Disability and Rehabilitation: Assistive Technology

ISSN: 1748-3107 (Print) 1748-3115 (Online) Journal homepage: www.tandfonline.com/journals/iidt20

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To cite this article: Sarah Anderson , Frederic Seghers , Lillian Saunders , Charles Reza , Frank Chikhata , Eshetu Bekele & Satish Mishra (27 Sep 2025): Developing National Priority Assistive Products Lists: experiences and lessons from six Sub-Saharan African countries, Disability and Rehabilitation: Assistive Technology, DOI: 10.1080/17483107.2025.2561246

To link to this article: https://doi.org/10.1080/17483107.2025.2561246

Published online: 27 Sep 2025.

DISABILITY AND REHABILITATION: ASSISTIVE TECHNOLOGY
https://doi.org/10.1080/17483107.2025.2561246

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RESEARCH ARTICLE

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Developing National Priority Assistive Products Lists: experiences and lessons from six Sub-Saharan African countries

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ABSTRACT

Purpose: This study examines the experiences and lessons learned from six Sub-Saharan African countries in developing National Priority Assistive Products Lists (APLs) between 2020 and 2024, aiming to provide insights for improving assistive technology (AT) access in low- and middle-income countries (LMICs). Materials and methods: The study employed qualitative descriptive methodology with a multi-faceted approach, including a comprehensive desktop review of documentation and publications, followed by semi-structured interviews and information review with key stakeholders ($n = 9$) from all six countries. Data analysis involved synthesising information to identify common themes, challenges, and best practices in APL development. Results: Key findings include the importance of multi-stakeholder engagement, challenges in data availability, varied prioritisation frameworks, and the need for local context adaptation. Countries faced common barriers, such as limited funding and regulatory challenges, however also identified facilitators like government leadership and integration with existing health systems. Conclusions: The study highlights the complex nature of developing National APLs and emphasises the importance of inclusive stakeholder engagement, data-driven prioritisation, and integration within broader health system strengthening efforts. These insights can guide other countries in developing and implementing effective APLs, ultimately improving AT access and advancing disability rights.

ARTICLE HISTORY
Received 6 March 2025
Revised 23 July 2025
Accepted 9 September 2025

KEYWORDS
Assistive technology; rehabilitation; LMIC; disability; APL

IMPLICATIONS FOR REHABILITATION

- Establishing inclusive Technical Working Groups (TWGs) may prove to be beneficial for effective assistive technology (AT) leadership and coordination, improving access to life-changing AT for persons with disabilities.
- Fostering multidisciplinary collaboration and actively engaging organisations of persons with disabilities (OPDs) in AT initiatives ensures user-centred solutions and promotes meaningful participation of persons with disabilities.
- Aligning AT efforts with international frameworks like the UN Convention on the Rights of Persons with Disabilities (CRPD) and Sustainable Development Goals (SDGs) ensures a rights-based and equity-focused approach to AT implementation.
- Investing in capacity building, knowledge sharing, and awareness raising among stakeholders builds a shared understanding of AT needs and facilitates more effective and sustainable AT programmes.

Introduction

Assistive technology (AT) plays a vital role in promoting independence, inclusion, and improved quality of life for people globally [1–3]. Yet, over 1 billion people worldwide lack access to AT, particularly in low-and middle-income countries (LMICs) where access is as low as 3% [4]. In 2016, to address this large

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and global need, the World Health Organisation (WHO) launched the Priority Assistive Products List (APL), a model list of fifty essential assistive products [5]. Modelled after the WHO Model List of Essential Medicines, the WHO Priority APL aimed to strengthen health systems and advance Universal Health Coverage (UHC) through improved AT provision, while also mobilising resources and stimulating market competition [5,6].

The WHO APL provides a guiding framework for countries to develop National APLs, tailored to local contexts and priorities [7,8]. These National APLs can inform local policies, resource allocation, and service delivery strategies, ultimately improving access to AT not only for people with disabilities but all who benefit from AT. Research has demonstrated that increased availability of assistive products can contribute to achieving multiple Sustainable Development Goals (SDGs), including poverty reduction, improved health outcomes, and enhanced educational and employment opportunities for persons with disabilities [7]. This underscores the importance of National APLs as tools for promoting UHC and social inclusion [6]. Despite the availability of the WHO Priority APL since 2016, country-level adoption of National APLs has been limited. By 2020, no African countries had developed National APLs. Between 2021 and 2024, work was done with several governments to develop and launch the first-ever National APLs, yet many African countries have yet to initiate this process [9]. Given this, the need for knowledge sharing across the international setting regarding the process, barriers, facilitators, and learnings from implementing National APLs is key [10].

A systematic approach

Recent frameworks have emphasised the importance of a systems approach to improving access to AT [11]. The WHO's Global Cooperation on Assistive Technology (GATE) initiative proposed a systems framework of 5P's – people, policy, products, provision, and personnel – as strategic points of action to improve global AT access, placing users at the centre [12,13]. An additional 5P's were later identified as key contextual factors for improving access to AT: procurement, place, pace, promotion, and partnership, situating AT services within national and local contexts [6,14].

This systems framework is crucial in developing National APLs for several reasons. It provides a holistic understanding of the interconnected factors influencing AT access, enabling policymakers to develop more effective and realistic APLs. By placing users at the centre, it ensures that APLs reflect the actual needs and preferences of AT users in specific contexts [15]. The framework helps tailor APLs to local settings, considering factors like procurement capabilities, cultural context, and existing infrastructure. It emphasises the need for cross-sector collaboration, which is essential for the successful implementation of APLs. Additionally, the framework allows for a systematic gap analysis, informing the development of more comprehensive APLs. By adopting this systems perspective, countries can develop APLs that are not only lists of products but comprehensive strategies for improving AT access, considering the complex interplay of various factors within their specific contexts.

The development of National APLs requires careful consideration of local contexts, resources, and priorities [9]. Matter et al. [10] highlighted the importance of adapting the WHO Priority APL to country-specific needs, emphasising that a one-size-fits-all approach is not effective. The authors found that stakeholder involvement, including organisations of persons with disabilities (OPDs), service providers, and policymakers, was crucial in identifying priority products to ensure that the National APL reflects the local needs and priorities.

The selection of priority AT for National APLs requires a systematic approach. Tebbutt et al. [7] proposed a methodology for prioritising assistive products based on population need, impact on functioning, and cost-effectiveness. Robust selection criteria, based on evidence and expert consensus, can help prioritise the most essential and cost-effective products. Cost considerations, including affordability and sustainability, are crucial for ensuring the long-term viability of National APLs and their impact on access to AT. This approach can help countries make evidence-based decisions when developing their National APLs, ensuring that limited resources are allocated to the most impactful and essential products.

Literature suggests that the successful development and integration of National APLs is dependent on addressing systemic barriers to AT access [2]. Key challenges in AT provision in LMICs have been identified, including limited awareness, inadequate funding, lack of trained personnel, and weak supply chains.

It has been argued that developing National APLs should be part of a broader strategy to strengthen AT systems, including policy development, workforce training, and service delivery improvements [2,9]. This comprehensive approach is considered essential for overcoming the multifaceted obstacles to effective AT implementation in resource-limited settings.

This article examines the experiences and lessons learned from six countries in Sub-Saharan Africa – the Democratic Republic of the Congo (DRC), Ethiopia, Liberia, Nigeria, Sierra Leone, and Zimbabwe – where the Clinton Health Access Initiative (CHAI) supported governments with the development of National APLs between 2020 and 2024. By documenting the approaches, design choices, and best practices across these diverse contexts, this study aims to contribute to the growing body of knowledge by describing the processes and lessons learnt related to establishing National APLs in six countries in Africa.

The findings from this study will provide insights for policymakers, NGOs, healthcare professionals, and disability advocates working to improve access to AT in LMICs. This article seeks to guide other countries in their efforts to develop and implement National APLs by sharing the successes, challenges, and lessons learned from these six countries. Ultimately, the wider adoption of National APLs has the potential to transform the lives of millions of persons with disabilities, promoting their full participation in society and the realisation of their rights under the UN Convention on the Rights of Persons with Disabilities (UNCRPD).

Methodology

This study employed a Qualitative Descriptive thematic content analysis [16] with a multi-faceted approach to data collection and analysis, consisting of three main phases: a comprehensive desktop review, semi-structured interviews, and synthesis of findings.

Desktop review

A comprehensive desktop review was conducted, examining documentation and publications related to the development of National APLs in the selected countries. The review included both publicly available documents (such as government reports, policy documents, and peer-reviewed publications) and internal programme documents, for which appropriate permissions were obtained. The search strategy involved systematic identification of relevant materials using electronic databases (e.g., PubMed and Scopus), official government websites, and organisational repositories. Documents were included if they described the development, implementation, or evaluation of National APLs in the selected countries between 2015 and 2024. All documents were reviewed by S.A. This review aimed to establish a baseline understanding of existing processes and identify potential gaps in knowledge.

Stakeholder interviews

Following the desktop review, semi-structured interviews were conducted with key stakeholders from all six countries. Participants were eligible if they were subject matter experts (SME) who had been directly involved in the development of APLs in their respective countries or had overseen APL development at a regional level. Potential participants were identified through their authorship or role in the development of APL documents and processes through professional networks. Eligible SME were invited to participate *via* email, with invitations outlining the study's purpose and the expertise sought. The semi-structured interviews were conducted as part of a broader qualitative, multi-method study design, employing an exploratory approach to gather in-depth perspectives from key SME. The interview questions were specifically designed to address gaps in understanding identified during the desktop review and elicit reflections on barriers and facilitators to APL implementation in specific countries (Appendix 1).

Interviews were conducted online *via* Microsoft Teams by two authors: L.S., an expert in the development of APLs with specific contextual knowledge of the African region, and S.A., a mixed methods researcher, PhD-qualified, with expertise in AT, health systems, and policy. Interviews lasted an average of 45 min (range: 32–59 min). Interviews were audio-recorded and transcribed verbatim. The content of the interviews was checked with interviewees to ensure accuracy. The verified interview data has been used to provide additional context and insights.

Data analysis and synthesis

Two researchers independently coded a subset of transcripts, and inter-coder reliability was assessed through discussion and consensus. Codes were then grouped into broader themes through an iterative process of review and refinement. Themes were defined by S.A. and L.S. through discussion and consensus, ensuring that they accurately reflected the data. The analysis process was supported by systematic documentation of coding decisions to maintain an audit trail.

The interview questions were developed after the desktop review to ensure that known gaps and country-specific issues were explored. However, the interview guide was designed to be comprehensive, and coding was conducted openly, allowing new themes to emerge from the data while also recognising that not all areas explored in the interview guide would necessarily become prominent themes in the final analysis. The absence of a theme does not indicate a lack of exploration, but rather a reflection of the relative emphasis and patterns found within the data itself. First, the desktop review data were analysed to identify common processes, gaps, and country-specific variations in APL development. Subsequently, interview transcripts were analysed to further refine understanding and provide additional context and insights. Data analysis was conducted by S.A., a PhD-qualified mixed methods researcher with expertise in AT, health systems, and policy, and L.S., an expert in APL development in the African context. To ensure trustworthiness, we employed member checking, triangulation of data sources, and maintained an audit trail of analytic decisions. All data were independently reviewed by two researchers, and discrepancies were resolved through discussion.

Ethical approval was not required for this study as it primarily focused on analysing policy, processes, and systems related to AT leadership and coordination. While the research did involve interviews with key stakeholders, these interviews were conducted to gather information about organisational processes and policy implementation rather than personal experiences or sensitive data. All interviewees provided informed consent for their participation, and their responses were anonymised in the analysis and reporting. The desktop review component of the study utilised a combination of publicly available documents and internal programme documents, with appropriate permissions obtained for the use of non-public materials. All data were handled confidentially and in compliance with data protection regulations. Throughout the research process, the study adhered to ethical research principles as outlined in the Declaration of Helsinki.

Results

The desktop analysis involved a comprehensive review of a range of reports, presentations, and related documents, as well as six semi-structured interviews and two validation interviews.

The interviewees who participated as SMEs in this study are all AT Program Managers or members of a central coordinating AT team, each leading their organisation's AT work in their respective countries. In all six countries, these SMEs serve as core members of the national Technical Working Group (TWG) on AT, collaborating closely with ministries of health and other key government and partner stakeholders. In addition to their country-level leadership, global technical support was provided by two members of a central AT team, ensuring a cohesive approach.

These SMEs played a central role in the development of national APLs, supporting the process at the direction of government either within a single country or by facilitating cross-country knowledge sharing and providing technical guidance, and supporting the navigation of challenges and aligning efforts with global best practice. The SMEs possess strong skills in stakeholder coordination, expert facilitation, and cross-sectoral collaboration within the context of APLs in Africa. Their subject matter expertise and first-hand experience enable them to shape APL content that is both relevant to national priorities and grounded in real-world service delivery contexts across Africa.

The development of National APLs across the six African countries studied revealed complex and multifaceted processes, with both common challenges and country-specific approaches. This section outlines the key findings from our analysis, highlighting the critical factors that influenced product prioritisation, implementation strategies, and potential pathways for sustainability.

Table 1 provides an overview of key aspects of APL development in the Democratic Republic of Congo (DRC), Ethiopia, Liberia, Nigeria, Sierra Leone, and Zimbabwe, highlighting data sources, stakeholder involvement, prioritisation processes, and other critical factors.

Key themes were identified that contribute to the development of a National APL, with these themes also impacting each other. For example, the lack of data made it difficult to prioritise products to meet in-country AT needs. Stakeholder engagement heavily influenced local context adaptation as service providers and AT users provided first-hand experiences. Figure 1 illustrates the interconnected and relational nature of the seven key themes surrounding National APL Development. These themes, including Stakeholder Engagement, Data Sources and Challenges, Prioritisation Process, Local Context Adaptation, Implementation and Integration, Funding and Sustainability, and Workforce Development and Local Manufacturing, are depicted as circles connected by bidirectional dotted lines to the central concept of National APL Development.

Data sources and challenges

All countries faced significant challenges in accessing comprehensive, up-to-date data on AT needs, including rates and types of disability within countries. Most relied on a combination of outdated or limited census data, demographic health surveys, global reports, and expert opinions to estimate disability prevalence and AT needs including:

- WHO Rapid Assistive Technology Assessment (rATA) survey results (Liberia)
- National disability surveys (Nigeria, Ethiopia)
- Expert opinion on population needs (all countries)
- WHO/World Bank/UNICEF regional estimates
- International cost benchmarks

For instance, Nigeria used the Nigeria Demographic and Health Survey 2018 supplemented by desk-based research, while Liberia utilised rATA data that was collected by the Ministry of Health in 2021. Zimbabwe, despite having more recent 2022 census data, noted that it lacked specificity on AT needs and distribution.

> We tried as much as possible to triangulate what the stakeholders were telling us to the data, but in cases where they had the varied descriptors, we would rely on the data…You hear something during a key format interview and then you know see if the data supports that assertion. (Liberia)

> We don't necessarily know how many Nigerians have mobility impairments or how many Nigerians are deaf, etc. We had some information to go with based on the NDHS 2018, which is a demographic survey that is conducted every five years in Nigeria. (Nigeria)

> There has been concerns from organizations working for persons with disability, and the National Commission for Persons with Disabilities (NCDP) that the data in the [2015] census under-estimated the number of persons with disabilities. (Sierra Leone)

The lack of reliable data posed a significant challenge in accurately estimating unmet AT needs across functional domains. Countries like Ethiopia faced particularly acute challenges, with conflicting prevalence estimates from different sources ranging from 1.7% to 17%. To address these data gaps, countries employed various strategies: Zimbabwe supplemented census data with input from the National Disability Policy; Sierra Leone and Nigeria conducted literature reviews and consulted with disability organisations; and Ethiopia reviewed service and waiting lists from rehabilitation services to estimate needs.

Stakeholder engagement

All six countries utilised and emphasised multi-stakeholder engagement in developing their APLs. Stakeholders often involved government ministries, OPDs, healthcare professionals, and international partners. The composition and leadership of these stakeholder groups varied, though many countries stressed the importance of having service providers and AT users in the same room.

Table 1. Key aspects of APL development across six African countries.

Country	Data sources	Stakeholders involved	Prioritization process	Number of products selected	Local context adaptation	Implementation Steps	Funding mechanisms	Existing AT Strategy	Local manufacturing
DRC	Assessment in 17 of 26 provinces (5 by WHO, 12 by CHAI)	• Government ministries • Practitioners • Academic bodies • NGOs • People with disabilities	Workshop with stakeholders to determine criteria	32	Considered environmental context (e.g., power availability, terrain)	Planning to integrate APL into national Essential Medicine List	Proposing funding for distribution of priority AT to pilot sites	No, National AT Policy to be launched in 2024.	Local suppliers exist, but lack standardization of product specifications
Ethiopia	2007 census WHO/World Bank estimates Service and waiting list data	• Ministry of Health • Experts in disability • International NGOs and partners	Weighted criteria system: Need (50%) Price (10%) Durability (10%) Ease of use (30%)	42	Added locally developed communication aids for children with autism	APL annexed to Ethiopian Pharmaceutical Supply Service Organisation's procurement list	Advocating for inclusion of priority AT in funding applications	Yes, National Plan of Action on Persons with Disabilities 2012–2021	Policies introduced to encourage local production, including tax exemptions for AT imports
Liberia	RATA 2021 by Ministry of Health Expert opinions	• Ministry of Health • National Council of Disability • Stakeholders (35 organizations) • People with disabilities	Two-step approach: 1. Expert panel 2. Broader stakeholder validation Weighted Criteria system: Need (32%) Price (21%) Impact 32% Availability (5%) Durability (5%) Ease of use (5%) User feedback (5%)	41	Focused on contextualizing products for terrain and climate conditions Local manufacturing helped contextualise	Developing product specifications for 5 priority items Planning strategic/ catalytic procurement of these 5 items	Using APL for resource mobilization and partner engagement	Yes, AT roadmap 2021–2023.	Exploring local manufacturing possibilities Include products in the National Essential Equipment List Market surveillance systems to monitor quality, safety and efficacy of these products once procured
Nigeria	Nigeria Demographic and Health Survey 2018 Literature reviews Expert opinions	• Federal Ministry of Health • National Commission for Persons with Disabilities • Academia • Medical Professionals • Rehabilitation professionals • Manufacturers/AT suppliers • PWDs and caregivers	Prioritization workshop with stakeholders to determine prioritization criteria and weighting Criteria included: - Estimated need - Affordability - Ease of use - Available HR and infrastructure -Environmental, cultural and social determinants	44	Considered social and cultural factors, ease of use, and maintenance	- Developed product specifications for 19 items - Created investment case for procurement	National Commission for Persons with Disabilities attempts annual procurement	Yes, AT scale up plan launched in 2022	Investigating local manufacturing possibilities, facing challenges in regulation and quality assurance

(*Continued*)

Table 1. Continued.

Country	Data sources	Stakeholders involved	Prioritization process	Number of products selected	Local context adaptation	Implementation Steps	Funding mechanisms	Existing AT Strategy	Local manufacturing
Sierra Leone	Stakeholder consultations	• Small expert working group, including technicians and specialists in AT provision • Larger validation group • Ministry of Health • Ministry of Social Welfare • NGO partners • National Commission for Persons with Disabilities35 stakeholder organisations	Two-step approach with expert panel and stakeholder validation. Weighted criteria system: Need (40%) Price (15%) Impact (5%) Availability (20%) Durability (5%) Ease of use (5%) User feedback (5%) Regulatory compliance (5%)	70	Used local production to build list	Implemented tax exemptions on AT imports	Not specified	Yes, AT Policy and Strategic plan 2021–2025	Not specified
Zimbabwe	2022 census data	• Ministry of Health and Child Care • Ministry of Primary and Secondary Education • Ministry of Public Service Labour and Social Welfare • Ministry of higher and Tertiary Education, Innovation, Science and Technology Development • OPDs • Development Partners • Regulatory Authorities – SAZ • Research and innovators • UN Agencies • AT manufacturers	Held a multisectoral stakeholder inception meeting held by the Ministry of Health and Child Care The stakeholders were then subdivided in sub committees and the subcommittee team for APL development was formed.	55	Added sunscreen for people with albinism, smart canes and incontinence products to the WHO's recommended list.	Coincided with national AT strategy development and printed in braille as well.	Implemented tax exemptions on AT imports	Yes, National AT Strategy 2024–2025	There are AT manufacturers but with limited funding they cannot ensure access nationwide.

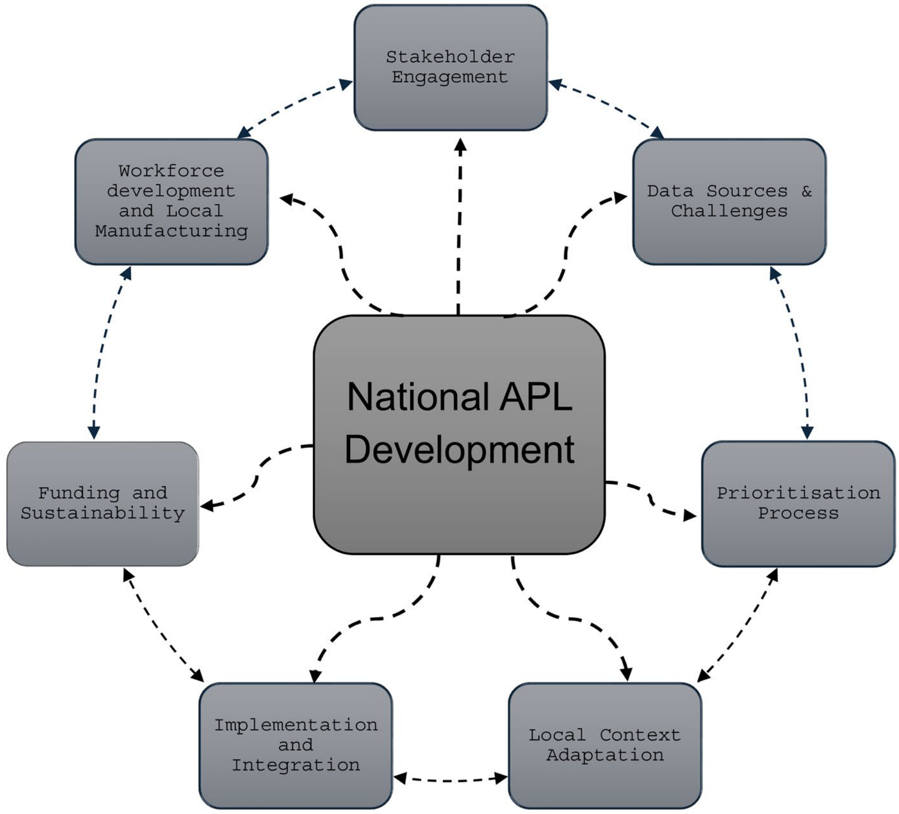

Figure 1. Key themes for the development of a national APL.

Sierra Leone's process involved 35 stakeholder organisations, while Nigeria convened experts from 18 different entities. Zimbabwe had wide government involvement across 4 sectors and included both persons with disabilities and caregivers of persons with disabilities as described by a representative:

> Our drive in having organizations of person with disabilities as well as caregivers as part of the technical working group was to have firsthand, lived experiences and to understand needs from the end users themselves as opposed to just going through literature. Having them as part of the working group and having them lead the discussions was quite insightful. (Zimbabwe)

The importance of government leadership was highlighted as key to adoption, implementation, financing and advocacy.

> Throughout this process, we have continuously engaged the Ministry of Health so that we make this a Ministry of Health activity and not our own activity… we have continued to engage the new government officials, orient them and ensure that this remains a priority for the country. (Liberia)

> We also worked with the Federal Ministry of Health (FMOH), specifically the Department of Hospital Services, the NCPWD. The FMoH led this development process based on their experience with developing similar documents e.g. the Essential medicines list and to inform facility-level AT procurement (Nigeria)

> "It's really good for the ministry, the government to drive the process. It also brings issues around sustainability, issues of ownership" [Sierra Leone].

> The program had all key ministries as part of the technical working group: Ministry of Health and Child Care, Ministry of Social Welfare, Ministry of Primary and Secondary Education and Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development. As well as different Organisations of Persons with Disabilities, PWDs, caregivers, regulatory bodies, research and innovative institutions, AT manufacturers and technical partners that have had experience with working with persons with disabilities… ministry being at the forefront of this has definitely improved visibility of AT within the country (Zimbabwe)

Countries prioritised the inclusion of persons with disabilities throughout their APL development processes, implementing various strategies to ensure meaningful participation and representation.

The involvement of OPDs was consistently emphasised as crucial to the process. Zimbabwe and Sierra Leone ensured OPDs were represented in their TWGs, while Liberia established a TWG co-chaired by both the Ministry of Health and the National Council of Disability to ensure PWD representation at the highest level of decision-making. This systematic approach to inclusion was evident across multiple countries:

Nigeria established strong PWD representation through their National Commission for Persons with Disabilities, which played a crucial role in stakeholder engagement. *"The Commission was very involved… they were able to bring on board the different stakeholders that needed to be part of it. They also helped us reach out to people that we didn't know in this space at the time"*

The DRC formalised PWD inclusion through their permanent commission structure: *"The Association of People Living with Disabilities … must have a representative in this permanent Commission"*

Nigeria implemented domain-specific working groups to ensure representation across different disability types: *"We had group sessions based on the different disability domains during the meetings and persons with disabilities were included in each group… It also included implementing partners, healthcare professions working in the respective domains and government staff" (Nigeria)*

Sierra Leone demonstrated the value of PWD expertise in the process, noting that *"Most times [information and device knowledge] was brought forward by persons with disability"*

Zimbabwe ensured continuous PWD involvement throughout their process, with representatives actively contributing knowledge and expertise: *"We had members from our OPDs [*Organisations of Persons with Disabilities] *who work with persons with disabilities that are also part of [the] working group"*

A systematic approach to PWD inclusion throughout the process helped ensure that lived experience informed the development of contextually appropriate APLs across these countries, leading to more relevant and effective assistive product lists that reflected actual user needs and preferences.

Prioritisation frameworks

Countries employed various methods to prioritise products for inclusion in their APLs, often balancing quantitative data with qualitative expert input. Ethiopia and Nigeria used a weighted criteria system (Table 1). Sierra Leone employed a two-step approach with an expert panel followed by broader stakeholder validation.

> For persons with disabilities, you know, …one device that seems that might appear irrelevant to a person without disability, might be the most important for someone with that particular disability. (Nigeria)

> We held two consultative meetings, which included group work, as it wasn't easy to reach consensus in a single session. These meetings were essential because the different groups of persons with disabilities present wanted to ensure their specific devices were included. (Sierra Leone)

The number of products included in final APLs varied significantly, ranging from 32 in the DRC to 70 in Sierra Leone. This variation reflected different approaches to balancing comprehensiveness with the feasibility of implementation.

> We knew for sure if we have a list with 50 or 100 products, nobody's going to look at it.
>
> Nobody's going to buy it, and it's just going to be another list on the shelf.
>
> So we need a list that can be operationalized in fact. (Liberia)

> Initially we wanted to keep the list small due to the feasibility of operationalization, but we were also cognisant of the need to make the list very representative of all persons with disabilities that require AT. This was how we ended up with 44 products. (Nigeria)

Local context adaptation

A crucial aspect of APL development was adapting the WHO's 50-item Priority APL to fit country-specific needs and contexts. Zimbabwe added 5 country-specific items, including sunscreen for people with albinism.

> …of major interest was sunscreen. … To say it was the country-specific one because I think the discussion was around albinism and how they have been left out in our interpretation of disability.(Zimbabwe)

Ethiopia excluded items based on bandwidth difficulties in country and included locally developed communication aids for children with autism, and Liberia focused on contextualising products for the country's terrain and climate conditions.

> one of the factors we considered was social and cultural factors in the country and also ease of use, ease of maintenance, … we wanted to make sure that the devices …were relatively acceptable for use. And wouldn't necessarily create more stigma for the person using it. (Nigeria)

These adaptations demonstrate the importance of considering local factors, such as climate, terrain, cultural acceptability, and existing manufacturing capabilities when developing national APLs.

Implementation and integration

Progress on APL implementation varied across countries, often depending on the stage of development and the level of integration with existing health systems and AT policies. Zimbabwe's APL development coincided with national AT strategy development, facilitating alignment. Nigeria has developed product specifications for 19 priority AT devices based on their APL. Ethiopia has annexed their APL to the Ethiopian Pharmaceutical Supply Service Organisation's procurement list.

> For now. We don't have any visibility… We will propose that we have funding for a smaller set of priority assistive products. That will be distributed to a pilot site…and at this the same time, we can develop data collection that will be put in the National Health system information. (DRC)

> Yes, outside developing the APL, we wanted to develop the product specifications. So, we started working with the Standards Organisation of Nigeria, but that process was a little bit lengthy. In 2024, the Standards Organisation of Nigeria launched 19 specifications for 19 priority assistive products. (Nigeria)

> *"We have two documents that are separate because when we* were *focusing more on the list of products and not paying much attention to the standards, but if you have one document, it's easy, yeah."*

> *"For individuals or stakeholders aiming for implementation, they can simply refer to a single document that provides both the necessary list and the applicable standards." (Sierra Leone).*

Regulatory considerations also played a role in implementation. Several countries, including Zimbabwe and Sierra Leone, implemented tax exemptions on AT imports as a result of their APL work, demonstrating tangible policy outcomes from the process. However, challenges remain in ensuring quality standards for both imported and locally produced assistive products. Furthermore, monitoring and evaluation of APL implementation was identified as an area requiring further development in most countries. While some countries discussed plans to integrate data collection on assistive products into national health information systems or to use pilot sites for initial monitoring, comprehensive monitoring frameworks and indicators were generally not yet established. This highlights a gap between APL development and ongoing evaluation of impact, which was acknowledged by several stakeholders as a priority for future work.

Funding and sustainability

Securing dedicated funding for APL implementation remains a challenge for most countries. However, the APL development process has opened new avenues for resource mobilisation. Liberia is using the APL for resource mobilisation and partner engagement. Ethiopia is advocating for the inclusion of priority AT in funding applications and exploring partnerships for specification development.

> We looked at funding from a financial sustainability perspective and we divided financial sustainability across three dimensions. The first one was availability of resources, money to do actual procurement. On these, we kind of did a resource mapping and partner mapping to see which partners are supporting this space… start off with, you know, helping them quantify the need and then helping them identify the partners who are able to fill the gaps. (Liberia)

> We developed an investment case, together with the National Commission for the persons with disabilities. The investment case included the need for investment in AT, the market landscape, the impact of investing in AT and reimbursement models for AT leveraging health insurance etc. (Nigeria)

> The Ministry of Health and Child Care has been invited by the Governor of the Reserve Bank of Zimbabwe to present on the APL list and the strategy at the 2024 Financial Inclusion Conference under the theme "Practical Considerations in Designing and Implementing Financial Inclusion Policies Targeting Marginalized Segments". So, it has gained momentum within the country and as I said, the ministry being at the forefront of this has definitely improved the visibility of APL within the country. (Zimbabwe)

The involvement of finance ministries in some countries' APL development processes has positively influenced decisions on import tax exemptions, highlighting the importance of cross-sectoral engagement and addressing regulatory barriers to affordability. Securing dedicated funding for APL implementation remains a challenge for most countries, which also impacts the ability to establish robust monitoring and evaluation systems to track the long-term impact and sustainability of APL initiatives.

Workforce development and local manufacturing

The APL development process has highlighted workforce gaps in some countries, leading to initiatives for training and capacity building in AT. Ethiopia, for example, has restarted prosthetics and orthotics training programmes at the bachelor's degree level. Regarding local manufacturing, countries are at various stages of exploration. Nigeria is investigating local manufacturing possibilities but faces challenges in regulation and quality assurance. Addressing these regulatory hurdles is crucial for ensuring the safety and effectiveness of locally produced assistive products. Furthermore, workforce development initiatives should include training on monitoring and evaluating the performance and impact of assistive devices to ensure their long-term effectiveness and sustainability. Ethiopia has introduced policies to encourage local production, including tax exemptions for AT imports.

When asked about key gaps in service delivery, interviewees responded -

> *"I think a bit of everything. Maybe machinery? … it cuts across human resources, material resources, educational resources…" (Zimbabwe)*

> We work with the global team to draft a proposal regarding regulation in the DRC because in the last project, we identified … a deficiency of regulation in the country. We don't have standardization and specification for the AT in the country.

These findings underscore the complex, multifaceted nature of developing and implementing National APLs. While challenges persist, particularly in data availability and funding, the process has catalysed important discussions and actions around AT access in all seven countries studied. The variations in approach and progress offer valuable lessons for other countries embarking on similar initiatives.

Discussion

This study examined the experiences of six Sub-Saharan African countries (DRC, Ethiopia, Liberia, Nigeria, Sierra Leone, and Zimbabwe) in developing National Priority APLs between 2020 and 2024. The findings reveal both common approaches and country-specific adaptations, highlighting key considerations for other nations seeking to develop their APLs. The findings of this study are consistent with experiences reported in other low, and middle, income countries developing National Priority APLs, where multi-stakeholder engagement, data challenges, and the need for local adaptation are common themes [3,4,9,10,17,18]. However, the specific approaches to prioritisation, integration with health systems [1,4], and strategies for sustainability varied [7], reflecting the unique contexts of each country [9]. This comparison highlights both shared challenges and innovative solutions that can inform future APL development globally.

All six countries emphasised multi-stakeholder engagement in their APL development processes, aligning with best practices recommended by the WHO and other experts [2,10]. The involvement of diverse stakeholders, including government ministries, OPDs, healthcare professionals, and international partners, helped ensure the resulting APLs reflected local needs and priorities. This approach is crucial for developing contextually appropriate and sustainable APLs [8]. However, the level and nature of stakeholder engagement varied across countries. For example, Sierra Leone's process involved 35 stakeholder organisations, while other countries had more limited engagement. Future APL development efforts should strive for comprehensive stakeholder involvement, with particular emphasis on the meaningful participation of persons with disabilities throughout the process [10,19,20]. In Nigeria, involving many stakeholders was important, but also a fine line to tread. It is important to bring everyone along in the process. One product that certain stakeholders do not know about could be the most important assistive product for a person with certain disability.

Each country utilised the WHO's 50-item Priority APL as a starting point and then developed country-specific prioritisation criteria. This approach aligns with WHO guidance on tailoring APLs to national contexts [5]. Common criteria included impact on quality of life, total population need, unmet need, cost-effectiveness, environmental conditions, local production capacity, and operational feasibility. These criteria reflect a holistic approach to AT prioritisation, considering both user needs and health system capacities [20].

The variation in final APL sizes (ranging broadly from 32 products in DRC to 70 in Sierra Leone) demonstrates the importance of balancing comprehensiveness with feasibility. Countries with more limited resources or nascent AT systems may benefit from starting with a focused list of high-priority products, as seen in Liberia and DRC, while gradually expanding over time [1,10]. It is a difficult balance to strike being inclusive of additional assistive products so no group or sector is excluded while maintaining a list that can be implemented. In Sierra Leone, the longer list has slowed down the process of developing standards and specifications as the working group had to re-prioritise, thus also slowing quantification efforts and procurement. Liberia on the other hand was intentional about keeping their APL list short.

Countries utilised a mix of data sources to inform product selection, including WHO rapid Assistive Technology Assessment (rATA) surveys [21], national census surveys, expert opinions, and international cost benchmarks. However, the lack of comprehensive, up-to-date data, including limitations with more recent collection methods, such as rATA, on disability prevalence and AT needs was a common challenge, with most countries using data from over 5 years ago. This aligns with global challenges in AT data availability and quality [17]. To address these data gaps, countries relied heavily on expert consensus and stakeholder input. While this approach can provide valuable insights, it also highlights the need for improved AT data collection and research on disability prevalence in low- and middle-income countries (LMICs). Future efforts should prioritise building robust data systems to host evidence based on, disability prevalence and AT need, to inform policy development and implementation [22].

All countries positioned their APLs as tools to guide broader health system strengthening around AT, including AT quantification, procurement, service delivery, and workforce development. This systems-thinking approach is critical for ensuring APLs translate into improved AT access on the ground [4,20]. The DRC and Liberia's plan to integrate their APL into the national essential medicines and medical devices list is a promising strategy for mainstreaming AT within existing health systems.

However, successful integration will require addressing regulatory frameworks, coordination across sectors, and building AT-specific capacities within health systems. Countries with national AT strategies and plans spoke of how the path was more straightforward than countries that did not have existing AT policies in place. In addition, countries recommended developing the National APL and assistive product specifications in parallel to improve the implementation of both documents. This speaks to the importance of developing comprehensive implementation plans alongside APLs to ensure the lists drive tangible improvements in AT access [1].

Several countries, including Ethiopia, Liberia, Sierra Leone, and Zimbabwe, explicitly considered local manufacturing potential in their APLs. This focus on domestic production aligns with broader efforts to strengthen AT supply chains and reduce reliance on imports in LMICs [14]. However, developing local manufacturing capabilities requires significant investment and capacity building. Countries should carefully assess the feasibility and cost-effectiveness of local production for different product categories, considering factors, such as market size, technical requirements, and existing industrial capacities [9,17,18].

Factors that have been barriers to the development of National APLs across the African countries include the limited availability of comprehensive disability data forces most countries to rely on outdated census information or incomplete surveys [3,4,9,10,18]. Financial constraints significantly impact APL implementation and procurement capabilities. The lack of standardised specifications and quality assurance mechanisms for assistive products, particularly for local manufacturing, creates implementation challenges. Infrastructure limitations, such as unreliable electricity for powered devices and challenging terrain for mobility aids, further complicate the selection and implementation of appropriate assistive products [3,4,9,10,18].

Several key facilitators have emerged in successful APL development and implementation efforts. Strong multi-stakeholder engagement, particularly the meaningful involvement of persons with disabilities, their careers and their representative organisations throughout the development process, has proven crucial. Government leadership and integration with existing health systems have demonstrated a significant impact [3,4,9,10,18], as shown by Ethiopia's success in annexing its APL to its Pharmaceutical Supply Service Organisation's procurement list. The development of clear prioritisation criteria, considering factors, such as local context, affordability, and maintenance requirements, has supported effective APL development and sustainability [3,4,9,10,18]. Countries that established systematic approaches, such as Liberia's roadmap and TWG structure, have shown more progress in implementation.

Limitations and future research

This study's reliance on desktop review and limited stakeholder interviews may not capture the full complexity of APL development processes in each country. Future research should include more in-depth case studies and broader stakeholder perspectives, particularly from persons with disabilities and local AT users. Additionally, longitudinal studies examining the impact of National APLs on AT access and outcomes over time would provide valuable insights for refining and improving these tools.

Conclusion

The experiences of these six Sub-Saharan African countries in developing National Priority APLs offer valuable lessons for other nations seeking to improve AT access. Key takeaways include the importance of inclusive stakeholder engagement, data-driven prioritisation processes, and integrating APLs within broader health system strengthening efforts. While challenges remain, particularly around data availability and implementation planning, these pioneering efforts represent significant progress towards improving health outcomes for diverse populations, including people with disabilities, older adults and those managing non-communicable diseases across Africa and beyond.

As more countries develop and implement National APLs, continued knowledge sharing and collaboration will be crucial. The global AT community should support these efforts through technical assistance, research partnerships, and platforms for exchanging best practices. Ultimately, well-designed and effectively implemented National APLs have the potential to catalyse improvements in AT access, contributing to both UHC goals and disability rights advancement, in line with the SDGs and the UNCRPD.

Acknowledgements

The authors would like to thank all who participated in interviews, provided desktop material for review and who have generously shared their learnings related to the development of APLs in their countries to benefit others.

Author contributions

CRediT: **Sarah Anderson**: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Writing – original draft, Writing – review & editing; **Frederic Seghers**: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing; **Lillian Saunders**: Data curation, Formal analysis, Project administration, Writing – original draft, Writing – review & editing; **Charles Reza**: Validation, Writing – review & editing; **Frank Chikhata**: Validation, Writing – review & editing; **Eshetu Bekele**: Validation, Writing – review & editing; **Satish Mishra**: Conceptualization, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Disclosure statement

The authors report no conflicts of interest and funding for this work was provided as part of business as usual work. SA was employed as a consultant to undertake this work.

CRediT taxonomy statement

SA undertook conceptualisation, data curation, formal analysis, methodology, programme administration, writing – original and draft.

LS undertook data curation, formal analysis, programme administration, writing – original and draft.

FS undertook conceptualisation, investigation, methodology, writing – original and draft.

CR validation, writing – review and editing.

FC validation, writing – review and editing.

EB validation, writing – review and editing.

SM undertook conceptualisation, methodology, project administration, supervision, validation, and writing original draft.

Data availability

Due to the qualitative and identifiable nature of data, this data is not available in non-aggregate form.

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Appendix 1

Data and Needs Assessment

Overarching Question:
How did you approach data collection and needs assessment for the Assistive Products List (APL) development?
Prompts:

- Lack of data: How did you address the lack of comprehensive disability prevalence data in your country?
- What strategies did you use to estimate unmet AT needs?
- Were there any useful tools or data sources that you used?

Prioritisation Process

Overarching Question: Can you walk us through the prioritisation process for including products in the APL?
Prompts:

- Were there criteria and/or methods that you used to prioritise products for inclusion?
- How did you balance inputs including expert opinion with quantitative data in the prioritisation process?
- What influenced the decision between a long *vs.* short list of items?
- What weights did you assign to different criteria for inclusion in the APL and how did you decide what these should be?

Stakeholder Engagement

Overarching Question: How were various stakeholders involved in the APL development process?
Prompts:

- How were persons with disabilities and their representative organizations involved?
- What challenges did you face in ensuring diverse stakeholder representation, and how did you overcome them?
- Which stakeholders were the key drivers of the APL development?
- For countries with limited specialists, which healthcare workers did you rely on for input?

Local Context Adaptation

Overarching Question: How did you adapt the WHO APL to fit your country's specific needs and resources?
Prompts:

- What were some country-specific considerations that necessitated adaptation of the original WHO APL?
- What unique products or categories did you add to address local disability profiles or cultural factors?

Implementation and Integration

Overarching Question: How is the APL being operationalised and integrated into broader health systems?
Prompts:

- What steps have been taken to operationalise the APL since its development?
- How is the APL being integrated into broader health system planning and budgeting processes?
- Has the APL helped in broader health system advocacy, planning, and budgeting?

Local Manufacturing
Overarching Question: Have local manufacturing considerations influenced APL development?
Prompts:
- Are there strategies being considered to promote local production of priority assistive products?
- Did you assess the feasibility of local manufacturing for different product categories and if so, how?
- Did the APL development bring up conversations around local manufacturing?

Regulatory Considerations
Overarching Question: What regulatory challenges do you anticipate in implementing the APL?
Prompts:
- What challenges do you foresee in ensuring quality standards for locally produced assistive products?

Funding and Sustainability
Overarching Question: Have you considered funding and long-term sustainability of the APL?
Prompts:
- What funding mechanisms are being explored to support the procurement and provision of priority assistive products?
- Has the APL helped drive conversations around funding?
- How do you plan to sustain and update the APL over time?

Workforce Development
Overarching Question: Has the APL informed plans for building the assistive technology workforce in your country?

Monitoring and Evaluation
Overarching Question: Do you have plans for monitoring and evaluating the impact of the APL?
Prompts:
- What indicators have been developed to track the impact of the APL on assistive technology access and outcomes?