instruments has been slow. The Government of Liberia (GOL) in its post-conflict recovery process has made some significant investments to improve and decentralize healthcare across the country, but the AT sector remains neglected and under-resourced, and even the availability and readiness of healthcare services to address the country's growing NCDI disease burden and health conditions that commonly require AT is highly inadequate.

Purpose of the Assessment

A country-specific understanding of the context, structures, and enabling environment for AT and rehabilitation services is essential to identifying gaps and barriers hindering AT access, and to devise tailored and effective solutions that will strengthen a country's healthcare and social systems and facilitate greater and equitable access to AT. The purpose of this assessment is to understand the current landscape of AT in Liberia by identifying the country's capacity to finance, procure and deliver quality, appropriate and affordable AT and services for people with functional limitations. The findings are intended to help raise awareness and increase knowledge of AT among key government, civil society, and development partners; and to identify gaps that would benefit from public and private investments. The assessment will also provide evidence to inform the development of national AT policies, guidelines, and programs by the GOL.

Methodology

The AT assessment was conducted within a 3-month period between September and December 2019. A mapping of in-country stakeholders in the disability and AT sectors was undertaken, and considered stakeholders from civil society organizations, non-government organizations (NGOs) and UN agencies, disabled people's organizations (DPOs) and their umbrella organization (National Union of Organizations of the Disabled [NUOD]), public and private health or rehabilitation facilities, Ministry of Health (MOH), Ministry of Gender, Children and Social Protection (MGCSP), and other government entities (see Appendix A).

WHO ATA-C Tool

Data collection was guided by the AT Assessment-Capacity (ATA-C) Tool developed by the WHO. The interview guides and questionnaires drawn from the Tool were contextualized to ensure they suit the local context (e.g. through modification of terminology), then used to gathered information in the following domains as they relate to AT:

- **Stakeholder** – Identification of government and non-government stakeholders, as well as their roles, responsibilities, and current activities
- **Policy and Financing** – Identification of existing policies, financing schemes, and programs for AT provision
- **Product and Procurement** – Mapping of available assistive products in the country, as well as their quality assurance, procurement and supply processes;
- **Human Resources** – Mapping of general and AT-related health workforce, and AT-related training programs in the country
- **Provision** – Mapping of workforce and facilities that provides/prescribes AT and related services, as well as any existing service standards and guidelines.

- **Population Data** – Identification of information systems that collect data related to AT and disability, and synthesizing the most recent data on AT and health conditions where AT is commonly needed.

Desk review

Data collection began with a detailed desk review of literature to collect available quantitative data and qualitative information on disability issues, AT service provision and related systems in the country. The search showed a small number of grey literatures on the topics of PWDs and AT access, including government policies and strategic documents such as the National Eye Health Program (NEHP), the Inclusive and Special Education Policy of the Ministry of Education (IE Policy) and the National Action Plan on the Inclusion of Persons with Disabilities. However, there were limited information and data in the literature on the needs, availability and access to AT and related services for populations in need.

In addition, we found few reports that have been developed by donors and NGOs which provided some information on the situation of persons with disabilities (PWDs), contexts for AT provision, and programs relating to the promotion and protection of the rights of PWDs. For example, the Swedish International Development Agency (Sida) released a report that provided helpful contexts on disability rights in Liberia and data from a survey conducted by UNICEF in Liberia in 1997 – immediately after the first Liberian civil war from 1989 to 1997. The SIDA report touched on the relevant policy and regulatory framework and progress achieved by the Liberian Government to ensuring the protection and promotion of the rights of PWDs, and also particularly shed light on the widespread vulnerabilities, marginalisation and exclusion of PWDs in many aspects of the Liberian society (Sida, 2014). Another example is a 2018 report produced by AIFO International with funding from the Italian Agency for Development Cooperation (Deepak, 2018), which focused extensively on assessing DPOs' institutional and technical capacity in fundraising, entrepreneurship, advocacy, networking and socioeconomic empowerment skills for PWDs in Liberia; the report provided some helpful background on key stakeholders within the disability sector (who were then contacted to participate in this assessment). However, no studies were found that specifically examined the provision of AT and related services in Liberia.

There are some secondary data on the prevalence and causes of disabilities and use of AT, but data are limited and often dated. We drew from sources such as the 2008 Population & Housing Census conducted by the Liberia Institute of Statistics & Geo-information Services (LISGIS, 2009), the 2009 Needs Assessment on Persons with Disabilities (MOHSW, 2009), the 2018 Liberia NCDI Poverty Commission Report (Liberia NCDI Poverty Commission, 2018). Detailed data can be found below in the '*Data and Information System related to Assistive Technology*' section. Data on general and AT-specific health workforce in the country were drawn from stakeholder interviews as well as the 2016 Human Resource for Health (HRH) Census (MOH, 2016a).

Focus group discussions & key informant interviews

In addition to the desk review, we also conducted focus group discussions (FGDs) and key informant interviews (KIIs) to capture information on the contexts, challenges, and opportunities related to AT availability and access in Liberia. FGDs and KIIs were done to ensure the incorporation of perspectives and knowledge of PWDs and other end-users of AT, as well as stakeholders and champions currently working in (or have the potential to work in) the AT and disability sector across various domains. FGDs were held with DPOs, including The Group of 77, Christian Association of the Blind (CAB) and some beneficiaries of the School of the Blind, and Florence A. Tolbert & the Disabled Advocates (FATDA); and 31 KIIs were conducted with key individuals from various government and non-government organizations (see Appendix A for complete list of stakeholders who participated).

Assessment Limitations

This assessment is a high-level overview of the systems in Liberia related to AT availability and service delivery, based on information shared by the stakeholders and AT users interviewed; it thus does not represent the views and perspectives of all PWDs or persons living with functional limitations in Liberia. This assessment also focuses mainly on the supply-side systems gaps and barriers to AT availability and access, and may not capture comprehensively the demand-side barriers that may be attributed to individual knowledge, attitudes, and practice related to AT and general care-seeking behaviours.

Although this assessment identified and interviewed a wide range of stakeholders across government ministries and agencies, NGOs, DPOs, and service delivery points, there remain some stakeholders who could not be reached due to their schedules; thus there may be some information and data not captured in this report. We also understood from MOGCSP that various local organizations / DPOs are no longer active, or lacked the updated contact information that would enable us to reach out for their participation. Furthermore, due to time and resource constraints, the majority of stakeholders interviewed are based in Montserrado, Nimba, and Grand Bassa, and we were unable to meet with stakeholders (e.g. county-specific chapters of certain DPOs) in other, more rural counties.

Within the three months of data collection for the assessment, it was recognized that availability of accurate, reliable, and up-to-date population-based data on functional limitations and on AT use and provision is very limited. We also identified discrepancies and inconsistencies in the data that is available on disabilities and AT. For example, the 2008 Population and Housing Census reported a much higher population of PWDs than a needs assessment conducted just a year later (2009) by the then Ministry of Health & Social Welfare (MOHSW; currently MOH), though the methodology used to select respondents and to conduct this assessment is unclear. The lack of routine data capture at the health facility level for various disabilities and AT use meant that little recent data was available on the scale of these issues.

Liberia's Capacity on Assistive Technology

1. Data and Information System related to Assistive Technology

Liberia's demographic profile

Liberia has a current population of 4.9 million people, with an annual growth rate of 2.5% and an estimated household size of 4.3 persons per household (LISGIS, 2017; UNDESA, 2019). Poverty is highly pervasive within the Liberian population, especially amongst rural population and disabled households. According to the Liberia Household Income Expenditure Survey (LISGIS, 2017), 50.9% of the Liberian population lives in absolute poverty—where households survive on less than a $1.00 per day; and 16.5% lives in extreme poverty. With weak healthcare and social welfare systems that often suffer from inadequate budgetary allocations and lack of capacity to meet population needs, PWDs in Liberia remain the poorest, most marginalized and excluded groups in the country, and are more susceptible to social and economic shocks and fragilities than their non-disabled counterparts. In addition, disabled households and individuals are multi-dimensionally poor and continue to experience enormous deprivations compared with non-disabled households and individuals in Liberia (Carew et al., 2019). This is particularly true for women and children with disabilities, who are more likely to be exposed to poverty, exploitation, discrimination and stigmatization across all aspects of their lives, including healthcare-seeking, education, and the labour market (Carew, et al., 2019; The World Bank, 2018). Liberia's health and social systems have also been exposed to various shocks in the past, including 14 years of civil wars and most recently through the 2014 Ebola epidemic, during which PWDs, women and children experienced severe inequalities in accessing healthcare services (UNICEF, 2017).

Liberia currently has a young population, typical of developing countries with a high fertility rate and low life expectancy (NMCP/MOH, LISGIS, & ICF, 2016). According to the 2016 Malaria Indicators Survey, almost half of the population (46%) is under the age of fifteen, 51% is between the ages of 15-64, and only 3% of the population is age 65 and older (NMCP/MOH, LISGIS, & ICF, 2016). However, the presence of a youthful population does not mean that immediate investments in AT and rehabilitation services are not necessary. AT access must be ensured to realize a fundamental human right, whether or not a large aging population exists in the country. Furthermore, in order for the country to harness the demographic dividends provided by adolescents and youth, improve their education and productivity, and avert future health costs, the government has the responsibility to improve access to high-quality and appropriate AT for the disabled population. The low life expectancy in Liberia (LISGIS, 2009) also highlights the need to improve healthcare service delivery, including access to assistive devices, to address NCDIs and functional decline that are associated with aging. While national data do not exist for many of the health conditions that commonly require AT, the recent national The Liberia Non-Communicable Diseases & Injuries Poverty Commission Report cites the 2016 Global Burden of Disease Study estimates for Liberia and shows that in the last two decades, the disease burden of and disabilities attributed to NCDIs has doubled (Liberia NCDI Poverty Commission, 2018). Lastly, Liberia will also see an aging population over the next few decades as a result of the demographic transition. It is estimated that in 2050, the percentage of individuals aged 60 years or over in Liberia will be 8.2%, up from 4.9% in 2017 (UNDESA, 2017)

Existing information systems and data sources

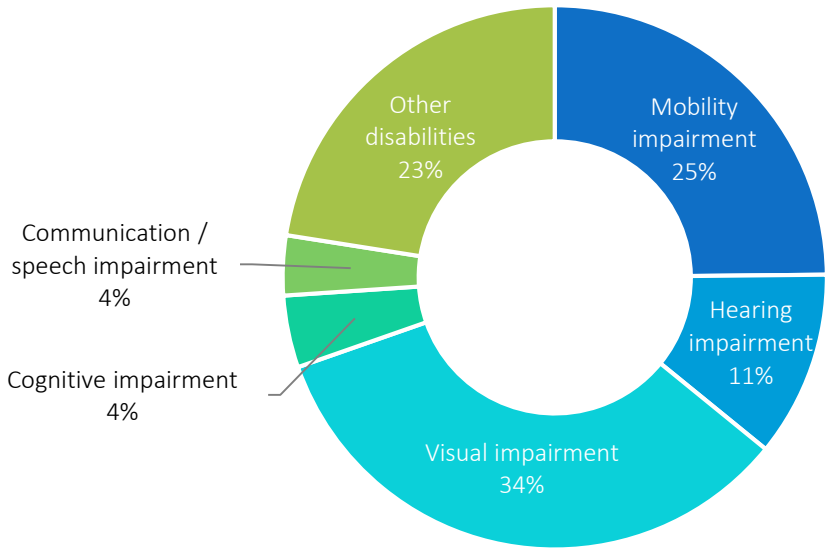
Currently, there is no routine data collection system on PWDs and access to AT in Liberia. The health management information system (HMIS) used by the MOH (hosted on the DHIS-2 platform) does not currently collect data on disabilities/functional limitations or AT service volume in health and rehabilitation facilities, and there are also very limited data on NCDIs. In the few facilities that currently provide AT and rehabilitation services, patient records do capture data on disability diagnosis; examples of these include patient records at the Liberia Eye Center (using the eyeSmart Electronic Medical Record system database) and at the Ganta United Methodist Hospital.

In the MOH's logistics management information system (LMIS), some types of spectacles and lenses are included under the reporting from the Eye Health Program. However, while the data element exists on both the paper-based and web-based Stock Status Report & Requisition (SSRR) form, actual facility-level data are not routinely captured. Therefore, data that provide information on PWDs, functional limitations and access to AT in Liberia have mostly been generated from surveys. The most recent population-based survey with data on these topics was the population census of 2008. Other national surveys with data on disability and AT use conducted include a needs assessment (though methodology unclear) conducted by the MOH in 2009 and the Labour Force Survey conducted by the Ministry of Labour in 2010 (see data below). Though these surveys attempt to capture the same data elements, lack of clarity and lack of standardization in definitions have resulted in discrepant results and low comparability (more below).

Prevalence of disabilities in Liberia

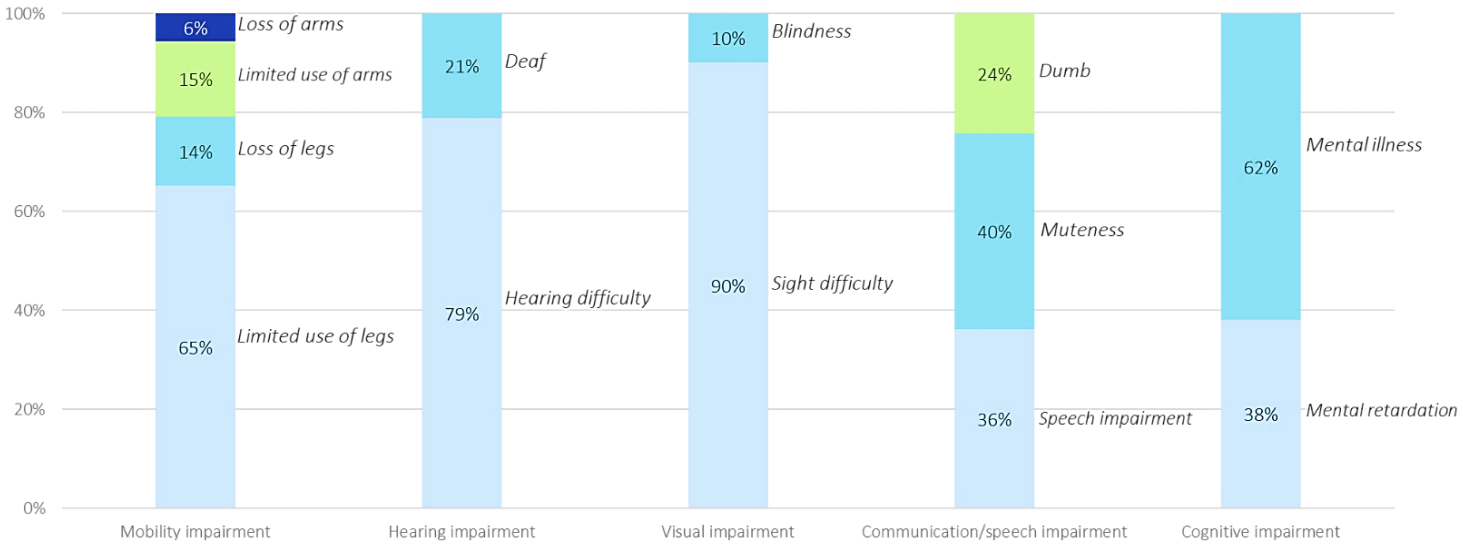
The 2008 Population & Housing Census conducted by LISGIS captured population-wide data on persons with disabilities and functional limitations. The proportion of PWDs constituted 3.17% of the total population at the time (110,260 disabled persons out of 3,476,608 population); however, this figure from the first post-war census is believed to be a significant underestimation of the prevalence of disability and functional limitations in the population. Of the disabled population in Liberia (Figure 1)[1], the majority of were due to visual impairments (34%), followed by mobility impairments (25%), hearing impairments (11%), communication/speech impairments (4%), and cognitive impairments (4%). Figure 2 below also shows the proportion of different levels of functional limitations within each impairment category as reported from the 2008 census.

Figure 1. Distribution of disabled population in Liberia by type of disability (Census, 2008)



[1] The census did not specify what is meant by 'other disabilities', nor how multiple disabilities within one individual is captured.

Figure 2. Distribution of levels of functional limitations, by impairment type (Census, 2008)



As mentioned above, the former Ministry of Health and Social Welfare (MOHSW) also conducted a Needs Assessment on PWDs in 2009, just a year after the census. The available report on this assessment does not provide much detail on the methodology, but states that the assessment was conducted across all fifteen counties in Liberia.

The assessment reports that a total of 8512 persons with disabilities were 'registered' (no details as to the exact definitions or procedures of registration) in 2009. This is significantly lower than the 110,260 PWDs identified in the 2008 census. However, the overall distribution of impairment types among PWDs (Figure 3) is similar to that observed in the census, leading with physical impairment and visual impairment (36% of PWDs, for each), followed by speech impairment (21%), and cognitive impairment (7%). In addition to prevalence of disabilities, the Needs Assessment captured some AT access data (see below).

Figure 3. Distribution of disabled population in Liberia by type of disability (Needs Assessment, 2009)

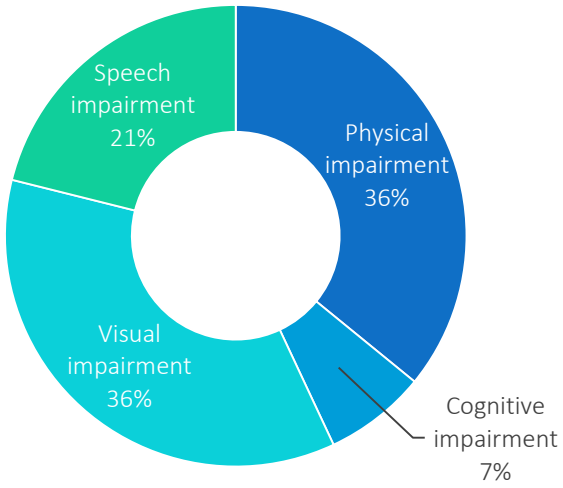
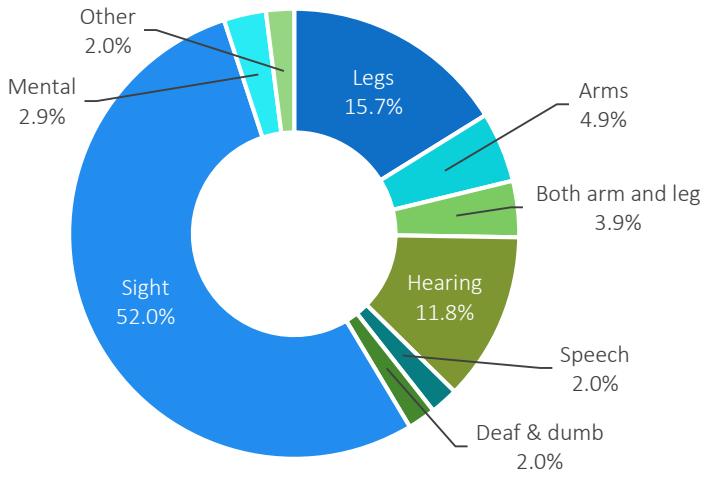


Figure 4. Distribution of disabled population in Liberia by type of disability (Labour Force Survey, 2010)



Another source of disability data can be found in the 2010 Ministry of Labour and LISGIS Labour Force Survey (LFS)[2]. The LFS estimates a total of 102,000 persons aged 5 and over who live with some type of disability or functional impairment (level of severity not captured) (LISGIS & MOL, 2011) (Figure 4). Similar to findings from the 2008 census and 2009 needs assessment, visual impairments ("sight") make up one of the major impairment types seen in the population.

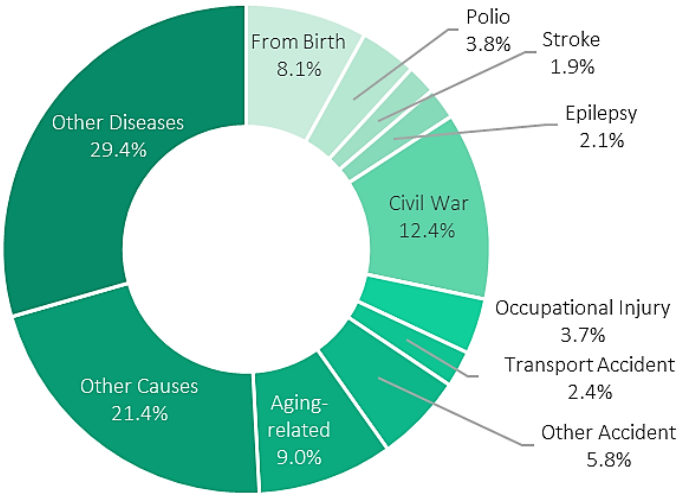
As mentioned above, there are also some recent facility-level data available on certain impairments. A retrospective review was conducted using records from all patients who presented to the Liberia Eye Center in Monrovia between July 2017 and July 2018 (Das et al., 2019). Within this period, 8234 ocular diagnoses were made in 5258 patients. The top five diagnoses were refractive error (34.89% of total diagnoses), cornea & anterior segment disorders (30.94%), cataract (14.11%), glaucoma (7.12%), and retina (5.11%).

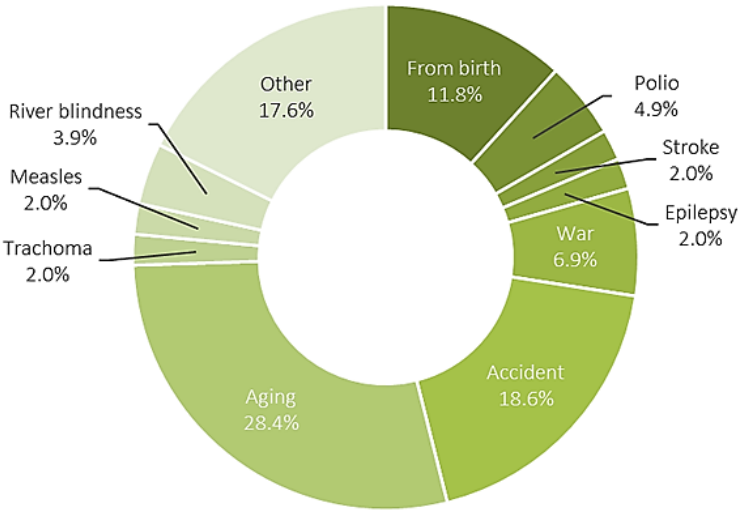
Causes of disabilities in Liberia

The 2008 census further provides data on major causes of disabilities (Figure 5). While it is believed that 30% of the Liberian population participated in the civil war; the 2008 census reported that war caused only 12.4% of the total disabilities, while the 2010 LFS estimated 6.9% of all disabilities had been caused by war (Figure 6) (LISGIS, 2009; LISGIS & MOL, 2011).

Figure 5 *(left)*. Distribution of disabled population in Liberia by cause of disability (Census, 2008)

Figure 6 *(right)*. Distribution of disabled population in Liberia by cause of disability (Labour Force Survey, 2010)



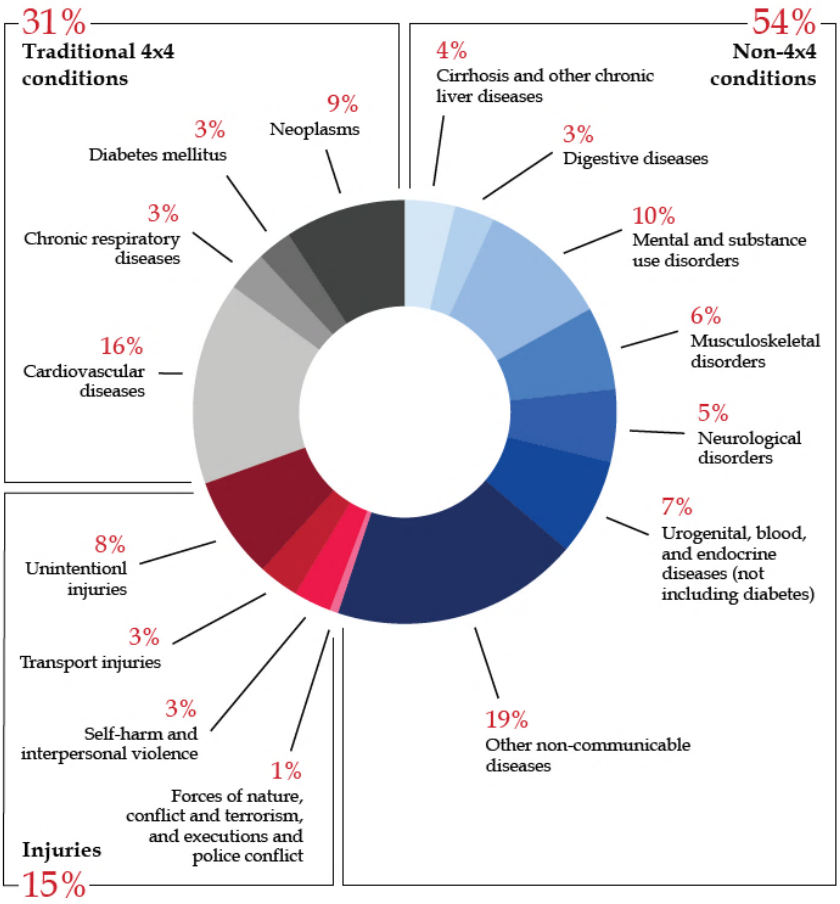


[2] The LFS used the sampled households/individuals to provide estimates on key variables for the Liberian population.

Prevalence of NCDIs in Liberia

In the last two decades, the disease burden of and disabilities attributed to NCDIs has doubled in Liberia. In 2016, 37.9% of all disability-adjusted life-years (DALYs) and 43.4% of all deaths were accounted for by NCDIs (Liberia NCDI Poverty Commission, 2018). Interestingly, over half (51.5%) of NCD DALYs and 69.8% of injury DALYs in Liberia occur at a young age —before age 40 (Liberia NCDI Poverty Commission, 2018). Figure 7 shows the proportion of DALYs attributed to each NCDI in Liberia, including diabetes mellitus, musculoskeletal disorders, and neurological disorders.

Figure 7. Estimated proportion of DALYs attributed to NCDIs in Liberia in 2016 (from Liberia NCDI Poverty Commission Report, 2018)



The NCDI Poverty Commission report further states from their literature review prevalence of the following: diabetes (2.1% of the population); musculoskeletal disorders – mainly low back and neck pain (10%); and congenital disorders (not specified) (1.1%) (Liberia NCDI Poverty Commission, 2018). During the data collection process, the Orthopedic Department at the Ganta United Methodist Hospital reported that between 2018 and 2019, 3500 children and adults with clubfoot and congenital anomalies visited the facility and received treatment and/or assistive products.

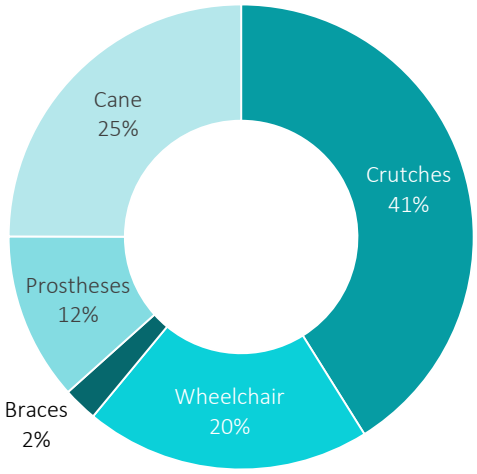
The Commission also concludes that this trend is likely to increase, partly due to the limited availability of appropriate healthcare services to adequate diagnose and manage NCDs. According to the 2016 Liberia Service Availability and Readiness Assessment (SARA) across government and non-government facilities, NCD services were available in less than half of the country's facilities; the most available service was diagnosis and management of cardiovascular diseases (in 43% of facilities) (MOH, 2016b).

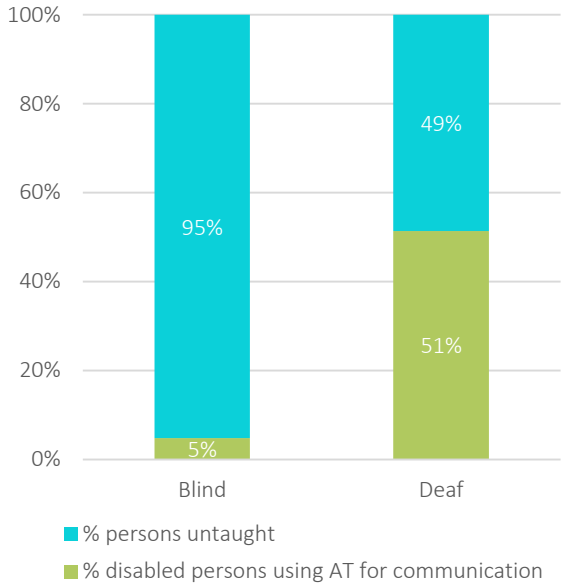
Data on AT access in Liberia

There is scarcity in user data on access to and use of AT; through secondary data search, it was found that the 2009 Needs Assessment by MOHSW has some data from users' perspectives on assistive devices. Of the 8512 PWDs identified in the Needs Assessment, only 16% of respondents reported having access to assistive devices and aids. Of those who reported access to aids (Figure 8), crutches were the most common AT reported (41%), followed by canes (25%) and wheelchairs (20%); no PWDs reported having access to hearing aids. Use of AT such as braille (for the blind) and sign language (for the deaf) was also reported (Figure 9). Approximately half of those who are deaf had ever been taught sign language; the other half untaught. The majority of those who are blind (95%) was not taught braille as a communication skill.

Figure 8 *(left)*. PWDs' reported access to assistive devices and aids (Needs Assessment, 2009)

Figure 9 *(right)*. Blind and deaf persons' reported education & access to communication-related AT (Needs Assessment, 2009)





Data source comparisons

As mentioned above, while there are multiple sources for disability and AT data (albeit dated), variations in data collection method, variable definitions, and sample population has resulted in lack of comparability among the data, as well as discrepancies in the data. The figures below attempt to illustrate data from various sources for key disability/AT variables.

Figure 10. Comparison of disability prevalence and types across data sources

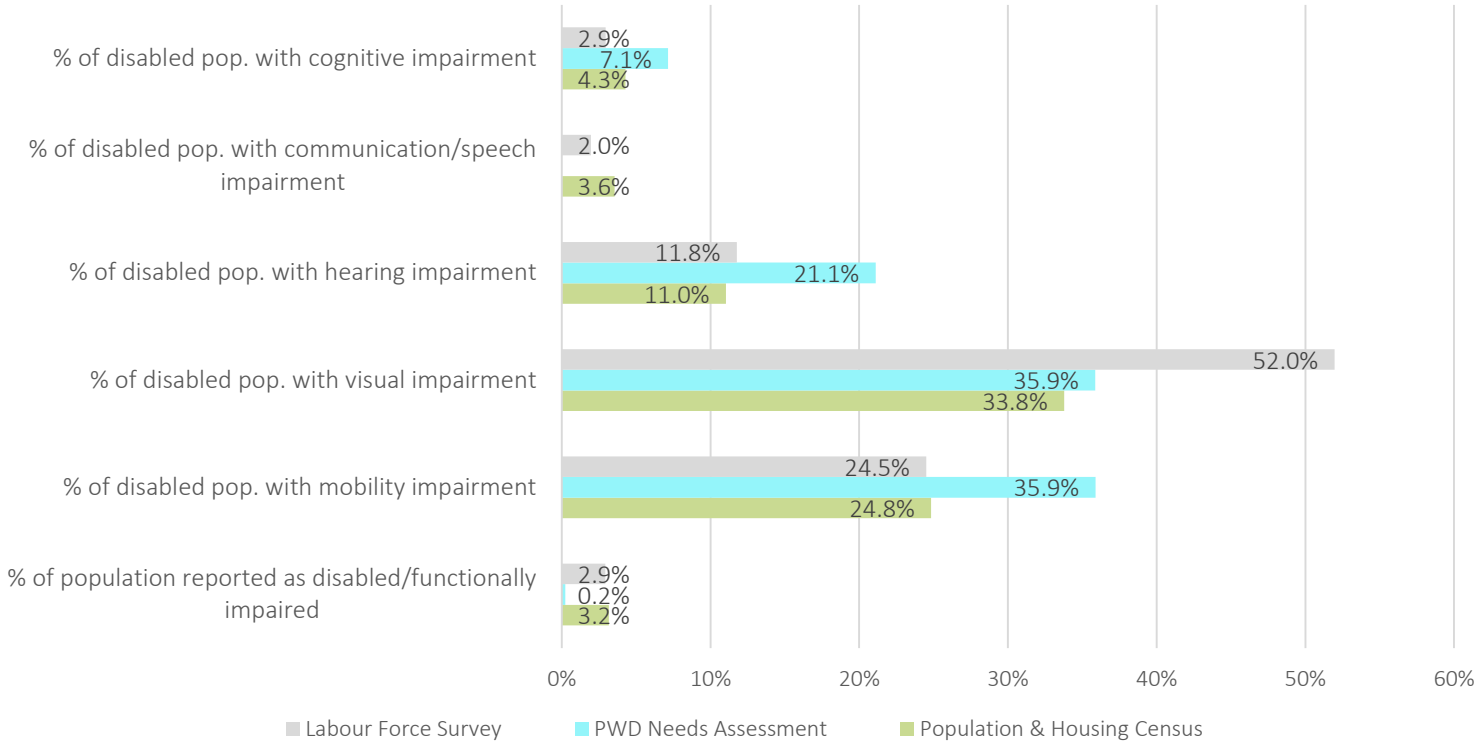
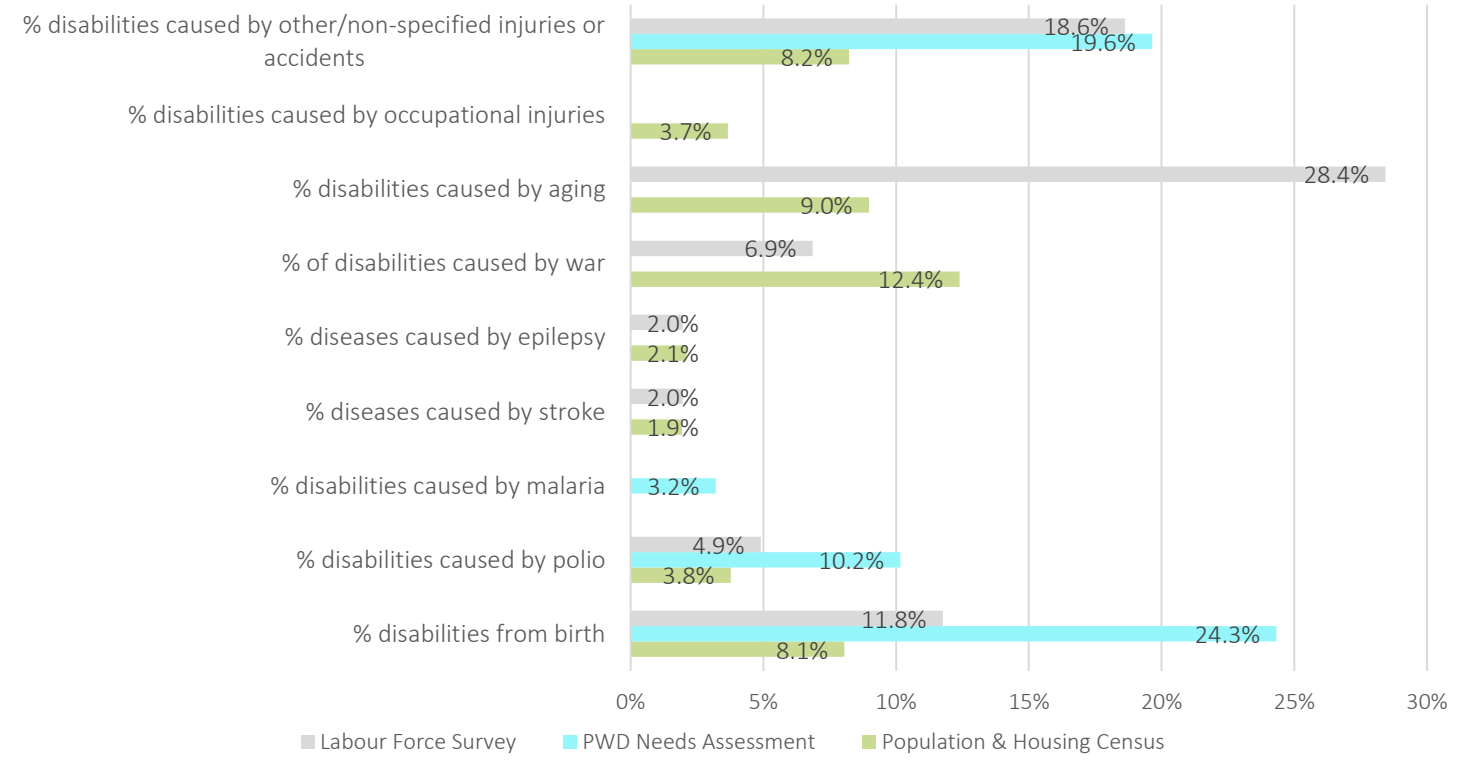


Figure 11. Comparison of disability causes across data sources



Gaps and opportunities in data systems

The lack of routine data capture as it relates to disabilities and AT poses a serious barrier to real-time understanding of the needs and demands of potential AT users in Liberia. While some population data exists from the previous census, the data are now more than a decade old and likely do not fully reflect the current picture of disability prevalence. Furthermore, these datasets do not capture any ocular, musculoskeletal, or neurological functional limitations that may have resulted from the 2014 Ebola epidemic (Jagadesh et al., 2018; Shantha et al., 2016; Wilson et al., 2018). Available data on mobility, hearing, visual, and communication impairments are also not disaggregated by type or severity. This lack of evidence for decision-making means government and partners are not able to effectively allocate the limited resources in the country for AT provision and service delivery.

Gaps in existing data may be improved by a nation-wide population-based survey either focused on, or containing substantive components on, disabilities, functional limitations, and AT. Collaborating with LISGIS, there is an opportunity to incorporate detailed questions on disability and AT into the upcoming population census, planned for 2020. Beyond this, the most sustainable way to integrate data capture for disability and AT would be to introduce indicators and data elements into the existing HMIS. This could be done by introducing new ledgers in facilities for AT providers to capture client load and service volume, impairment types of clients, and product types offered; DHIS-2 should continue to be used as the central platform to collate lower-level data. There are also opportunities for MOH to review (and revised, if necessary) the reporting responsibilities of not only public facilities, but of private facilities, as the majority of AT provision and services are currently offered outside of the public health system. In parallel, the MOH should work with rehabilitation centers currently providing AT to aggregate existing facility-level patient and provision data centrally, and to disseminate routine data to stakeholders across all sectors.

2. Stakeholder Landscape

Role of government stakeholders in AT

During pre-war era, social welfare interventions including services for PWDs were mainly led by the former MOHSW. Following the civil crisis and endorsement of the CRPD by the Liberian government in 2007, the number of government stakeholders (as well as non-government actors) in the disability space has increased considerably. Aimed at consolidating the governance of women and children's affairs, and those of vulnerable and marginalized groups under the authority and coordination of one agency, the GOL also combined the previous Ministry of Gender and Development (MGD) with the Department of Social Welfare within MOHSW, and renamed the new entity as the Ministry of Gender, Children and Social Protection (MGCSP). In addition, through the enactment of the National Commission on Disability Establishment Act in 2005, the NCD was formed with the mandate to coordinate, supervise and monitor the implementation of the CRPD, and to ensure the inclusion of, and to mainstream disability matters in national programs.

Thus, the current role of the government in AT provision and service delivery is divided across several line ministries and agencies, and the division of responsibilities, scope, and mandate is somewhat tangled (Table 1a). The coordination, supervision and monitoring of programs relating to PWDs and AT are statutorily assigned, at varying degrees, to the Ministry of Health (MOH), MGCSP, Ministry of Education (MOE), and the National Commission on Disabilities (NCD). These government entities are also responsible for inter-governmental coordination as well as foster partnerships cooperation with non-government partners. Through stakeholder interviews, this assessment found that the roles and responsibilities of these government entities substantially overlap in theory, thereby creating some inter-ministerial and inter-sectorial confusion surrounding implementation of the mandated activities, and result in limited financial resources linked or related to AT to be fragmented across entities with little to no mechanism for coordination. This lack of clarity has contributed to lack of focus on and fragmentation of disability and AT-related activities in Liberia.

Within their own ministry policies, strategies, and action plans, each of the line ministries mentioned above play some role (either directly or peripherally) in improving disability services and AT access, through policymaking, service provision, and advocacy. For example, the MOH's National Eye Health Program is planning to revise and update their strategic plan and policy, which would set standards for the delivery of eye care services, including the provision of assistive devices such as spectacles. While there is awareness on the importance and demands for AT among individuals working within key departments of these government entities, and this knowledge serves as the foundation for resource mobilization and coordinating resources and partner support, there is no routine, central platform for the various government entities to come together for more holistic policymaking and advocacy, and to ensure involvement of all relevant government departments (even those who do not traditionally consider themselves to be linked to disability and AT access). There has been some recent progress though, during the development of the National Action Plan for the Inclusion of Persons with Disabilities in Liberia (NAP 2018-2022) (GOL, 2018)., where coordinated stakeholder forums had been held to complete this document (see '*Policy & Financing'* section below). It is also important to note that Ministry of Justice, while not directly focused on disability services nor AT, oversees human rights issue on a broader scale and leads Liberia's reporting to the UN on implementation of the CRPD (GOL, 2019).

In terms of service provision, the John F. Kennedy Medical Center (JFKMC), working with the MOH and through its public facilities Monrovia Rehabilitation Center and Liberia Eye Center, directly provides AT, disability care, rehabilitation services. These two facilities are the major service providers for AT and rehabilitation services in Liberia's public sector. However, these facilities have little to no budget allocation from the GOL and are mainly supported through donations by non-government partners. The MOH and MOE also plays a role in AT service provision through several other non-facility-based programs, but again with significant technical and financial support from non-government partners. Additional details on these facilities and programs will be discussed in the *'Policy & Financing'* and *'Provision of Assistive Products'* sections below.

The government does not currently play a significant role in AT financing (either for products or service delivery), with many available assistive devices in the country being financed by international donor funding. See '*Policy & Financing'* section below on the current involvement of the GOL and non-government partners in AT financing. Along the same vein, while the government has the potential to lead in assistive product procurement and distribution through existing departments (for example, through the MOH Procurement Unit, MOH Supply Chain Management Unit), they do not currently perform these functions for assistive products (see '*Assistive Products & Procurement Systems'* section for details).

In terms of regulatory functions related to AT, the Liberia Medicine and Health Products Regulatory Authority (LMHRA) is the main entity in the country with the mandate to regulate and ensure safety of all medicines and health products in the country. While the LMHRA is responsible for the registration of health-related products, it does not currently have any registration guidance or product regulation for assistive devices. AT access must consider not only the device/product itself, but also the spectrum of services related to provision/prescription of AT to the individual, including assessment, fitting, user training and follow-up, maintenance, repairs. The government entity that is tasked with the regulation of health service providers who deliver this spectrum of services in Liberia is the Liberia Medical and Dental Council (LMDC). While LMDC has the mandate to register and license all healthcare professionals in both the public and private sector, it does not current have oversight responsibility and role in ensuring the registration or licensing of specialists or health professionals providing AT and rehabilitation services across the country.

Thus, while government entities have the potential to lead all aspects of AT provision and service delivery, they are currently limited to just a few functions (and even so, efforts remain fragmented among government entities). Interventions to increase AT availability and access has not yet permeated all levels of the relevant ministries to be mainstreamed into national programs, mainly due to a weak policy environment surrounding AT, low political will, lack of resources/capacity, lack of prioritization, poor coordination among national stakeholders and individuals who are championing access to AT and other services.

Role of non-government stakeholders in AT

As a result of limited government resource and capacity in delivering AT-related services, the majority of AT and rehabilitation service provision is currently gap-filled by non-government partners, such as through programs funded by NGOs, faith-based organizations, or through fee-for-service in private health and rehabilitation facilities. Unlike with policymaking, advocacy, and regulatory functions where the government plays a role (albeit fragmented), service provision is one the functions saturated with non-government stakeholders. Along with service provision, non-government partners also play leading roles in AT financing, procurement, and distribution. However, with little leadership from the government, non-government partners also suffer from lack of coordination amongst each other and with line ministries when it comes to AT provision, resulting in service delivery that is fragmented, ad-hoc, and unlikely to be sustained beyond departure of non-government partners and donors.

Working alongside the government, various non-government stakeholders support the functions of policymaking and advocacy as related to disability and AT (Table 1b). This currently includes partners such as L V Prasad Eye Institute (LVPEI), SightSavers International, Lions Clubs International, AIFO International, The Carter Center, EYElliance, Christian Aid Ministries (CAM), The Church of Jesus Christ of Latter-day Saints (LDS), and the United Nations Development Programme (UNDP) (Appendix A). In 2018, UNDP played an important role in supporting the MGSCP, NCD, and DPOs in developing the NAP for the Inclusion of Persons with Disabilities to facilitate the implementation of the CRPD. At the time of writing this report, the UNDP is the only UN agency providing some support to the government in terms of disability-related services and AT provision (e.g. disability land rights project), though there is currently no budget support for activities related to AT provision. Select non-government (national and international) stakeholders also form part of a group called the Alliance on Disabilities, which

aims to ensure implementation of the CRPD in Liberia to improve disability, human rights, and social inclusion; however, AT has not often been a topic on meeting agendas.

There is also the presence of disabled person's organizations (DPOs) and other local organizations in Liberia active in the disability space. Their main functions as related to disability and AT include advocacy and some service provision. The National Union of Organizations of Disabled (NUOD) was established in 1995 as the umbrella organization for all DPOs in the country. It is the national body to steer the affairs of all DPOs in Liberia and support the government to champion disability matters and implement relevant programs that would strengthen the capacity of DPOs and provide empowerment for its members. DPOs have played significant advocacy and leadership roles in propagating the rights of PWDs and ensuring the inclusion and integration of disability matters in national programs across all sectors. Notably, NUOD successfully mobilized and advocated for the establishment of the National Commission on Disability. In 2017, the NUOD became a full member of the African Disability Forum, and established local chapters in all fifteen counties, with a county coordinator in each to represent the union at the county level. However, despite the progress achieved in the past years, the institutional, operational and technical capacity of NUOD and its member DPOs remains weak. NUOD currently has 33 DPOs as members across the country; however, most of them are inactive due to lack of financial resources, as well as the technical capacity to mobilize the resources needed to sustainably operationalize and run their programs. Representatives from some key DPOs and local organizations that are still active were interviewed as part of this assessment, and the findings are described below.

The Group of 77 is one of the oldest DPOs in the country; established in 1977 and based in Monrovia, its mandate is to provide assistance to PWDs and other underprivileged Liberian citizens with social safety nets and other basic needs, including advocacy for inclusion of disabled people in national programs and policies and provision of wheelchairs and other assistive devices to disabled people in Montserrado. It also operates a school and health facility (commonly called the Group of 77 School and Group of 77 Clinic) that provides free education and healthcare services to children and adults with disabilities and other special needs. The Group of 77 is managed by the Office of the Vice President of the Republic of Liberia.

Other active DPOs include the Christian Association of the Blind (CAB) and Florence A. Tolbert & Disabled Advocates (FATDA). CAB is located in lower Margibi County, which plays an important role in policy development and advocacy (in collaboration with NUOD) for the inclusion of PWDs in education, the labour market, and other sectors. CAB also operates the School of the Blind, which offers education and some AT to persons with visual impairments. FATDA is a DPO based in Monrovia and with sub-offices in Lofa, Bong, and Grand Gedeh; it provides certain categories of assistive devices to PWDs. FATD also serves as one of the leading DPOs in advocating for disability inclusion, but it faces institutional and financial challenges in fully implementing its programs and catering to the needs of its members and beneficiaries. See *'Policy & Financing'* section for details on AT provision by CAB and FATDA.

Key AT programs supported by non-government partners

AT programs in Liberia supported by non-government partners are described briefly below. These programs are linked to the functions of AT financing, procurement, distribution (i.e. assistive device is given without related services such as fitting and assessments), and service delivery (i.e. assistive device is given with related spectrum of services). Details on each of these programs will be explored more in relevant sections of *'Policy & Financing'*, *Assistive Products & Procurement Systems', and/or 'Provision of Assistive Products'.*

Non-government partners provide operational and financial support to the AT service delivery programs ran by the JFKMC's MRC and Liberia Eye Center. The MRC was established with financial support from Handicap International (HI) in 2006, and currently provides AT for persons with mobility impairments, free of charge. It was also previously supported by Christian Aid Ministries (CAM) and The Church of Jesus Christ of Latter-day Saints (LDS), who procure and supply AT materials such as wheelchairs, prostheses, orthoses, crutches, etc. In 2016, LDS procured and supplied the MRC with 1,500 units of assorted

assistive products, but no further support has been provided since then, due to financial constraints. LVPEI is the main partner providing technical and financial support to the Liberia Eye Center, through a Memorandum of Understanding signed with the MOH. In this sense, the AT support provided by the aforementioned partners span across financing, procurement, and service delivery.

The MOH, Liberia Eye Center, in collaboration with LVPEI, SightSavers International, Lions Clubs International, and other partners, are also in the process of planning the decentralization of eye care through establishment vision centers in secondary health facilities across all counties in Liberia. Lions Clubs International has supported the construction and refurbishment of eye health infrastructures at key health facilities (e.g. in Grand Bassa), provided eye health medication and vision screening equipment to health facilities, and supported awareness-raising through health campaigns in local communities. Through support from Lions Clubs International, there is now an eye center at the Liberia Government Hospital in Buchanan, Grand Bassa; the center main services patients from Grand Bassa and Rivercess.

Some AT service delivery programs that are supported by non-government partners also sit outside of health facilities. One example is the School Eye Health Program supported by EYElliance through the MOE in 2018. EYElliance piloted the program in 50 public schools in Montserrado and trained 100 teachers on structures and functions of the eye, refractive errors, common eye conditions in children and vision screening procedures to diagnose and correct them through provision of AT. Working with the MOE, EYElliance, LVPEI, and SightSavers is developing a blueprint for expanding this school-based eye health initiative by the end of 2021 to Bong, Bomi, Grand Cape Mount, Grand Cru, Grand Gedeh, Margibi, Maryland, Montserrado, River Gee, and Sinoe.

There are also several AT programs within the private sector in Liberia. These programs again cut across the functions of AT financing, procurement, and service delivery. At the time of writing, only few private facilities offered AT and rehabilitation services, most of which are clustered in central/northern region of Liberia. The Ganta Leprosy Rehabilitation Center was established by Missionaries of the United Methodist Church in Liberia to locally produce and provide free assistive products and rehabilitation services to persons with leprosy-related disabilities and those affected by clubfoot and polio diseases. It is currently being managed and operated by the Catholic Diocese of Gbarnga, with support from the German Leprosy Relief Association. Before the 2014 Ebola outbreak, the Center received support from the German Leprosy Relief Association, mainly with in-kind assistance and supply of AT products (in parts and whole) for local assembly. While it is currently still operational, the Centre faces challenges with sourcing of AT production materials, whole assistive products, and overall financial sustainability.

The Ganta United Methodist Hospital is a private facility with an orthopedic department and an optical center. The orthopedic department currently employs two prosthetic and orthopedic technicians who provide assistive devices and rehabilitation services for individuals with club foot and other physical impairments. The optical center has a cataract surgeon and ophthalmic nurses who provide eye care services to persons with visual impairments in Nimba, as well as those referred from other counties and health facilities.

The Phebe Optical Center, of Phebe Hospital, partnering with MOH, provides eye care services at its optical center for individuals with visual impairments, with the majority of patients coming from the central Liberia region (Bong, Lofa, Nimba counties). The Center was established with support from SSI and OneSight to address the burden of uncorrected refractive error (URE) and other avoidable blindness in the country.

*Table 1a. Select government stakeholders in AT**

	Policymaking	Regulatory	Financing	Procurement	Distribution	Service provision	Advocacy	Focus area(s) of AT	Key AT program
MGCSP – Department of Social Welfare – Rehabilitation Unit	Yes lead	Yes lead	Yes lead	No	Yes support	Yes support	Yes support	Not specified	Social Cash Transfer Programme
MOH – National Eye Health Unit	Yes lead	Yes lead	Yes support	No	Yes support	Yes support	Yes lead	Visual impairments	National Eye Care program
MOE – Inclusive and Special Education Division	Yes lead	Yes lead	No	No	Yes support	No	Yes lead	Schoolchildren with disabilities	Inclusive and Special Education for Children with Disabilities; School Eye Health
National Commission on Disability (NCD)	Yes lead	Yes lead	Yes support	No	Yes support	Yes support	Yes lead	All forms of impairments	Quarterly Social Cash Subsidies for persons with disabilities
JFK Medical Center - Monrovia Rehabilitation Center	Yes lead	Yes support	No	No	Yes lead	Yes lead	Yes lead	Physical/mobility impairments	Physical Rehabilitation and Physiotherapy
JFK Medical Center - Liberia Eye Center	Yes support	Yes support	No	Yes lead	Yes lead	Yes lead	Yes support	Visual impairments	Eye health program

**Tables 1a/b do not show the exhaustive list of stakeholders working across the seven key functions in the AT sector. For the full list of stakeholders currently involved in AT, those with potential for involvement in AT, as well as their roles in the key functions, please contact CHAI for additional information.*

*Table 1b. Select non-government stakeholders in AT**

		Policymaking	Regulatory	Financing	Procurement	Distribution	Service provision	Advocacy	Focus area(s) of AT	Key AT program
International NGOs (not for profit)	SightSavers International	Yes lead	Yes support	Yes lead	Yes lead	Yes lead	Yes lead	Yes lead	Visual impairments	School Health Integrated Program (SHIP)
	AIFO International	Yes support	Yes support	Yes support	No	No	No	Yes lead	Not specified	Disability and Start-up project (DASU)
	Lions Clubs International	Yes support	No	Yes support	Yes support	Yes support	No	Yes support	All forms of impairments	Community Eye Health Project
	L V Prasad Eye Institute	Yes Support	No	Yes Support	Yes Support	Yes Support	Yes Lead	Yes Support	Visual impairments	Eye health program
	EYElliance Consortium	Yes Support	No	Yes Support	Yes Support	Yes Support	Yes Support	Yes Support	Visual impairments	School Eye Health Program
	Christian Aid Ministries (CAM)	No	No	Yes Support	Yes Support	Yes Support	No	Yes Support	All forms of impairments	Disability support project
	The Church of Jesus Christ of Latter-day Saints	No	No	Yes Support	Yes Support	Yes Support	No	Yes Support	All forms of impairments	Disability program
	United Nations Development Programme (UNDP)	Yes support	No	Yes support	No	No	Yes support	Yes support	All forms of impairments	Disability Land Rights Project
Private facilities	Ganta United Methodist Hospital Orthopedic Center	No	No	No	No	Yes support	Yes support	Yes support	Mobility impairments	Clubfoot rehabilitation program
	Ganta Methodist Hospital Optical Center	No	No	No	No	Yes Support	Yes Support	Yes Support	Visual impairments	Eye care program
	Ganta Leprosy Rehabilitation Center	No	No	No	No	Yes lead	Yes lead	Yes support	Mobility impairments	Leprosy Rehabilitation Program
	Phebe Optical Center	Yes support	Yes support	No	No	Yes support	Yes support	Yes support	Visual impairments	Eye care program
	SDA Cooper Hospital Eye Center	No	No	Yes Support	Yes Support	Yes Support	Yes Support	Yes Support	Visual impairments	Eye health program
User Groups / DPOs	National Union Organization for the Disabled (NUOD)	Yes lead	Yes support	No	No	Yes support	No	Yes support	All forms of impairments	DPOs Empowerment and Advocacy
	Christian Association of the Blind (CAB)	Yes support	Yes support	No	No	Yes support	No	Yes lead	Visual impairments	School for the Blind

Gaps and opportunities to improve stakeholder landscape

Based on the above findings on the current roles, responsibilities and capacity of the various government institutions involved in AT, there appear to be many opportunities to develop the capacity of relevant agencies such that they can more effectively carry out their functions. For example, the LMHRA is well-positioned in its mandate to regulate the (local) manufacturing, procurement and product standards, and distribution, and there is an opportunity to build the capacity of the agency such that it is able to develop a national registry of assistive devices and products as a first step towards regulating the quality and safety of imported or locally-manufactured AT. Non-government partners that currently have a presence in Liberia should also be leveraged. For example, the WHO and UNICEF, through the Global Cooperation on Assistive Technology (GATE) initiative and AT2030 globally, could provide local technical and financial support to all relevant ministries to improve AT policymaking and regulation, advocacy, product & procurement, and service provision.

Furthermore, while the assessment identified a large number of stakeholders who are directly or indirectly involved in the AT and/or disability sector, there is a lack of coordination and collaboration among the different parties. Thus, a strong coordination mechanism must be established to reduce fragmentation in the AT sector, increase knowledge-sharing and communication, and improve collaboration to ensure that existing resources are maximized. Establishing a cross-sectorial Technical Working Group (TWG) specifically for AT (and potentially inclusive of all health services for PWDs and the elderly) with participation of all relevant line ministries, other government agencies, disabled people's organizations (DPOs), non-government organizations (NGOs), donors, and private sector partners, provides such a mechanism. TWG meetings have the opportunity to be a regular forum for stakeholders from both the demand side (e.g. DPOs, current and potential AT users) and the supply side (service providers, suppliers, donors) to identify needs, challenges and gaps in the implementation of AT services. The TWG may also be leveraged to lead the implementation of short and medium-term recommendations stemming from findings of this assessment, plan for longer-term actions (e.g. dedicated ministerial department or unit), consolidate partner resources and efforts, lead advocacy and resource mobilization, and develop financing and sustainability strategies.

3. Policy and Financing

CRPD and national legal framework

Liberia ratified[3] the CRPD in 2012, yet to date has not enacted any national laws to facilitate its implementation (other than establishment of the NCD). The CRPD particularly mandates member states to ensure 'access to quality assistive technology at an affordable cost' (Article 20) and foster international cooperation (Articles 4, 20, 26 &32) in support of national efforts to increase the availability of and access to AT in the country. While the ratification of the CRPD symbolizes the GOL's commitment to promote the rights of PWDs, there is currently no legislation, policy or national programs on AT and rehabilitation services for this population. As mentioned above in the '*Stakeholder Landscape*' section, this may be due to the lack of dedicated financial and human resources for AT and rehabilitation within the national budget. The Act establishing the National Commission on Disability was passed in 2005; however, it was not until 2011 that the NCD became fully operational through the appointment of its first commissioner. As discussed above, the 2005 NCD establishment Act gave the NCD the statutory mandate to coordinate, supervise and monitor the implementation of the CRPD, and to ensure the inclusion of, and to mainstream disability matters in national programs. In 2013, in consultation with NUOD, DPOs and other stakeholders, the NCD submitted an amendment to the Act to the national legislature to amend certain provisions in the 2005 Act such as to strengthen the right of PWDs in accordance with the CRPD and expand its mandates. At the time of writing the amended bill is still tabled at the national legislature, and the NCD operates with a limited budget aimed at building the capacity of DPOs through quarterly subsidies, as well as a small team that is stretched in its ability to oversee all disability-related activities; no direct provision of AT or rehabilitation services is facilitated through the NCD at the moment.

Thus, there are many opportunities to continue the advocacy necessary to pass the amended NCD Act, which would ideally give the Commission broader responsibilities and more resources to implement the CRPD, including the provision of quality AT and rehabilitation services. The presence of the NCD is a step in the right direction; however, activities such as those outlined in the recently validated NAP for Inclusion of PWDs in 2018 would benefit significantly in their implementation should targeted support by provided by the NCD. Other national legislations that complement the NCD Establishment Act are also necessary to provide an enabling environment for both government and non-government partners to make financial and human resource commitments and to implement disability-related activities in Liberia.

Other relevant policies

There is currently no national policy that explicitly outlines the GOL's vision, goals, guiding principles and expectations regarding rehabilitation services and AT access for the populations in need. Some policy documents do exist within line ministries and agencies that touch upon the provision of AT in Liberia, such as those from the NCD, MOE, and MOH.

The first ever National Action Plan for the Inclusion of Persons with Disabilities in Liberia (NAP 2018-2022) was developed and validated in 2018 with technical and financial support from the United Nations Development Programme (UNDP). The NAP is a technical document for donors and implementing partners working in the disability sector, and proposes six interlinked thematic areas to guide implementation of activities for PWDs that include public accessibility, inclusive education, employment and livelihood, healthcare, independent living & self-determination, and access to justice & social protection. In the NAP, there are two performance indicators (PI) that explicitly mention AT: (i) access to appropriate and affordable services, devices, and other assistance for disability-related needs, including accessible housing and other social amenities, mobility aids, and caregivers; (ii) available public funding for access to assistive devices and technology. Specific activities included in the NAP to achieve these PIs include:

- Create shelter or safe housing accommodations for persons with disabilities who are homeless

[3] Liberia ratified the Convention without the optional protocol that establishes the mechanism which would allow individuals to file complaints to the UN if they believe their rights under the Convention have been violated.

- Establish a rehabilitation resource center which provides assessment of functional needs and access to reasonable accommodations
- Establish a fund to provide access to resources and funding for accommodations to allow persons with disabilities to live independently, including both equipment and trained service providers

While the indicative activities in the NAP are not meant to be an exhaustive list of interventions, it is clear that a more actionable and detailed implementation plan is needed to guide Ministries and partners in carrying out the listed objectives, which would also be more explicit in terms of the NAP's planned activities on AT access and provision. Since it's validation, implementation of the NAP remains a serious challenge due to lack of funding and resources to its implementing ministries and agencies (GOL, 2019).

In December 2018, the MOE developed and validated the Inclusive Education (IE) Policy and the Division of Special and Inclusive Education was established to ensure the policy's implementation. The IE policy provides a framework for educational institutions in Liberia to make fundamental changes in their system and infrastructure, by integrating inclusive pedagogical methodologies for the inclusion of children with disabilities and promoting an inclusive learning culture. The IE policy places more emphasis on systemic changes in the educational sector for inclusive education. The IE policy is guided by the value that '*all children regardless of their disabilities can be achievers and that children with disabilities need many different related services that require inter-ministerial support to deliver those services*'. The IE policy sets out various objectives, though AT is not explicitly mentioned:

- Increase access to education for all children and young people, by making systemic changes that eliminate the environmental, attitudinal, policy, practice and resource barriers that prevent some students from attending their local school with their peers.
- Increase active participation of all students in the learning process, and improve their social and academic learning outcomes, through the use of child-centred approaches, and by developing flexible curricula, teaching and learning materials and assessment mechanisms that can be adapted to the individual needs of learners.
- Develop a cadre of teachers, support staff and school leadership who have the right attitude, practical skills and theoretical knowledge, to implement quality, child-friendly, inclusive education within the mainstream education system.

The Strategic Plan for the National Eye Care Program of Liberia (2006-2011) is the key policy document that sets out the goal, purpose, and objectives of the NECP as the national lead in improving eye health in Liberia (MOH, 2006). While the MOH's NEHP is in process of revising and updating their strategic plan and policy, this existing national eye care plan is one of the few national policy / strategic documents that explicitly outline objectives and activities related to AT provision and services; for example, the document sets out the following priority activities:

- Train community Eye Health promoters to identify & refer
- Provision of glasses for 80% of presbyopia and 30% of distance correction by year 5
- Regular Eye screening, refraction and provision of glasses in outreach programs and camps
- Visual acuity testing for 80% of children attending under-five clinics, pre-school and school children by trained teachers and nurses
- Referral and back up services for refraction and provision of glasses, other treatment and integrated education of the irreversibly blind and low vision children

Gaps and opportunities in AT policies

As discussed above, while there are some national policy and strategy documents that mention AT provision and services, there is a need to integrate the priority actions set out, or to consolidate and develop a national policy with an explicit

component on AT and rehabilitation services. Stakeholders interviewed mentioned that they often face challenges during resource mobilization as no national policy or strategic plan on AT is available to demonstrate government priorities to donors.

A national AT policy and strategic plan is a key step to formalize the government's commitment to AT access, and to operationalize Liberia's ratification of the CRPD. A national AT policy could be developed under the umbrella of the NAP, specifically to guide stakeholders in achieving the objectives under the domains of 'Health Care' and 'Independent Living and Self-Determination', and outline the following:

- Vision and guiding principles in ensuring AT access
- Roles & responsibilities, emphasizing cross-sector collaboration and inter-ministerial coordination
- Access and rights to AT
- Assistive product regulations and spectrum of services
- Health workforce and community-based rehabilitation
- Population data, monitoring & evaluation
- Quantification, procurement, and supply planning
- Financing and sustainability

In addition to improving the legal and policy environments surrounding AT provision and services, government and partners should also work to eliminate the gap between policy formulation and policy implementation; this requires dedicated efforts in resource mobilization for AT, and commitment of both partner resources in the short/medium-term and government resources in the long-term to ensure sustainability.

AT financing

Government health and/or social welfare insurance schemes

The GOL administers a number of national health, social security and welfare schemes that aim to increase access to basic health and social services by Liberians. The National Social Security and Welfare Corporation (NASSCORP) was established to plan, design and administer schemes aimed to provide social security protection to insured individuals and their dependents, in the event of loss of natural ability to earn income temporarily or permanently, due to work-related injuries, occupational diseases, old age, invalidity, or death. However, NASSCORP is not a national social insurance program (i.e. does not cover every Liberian citizen), and in order to be eligible to make contributions to NASSCORP and receive the relevant benefits, an individual must be a civil servant employed with the GOL, or be employed in the private sector in Liberia through an organization registered with NASSCORP. NASSCORP is mandated to administer the Employee Injury Scheme (EIS), the National Pension Scheme (NPS), and the Welfare Scheme (this scheme has not yet been implemented) via registering of employees and employers, collecting contributions from employees and employers, managing funds, receiving claims and paying benefits. According to NASSCORP's official mandate, the EIS is designed to provide cash and material benefits for employees who sustain injuries or becomes disabled as a result of job-related accidents or occupational diseases; whereas the NPS is designed to provide cash benefits to employees who had to stop working for their employer due to illness or disablement, to elderly persons who can no longer work, and to survivors of deceases injured employees.

Within the health sector, the MOH National Health and Social Welfare Policy and Plan (NHSWPP 2011-2021) (MOH, 2011c) and Essential Package of Health Services (EPHS) implementation plans outline the selection of health services that should be provided free-of-charge to all patients within the country's primary, secondary, and tertiary health facilities (MOH, 2011a; 2011b). However, implementation of the EPHS has difficult due to factors such as inadequate staffing and limited fiscal space; a review and update of the EPHS, as well as the establishment of sustainable health financing mechanisms in the public sector is also long overdue.

Other financing schemes that were recently active through the GOL include the NCD's quarterly subsidies for DPOs, and the MGSCP's social cash transfer program. The NCD's quarterly subsidies are directed to DPOs, while MGSCP's cash transfers are directed to individuals from the social registry who live below the poverty line and other vulnerable populations such as PWDs (we were not able to obtain detailed information on the criteria, selection, and disbursement process for the social cash transfers). These financing schemes were originally intended to provide capacity-building (at an organization level), entrepreneurship and livelihood opportunities for PWDs and other vulnerable populations; neither of these financing schemes explicitly target AT. However, there are also no explicit restrictions on how beneficiaries can use the funds provided to them; stakeholders interviewed explained that recipients of these subsidies and transfers sometimes use the funds for procurement of assistive devices when necessary. The quarterly subsidies and social cash transfer projects were funded initially by the World Bank (with approximately $10 million USD) for a period of five years; however, phase one of the project concluded in 2017, and the MGCSP and NCD are currently engaging the World Bank for phase-two of the project.

In summary, none of the current government health and social security insurance schemes provide explicit coverage for AT and rehabilitation services for its beneficiaries, though beneficiaries may utilize the funds available to them for the procurement of assistive products and related services (Table 2).

Table 2. Existing government financing schemes for AT

Ministry/Agency	Schemes/programs names	Assistive products covered	Total beneficiaries	Total budget and/or expenditure (most recent fiscal year)
Ministry of Gender, Children and Social Protection	Social Cash Transfer Program	This scheme is intended to empower PWDs and DPOs to engage into entrepreneurship, but they could also use the money to AT products based on their needs	23 DPOs (between 2014-2016)	Unknown
National Commission on Disabilities	Quarterly Subsidies for DPOs	Scheme focuses on empowerment of DPOs and not directly covers AT products, but money could be used to purchase AT devices when the need exists	Unknown	$11,500

Other public sector programs related to AT financing and provision

As discussed in the '*Stakeholder Landscape*' section above, there are public and private programs in Liberia outside of national insurance schemes that provide assistive devices and services, with various models of financing (Table 3):

(i) Programs that provide AT free-of-charge or at subsidized costs

As discussed previously, the Monrovia Rehabilitation Center and Liberia Eye Center situated within JFKMC are the two public health facilities providing assistive devices and services. Their operating costs are supported mainly by non-government partners and donors. The cost for AT products at the Liberia Eye Center are still provided by LVPEI and other non-governmental organizations including HI, LDS, and CAM. The GOL currently provides only salaries for the civil servants employed at these facilities.

MRC currently provides products including wheelchairs, prostheses and orthoses, crutches, walking frames, white canes, while the Liberia Eye Center provides spectacles and magnifiers. There are no clear procedures and eligibility criteria that qualify PWDs before they can access the services at the MRC or the Liberia Eye Center. Anyone with an impairment can seeks services directly at these facilities, and will be seen by the attending physicians and specialists. In some cases, patients may be referred to these facilities by a physician or physiotherapist from another facility, specifically for accident-related disabilities. Once at the MRC, assistive products and related services are provided free of charge to patients, though a minimum recovery fee is charged to patients who can afford to pay or are gainfully employed; this decision is made at the discretion of the

provider who assesses the patient during the registration process. For example, patients who need crutches or walkers for movement, and could afford payment, the patient takes on a pair of crutches or walking frames at a cost of $20.00 USD. However, for patients visiting from outside Monrovia, they must still bear the burden of transportation, accommodations, and other logistical costs even if the assistive products are provided free at MRC.

As mentioned previously, Liberia Government Hospital in Grand Bassa now has an operational eye center; however, details regarding patient eligibility and cost of services are not available at the time of writing.

Table 3. Government programs related to AT financing and provision

Facility	Schemes/programs Names	Assistive products covered	Total beneficiaries (timeframe)	Total budget and/or expenditure (most recent fiscal year)
JFKMC – Liberia Eye Center	Eye Care Programme	Spectacles, magnifiers	8,263 persons (2018-2019)	Unknown
JFKMC – Monrovia Rehabilitation Center	Rehabilitation Programme (physiotherapy and orthopedic)	Wheelchairs, crutches, Orthoses, prostheses for lower and upper limbs, clubfoot	5,000 persons (2008-2016)	Unknown

Other private sector programs related to AT financing and provision

There are a number of non-government, private and faith-based financing schemes and programs that periodically provide assistive technologies to PWDs through mass donation and distribution (Table 4). Consequently, these programs are unsustainable and short-term and only operational based on the availability of donor funding. NGOs including faith-based organizations and private health facilities play key roles in the AT sector and/or disability sector in Liberia, with limited (or no) budgetary commitment from the national government due to the shrinking fiscal space or declining economic growth. As a result, there is always a relapse in the realization of the rights of PWDs including their access to AT products, when the donors make cuts in the funding or stop support to these projects. In comparison with other areas of disabilities, the eye health sector has attracted huge support over the years from the non-governmental organizations and has experienced some level of improvements than all other areas of disability in the country.

(i) Programs that provide AT free-of-charge or at subsidized costs

The Ganta Leprosy Rehabilitation Center provides free-of-charge assistive products to its patients, and is currently being operated and managed by the Catholic Archdiocese of Gbarnga. The Center was previous funded by the German Leprosy Relief Association; funding support ended in 2014 during the Ebola outbreak. The Center is now operated through the Catholic Dioceses of Gbarnga.

The Ganta United Methodist Hospital's orthopedic center is the only orthopedic center in northern/central Liberia, and provides free assistive products and rehabilitation services to children and adults with clubfoot and other mobility impairments. The hospital also operates an optical center that provides free assistive products and services to persons with visual impairments.

The MOH's School Health Integrated Programme (SHIP) is supported SSI to strengthens eye care provision and services at both school and community levels, by training school teachers and community members on first level eye screening, and on provision of spectacles to school-attending children and community members affected by different eye diseases. SSI also works with the MOH and other partners to decentralize access to eye health

services, and plans to establishing and operating optical centers within primary and secondary health facilities across various counties in Liberia. In 2017, SSI received funding from the Dubai Care Foundation in the amount of $1,998,317 USD to support community and facility-based eye care services.

In parallel, the EYElliance Consortium piloted a school eye health programme in close collaboration with the MOE and MOH. Through training of school teachers to conduct basic eye screening and AT provision (ready-to-clip glasses dispensed on-site) for schoolchildren, the program benefited a total of 15,816 students across 50 schools in Montserrado. Students who required additional care or more customized glasses were referred to the JFKMC Liberia Eye Center for free services.

(ii) Programs that provide AT through mass distribution campaigns

Mass distribution campaigns of AT to DPOs or PWDs is carried out occasionally by NGOs and faith-based organisations, and often include wheelchairs, white canes, crutches and braille equipment. These campaigns happened frequently immediately after the civil war. HI, LDS, and CAM were the major NGOs that carried out mass distribution of assistive products during that time, but these campaigns have reduced in recent years due to lack of partner support.

Current programs that provide AT through this approach include the SightFirst program implemented by Lions Clubs International, which distribution of white canes and braille equipment to visually impaired persons in Liberia. Furthermore, the CAB operates the School of the Blind where persons with visual impairments are provided with specialized education and training, such as on the use of manual braille equipment and hi-tech braille devices (e.g. braille keyboard computers or laptops). The School also distributes white canes to enhance the mobility of visually impaired persons.

The distribution programs run by FATDA also distribute devices such as wheelchairs, crutches, walking frames and white canes to PWDs; these devices were received as donations from Mobility Worldwide and other donors (organization or individual). FATDA provides basic training to recipients of assistive devices, and conducts follow-up visits in their operating counties when funding is available. FATDA has works ten different counties in Liberia.

Table 4. Non-governmental programs for AT financing or provision

Organizations	Schemes/programs names	Assistive products covered	Total beneficiaries	Total budget and/or expenditure (most recent fiscal year)
SightSavers International	School Health Integrated Programme	Spectacles, magnifiers	15,000	$100,000
EYE Alliance Consortium	School Eye Health	Spectacles, magnifiers	34,516	$42,549.51
Ganta United Methodist Hospital Orthopedic Center	Orthopedic Centre	Prostheses for clubfoot, orthopedic devices for clubfoot; lower limb prostheses, upper limb prostheses	3,500	Unknown
Ganta United Methodist Hospital Optical Center	Optical Center	Spectacles	Unknown	Unknown
Ganta Leprosy Rehabilitation Center	Leprosy Rehabilitation Programme	Wheelchairs, prostheses, orthoses, walking frames, crutches	2500	Unknown

Organizations	Schemes/programs names	Assistive products covered	Total beneficiaries	Total budget and/or expenditure (most recent fiscal year)
LV Prasad Eye Institute	Eye care program	Spectacles	5,263	Unknown
Phebe Hospital Optical Center	Eye care services	Spectacles	4617	Unknown
New Sight Eye Center	Community Eye Health; training of Eye care professionals	Spectacles	Unknown	Unknown

Gaps and opportunities in AT financing

Overall, the realization of the CRPD and implementation of activities within the NAP in Liberia, including those related to AT and rehabilitation services, remains under-financed. In the absence of donor funding, the GOL does not have any budgetary allocation for the implementation of activities that will increase AT access. Though the government has made commendable progress towards the provision of social and economic empowerment opportunities for PWDs, access to assistive devices to improve independence and participation of PWDs is not well integrated into existing government programs or schemes on social security and/or health.

NASSCORP is currently Liberia's largest implementer of social security insurance, but does not currently offer AT coverage as part of its EIS) or NPS. Working with the relevant government agencies, these are potential contributory financing mechanisms that could be leveraged in the future for AT coverage for PWDs and the aging population. There are opportunities for the GOL and NASSCORP to work with national or international suppliers of assistive products, and with AT providers, in order to benefit from reduced or subsidized pricing for assistive products and services for its beneficiaries. However, there would remain a gap in comprehensive coverage since NASSCORP schemes do not cover any unemployed individuals, and are unlikely to cover individual in the informal employment sector (which constitutes a large portion of Liberia's population). PWDs and the elderly may therefore be disproportionally affected by this gap if they have never been/are currently employed with an eligible organization registered with NASSCORP; a separate social security mechanism would be necessary for this subpopulation to ensure AT access for all who require it.

Furthermore, the national mandate that provides free healthcare to all Liberians (as opposed to only eligible Liberians through the NASSCORP schemes) through the EPHS does not explicitly provide coverage for assistive products nor its related services. By leveraging on the planned review and update of the EPHS, and establishment of potential national health financing and provision mechanisms for the country (e.g. health equity fund, revolving drug fund), there is an opportunity to ensure that assistive devices and rehabilitation services are covered for all Liberians who require them, and that these services are integrated into each level of the health system as appropriate.

In order for any program to sustainably finance and provide AT in the public sector, there must be adequate and committed financial resources within the national budget for assistive products and services. To bridge AT financing gaps in the short-term, the government could look to engage both traditional and non-traditional donors for AT funding (which in turn requires political will and a developed national strategy and plan), and to coordinate existing in-country resources to maximize their impact. There is an opportunity for the government and its partners to develop an investment case (IC) for AT to describe a prioritized set of high-impact interventions; serving as a unified tool for advocacy and resource mobilization, the IC can be used to (i) guide the use of available resource envelopes effectively, and (ii) plan for longer-term investments and mobilize additional resources. The IC should be developed based on findings from the ATA-C, additional stakeholder consultations, and other exercises such as detailed partner and resource mapping. The IC will help achieve complementary financing while avoiding the current fragmentation and duplication of resources and support from various partners.

4. Assistive Products and Procurement Systems

Product regulation & procurement

As discussed above, the LMHRA is the government entity with the mandate to regulate and ensure safety of all medicines and health products in Liberia; yet, the agency's current regulatory mechanisms (e.g. product registration process) do not consider assistive products that are being produced locally or being imported into the country. A review of a sample copy of the Procurement of Health Sector Goods Standard Bidding document by the GOL, intended to be used for procurement of goods through International Competitive Bidding, considers pharmaceuticals, vaccines, and condoms, but do not provide guidance for bidding and procurement of assistive devices (GOL, 2001). Guiding documents that may be relevant from the MOH, such as the National Guidelines for Donation of Drugs and Medical Supplies (MOH, 2014) which sets out standards for medicines selection, quality assurance, and customs clearance, also exclude any mention of assistive devices. Thus, there is no regulation or standard with which assistive products must comply before being distributed in Liberia.

Furthermore, Liberia does not currently have a national list of approved assistive products. The National Standards Therapeutic Guidelines and Essential Medicines List (STG/EML) (last updated in 2017) does not include any AT. There is also no national guidance for the procurement and supply of quality, accessible and durable assistive devices in consideration of the environmental situation in Liberia. The majority of activities implemented currently linked to AT is the procurement and provision of spectacles and other medicines for visually impaired persons; these are largely supported by non-government partners, and follow existing international technical specifications and guidelines. Liberia is situated within a tropical region with rough terrain and poor quality of roads that poses difficulties to the independent mobility of AT users – particularly wheelchairs which suggests that provisions of AT products to disabled people should meet the needed specifications.

Similarly, the Government of Liberia does not directly procure nor oversee the procurement of AT, largely due to the limited fiscal space in the government budget, and lack of dedicated budget line for assistive devices, which has in turn led to the absence of any AT-specific procurement and distribution guidance and standards in the country. As a result, AT procurement in the country is often led by non-government partners and donors, a process which is in itself fragmented and unregulated, driven largely by donor interests as opposed to government priorities. Each non-government partner that provides monetary support towards AT procurement or procures AT directly works within a siloed process; procurement thus occurs across various organizations. Assistive devices that are brought into the country through partners do not go through the public sector supply chain system, nor does it pass through the government's Central Medical Store (CMS) for storage and distribution. Stakeholders mentioned that assistive devices are often directly distributed to the population through mass distribution campaigns or donations, without considering quality and environmental and health suitability for end-users or with disabilities in Liberia. Stakeholders from MOH and MGCSP noted that the only function related to AT procurement being performed by the government is the granting of duty free permits (i.e. tax exemption) to NGOs and charity organizations that bring assistive devices into the country.

In summary, while a good range of assistive product types are available in the country (Table 5), there is no evidence-based national guidance on product list/selection, quality assurance, nor technical specifications as it relates to assistive products. AT not listed in the table are unavailable in Liberia based on the information collected (the assessment revealed that there are no hearing aids available in the country).

Table 5. AT product availability & supply landscape in Liberia

Product category	Existence of technical specs	Primary donor(s)*	Primary receiving entities	Level of procurement	Annual vol. given	Procurement model	Mechanism to choose supplier	Info used by procuring entity to determine quantity	Frequency of procurement	Assessed taxes & duties
Canes/sticks (including tripods and quadripods)	No	Ambutech, Lions Club International	Christian Association of the Blind	Internationally procured by donor/NGO	200 units	Bulk purchasing	Direct procurement *(sometimes competitive and open tenders)*	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Crutches, axillary/elbow	No	LDS, CAM	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	300 units	Bulk purchasing	Direct procurement	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Walking frames and rollators	No	LDS, CAM	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	150 units	Individual purchase based on need	Open tenders	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Orthoses	No	LDS, CAM, Ambutech UK	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	700 units	Bulk purchasing	Direct procurement	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Prostheses	No	CAM	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	1500 units	Bulk purchasing	Open tenders	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Therapeutic footwear; diabetic, neuropathic, orthopaedic	No	German Leprosy Relief Association	Ganta Leprosy Rehabilitation Center, Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	1000 units	Bulk purchasing	Open tenders	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Pressure relief cushions	No	LDS, CAM	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	Unknown	Individual purchase based on need	Direct procurement	Info from DPOs	Individual purchase based on needs / available funding	Exempt
Wheelchairs, manual for active use	No	German Leprosy Relief Association, CAM	Ganta Leprosy Rehabilitation Center, Monrovia Rehabilitation Center	Internationally procured by donor/NGO	15,000 units	Bulk purchasing	Competitive negotiations	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt
Club foot braces	No	Limbs International, German Leprosy Relief Association	Ganta Hospital Orthopedic Center	Internationally procured by donor/NGO	500 units	Bulk purchasing	Direct procurement	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt

Product category	Existence of technical specs	Primary donor(s)*	Primary receiving entities	Level of procurement	Annual vol. given	Procurement model	Mechanism to choose supplier	Info used by procuring entity to determine quantity	Frequency of procurement	Assessed taxes & duties
Wheelchairs, manual assistant-controlled	No	Mobility Worldwide, CAM	Florence A. Tolbert and Disabled Advocates (FATDA)	Internationally procured by donor/NGO	10000 units	Bulk purchasing	Open tenders	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt
Ramps, portable	No	Limbs International, Handicap International	Monrovia Rehabilitation Center, DPOs	Internationally procured by donor/NGO	Unknown	Bulk purchasing	Competitive negotiations	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt
Magnifiers, optical	Yes	SSI, EYEAlliance, Lions Club International, One-Dollar Glass, LVPEI	JFKMC Liberia Eye Center	Internationally procured by donor/NGO	Unknown	Bulk purchasing	Direct procurement	Donor/procuring entity's internal processes	Yearly / based on available funding	Exempt
Spectacles	Yes	SSI, EYEAlliance, Lions Club International, One-Dollar Glass, LVPEI	MOH, MOE, eye/vision centers in health facilities, DPOs	Internationally procured by donor/NGO	34,516 units	Bulk purchasing	Competitive negotiations	Donor/procuring entity's internal processes	Yearly / based on available funding	Exempt
White canes	No	Ambutech UK, Lions Club International	Christian Association of the Blind	Internationally procured by donor/NGO	500 units	Bulk purchasing	Competitive negotiations	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt
Braille equipment	No	Ambutech UK	Christian Association of the Blind	Internationally procured by donor/NGO	200 units	Individual purchase based on need	Open tenders	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt
Magnifiers, digital hand-held	No	Ambutech UK	Unknown	Internationally procured by donor/NGO	Unknown	Unknown	Open tenders	Donor/procuring entity's internal processes	Individual purchase based on needs / available funding	Exempt

**All assistive products in Liberia are donated by non-government entities, who also carry out the procurement process independently*

Table 5 above also shows that assistive products available in Liberia are all currently being procured by NGOs and faith-based organizations (through donations), and products are procured internationally. There are no national technical specifications used by government to regulate the products procured by non-government organizations; though products such as spectacles follow internal specifications used by donating entities. NGOs frequently use the bulk purchasing model and direct procurement from their suppliers. There is little regularity in the frequency of procurement; it is often based on the needs of local DPOs and facilities, with high dependency on availability of funding from the procuring organization. Most stakeholders stated that procurement is done through bulk purchasing, though the mechanism to select suppliers varies. As mentioned previously, national data on disability needs and AT demand is not comprehensive; thus, the quantity of each product type to be procured is determined by the procuring organization itself. Very little supplier data could be obtained from the donating/procuring entities interviewed, though all organizations procure from international suppliers. Data available on unit costs of various products are also not comprehensive. All assistive products currently available in Liberia are exempt from import taxes and duties.

It is also interesting to note that there has previously been some small-scale local production of assistive devices, for example through programs at the Ganta Leprosy Rehabilitation Center supported by AIFO and the German Leprosy Relief Association, though no current funding is available for their continuation. Furthermore, FATDA mentioned that during their distribution of wheelchairs, it was found that Jackson F. Doe Memorial Hospital in Nimba has equipment and supplies to locally fabricate prostheses/orthoses, but they lacking the technicians with the training and skills to do so. Technicians who are trained to produce assistive devices are currently located in Montserrado within the MRC.

Informal retail markets

Amidst the fragmented conditions of the AT market in Liberia, there is some evidence of an informal private market for assistive products. One local business center in Congo Town, Monrovia – Foday Business Center – is purchasing assistive products such as wheelchairs, crutches, and c, and are selling them at high and fluctuating prices. Following the end of the civil war and recognizing the high number of war-related amputations, the Foday Business Center began operations in 2005 by purchasing assistive products from the Liberian diaspora in the United States, who imported AT with other goods. The Foday Business Center is the only known retail business center buying and selling AT in the local market. The manager the retail center noted that after the civil war, non-governmental and charitable organizations such as CAM and LDS used to purchase assistive products from his business center, then distribute the products to amputated ex-combatants and other PWDs. However, purchasing by these organizations has since stopped, potentially due to lack of funding.

The price for a wheelchair (manual) at this retail center is $350 USD, while a wheelchair for active users costs $950 USD. This places a high financial burden on PWDs; those who reside in rural areas or other counties must also bear the costs for transportation and accommodations if they decide to travel to Monrovia to purchase these products. Markets such as this often serves as the last option for patients due to the shortage or unavailability of wheelchairs and other AT products at the existing public rehabilitation facilities.

Gaps and opportunities in AT product & procurement

There is a risk that poor quality assistive products will be distributed in Liberia to PWDs as there are no national standards to regulate organizations that procure and distribute assistive products; there is also little evidence that relevant needs assessment are conducted to understand the needs of the population prior to AT provision. As an important first step, assessments of AT needs, not only in terms of volume and category of products demanded, but also in terms of population profile and clinical requirements, environmental requirements, and user preferences, are necessary to understand the needs of the target population. From assessment findings and using the WHO priority assistive products list (APL) as a model, a national APL should be developed with adaptations and modifications made through a consultative process to align with the Liberian context (e.g. country needs, resources, and capacity). Integrating (or appending) the APL to the national STG/EML

will also ensure that assistive products are considered during the government's supply planning processes. The APL will also serve as an effective resource mobilization tool for potential donor commitment in procurement funding, and to guide product donations.

The existence of a national APL will also provide the LMHRA with the impetus to develop standards to regulate assistive products in both the private and public market, which will help ensure that products produced or imported into the country are safe, high-quality, and fit-for-purpose. National product standards and procurement guidelines may be adapted from AT product specifications (APS) currently being finalized by WHO/GATE initiative, and should be appended or incorporated into revisions or updates of existing relevant documents, such as the Guidelines for the Donation of Medicines and Medical Supplies for Liberia.

To ensure regulatory oversight on AT procurement and sustainability of the AT supply chain in the public sector, it is essential for government entities to have ownership over these processes. There is potential for government departments that are already established and functioning to lead on product regulation, procurement, and overall supply chain functions for assistive devices. Government and partners should work to build the capacity of existing entities such as the LMHRA, MOH Procurement Unit (as well as similar units in MOE and MOGSP), MOH Supply Chain Management Unit, CMS, and supply chain personnel in public health facilities, such that they become familiar with procurement and supply chain considerations for AT. As personnel capacity is built, the government should also work alongside its partners to develop and optimize procurement and supply chain processes that will enable regulation and oversight of assistive products in the country. Through its relevant supply chain units, the government should also work to aggregate AT demand and centralize procurement across facilities and sectors, which may further offer opportunities to negotiate for AT price reductions with local or international suppliers based on volume guarantees.

To effectively address the current gaps and market challenges affecting the AT sector, the government should leverage on existing structure and partners in transforming the market for assistive products. For example, ensure sustained availability and accessibility as well as minimize cost of importation for assistive products into Liberia, the GOL and its partners should consider developing local AT production (either parts or complete products), through approaches such as small business incentives, training programs for local manufacturers. Where possible, stakeholders should also work to link complementary resources for AT currently in the country (e.g. connect facilities or partners with raw materials and equipment available with those that have workforce skills for the local production of assistive products). Public-private partnerships and corporate social responsibility programs could also be explored to catalyze investment in the local AT market and expand local production capacities. Empowerment of local communities and businesses through these approaches may also further reduce any stigma associated with disability issues, and promote social cohesion in the country.

5. Human Resources

The absence of a fit-for-purpose health workforce for the provision of AT and rehabilitation services in Liberia is a major barrier to AT access. Since 2007, Liberia has made significant investments in health workforce development, focusing on increasing the quantity and improving the quality of skilled health workers and technicians. Though some progress has been made, significant gaps still exist in the country's health workforce. The most recent HRH Census was conducted in 2016 across 701 public, private, and faith-based facilities in Liberia, and identified 16,064 health workers (professional and non-professional) (MOH, 2016a). A large proportion of the health workers are assigned in Montserrado, NImba, Lofa, and Bong, corresponding to the higher population in these counties. Nationally, the health worker to population ratio in Liberia is 11.8 per 10,000 population, significantly lower than the WHO's minimum target of 23 skilled health workers per 10,000 population necessary to achieve 80% coverage of essential health services.

Specialized health workforce for the provision of AT and rehabilitation services is lacking in Liberia. Investments in the general health workforce have not considered how the health workforce could be leveraged to provide assistive devices and rehabilitation services. A breakdown of the health workforce (focusing on skilled health workers and those with potential to provide AT and rehabilitation services) is shown in Table 6 below; overall, there is a significant shortage of general skilled health workers as well as specialized professionals for AT provision.

*Table 6. AT-related workforce in Liberia**

Workforce category	Presence in government sector						Total number in non-government sector
	Total Number	Community	Primary	Secondary	Tertiary	Other	
General health workforce							
Midwives	761		✓	✓	✓		166
Nurses	2351		✓	✓	✓		726
Nurses - Ophthalmic Nurses	21			✓	✓		6
Physician Assistants	408		✓	✓	✓		110
Doctors	175			✓	✓		59
Community Health Assistants (CHA)	2331	✓					-
General Community Health Volunteers (gCHV)	3844	✓					-
Specialist doctors							
Ear, Nose, Throat (ENT)	1				✓		Unknown
Ophthalmology	19			✓	✓		7
Orthopedics	3				✓	rehabilitation center	5
Pediatrics	16			✓	✓		4
Rehabilitation	11			✓	✓		6
AT-specific workforce							
Biomedical Engineers	15			✓	✓		Unknown
Mobility Orientation Trainers	3			✓	✓	other – unknown	2
Occupational Therapists	1			✓	✓	other – unknown	Unknown
Opticians	5			✓	✓	other – unknown	Unknown

Workforce category	Presence in government sector						Total number in non-government sector
	Total Number	Community	Primary	Secondary	Tertiary	Other	
Orthotists	4			✓	✓	rehabilitation center	3
Physiotherapists	5			✓	✓	rehabilitation center	2
Prosthetic & Orthotic (P&O) Technicians	8			✓	✓	rehabilitation center	5
Prosthetists	6			✓	✓	other – unknown	4
Wheelchair Technicians	2					other – unknown	3
Community-Based Rehabilitation (CBR) Workers**	5	✓	✓			other – unknown	3
Other							
EYElliance's trained teachers in vision screening	100	Based in 50 public schools across Monrovia					None

**Specialists and professionals not listed above are not available in Liberia; speech/language therapists and braille teachers exist in very few institutions and exact numbers are unknown; **CBR workers are not an official cadre as recognized by the MOH; there are no additional details available on their selection, recruitment, training and deployment*

Training of AT workforce

There is little to no in-country training of AT-related workforce in Liberia. The development of cadres such as physiotherapists, mobility orientation technicians, P&O technicians, speech therapists, community-based rehabilitation (CBR) workers continue to be under-funded and deprioritized. The majority of training and support to the current AT workforce have been, and is currently being provided, by NGOs and faith-based organizations, with little integration into existing health training programs and institutions. One major factor responsible for the under-development of the AT workforce is that professional and training institutions have yet to introduce or incorporate in their curriculum discipline in the field of assistive technology; this is influenced by barriers such as lack of national standards for AT prescription and provision, lack of funding to establish programs, and lack of in-country professionals to serve as instructors on AT. Currently, most health training institutions in Liberia do not have degree/certificate programs or even courses on rehabilitation science or AT provision.

There has been some progress made in developing a health workforce for eye health. From 2006 to present, the GOL and its development partners have begun training specialized professionals to work with persons with visual impairments over the years and deployed at health facilities across the country. In the last two years, the New Sight Eye Centre (NSEC) in collaboration with the MOH National Eye Health Program has also been providing a one-year certificate/diploma training program to nurses in ophthalmic nursing. NSEC has been providing this training to a batch of eight nurses (current enrolment cap) selected from health facilities across the country each year, and they are re-deployed back to their respective facilities after the training to serve as professional eye health workers. It was only recently in 2019 that ophthalmology was introduced at the Liberia College of Physicians and Surgeons (LCPS) as a post-graduate course for medical doctors to pursue as a specialization in eye health. However, this specialist training requires doctors to travel to India or other European countries; the training program is supported collaboratively through the LCPS by LVPEI, MOH, SightSavers, and Lions Clubs International.

Furthermore, with financial and technical support from LVPEI, SightSavers International, Lions Clubs International, New Sight Eye Center, Handicap International, and EYElliance, approximately 26 ophthalmologists, 27 ophthalmic nurses, 15 biomedical engineers, and seven physiotherapists have been trained to date (through programs abroad) and deployed to facilities across Liberia.

In addition, the Tubman National Institute of Medical Art (TNIMA), which currently offers degree programs for nursing, midwifery, and PAs, is in the process of developing a curriculum for several specializations in AT and rehabilitation. TNIMA noted that the institution is working in close partnership with LVPEI to develop a standalone curriculum and will begin offering courses in AT and rehabilitation at certificate and diploma levels in the coming years.

Gaps and opportunities in AT workforce

Though not captured in the NAP nor the National Human Resources Policy and Plan for Health and Social Welfare (NHRPP 2011-2021) (MOH, 2011d), it should be recognized by line ministries and agencies that the development of an inclusive and accessible health system must consider the incorporation of rehabilitation sciences and AT into existing curricula of health professional training programs in the country, or the establishment of new degree/certificate programs and schools (for both in-service and pre-service training) to produce a AT workforce. Building on the model of training nurses to be specialized ophthalmic nurses, there may be opportunities for additional task-shifting of other AT provision services. The government should engage technical experts and user-groups (e.g., disabled persons' organization), both in-country and abroad, to help develop the necessary materials to begin training-of-trainers (ToT) and produce a critical mass of workers who can provide AT; the ToT approach can be utilized either in combination with the task-shifting approach, or to train new cadres of AT specialists.

While efforts have been made to train specialist doctors and nurses in ophthalmology, the government and its partners should also advocate for investments in workforce training for other health conditions and disabilities that require AT (e.g. for persons with mobility impairments, congenital disorders, hearing impairments, cognitive impairments).

Furthermore, there are opportunities to scale up community-based rehabilitation (CBR) programs across Liberia. The WHO recognizes CBR as an effective and multi-sectorial approach to support PWDs; as it relates to health, CBR aims to work across areas of health promotion, prevention, medical care, rehabilitation and assistive devices (WHO, 2010a). Specific interventions in CBR include training of family and community members on disability; facilitating inclusive education through capacity-building of teaching staff and students; referral to specialist services; provision of assistive devices, etc. (WHO, 2010b). The community-based and participatory aspects of CBR is key to linking PWDs to healthcare services, particularly in resource-limited and rural settings where access to care may be particularly difficult for PWDs; 60% of Liberia's population live outside the 5km radius to the nearest health facility. There have been some programs initiated in the past to introduce CBR in Liberia, though few details are available on the scope and status of these programs: Partners such as AIFO conducted training for CBR workers; most recently in December 2018, the Institute on Community Integration (ICI) from the University of Minnesota worked alongside the Ministry of Education to train community members in Montserrado, Margibi, and Bomi on CBR interventions (ICI, 2019; Mendin, 2013). There is thus an opportunity to greater collaboration between partners working in CBR, and to leverage existing community-based health workers, including gCHVs and CHAs, to further scale up CBR in rural communities across the country.

6. Provision of Assistive Products

Provision of AT in Liberia is fragmented and uncoordinated, heavily donor-dependent, and has not followed the decentralized approach envisioned and seen in other government services. Approximately 84% of PWDs do not have access to assistive products and services nationwide as the 2009 PWD needs assessment (MOHSW, 2009). Despite this glaring gap between demand and supply of AT, there are only few types of AT products available in the country, and even fewer health facilities or rehabilitation centres that prescribe and provide them (Table 7). The assessment revealed that AT such as hearing aids, communication devices, incontinence products and alarm signallers are not readily available to people who require them.

As described in the section '*Stakeholder Landscape'*, multiple government actors have mandates and roles related to AT provision, though none have developed any national policies, guidelines, or service delivery standards to regulate AT prescription and provision with regard to clinical best practices nor provider competencies. Combined with the majority of AT provision in the country being led and supported by NGOs, who may either use organization-specific guidelines or other guidance that results to inconsistencies in the practice of assistive product provision across different facilities and across different providers. There are also no nationally validated policies regulating the health workforce cadres who are allowed to prescribe or provide different assistive devices. Generally, physician specialists in the existing rehabilitation facilities are the only ones with knowledge and skills on AT provision, and thus is the main cadre providing these services.

Public providers

Public AT and rehabilitation service provision are highly centralized in Monrovia – Liberia's capital city. JFKMC hosts the two main AT providers in the public sector, which are the MRC and the Liberia Eye Center. Both of these facilities are national referral centers that cater to patients and clients across all 15 counties in the country.

The MRC provides physiotherapy, physical rehabilitation, and social work services to PWDs. In addition, they locally produce and provide some AT materials such as prostheses and orthoses for lower limbs and for upper limbs, wheelchairs, walking frames, crutches, and walking sticks. Cadres that provide AT and/or rehabilitation services at the MRC include physician specialist, physiotherapists, mobility and wheelchairs technicians, and P&O technicians. The Liberia Eye Center provides eye care services and assistive products such as spectacles and magnifiers for those with visual impairments. Cadres that provide these services at the Eye Center include ophthalmologists, cataract surgeons, and ophthalmic nurses and PAs.

While physicians in health facilities (public or private) could refer patients to central locations such as Monrovia Rehabilitation Center for prescription and provision of assistive devices, no formal referral mechanisms exist that consists of appropriate documentation, clear care-seeking and follow-up pathway, directory of specialists/providers, etc. This lack of formal referral mechanism and poor coordination amongst providers within the AT sector was identified by stakeholders as a key barrier to connecting not only services providers, but also linking patients to facilities where their needs can be addressed optimally.

The eye center at the Liberia Government Hospital in Buchanan, Grand Bassa provides AT and services to patients with visual impairments, and is staffed with an ophthalmologist and an ophthalmic nurse.

Other providers

Faith-based health facilities and international non-governmental organizations are the key players in the AT and disability sector, and they continue to make contributions toward the provision of AT and rehabilitation services in Liberia. Provision of AT is carried out by NGOs through mass distributions/donations and provide capacity building, infrastructure development and equipment. There are limited numbers of NGOs however, involved with AT provision and they are briefly discussed below.

The Ganta Leprosy Rehabilitation Center provides services and AT to persons with leprosy-related disabilities or with clubfoot and other physical impairments. The facility has been able to produce (previously) and provide prostheses, orthoses, wheelchairs, walking frames, and walking sticks for PWDs in Liberia as well as border towns in Guinea. The rehabilitation center has three trained P&O technicians who provide AT and related services. In 2017, the facility provided 223 units of assistive products such as wheelchairs, prostheses, orthoses, and walkers, to patients with leprosy-related disabilities.

The Ganta Methodist Hospital's orthopedic center and optical center both provide AT and associated services for those in need. In the last two years, the orthopedic center has served over 3000 patients from Nimba (where the facility is located) as well as surrounding counties, and have provided 2500 orthopedic devices to patients, such as those with clubfoot and lower limb deformities. The orthopedic center also provides assessments and fittings for patients for these assistive products. The hospital's optical center provides eye care services and assistive products for visual impairments and currently employs a cataract surgeon and various ophthalmic nurses. The optical center serves patients in Nimba as well as those from surrounding counties in Liberia's central/northern region (e.g. Bong, Lofa).

The optical center at Phebe Hospital located in Bong also provides eye care services and AT such as spectacles to persons with visual impairments, with its patient load mainly coming from Bong, Lofa, and Nimba. The optical center is staffed by an ophthalmologist and two ophthalmic nurses who provide the necessary services.

Table 7: Key AT provider landscape in Liberia

Name of service provider	Category	Level of facility	Estimated annual number provided
Liberia Eye Center	Government (MOH/JFKMC)	Tertiary	8,263 spectacles
Monrovia Rehabilitation Center	Government (JFKMC)	Tertiary	850 wheelchairs and P&O devices
Ganta Methodist Hospital Orthopedic Center	Non-government, for profit	Tertiary	2500 orthoses for clubfoot, lower limbs
Phebe Hospital Optical Center	Non-government, for-profit	Tertiary	250 spectacles
Ganta Leprosy Rehabilitation Center	Non-government, non-profit	County level	80 prostheses, 66 orthoses, 33 walkers
EYElliance	Non-government, non-profit	National level	15,518 spectacles
Florence A. Tolbert & Disabled Advocates (FATDA)	Non-government, non-profit	National level	10,000 wheelchairs; various quantities of canes, walkers, crutches, eye glasses
Lions Clubs International	Non-government, non-profit	National level	Various quantities of braille equipment, white canes

Another gap identified within provision of AT is the replacement and repair of assistive devices, which is stated by most respondents (including end users) during FGDs and KIIs to be non-existent in Liberia. The central rehabilitation centers that provide AT still lack the capacity (human skills and material resources) to conduct repairs or replacements (parts or whole). Due to the rough terrains that cover the majority of the country, assistive devices are quick to break, and as such, end users often only have the option to repair the devices themselves. According to key informants, wheelchairs and P&O devices may be repaired throughout the lifespan of the products, but replacements are rare unless another round of donation occurs (which may be five or more years from the initial donation). One innovative approach used during or after AT provision in other countries is peer-to-peer training, where users can provide training and support (for example, in AT use and repair) for other AT users. This approach supports interactions amongst people with similar disabilities, which could help AT users feel connected and reduce the risk of social isolation (Holloway et al., 2018). However, peer education for AT rarely takes place in Liberia, and training of AT service providers is largely conducted by NGOs or the few rehabilitation centers that exist.

At the AT end-user level, there is currently no routine system that collects information on users' satisfaction after service provision in order to measure the impact of the received assistive devices on health outcomes or general well-being in the lives of the users. Such information systems are absent from public facilities, private facilities, as well as NGOs that provide assistive devices and rehabilitation services to PWDs. Stakeholders did mention that the follow-ups conducted by MRC to some patients includes a user satisfaction component, and that with support from HI, MRC had previously conducted a more comprehensive user satisfaction survey in 2012.

Gaps and opportunities in AT provision

Overall, there are significant gaps in AT provision and service delivery in the country, despite these being filled largely by non-government partners but in an uncoordinated manner. Fragmentation of AT provision among different providers also results in lack of consistency and standardization in service delivery.

In order to ensure that high-quality, safe, and appropriate assistive devices and services are provided to those in need, government entities such as the MOH and MGSCP must develop and validate service delivery guidelines and standards for the provision of AT. These guidelines could be developed by reviewing and adapting international best practices, such as the suite of resources currently in development by the WHO/GATE initiative. AT service standards must incorporate guidance on referrals and counter-referrals across all levels of the health system, as well as cross-system referrals (e.g. to/from schools, the workplace). Development of a formal referral pathway will enhance proper coordination and improve communications between health facilities, non-health service providers and clients as a means to track effective AT provision for persons with disabilities and other functional restrictions. It will also help strengthen the monitoring, coordination, and supervisory capacity of the relevant government and non-government entities responsible for AT. Similarly, development of a patient registry for AT and rehabilitation services that incorporates data elements on user satisfaction, user health outcomes, and other indicators such as education and employment will enhance the process of capturing information on users' impacts and effectively generating feedback from end-users. With proper data collection and management, such a registry will be able to disseminate user feedback to AT service providers to support improvements in AT prescription and provision.

In parallel, a national AT policy should be developed with guidance on the cadre of health workers who are able to / should provide AT (also see the *'Policy & Financing'* section). Recognizing that effective AT provision is cross-sectoral, national policies on the AT workforce must also consider non-health staffing such as social workers, teachers, community-based rehabilitation workers, and AT peer users. In a resource-limited setting such as Liberia, the approach of peer training should be explored and scaled up to improve user training in AT. Pilot programs could be implemented in facilities already provider assistive products, such as the Monrovia Rehabilitation Center, where small cohorts of existing users could be trained to become peer trainers. This approach, along with community-based rehabilitation activities (see 'Health Workforce' section), could be effective in addressing key barriers to AT access in the country, such as having limited availability of health professionals as well as logistical difficulties in accessing health facilities in a large number of communities.

Lastly, there is a need to ensure that the provision of assistive devices and related services, whether happening in the public or private sector, can be decentralized. Major facilities providing AT are located in large cities such as Monrovia, Ganta, and Phebe, which are all concentrated in Liberia's central/northern region. Although there is ongoing work by the MOH and partners to decentralize eye care services with eye centers to every county in Liberia, there are currently no other public facilities providing AT or services for other functional impairments in Liberia's southeast region. Task-shifting of basic AT provision to existing health cadres may be one approach to ensure rapid decentralization of services to existing primary and secondary health facilities in the counties.

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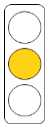
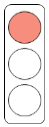
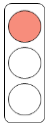
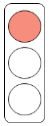
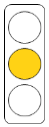
Summary of Analysis Result & Recommendations

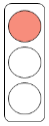
Current Status of Country Capacity on AT

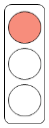
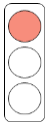
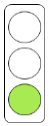
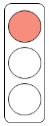
In January 2020, a consultative workshop was held to disseminate the above quantitative and qualitative findings to stakeholders, build consensus among stakeholders on the current status of each 'criteria for success', develop recommendations and action points to accelerate AT access in the country (see Appendix # below for attendance list). Under reach system domain related to AT, stakeholders were shown the 'criteria for success' (i.e. what is necessary for AT availability and access) and findings regarding the status in Liberia ('rationale'). Once consensus was built on the status of each criteria related to system capacity (either not present, needs strengthening, or present/functioning), stakeholders then suggested recommended actions that will bring Liberia from its current status of implementation to the desired outcome. The final consensus on status and rationale are shown below; the recommendations to accelerate AT access are discussed in the next section.

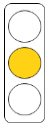
Policy, Program, and Financing for AT			
	Criteria for success	**Status**	**Rationale**
1	Assistive technology has a legal framework		▪ CRPD ratified by Liberia (however, did not ratified the optional protocol) ▪ Revised National Commission on Disability Establishment Act (2011) that bestows expanded mandate and role to NCD has not bene fully passed by national legislature; currently tabled at the Senate ▪ No other legal framework or national policy exists to formalize rights of PWDs or AT access

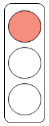
2	Unified national strategy or policy for increased access to AT exists, with clear roles, responsibilities, and strong coordination among government entities for its successful implementation		▪ No unified national strategy or policy for AT
			▪ National Action Plan for Inclusion of PWDs developed but not implemented
			  ○ Only 2 performance indicators touch upon AT, but activities to achieve them are not specific
			▪ Mandates of several government entities are related to AT but lacks delineation of roles/responsibilities (between Ministry of Health; Ministry of Gender, Children & Social Protection; National Commission on Disabilities; etc.)
			▪ There is awareness on importance of AT among individual champions within key government entities, but no central platform exists for holistic policymaking nor advocacy to promote AT to stakeholders not currently involved
			  ○ No coordinating mechanism or knowledge-sharing platform for AT among gov't entities
			▪ Gov't plays very limited role in ensuring AT availability and access, and AT-related interventions are often donor-driven and fragmented

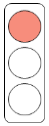
Policy, Program, and Financing for AT			
	Criteria for success	**Status**	**Rationale**
3	Government entities implement programs for AT (provision, training, standards/regulation, procurement, etc.) with defined monitoring and evaluation plan		▪ Gov't entities do not lead implementation of AT programs for provision, training, standard/regulation, procurement, etc.; programs largely donor-driven and fragmented ▪ National M&E plans and indicators do not exist for AT programs
4	Sufficient government financing exists to support programs for AT (provision, training, standards/regulation, procurement, etc.)		▪ Gov't financing does not exist to support AT programs due to limited national budget ○ Limited allocation in national budget for AT in any gov't entities (e.g. MOH, MGCSP, MOE, NCD) ▪ Donors and non-gov't partners gap-fill financing roles
5	National health financing scheme provides appropriate coverage for AT		▪ There is no national health insurance ○ MOH NSWPP provides for the Essential Package of Health Services (EPHS), however: • Health services are often not free • Essential package of services does not include AT provision ▪ There is no national social/welfare insurance ○ NASSCORP is largest administrator of social insurance, with NPS and EIS peripherally related to old-age/disability and AT; but excludes individuals who are unemployed, informally employed, or work with non-registered organizations

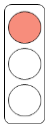
Assistive Products and Procurement Systems			
	Criteria for success	**Status**	**Rationale**
6	Country has a national assistive products list (APL) or similar, with sufficient technical specifications		▪ National APL does not exist ▪ National Standard Therapeutic Guidelines/Essential Medicines List does not include AT ▪ No other national technical specifications for assistive devices are available

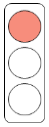
Assistive Products and Procurement Systems			
	Criteria for success	**Status**	**Rationale**
7	Assistive products are regulated		▪ Regulatory structures and mechanisms for assistive products are non-existent across both public and private sectors ▪ Within public sector, mechanisms such as those within MOH and LMHRA do not currently consider AT ○ e.g. Essential Medicines List, National Guidelines for Donation of Drugs and Medical Supplies, product registration processes
8	There is an established government procurement system for AT		▪ Gov't is not undertaking procurement of assistive products ○ Gov't procurement systems exist but does not consider AT ▪ AT procurement is reliant on donors/non-gov't actors, or through donations
9	Assistive products are exempt from tax and duties		▪ A wide range of assistive products are currently exempt from tax and duties
10	In-country capacity exists for production or assembly of a wide range of assistive products		▪ While there was previously capacity for small-scale production of assistive products in the country (e.g. through rehabilitation center and programs in Ganta), support and resources have dwindled in recent years, resulting in cease in local production of AT

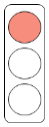
Human Resources			
	Criteria for success	**Status**	**Rationale**
11	Workforce related to AT is sufficiently available		▪ There are cadres within health or other workforce that could be leveraged for AT provision ○ e.g. certificate training program initiated for ophthalmic nursing; school teachers trained on basic vision screening and spectacles provision ○ However, there is still shortage of general health workforce: nationally, HCW (professional and non-professional) to population ratio is 11.8 per 10,000 population, significantly below WHO target of 23 SBAs per 10,000 population to achieve sufficient coverage of essential health services (HRH Census, 2016) ▪ Specialized AT workforce is lacking ○ Very limited number of specialist doctors or AT professionals (ophthalmologists, orthopedic surgeons, mobility orientation trainers, physiotherapists, prosthetic & orthotic (P&O) technicians, etc.); cannot meet demand for service ▪ Community-based rehabilitation (CBR) workers generally not available

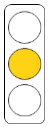
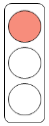
Human Resources			
	Criteria for success	**Status**	**Rationale**
12	Structures/resources to build or strengthen the capacity of workforce in AT is available		▪ Training institutions available for narrow range of health workforce ○ AT or rehabilitation sciences courses or curricula not included in HCW training programs ▪ Low capacity and lack of resources in country to offer specialized AT training

Provision of AT			
	Criteria for success	**Status**	**Rationale**
13	The provision of assistive products is guided by clear guidelines or standard		▪ No national guidelines or service standards for AT provision ▪ Quality of AT provision varies widely from one provider to another

14	Assistive product service provision largely occurs in facilities within the governmental sector		▪ AT service provision mainly occurs in only 2 public health facilities
			  ○ JFK Liberia Eye Center, JFK Monrovia Rehabilitation Center
			▪ Significant challenges in AT service delivery in public sector
			  ○ Lack of human, material, and financial resources
			▪ Private and faith-based organizations also make up significant portion of AT service provision
			  ○ Ganta Methodist Hospital Orthopedic and Optical Centers, Ganta Leprosy Rehabilitation Center, Phebe Optical Center, etc.

15	Assistive product service provision is person-centered		▪ No current system to collect information on user satisfaction or impact of received AT on health and other outcomes
			  ○ None in public facilities, private facilities, or NGOs; previously, Monrovia Rehabilitation Center and Handicap International worked together on a user satisfaction survey, as well as capture user satisfaction as part of follow-up
			  ○ Therefore no current/up-to-date routine data to be utilized to improve service provision

16	Assistive product service provision is well-connected and coordinated		▪ No formal referral mechanisms to connect users to providers
			  ○ Patients/clients may be referred informally to JFK MRC for prescription or provision of AT
			  ○ However, there is absence of standardized documentation, clear care-seeking and follow-up pathway, directory of specialists/providers, etc.
			▪ Service provision is fragmented and no coordinated among different stakeholders involved

Data and Information Systems related to AT			
	Criteria for success	**Status**	**Rationale**
17	Reliable information is collected to accurately estimate the need and demand for AT		▪ Gov't does not collect routine data on disabilities and functional limitations, therefore cannot estimate population need for AT ▪ Most disability data are from national surveys and are outdated (Population & Housing Census, 2008; Labour Force Survey, 2010) ▪ Some health facilities that provide AT and rehab services have patient records to capture disability diagnoses, but these are not aggregated nationally on HMIS o e.g. Liberia Eye Center using eyeSmart Electronic Medical Record database, Ganta United Methodist Hospital patient records ▪ Gov't collects some routine data on limited number of health conditions relevant to AT, but data are incomplete e.g. Health Management Information System (HMIS) has data elements on eye health conditions
18	Information is collected on the provision and utilization of AT		▪ Gov't does not collect routine AT provision and utilization data ▪ Some health facilities that provide AT and rehab services have patient records to capture AT provision and utilization, but these are not aggregated nationally on HMIS ▪ Donors, DPOs, and other non-government organizations that provide or donate assistive devices have internal records on AT volumes provided

Recommendations for Action to Accelerate Access to AT

The January 2020 workshop was also used as a forum for stakeholders to brainstorm recommendations to accelerate access to AT in Liberia. The recommended action points under each 'criteria for success' as agreed upon by key stakeholders are described below.

Policy, Program, and Financing for AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
1	Assistive technology has a legal framework	**Strengthen national legislations related to PWDs and access to AT** ▪ Form advocacy group inclusive of civil society organizations and champions from the disabled community, and advocate for the full ratification of the CRPD (i.e. inclusive of the optional protocol): (i) Develop briefing document for government stakeholders on the CRPD, the optional protocol, and landscape of AT in Liberia (based on findings from ATA-C assessment) (ii) Identify key government partners for advocacy, including Office of the Vice President and the Group of 77 (iii) Conduct dialogue between CSOs and government entities to increase awareness and solidify political commitment ▪ Form advocacy group inclusive of CSOs and champions from the disabled community, and advocate for the revised NCD Act (2011) to be fully passed by the national legislature: (i) Identify key government partners for advocacy, including Office of the Vice President and the Group of 77 (ii) Conduct dialogue between CSOs and government entities to increase awareness and solidify political commitment ▪ Disseminate the National Action Plan for Inclusion of PWDs (2018-2022) widely to all relevant stakeholders	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), Group of the 77, Office of the Vice President
2	Unified national strategy or policy for increased access to AT exists, with clear roles, responsibilities, and strong coordination among government entities for its successful implementation	**Establish a coordinated national effort for increased access to AT and rehabilitation services** ▪ Establish cross-sectoral technical working group (TWG) for AT and rehabilitation services as coordination, knowledge-sharing, and implementation oversight mechanism, inclusive of representatives from relevant line ministries, other government agencies, disabled people's organizations (DPOs), non-government organizations, donors, and private sector partners ▪ Leverage monthly meetings of the Alliance for Disabilities to discuss issues related to AT, present findings and recommendations from ATA-C assessment; include additional stakeholders in meetings to ensure coordination between non-government and government partners ▪ Develop national AT policy and strategy, with detailed M&E plan, to formalize government commitment to improve AT access, delineate roles & responsibilities among relevant government entities, and guide stakeholders in achieving objective including those under the domains of 'Health Care' and 'Independent Living and Self-Determination' in the NAP (2018-2022) ▪ Integrate considerations for AT availability and access into existing national policy or strategic documents, such as the EPHS ▪ *Also see recommendations for Criteria #3, #5*	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), WHO, UNICEF, CHAI, AIFO, Lions Clubs International, LVPEI

Policy, Program, and Financing for AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
3	Government entities implement programs for AT (provision, training, standards/regulation, procurement, etc.) with defined monitoring and evaluation plan	**Build and improve the government's capacity to implement programs for AT, across areas of standards/regulations, procurement and supply chain, workforce, provision, data systems, etc.** ▪ Establish national programs for AT within or across relevant government agencies, including but not limited to Ministries of Health; Gender, Children and Social Protection; Education; and National Commission on Disabilities, Liberia Medicines and Health Products Regulatory Authority (LMHRA), Liberia Medical & Dental Council (LMDC) o AT programs should be integrated into existing ministry departments, units, or programs whenever possible o Develop detailed M&E plans for national programs ▪ Build the capacity of existing government departments and units to more effectively lead or coordinate implementation of AT activities: o Build capacity of LMHRA to regulate AT manufacturing, procurement and product standards, distribution, and importing o Build the capacity of procurement and supply chain units within MOH, MGCSP, MOE to improve procurement and supply chain processes related to AT ▪ *Also see recommendations for Criteria #2, #17, #18*	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), LMHRA, LMDC, WHO, UNICEF
4	Sufficient government financing exists to support programs for AT (provision, training, standards/regulation, procurement, etc.)	**Advocate for and sustain availability of financial resources to support AT (across areas of standards/regulations, procurement and supply chain, workforce, provision, data systems, etc.)** ▪ Conduct detailed resource mapping among partners to understand technical and financial resource coverage across different facilities, counties, disabilities and AT types, and to reduce duplication of efforts and maximize population coverage o Where possible, link complementary resources for AT, e.g. connect equipment and material availability at Jackson F. Doe Hospital with workforce availability and skills at Monrovia Rehabilitation Center for the local production of assistive products ▪ Based on national AT policy and strategic plan, develop detailed and realistic budget for activity implementation and an associated resource mobilization strategy that considers a wide range of assistive products as well as provision of AT across all sectors (health, education, labor, etc.): o Develop Investment Case for AT to more effective use limited resources to maximize impact, and to advocate for donor funding (short/medium term), including identification of capital investments to kick-off initial implementation o Explore corporate social responsibility (CSR) programs with local private sector partners (e.g. Orange, Lonestar, etc.) (short/medium/long term) o Advocate for inclusion of ear-marked AT funding in national budget (medium/long term) ▪ Utilize government fiscal space analyses to identify opportunities to widen fiscal space for AT and rehabilitation services	MOH, MGCSP, MOE, NCD, MFDP, NUOD and DPOs (including FATDA and other end-user groups), Group of the 77, Office of the Vice President; Implementing Partners

Policy, Program, and Financing for AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**

5	National health financing scheme provides appropriate coverage for AT	**Advocate for the inclusion of AT into existing or planned national health insurance or social welfare schemes or programs**
		▪ Work to include AT and rehabilitation services into social/welfare insurance, through any or all of the following:
		  ○ Include AT and rehabilitation services into the NASSCORP social welfare scheme (which is yet to be implemented)
		  ○ Expansion of social insurance coverage to cover unemployed individuals and individuals in the informal employment sector
		  ○ Establishment of a new national social insurance scheme that includes AT coverage
		▪ Work with national and international suppliers for assistive products and with in-country AT providers to advocate for reduce or subsidized pricing of AT services for beneficiaries covered under NASSCORP (or any other schemes)
		▪ Leverage the planned/upcoming review and update of the EPHS to ensure that AT and rehabilitation services are included, and that these services are integrated into each level of the health system as appropriate
		▪ Leverage discussions on Universal Healthcare Coverage and planning for a national health insurance mechanism (e.g. Health Equity Fund, Revolving Drug Fund) to ensure that AT and rehabilitation services are covered for all who require them
			MOH, MGCSP, MOE, NCD, MFDP, NASSCORP, NUOD and DPOs (including FATDA and other end-user groups), MFDP

Products & Procurement Systems			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
6	Country has a national assistive products list (APL) or similar, with sufficient technical specifications	**Develop national assistive products list (APL) and other technical specifications** ▪ Develop a national APL, modelled after the WHO APL and adapted based on Liberia's context, environment, demand and need, ensuring there is inclusion of a wide range of product types to cover various disabilities/functional impairments ▪ Develop technical specifications for manufacturing, importing, and procurement of assistive products on the national APL *(see recommendations from Criteria #6)* ▪ Leverage on the planned review of the National Standard Therapeutic Guidelines & Essential Medicines List (STG/EML) to ensure expansion into/incorporation of AT	MOH, MGCSP, MOE, NCD, LMHRA, NUOD and DPOs (including FATDA and other end-user groups), WHO, UNICEF

7	Assistive products are regulated	**Establish guidelines/standards and regulatory mechanism for assistive products**
		▪ Review, revise or update guidelines/standards within the LMHRA regarding product manufacturing and importing, product registration, and product quality & safety, to ensure that assistive products are included and considered
		  ○ International guidelines such as WHO's Assistive Product Specifications (APS) for Procurements should be adapted to align with the Liberian context
		  ○ Establish registry of national and international AT manufacturers and suppliers pre-qualified by LMHRA
		▪ Incorporate AT into any post-market surveillance systems (e.g. through expansion of scope of health products under purview of LMHRA Pharmacovigilance Unit) to monitor quality, safety, and efficacy of assistive products and adherence to regulatory standards
		▪ Incorporate AT into revision/update of the National Guidelines for Donation of Drugs and Medical Supplies, to ensure donors and non-government partners adhere to product quality and safety standards
		▪ *Also see recommendations from Criteria #3, #6*
			MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), LMHRA

Products & Procurement Systems			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
8	There is an established government procurement system for AT	**Establish and integrate a government procurement system for assistive technology into the existing supply chain and procurement system** ▪ Ensure that non-government organizations' procurement of AT is coordinated throughout the government (through the relevant TWG), as a stepping stone to government-led procurement of AT in the long-run ▪ Build capacity of and leverage existing government units and platforms (e.g. for procurement, supply chain management, quantification, Central Medical Store [CMS]) to lead and coordinate AT procurement, as part of broader supply chain strengthening o Across functions of tendering, awarding, managing contracts; forecasting and quantification; storage and distribution ▪ Establish or incorporate AT into existing government procurement/supply chain policies, processes and forms, using technical specifications for priority assistive products **Ensure that assistive products on the national APL are available in Liberia through government procurement** ▪ Based on national APL, begin to scale up government procurement through aggregation of demand for select assistive products across ministries and sectors to enable centralized procurement ▪ Work with non-government partners and donors to negotiate for reduced or subsidized prices of assistive products based on demand ▪ *Also see recommendations from Criteria #3, #6*	MOH, MGCSP, MOE, NCD, Public Procurement & Concession Commission (PPCC)
9	Assistive products are exempt from tax and duties	**Maintain and increase the range of assistive product categories that are exempt from tax and duties** ▪ Ensure that assistive product categories on the national APL (to-be-developed) are tax-exempt	MOH, MGCSP, MOE, NCD, LMHRA, Liberia Revenue Agency (LRA)
10	In-country capacity exists for production or assembly of a wide range of assistive products	**Improve high-quality local production or assembly of a wide range of assistive products** ▪ Develop capacity for local AT production (either parts or complete products) through approaches such as small business incentives, training programs for local manufacturer and engagement of local communities ▪ Link complementary resources for AT production currently in country (e.g. connect facilities with raw materials and equipment available with those that have workforce skills for production) ▪ Explore public-private partnerships and corporate social responsibility programs to catalyze investment in the local AT market and expand local production capacities ▪ Initiate training programs in health training institutions or other vocational training schools on AT production; conduct skills upgrade of workforce involved in existing AT production in the country	MOH, MGCSP, MOE, NCD, LMHRA, NUOD and DPOs (including FATDA and other end-user groups), health training institutions and other vocational training schools, health facilities and rehabilitation centers

Human Resources			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
11	Workforce related to AT is sufficiently available	**Increase the quantity, quality, and skill diversity of the public sector workforce (both health and non-health) as related to AT service delivery** ▪ Assess gaps in the AT workforce through surveys or rapid assessments to identify personnel needs at different levels of the AT provision system, and to inform workforce development priorities and plans ▪ Incorporate considerations and priorities for AT workforce development into existing national human resource plans and policies across various sectors (health, social welfare, education, etc.) to ensure integration ▪ Develop and implement policies and standards regarding eligible cadres (health and non-health) for AT service delivery (across all functions e.g. prescription, provision, assessment & fitting, repair & replacement, referrals), with clear delineation and coordination across relevant line ministries linked to AT provision ▪ Train specialized AT workforce across health, social welfare, and education, prioritizing cadres as needed based on population demand and category of products on national APL ▪ Train CBR workers to develop community-based delivery of AT and rehabilitation services, leveraging existing community health cadres where possible ▪ Build the AT workforce through task-shifting of basic AT delivery to existing cadres of workers (both health and non-health, e.g. nurse, physician assistant, teacher, social worker, etc.) ▪ Develop and implement policies to outline recognition/classification, scope of work, salary & benefits, retention strategy and career pathway/continuing professional development for the AT workforce (whether newly trained or through task-shifting) ▪ *Also see recommendations for Criteria #12*	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), WHO, UNICEF, health training institutions and other vocational training schools, professional regulatory boards
12	Structures/resources to build or strengthen the capacity of workforce in AT is available	**Establish and strengthen structures and capacity of the country to develop AT workforce** ▪ Develop pre-service and in-service curricula and training materials for AT and rehabilitation services based on international best standards ▪ Introduce and integrate courses, certificate, diploma, and/or degree programs related to AT and rehabilitation services within existing education institutions, for the eligible workforce across health, social welfare, education ▪ Build capacity of education institutions to train AT specialists; establish center of excellence to provide training in collaboration with existing institutions such as Monrovia Rehabilitation Center and Liberia Eye Center ▪ Conduct training-of-trainers within existing health, social welfare, or education workforce, to cascade training of basic AT delivery as part of task-shifting ▪ Establish or expand scholarships (both government and non-government) for students to pursue pre-service or in-service training in AT abroad ▪ Establish professional associations (for examination and licensing, accreditations, etc.) for AT workforce, working alongside existing regulatory bodies such as the LMDC ▪ *Also see recommendations for Criteria #11*	MOH, MGCSP, MOE, NCD, WHO, UNICEF, health training institutions and other vocational training schools, professional regulatory boards

Provision of AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
13	The provision of assistive products is guided by clear guidelines or standard	**Develop national guidelines and service standards to guide high-quality and safe provision of AT** ▪ Develop and enforce use of national guidelines and service standards for AT based on international best practice and adapted for Liberian cultural and socioeconomic context ▪ Orient existing AT specialists to the most updated international standards for service delivery ▪ Develop and implement mechanisms within existing bodies or newly-established regulatory bodies to monitor adherence to service standards; mechanisms should include clear performance indicators at the provider level, facility level, and from perspectives of the end-user *(also see recommendations for Criteria #15)*	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF, health training institutions and other vocational training schools, professional regulatory boards

14	Assistive product service provision largely occurs in facilities within the governmental sector	**Increase the provision of assistive products in public sector facilities**
		▪ Integrate AT provision (or referrals) into routine health service delivery
		  ○ Identify public health facilities where AT provision could be added into existing package of services offered, across primary, secondary, and tertiary levels of care, as well as at the community-level
		▪ Work to decentralize AT services to ensure greater coverage of the population (e.g. through expanding the facility-based and community-based AT workforce, increasing local AT production, etc.)
		  ○ Allocate human and financial resources to increase the number of service delivery points over time, across all sectors (health, social welfare, education)
		▪ *Also see recommendations for Criteria #11, #16*
			MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF, health training institutions and other vocational training schools, professional regulatory boards

15	Assistive product service provision is person-centered	**Strengthen person-centeredness within assistive product service provision** ▪ Rebuild and strengthen systems to routinely collect user satisfaction and impact information, including development of necessary tools for data collection ▪ Conduct operational research on satisfaction and well-being outcomes of AT end-users ▪ Disseminate data and findings from data systems and operational research back to service providers to improve service delivery ▪ Establish programs for peer-to-peer training and support (e.g. for AT user training, repairs) between AT users to address barriers in AT workforce and access to facilities, as well as to improve interactions among users and promote community-building	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF

Provision of AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**
16	Assistive product service provision is well-connected and coordinated	**Develop a well-connected and coordinated AT provision system, inclusive of a formal referral mechanism to link patients/clients to facilities, and to connect facilities** ▪ Develop directory of AT providers and rehabilitation services across all sectors, and disseminate to patients/clients and providers for their use; also develop complementary patient care-seeking pathway maps ▪ Integrate AT into existing referral systems within health, social welfare, and education sector ▪ Develop and enforce use of appropriate referral and follow-up documentation for AT provider use; Train AT workforce on AT referral processes	MOH, MGCSP, MOE, NCD, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF

Data and Information Systems related to AT			
	Criteria for success	**Recommended actions**	**Relevant stakeholders**

17	Reliable information is collected to accurately estimate the need and demand for AT	**Strengthen existing information systems to expand data coverage on health conditions and functional limitations that require AT**
		▪ Conduct nation-wide survey on disabilities and functional limitations
		  ○ If possible, leverage upcoming DHS to include disabilities/functional limitations data
		▪ Engage and encourage research institutions to participate and fill gaps on data availability through research activities
		▪ Develop national M&E and data collection plan for disabilities and AT need/demand data, as part of the national AT policy and strategic plan, and incorporate new data elements into existing HMIS
		  ○ Leveraging on revision and roll-out of new HMIS facility ledgers and reporting forms to ensure data elements on disabilities and non-communicable diseases & injuries (NCDIs) are included
		  ○ Conduct training for facility-based providers and central ministry HMIS staff on the recording, aggregation, analysis and use of key disability and NCDI indicators
		▪ Develop and implement strategy to collect and disseminate disability/AT data outside across all relevant government agencies, beyond MOH (which currently hosts the HMIS), and promote utilization of data for evidence-based decisions in AT programming
			MOH, MGCSP, MOE, NCD, LISGIS, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF

18	Information is collected on the provision and utilization of AT	**Establish information systems for data coverage on the provision and utilization of AT** ▪ Conduct nation-wide survey on disabilities and functional limitations (including AT use) ○ If possible, leverage upcoming DHS to include AT use data ▪ Incorporate new data elements on AT provision (service volume) into existing HMIS ▪ *Also see recommendations for Criteria #17*	MOH, MGCSP, MOE, NCD, LISGIS, NUOD and DPOs (including FATDA and other end-user groups), health facilities, WHO, UNICEF

Appendices

Appendix A: List of individuals/organizations involved in AT assessment

Name of Organization/Department	Category of Ministries, Agencies, Commissions & NGOs	Location	Contact Information		
			Name	Email Addresses	Mobile Numbers
National Eye Health Program	Ministry of Health	Montserrado	Dr. Joseph Kerkula	joekerkula66@gmail.com	0770128042 / 0886528133
Non-communicable Diseases Unit (NCD)	Ministry of Health	Montserrado	Dr. Fred Amagashie	drfredamagashie@gmail.com	0775820477
Supply Chain Management Unit (SCMU)	Ministry of Health	Montserrado	John T. Harris	johntutuharrisscmunds@gmail.com	N/A
Health Financing Unit (HFU)	Ministry of Health	Montserrado	Roland Kesselly	rolandykess@gmail.com	N/A
Procurement Unit	Ministry of Health	Montserrado	Jacob Wapoe	wapoejacob29@gmail.com	N/A
Liberia Medical & Dental Council (LMDC)	A public commission	Montserrado	Dr. Joseph Coleman	josephcolman@yahoo.com	N/A
Phebe Hospital Optical Center	Faith-based Facility	Bong	Dr. Jeffrey Sibley	jsibleydr@gmail.com	0886540813
Ganta United Methodist Hospital – Optical Center	Faith-based Facility	Nimba	Dr. Albert Willicor	alb.wcor@yahoo.com	088656407
Ganta United Methodist Hospital – Orthopedic Center	Faith-based Facility	Nimba	Dr. Albert Willicor	alb.wcor@yahoo.com	088656407
Ganta Leprosy Rehabilitation Center	Faith-based Facility	Nimba	Sis. Irene Mavika & Martin Dolo	gantarehab@gmail.com; rmartindolo@gmail.com	0775510954
Tubman National Institute of Medical Art (TNIMA)	Training institution	Montserrado	Sarah Kollie	info@tnimaa.org	0886554832
JFKMC – Liberia Eye Center	Public health facility	Montserrado	Dr. Edward Guizzie	guiziee@yahoo.ca/eguizzie@gmail.com	0886514085
National Commission on Disabilities (NCD)	Gov't agency	Montserrado	Richardia Dennis	ncd-liberia@gmail.com	0777010582
Division of Social Welfare & Assistance	Ministry of Gender, Children and Social Protection	Montserrado	Alfreda Jacobs; Hon. Lydia M. Sherman	genderministryliberia@gmail.com; lydiamai2001@yahoo.com	0777368654
National Social Security & Welfare Corporation (NASSACORP)	Gov't agency	Montserrado	Nensee Sahr	info@nasscorp.org.lr	0777856003
Division of Inclusive & Special Education	Ministry of Education	Montserrado	Theresa Garwoe	garwo81@gmail.com	0776284947 / 0886582826

Name of Organization/Department	Category of Ministries, Agencies, Commissions & NGOs	Location	Contact Information		
			Name	Email Addresses	Mobile Numbers
Demographic Health Survey Division	Liberia Institute of Statistics & Geo-information Services (LISGIS)	Montserrado	Germue Gbarwoquiya	ggbarwoquiya@yahoo.com	0886583839
Group of 77	DPO, Project under Office of the Vice President's Office	Montserrado		N/A	0776772703 / 0777603869
Liberia Medical & Health Products Regulatory Agency (LMHRA)	Gov't agency	Montserrado	James Goteh	jgoteh@gmail.com	0777281914 / 0886530270
Ministry of Justice	Ministry of Justice	Montserrado	Mr. Devine Kutuka	kutakat2005@gmail.com	
Ministry of Labor	Ministry of Labor	Montserrado	James Kwabo	kwabojunior1989@gmail.com	
JFKMC – Monrovia Rehabilitation Center	Public health facility	Montserrado	Borbor Akoi	mon_rehab@yahoo.com	0886515845 / 0886522749 / 0886558056
AIFO International	NGO	Montserrado	Sylvia Poggiolio	aifoliberia@gmail.com	088634019 / 0776426932
SightSavers International (SSI)	NGO	Montserrado	Alex Bedell	abedell@sightsavers.org	0770187370
United Nations Development Programme (UNDP)	UN Agency	Montserrado	Boye Johnson	boye.johnson@undp.org	0886556348
World Health Organization (WHO)	UN Agency	Montserrado	Dr. Gebrekidan Mesfin Zbelo	mesfing@who.int	0770480084
EYElliance	NGO	Montserrado	Jay Corless	jay@eyealliance.org	N/A
Lions Clubs International	NGO	Montserrado	Cllr. Dickson Cooper	dicksonnd@yahoo.com	N/A
National Union Organization of the Disabled (NUOD)	DPO	Montserrado	Naomi Harris	noud-liberai@yahoo.com	0770391278
Florence A. Tolbert & the Disabled Advocates (FATDA)	DPO	Montserrado	Sam Dean	fatdaaid@gmail.com	0777916865
Christian Association of the Blind (CAB)	DPO	Montserrado	Beyan Kota	beyankota@yahoo.com	0886878464

Appendix B: Stakeholder consultative workshop attendance list

Name	Organization	Position
Luther S. Wendi	AIFO	Program Officer
Moses Massaquoi	Clinton Health Access Initiative	Country Director
Vekeh L. Donzo	Clinton Health Access Initiative	M&E Associate
Wenzile Mthimkhulu	Clinton Health Access Initiative	Supply Chain Associate
Lily Lu	Clinton Health Access Initiative	Senior Associate, SRH
Julie Nicholson	Clinton Health Access Initiative	Deputy Country Director
Korsay R. Berrian	DSA Eye Clinic	OPN
Samuel Dean	Florence A. Tolbert and the Disabled Advocates (FATDA)	Executive
Lettecia T. Morais	Florence A. Tolbert and the Disabled Advocates (FATDA)	Member
Lango W. Toe	Ganta Hospital	Director of Health
Edward B. Guizie	JFKMC-Liberia Eye Center	Head
Dorbor M. Akoi, Sr.	JFKMC-Monrovia Rehabilitation Center	Project Manager
Youngor Zayzay	Liberia Government Hospital Buchanan - Eye Center	Cataract Surgeon
Cllr. Dickson N. Doe	Lions Clubs International	Lions Commissioner
Mildred Dean	Lions Clubs of Liberia	Zone Chair
James D.K. Goteh	LMHRA	Director of Pharmacovigilance
James W. Karwah	Ministry of Gender, Children and Social Protection	Supervisor
Theresa W. Garwo	Ministry of Education - Special & Inclusive Education Division	Director
Dr. Wilhelmina Jallah	Ministry of Health	Minister of Health
Joseph L. Kerkula	Ministry of Health - National Eye Health Program	Program Manager
Hiaka Hinneh	Ministry of Health - National Eye Health Program	National Coordinator
Carlton G. Kpahn	Ministry of Health - National Eye Health Program	Senior Planning Officer
Rev. Fallah S. Boima	National Commission of Disabilities	DDA
Edwin T. Korsor	National Commission of Disabilities	SA
Robert F. Dolo	New Sight Eye Center	Executive Director
Naomi B. Harris	National Union of Organizations of the Disabled (NUOD)	President
C . Allison Paygar	OneSight	Program Manager
A. Emmanuel Kanneh	SightSavers	Field Project Coordinator
Barkon Dwah	WHO	NCD Focal Point