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World Health Organization

A manual for public procurement of assistive products, accessories, spare parts and related services

Global Disability Innovation Hub

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Contents

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Executive summary

Today only one in every 10 people in need of assistive products globally has access to them, and this gap is even more prominent in low- and middle-income countries. Reasons for this include a lack of national resources and programmes for assistive technology including systems to procure assistive products.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD), requests that Member States ensure access to quality assistive products at an affordable cost. At the 71st World Health Assembly in 2018, a resolution on improving access to assistive technology was adopted. Resolution WHA71.8 urges Member States to develop, implement and strengthen policies and programmes to improve access to assistive technology within universal health coverage.

The resolution mandates the World Health Organization (WHO) to provide the necessary technical and capacity-building support to Member States, aligned with national priorities, to develop national assistive technology policies and programmes, including for procurement of priority assistive products.

This manual focuses on public procurement and specifically on tendering (competition) for assistive products, accessories, spare parts and related services, hereafter called assistive products. The manual is based on procuring these products from manufacturers, or one of their economic operators, called suppliers.

This manual aims to:

- Give an overview of procurement and supply management for assistive products (planning and needs assessment, decisions about the mix of products selected (product assortment), procurement, deliveries/storage, distribution, use and follow-up activities) in Chapters 2 and 3.
- Describe core principles of assistive product procurement (integrity, fairness, transparency, competition and cost efficiency) in Chapter 4.
- Identify the different actors and their roles in the procurement process (the procurement team, the procurement office and assistive technology centres) in Chapter 5.
- Describe an assistive product procurement process based on competition/tendering (planning the tender, accomplishing the tender process from making plans to signing contracts with the suppliers, contract implementation, and follow-up) in Chapter 6.
- Describe other means of acquiring assistive product (local production, pooled procurement, donations and refurbishment of used products) in Chapter 7.

Commitment is needed from both the public and private sector at all levels in the country to establish a sustainable system for assistive product procurement. Leadership at national government level is essential for its ongoing success and to ensure the necessary resources are available for policy development, finance, innovation, workforce building and training. These are all key to an effective and efficient national assistive technology programme.

1 Introduction

1.1 Background

Assistive products enable people with health conditions and functional limitations to participate meaningfully in the activities of daily life. Access to appropriate, quality assistive products is needed to help with mobility, hearing, vision, communication and cognition issues in a way that meets the user's needs and local environmental conditions. Access to such products is a precondition for achieving equal opportunities, enjoying human rights and living in dignity *(1)*.

However, only one in 10 people in need globally have access to the necessary and appropriate assistive products today *(2)*.

This is primarily due to high out of pocket costs, a lack of resources in general (funding for assistive technology programmes, service provision and the cost of assistive products), or a lack of specific national programmes including systems for procuring assistive products, accessories, spare parts and related services.

70 million people need a wheelchair globally, but only 5–15% have access to one.

Hearing aid production only meets 10% of total global need *(2)*.

Approximately 200 million people with low vision do not have access to spectacles or other relevant assistive products.

The burden can be even greater in low- and middle-income countries where two thirds of people with severe-to-profound hearing loss live *(3)*.

Accessories are parts that alter the functionality and/or qualities of the assistive product. Accessories may be fitted in addition to or instead of parts in the standard set up.

An assistive product is defined as any external product (including devices, equipment, instruments or software), that maintains or improves an individual's function and independence and thereby promotes their well-being. Assistive products are also used to prevent physical and/or cognitive impairments and secondary health conditions. Examples include eyeglasses, hearing aids, wheelchairs, pill organizers, augmentative communication devices and incontinence products.

Assistive technology (**AT**) is an umbrella term covering assistive products and the systems and services related to their delivery.

Functional limitation is a term for physical and cognitive impairments, activity limitations and participation restrictions that negatively affect an individual (with a health condition) and their contextual factors (environmental and personal factors).

Person with functional limitations is an individual with one or more impairments, one or more activity limitations, one or more participation restrictions or a combination thereof.

Quality means the degree, especially high degree, of goodness or worth. The quality of an assistive product is understood as the group of features and characteristics of an assistive product, which determine its desirability and which can be controlled by a manufacturer to meet certain basic requirements. Such requirements may include constraints, demands, necessities, needs or parameters of assistive products that must be met or satisfied. It may also include a standard of benefit, cost, timeliness and value of an assistive product or service as expressed or perceived by a customer.

Related services are support services needed for the maintenance of assistive products. Further, related services are necessary for assistive product providers and caregivers to enable people with functional limitations to receive rehabilitation, fitting and training in the use of assistive products. Related services may include assessment of individual needs for assistive products, selection of an appropriate and necessary product, fitting, training of users and service providers, and follow-up services. Further, maintenance, repair and refurbishing (see above) are seen as part of related services.

Spare parts do not alter the functionality and/or quality of an assistive product but replace a worn-out or broken part that the assistive product is made of. When accessories consist of several individual parts that can be replaced when being repaired, each part is then considered to be a spare part.

Users refers to people who already use an assistive product or who can benefit from using one because of their functional limitation(s).

The range of assistive products provided to users varies from one country to another (Box 1) *(4)*. For example, manual wheelchairs come in several different models to meet a variety of user needs, but this fact is often not known and as a result such products are not procured.

Without assistive products, people are often socially excluded and can become locked into a cycle of poverty and isolation. This situation may also exacerbate the onset and progression of diseases and functional limitations. With assistive products a more inclusive and productive society is fostered where not only the user benefits, but also caregivers and the community as a whole.

Box 1. Assistive product availability varies between countries

The range of assistive products available varies from one country to another. In India there is good coverage for vision products and hearing aids, but few options for accessing assistive mobility products.

In Turkmenistan, wheelchairs and prosthetics are available but there are shortages in other assistive product areas. The UNICEF country office is prioritizing hearing products to try and meet unmet need.

In Ukraine, wheelchairs are also a priority, whereas availability of incontinence products depends on local governments.

Armenia has a national assistive products list including wheelchairs, orthosis, prostheses and hearing aids, but no communication software.

Bulgaria also has a national list including 16 products mainly for mobility needs.

In the Nordic countries a variety of assistive products are provided to solve daily problems with mobility, hearing, vision, cognition and self-care.

Source: *(4)*

The United Nations Convention on the Rights of Persons with Disabilities (CRPD), requests that Member States ensure access to quality assistive products at an affordable cost (Article 20), and to foster international cooperation (Article 32) in support of national efforts for the realization of the purpose and objectives of the Convention *(5)*. Access to assistive products is a fundamental human right and it is a legal obligation for all signatories to take effective measures to ensure personal activity and participation, with the greatest possible independence, for people with functional limitations. It is a corresponding responsibility to promote and ensure availability and access to assistive products *(5)*.

Activity is the execution of a task or action by an individual.

Participation means involvement in a life situation, i.e. taking part, being included or engaged in an area of life, being accepted, or having access to needed resources. A person usually participates with others.

Procurement functions include all actions necessary for the acquisition, by purchase or lease, of property, including products and real property, and of services, including works, for the best value for money.

Referring to resolution WHA71.8, the World Health Assembly calls on Member States to improve access to assistive products for older people and people with functional limitations *(6)*. The World Health Assembly also recognized that the inclusion of assistive products into health systems, in line with countrieś national priorities and context, is essential for realizing progress towards the Sustainable Development Goal (SDG) targets *(7)*.

WHO is coordinating the Global Cooperation on Assistive Technology initiative (GATE) to address this huge and unmet need and to realize Article 32 of the CRPD on international cooperation *(8)*. GATE has one goal: to improve access to high quality, affordable assistive products globally. This highlights the importance of procurement processes in improving access to quality assistive products in a timely manner that is appropriate to the user's context *(9,10)*.

Assistive products should be available in sufficient quantities and located as close as possible to users. Cost is a key barrier to procurement, especially in low- and middle-income countries *(9)*. Quality and appropriateness of assistive products needs to be determined on a country-by-country basis and in a transparent manner, based on available data *(3)*. A lack of knowledge and awareness, a shortage of well-trained professionals and standards for quality assurance, are also barriers to assistive product provision in many countries. This procurement manual aims to help countries to build capacity to source appropriate, quality and affordable assistive products.

Progress in accessing assistive products varies a great deal between different countries. Box 2 reports on exciting developments in Kenya *(11,12)*. Box 3 illustrates important advances and challenges in Nepal *(13)*.

Accessibility is defined as the ease with which programmes that support people with functional limitations can obtain assistive products. It depends on factors such as availability, cost of the assistive products, cost of transportation, economic factors like income or funding, social and cultural factors such as ethnic or religious preferences.

Box 2. Digital technology brings custom-made wheelchairs to remote areas


MOTIVATION, MATT GRAYSON

In Kenya over the last two years, the UK-based international NGO Motivation has been testing how it can use additive manufacturing to better inform its design and manufacturing processes, and apply it to wheelchair provision. With external funding, the NGO has successfully demonstrated that it can tailor seating solutions for people with functional limitations. Working remotely with clinicians in isolated locations, Motivation staff have shown how digital client measurements can be taken, and highly personalized postural support products can be printed from an online catalogue of predesigned Computer Aided Design (CAD) components.

There is more to come: engineers, designers and clinicians at Motivation are developing a new system that allows local service providers to automatically design and manufacture wheelchairs of custom shapes and sizes, according to individual client needs, using 3D-printed components to make use of materials and parts that have been locally procured. This novel approach could improve the availability of made-to-measure wheelchairs everywhere, but particularly in areas that traditionally suffer from centralized services and reliance on international aid.

Source: *(11,12)*

Box 3. Successes and challenges in Nepal

Nepal has confirmed the right to access assistive products in its 2017 Act Relating to Rights of Persons with Disabilities (2074). In 2018 it also published the country's first priority assistive products list. Despite these positive moves, there are still challenges to overcome:

- availability of assistive products is a key issue for disabled people: the private sector is the main provider;
- quality is not ensured as there are no guidelines on standards for assistive products;
- there is a shortage of well-trained professionals, and a lack of up-to-date information on assistive product developments;
- people in need lack knowledge and awareness of assistive products;
- customs clearance presents a big problem when importing assistive products, components and raw materials.

Source: *(13)*

1.2 The scope of this manual

Assistive products may be procured by public as well as private organizations, including nongovernmental and user organizations. This manual focuses specifically on public procurement (purchase/procurement by governments and state-owned enterprices of goods, services and works) and most of the content is based on procurement through tenders (competition) carried out by procurement teams *(14)*.

This aims to be a practical and simple guide that helps countries to access appropriate and quality assistive products and accessories, spare parts and related services that are safe to use, at fair prices. Fairness implies positive incentives or benefits for all stakeholders *(15)*.

Assistive products may be procured from different sources: directly from the manufacturer or its economic operators (supplier, distributor, agent etc., hereafter denoted the supplier) and may be locally manufactured or imported. Assistive products may also be acquired by other means such as pooled procurement, donations from United Nations (UN) agencies or nongovernmental organizations, or by refurbishing used products. This is discussed in Chapter 7.

While this manual does not cover all aspects of the procurement management cycle, it describes the core principles and processes used to procure affordable, appropriate and quality assistive products through competition/tendering. The aim is to provide an overview of the following:

- procurement and supply management
- strategic objectives for efficient procurement
- core principles for procurement of assistive products
- the role of the procurement team and other actors involved in the process
- the assistive product procurement process based on competition (tendering)
- other means of acquiring assistive products.

Small scale acquisition is not within the scope of this manual. All of the examples and recommendations are based on a centralized, national assistive technology provision system.

While the manual is targeted primarily at those responsible for the procurement of assistive products, it will also serve as a useful resource for stakeholders engaged in the provision of assistive products, such as planning agents, quality assurance professionals and policy-makers at all levels.

Refurbishing means servicing and/or renovation of an older or damaged assistive product to bring it to a workable or better-looking condition. Refurbishment of assistive products usually includes inspection, replacement of worn-out parts and proper cleaning of the product. A refurbished assistive product must be safe to use.

A ***supplier*** is a participant in the procurement process either as a contractor or as an entity that makes a submission (bid or offer).

Supply management (procurement) is the method and process of modern corporate or institutional buying.

A ***tender*** is an invitation to bid for a project with the objective of entering into an agreement for large volumes of assistive products, accessories, spare parts and related services. Tendering usually refers to the process whereby governments (and/or their representatives) invite bids, based on product specifications, that must be submitted within a definite deadline.

1.3 What to procure: assistive products, accessories, spare parts and related services

This manual is about procuring assistive products, accessories, spare parts and related services. Accessories are parts that alter the functionality of a product, for example a special foot rest for a wheelchair. Spare parts replace worn-out or broken components, for example broken casters on a wheelchair.

Related services are considered to be an integral part of assistive product procurement as they greatly enhance efficient and effective product provision. Services can include assessment of an individuaĺ s needs; product fitting, maintenance and repair; and follow-up for preventive and corrective purposes. In all circumstances, regular maintenance can prolong the lifetime of assistive products and should be specified in the contract with the supplier *(16)*.

A ***contract*** is defined as a binding agreement between two or more parties, especially one that is written and enforceable by law.

Preferably, the related services should be carried out by professionals at the primary/local community, secondary and tertiary level assistive technology (AT) service centres. Sometimes these services must be done by the product supplier. Possible reasons for this are:

- appropriate competence on a specific assistive product is not otherwise available;
- the supplieŕ s service centre is closer to the user than other service centres;
- the supplier can provide a more efficient service (e.g. availability of spare parts) to the user.

In many low- and middle-income countries there is a shortage of adequately trained personnel to provide these related services. Therefore, it is critical that interested lay people are involved and educated to an appropriate standard in provision, fitting and simple repairs by care providers, such as local health-care workers and/or rehabilitation staff.

This training can also be carried out by the assistive product supplier and consequently, in most cases, it is practical to include relevant services in their contracts. Assistive products, accessories, spare parts and related services will hereafter be collectively called *assistive products* (except when accessories, spare parts or related services are described specifically).

Primary, secondary and tertiary Primary health care provides care at a community level that is promotive, protective, preventive, curative, rehabilitative and palliative throughout the life course. Secondary health care refers to a second tier of health care, at the provincial/regional/district level, to which individuals (patients, users) are referred from primary health care to specialists for treatment. Tertiary health care refers to a third level, national health system, in which specialized consultative care is provided usually on referral from primary or secondary health care levels. For assistive technology, the primary level is represented by health facilities in local communities/municipalities, while the secondary level is represented by health-care facilities at district, regional or county level. The tertiary level is the national level of assistive product provision.

For example, in New Zealand, service level agreements asks suppliers to include maintenance support for assistive products as part of the tendering process (Box 4) *(17)*.

A ***Service Level Agreement (SLA)*** is a commitment between a service provider and a client in relation to products and services supplied. Particular aspects of the service – quality, availability, responsibilities – are agreed between the service provider and the service user.

Box 4. Service level agreements prioritized in New Zealand

During the tender process in New Zealand, suppliers are asked to offer maintenance support for all assistive products provided throughout their expected lifespan (generally five to seven years), and the supplier's capacity to provide after sales support, servicing and maintenance is assessed.

All specific service requirements are documented through the tendering process and the supply agreements will outline specific terms and conditions that suppliers must operate under for all purchased assistive products.

Source: *(17)*

2 Assistive product procurement and supply management

2.1 Public and private procurement

In some countries, for example Germany, insurance companies (usually private) are responsible for the provision of assistive products to those who need them.[1] In other countries, for example Norway, a government organization is responsible *(18)*. The content of this manual focuses on public procurement; however, much the same principles can be applied to procuring assistive products from non-public organizations, including nongovernmental and user organizations. In both situations, the principle of 'best value for money' should be applied.

Best value for money means the cost and quality of the assistive product needed to meet the user's requirements, while taking into consideration the potential risk factors and resources available. The goal is to achieve maximum benefit for the procuring organization.

2.2 Procurement at the tertiary, secondary or primary level

Assistive products can be procured at different administrative levels *(14)*.

- At the tertiary level (national): procurement will take place centrally and contracts with suppliers are for assistive product deliveries all over the country.
- At the secondary level (district, county, provincial and regional): AT centres, rehabilitation institutions or health facilities are given the authority and budget to procure assistive products.
- At the primary level (local community): procurement processes are initiated within the local health-care system.

[1] Information from the stakeholder consultation.

National procurement has several advantages.

- It saves resources by avoiding parallel processes: one procurement team per product category, which will save in time and personnel compared to running corresponding processes at the secondary or primary levels.
- It optimizes contract terms: fewer customers for the different suppliers in the country, which increases competition leading to optimized contract terms and conditions.
- There is greater volume for lower unit prices: greater volume compared to procurement at secondary or primary level, which brings down the unit price.
- Equal prices for whole country: long-term agreements are made with the suppliers and purchases are based on these contracts.

The advantage of procurement at the secondary and/or primary level is that the districts and local communities have greater control over the procurement process and can to a greater extent decide what they need to procure. Box 5 describes different systems for assistive product procurement in Denmark (local) and Norway (national) *(19,20)*.

Box 5. National and local procurement in Denmark and Norway

Norway has established one centralized office under the Norwegian Labour and Welfare Service, which is a directorate under the Ministry of Labour, with specialist competence in procurement, health and technical issues. Contracts are agreed with suppliers following a tendering process for assistive products to solve practical problems caused by mobility, hearing, vision, communication and cognition issues.

Norway has established assistive technology centres (also under the Norwegian Labour and Welfare Service) at the secondary level (one in each of the 18 counties). Based on the national contracts, the assistive technology centres purchase the various assistive products, accessories, spare parts and services that they need to serve their users. All purchases, distributions to users, repairs and maintenance are registered in a national assistive technology information system. The data are used as a basis for planning the next round of tenders.

In Denmark, it is the responsibility of each municipality (usually the primary health-care services) to procure the assistive products, accessories, spare parts and related services, and to make agreements and contracts with the various suppliers. In some cases, they cooperate and organize contracts on behalf of several municipalities.

Source: *(19,20)*

2.3 Layers of cost

In many countries, assistive products are not affordable. The main reason, but not the only one, is the multitude of economic operators who may be involved in the chain to deliver assistive products to users. However, intermediaries such as wholesalers, country and district agents are important distributors with agreements to represent manufacturers. In some countries, assistive

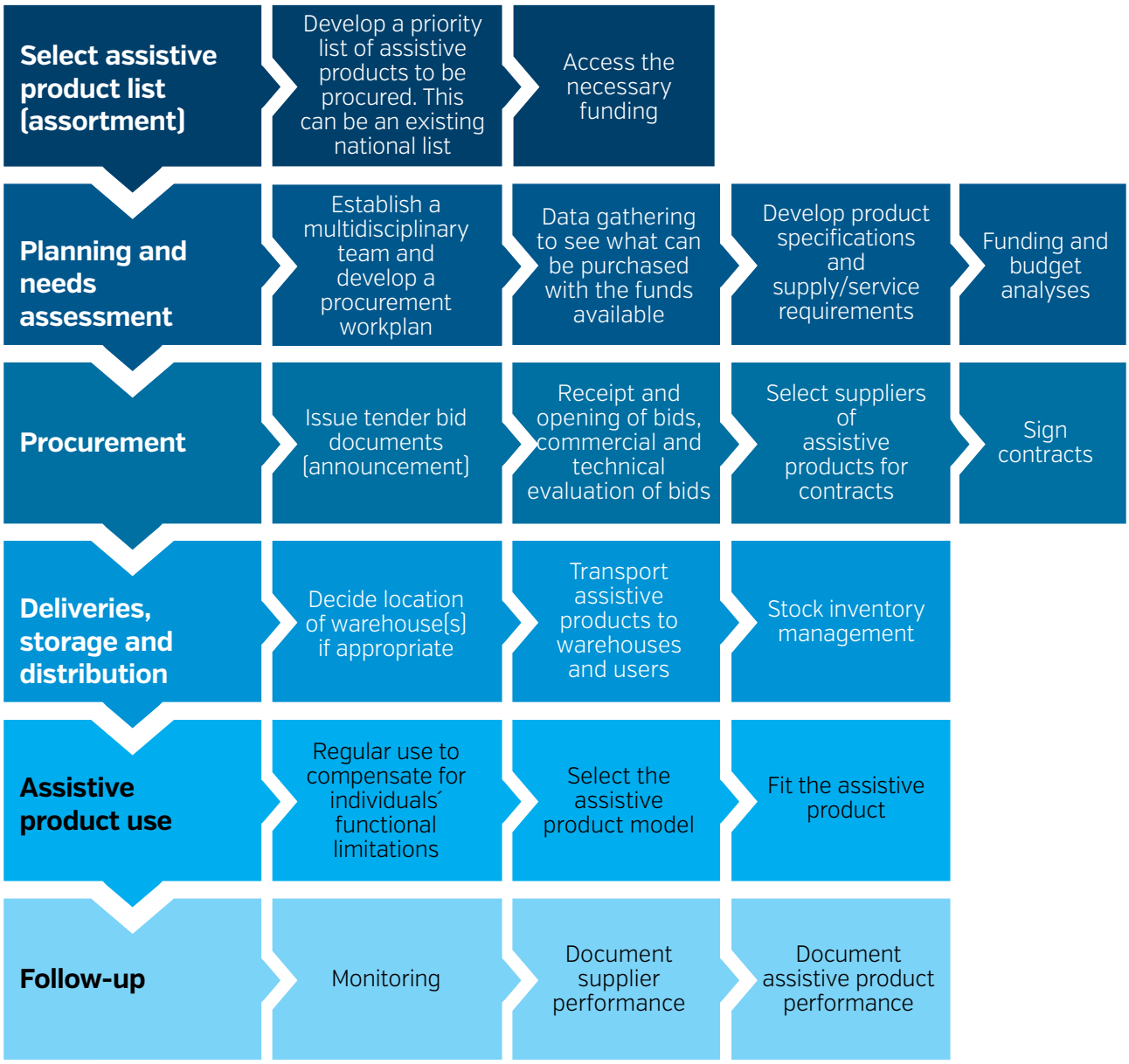
products would not be available at all without these intermediaries, but reducing the layers of cost is one way of making the assistive products affordable.

2.4 The procurement management cycle

Procurement and supply management is a systematic activity that ensures the continuous quality and availability of products through optimal procurement planning, storage and distribution from the manufacturer to the end user *(16)*.

Procurement is one of several elements of assistive product supply management. The product management cycle comprises: (1) selection of assistive products (deciding the assistive product assortment); (2) planning and needs assessment (quantification); (3) procurement; (4) deliveries/storage/distribution; (5) use of the assistive product; and, (6) follow-up. Fig. 1 gives an overview of the assistive product management cycle.

Fig. 1. An overview of the assistive product management cycle



Select an assistive products list

A national essential/priority assistive products list can be used as a model to guide procurement. The products for such a list should be selected by a committee convened for this purpose and must be based on available funding. Where this does not exist, an ad hoc procurement team should be set up to select certain categories of assistive products for a national or regional assistive products list *(21).* The WHO *Priority assistive products list* (APL) published in 2016 is a useful reference.

Planning and needs assessment

Quantification is a broad concept that includes *forecasting* and *supply planning*; in other words, it is needs assessment – how much will be procured and when will it be delivered *(16).* This means estimating the expected need for assistive products to meet the demand during a particular period of time and within available financial resources. For example, the quantification is usually a projection made for a one year period in Norway *(19)*. An appropriate information system registering AT provision data would be beneficial for this assessment.

The demand and need for assistive products in a given country are dependent on a large number of related factors, such as awareness, available resources, the economic situation, the built environment (e.g. accessible buildings) and demographics, among other factors. To increase forecasting accuracy, it is important to collect multiple data sets and use mixed forecasting methodologies for comparative purposes.

Such data sets may include reliable statistics on assistive product purchases over the last two to five years; for example, the national registry on diseases and health conditions, and international databases on health conditions. If there is a shortage of data, household surveys on assessments of assistive product need can be used to collect population data, which can support an initial analysis of product needs.[2] Box 6 shows how Tajikistan used different methods to quantify assistive product need *(22)*.

Box 6. Tajikistan uses different methods to quantify need

Three methods were used to calculate estimates of need for products on the Tajikistan National Assistive Products List (APL). The type of product and available information determined the method used to obtain data.

Survey results. Participants were recruited from community-based rehabilitation programmes and the sample was relatively small. The results from this rapid needs survey were used to derive needs' estimates for most mobility and self-care products on the national assistive products list, (such as wheelchairs, crutches, incontinence products, shower chairs etc.). The results were not used to estimate the need for products to help with vision, hearing and cognition impairments, as these were under-represented in the survey. Nevertheless, the results can be used to calculate broad needs' estimates for products on the APL.

[2] The WHO Module Disability Survey (MDS) and the rapid Assistive Technology (rATA) survey are being developed and piloted in countries to provide high-level estimates of current supply and demand of AT in the population.

Indirect methods. For most of the remaining APL products, estimates of the total need were obtained from the prevalence of related pathologies or conditions. Some conditions or pathologies are strongly associated with specific assistive products, and some products on the APL are needed predominantly by people who live with particular conditions.

International data. For some products on the APL, there were no regional data available. In these instances, international data were used to derive estimates. Also, some assistive products are useful to people with diverse conditions or pathologies, so it is impractical to base the estimates on correlations with pathologies or medical conditions. In these cases, international data were also used.

Source: *(22)*

Supply planning is the final output of the quantification process. Supply planning details the quantities required to meet demand, the costs incurred, and the lead times needed to ensure optimal procurement and delivery schedules *(16)*. Supply planning is usually done with budgeting constraints taken into account. Economic resources must be available before a certain number of assistive products can be purchased, and should be prioritized at the beginning of a procurement process.

Lead time is the time between the initiation (putting in an order based on an existing contract) and completion (the assistive products being in the hands of the buyer) of a specific procurement process.

Deliveries to the warehouse, storage and distribution

The contract with the supplier should state where the assistive products will be delivered. International purchases, sales and transportation are regulated by international commercial terms, known as Incoterms®, which are rules established by the International Chamber of Commerce. They are used to govern procurement contracts by defining the responsibilities and liabilities of the buyer and the seller; specifically communicating tasks and costs that signify when risk passes from one to the other and when delivery legally occurs *(23)*.

Incoterms® must be specified in the contracts with suppliers. In tenders the procuring organization can ask for assistive product offers according to a specific Incoterm®. For example, with national contracts 'delivered duty paid' (Incoterm® DDP) is preferred when the contract with the supplier includes deliveries to different warehouses (hubs). The supplier is then responsible for delivering the assistive products to a named warehouse (hub) in the country, including paying all duties, taxes, customs and transportation. This results in equal prices on the assistive products throughout the country.

Incoterms® rules are universal trade terms published by the International Chamber of Commerce (ICC). They are intended to clearly communicate the tasks, costs and risks associated with the transportation and delivery of goods in an international transaction. They describe how responsibility is allocated between the seller and the buyer for different parts of the transaction.

Assistive products can be stored either in a single warehouse at the tertiary/national level, or in several regional warehouses at the secondary/district level for onward transportation to primary

level and distribution to users. But storage is costly and it is important to restrict the number of warehouses used to only a few and to avoid using storage at the community/primary level except for the most simple much-demanded assistive products.

It is also essential to use a reliable software/logistics system to monitor the assistive products entering and exiting the warehouse to avoid wastage and stock-outs. Identifying and registering the approved minimum and maximum stock levels of each specific assistive product model can instantly inform what orders need to be made. These approved levels are usually set based on previous experience. Box 7 shows how this works successfully in Norway *(19)*.

A system that enables coordination between assistive product demand and supply will ensure adequate and timely distributions of assistive products; for example, from a central or regional warehouse to local health-care facilities *(24).* This includes an efficient system for transporting assistive products using a contracted transport agency.

Box 7. Using a nationwide management system to plan purchases in Norway

Since 2004 Norway has been using a common information management system for the whole country to register all purchases, repairs, maintenance, refurbishment, storage and distribution of assistive products.

This makes it possible to generate data for the whole country from national to regional and local community/municipality levels. These are analyzed and enable the authorities to make accurate predictions of purchase needs for the next time period. Experience shows that the demand for assistive products in Norway does not vary very much from one year to the next.

Source: *(19)*

The assistive products should have robust packaging that withstands exposure to weather conditions and protects from the impacts associated with long distribution chains that are common in many low- and middle-income countries. This should be set out in the tender terms of delivery.

Use

In addition to being available when needed, assistive products must be provided to the right users at the right time. The product must be both *necessary* and *appropriate* to solve or compensate for the user's functional limitations in daily life *(19).* Assistive products may be adapted and modified when they are fitted, to ensure they are appropriate to the individual's requirements *(25).* Users are diverse and have different needs, which is why a number of different models in a specific assistive product category must be available.

Follow-up

Once the procurement process is complete and users have received their assistive products, it is important to check whether every step in the chain was performed as expected, including the

purchase decisions, deliveries, services and assistive products themselves. In other words, did efficient assistive product procurement take place?

Consequently, the procurement team should document how well the suppliers complied with the terms of their contracts (supplier performance); and find out if the assistive products and services were delivered on time, in full and in good condition *(23)*.

Furthermore, it is important to document assistive product performance, (effectiveness in compensating for the user's functional limitations), during the lifetime of the product. For example, how often did the product breakdown/need repairing or did it have a fault that led to an accident?

Information on suppliers and product performance should be included in the management information system to assess the cost-effectiveness of assistive products. For more information on follow-up activities, see Chapter 6.7. The following resources suggest methods and instruments that can be helpful to investigate supplier compliance.

Effectiveness is defined as the degree to which attainable improvements in assistive product provision are attained.

- The Individually Prioritised Problem Assessment (IPPA) instrument is constructed to investigate the effectiveness of assistive products *(26)*.
- The OSH WIKI Networking knowledge website explains how to get information about accidents involving assistive products *(27)*.
- The article by Worobey et al. gives useful information about registration of assistive product breakdowns *(28)*.

3 Strategic objectives for efficient procurement

Assistive product procurement is usually based on four strategic objectives: (1) procure appropriate, good quality, affordable assistive products; (2) select reliable suppliers; (3) ensure timely deliveries; (4) achieve the optimal total cost of ownership *(21)*. These objectives are relevant to any assistive product procurement and supply system, no matter which combination of public and private services is used to manage the supply system.

3.1 Procure appropriate, good quality, affordable assistive products

Ensuring efficacy

Based on countrywide needs and context, national programmes should consider developing a national list of priority assistive products that are affordable and cost-effective. The APL developed by WHO is an example of such a list and contains 50 priority assistive products *(10)*. Some countries, such as Nepal and Tajikistan, have adapted the WHO APL to create their own national list. Ideally, the list should include assistive products that cover the six key areas of functional limitations: mobility, hearing, vision, communication, cognition and self-care domains. Box 8 describes Tajikistan's experience *(22)*.

Efficacy means the ability to produce a desired or intended result. Used in the assistive technology context, efficacy means the ability of services and assistive products to bring about improvements in the activity and participation of users. Efficacy is the standard against which any improvement in activity and participation achieved in actual practice should be compared. Efficacy is not itself subject to monitoring for example when the quality of practice is being assessed. Rather, it is a product of research, experience and professional consensus.

Box 8. Tajikistan develops a national assistive products list

The Ministry of Health and Social Protection of Tajikistan, with technical support from WHO, recently developed a national assistive products list (APL). This includes 30 priority assistive products that are essential for the well-being of people with disabilities, older people and those with noncommunicable diseases, among others.

A consensus meeting took place in April 2018 in Dushanbe to identify the most needed products in the country. This gathered together representatives from the Ministry of Health and Social Protection and other stakeholders including government, donor agencies, nongovernmental organizations, disabled people's organizations and users of assistive products. In preparation for the meeting, WHO worked in collaboration with the ministry to carry out an analysis of current assistive technology provision, and to identify the total need for different assistive products in the country. A survey was developed for the analysis, and focus groups were conducted in 12 districts.

As a result of its deliberations, the 57 participants reached a consensus on 30 assistive products selected mainly from WHO's APL, which served as a model.

Source: *(22)*

Ensuring safety, performance and quality

It is important to ensure that assistive products are safe, perform according to their intended use and are of good quality. Assistive products should be designed so that risk of injury or other adverse event related to use of the product, such as sudden or unexpected failure, is minimized *(25)*. To achieve this, they must meet the appropriate requirements of national and/or international standards *(29)*.

Standards can help the provider and user to understand important features about a product, which will help to guide their choice (for example, how steep is the slope that a wheelchair can manage and at what point will it become unstable; or, the maximum body weight a manual wheelchair is designed to carry). However, international standards, such as those issued by the International Organization for Standardization (ISO), generally do not include specific requirements for individual countries or regions, nor do they define which product is appropriate for an individual or setting *(30)*.

Some assistive products are regulated as a medical product (or 'device') in certain jurisdictions (for example, powered wheelchairs and electrical beds). Therefore, standards on the quality, safety and performance of medical products will be more applicable. More information about regulatory frameworks for medical devices can be found in other WHO publications *(31)*.

To ensure that assistive products are appropriate to the context in which they are being used, many countries use international standards to develop detailed requirements that relate specifically to their situation. For example, within Europe product standards for manual wheelchairs have been developed that set overall requirements based on the tests and results from the ISO series. Therefore an assistive product that passes the relevant European standards for that type of assistive product would be considered to have met all the relevant ISO standards too *(30)*.

In some instances, the procurer must take special precautions to ensure the assistive product will work well. For example, hearing aid batteries are prone to rust, particularly in conditions of high humidity that are found in many low- and middle-income countries *(32)*. Batteries intended for use in these environments should be rust resistant, and should be delivered with the assistive products by the supplier/manufacturer. The provider or user should ensure that this also applies to replacement batteries.

Hearing aids must operate using a battery type that is easily obtained in the local area. For example this can include conventional hearing aid batteries, watch batteries (which may be more readily available in some low- and middle-income countries) and rechargeable cells *(3)*. The batteries should also be appropriate for the local environment. Both issues should be included in the procurement specifications for the tender announcements. Box 9 gives an example *(3)*.

A ***procurement specification*** is a document that clearly describes what is required in terms of deliveries of assistive products and services. The specification should reflect the needs of the purchaser and user groups.

Box 9. Environmental requirements in a tender for hearing aids

The hearing aids must be able to withstand various weather conditions including light rain, snow and dust.

To ensure durability of hearing aids likely to be exposed to water, humidity and/or dust, products with an Ingress Protection (IP) rating (a measure of product tolerance for such environments) should be considered; this will help to ensure that the hearing aids are appropriate for the end user's environment.

The hearing aids should be able to function in ambient temperatures from +45 to -20 degrees Celsius and relative humidity ranging from 0% to 80%.

Source: *(3)*

3.2 Select reliable suppliers

Efforts should always be made to find reliable suppliers of good quality products. This can be achieved with active quality assurance programmes involving both surveillance of performance and testing of product quality *(21)*. A system of preselecting suppliers and monitoring product performance should be established. Preselection is usually open to any interested supplier and their assistive products. The purpose of preselection is to ensure that the supplier is a registered company in a public registry and that the assistive products offered are manufactured in compliance with good manufacturing practices *(24)*. The preselection of suppliers should be undertaken objectively, and therefore selection criteria must be in place before inviting bids/offers from suppliers *(33)*.

Preselection of (suppliers) bidders is to identify/select, prior to soliciting bids, a limited number of suppliers of assistive products that best meet the criteria to qualify for a procurement. The selection can be based on factors such as experience, financial ability, managerial ability, reputation, work history etc. Qualified bidders will receive the invitation to bid documents (announcement).

3.3 Achieve the optimal total cost

The total cost means all direct and indirect monetary costs related to the procurement, storage, transportation, custom clearance, insurance, quality assurance and distribution of an assistive product, any accessories, spare parts and related services *(21)*. The procurement procedure should aim to achieve the optimal total cost *(34)*. Procurement based on competition (tender) is usually the best guarantee of achieving optimal cost.

4 Core principles of procurement

The Model Law on Public Procurement enacted by the United Nations Commission on International Trade Law (UNCITRAL), promotes "fairness, integrity, transparency, competition and cost efficiency for the procurement of equipment, including assistive products" *(35)*. These are principles supported by WHO.

Efficiency refers to the ability to lower the cost of assistive products, accessories, spare parts and related services without diminishing the attainable quality of the products and services.

4.1 Integrity, fairness and transparency

A code of conduct or declaration of values is an asset when promoting good practices and high ethical standards in procurement. Integrity, fairness and transparency are key factors in this context *(35)*.

A procurement process has integrity when all parties are honest, follow an accepted code of ethics, have high moral principles and are transparent. A fair procurement process is a process where all parties are treated without favouritism or discrimination. For assistive product procurement processes, fairness is essential to attract reliable suppliers and achieve the best prices *(35)*.

Mechanisms to monitor that the procurement process' rules are being followed and to enforce them if necessary, are key features of a transparent procurement process. Such mechanisms include audits and investigations, and prosecutions for criminal offences. Suppliers/contractors have the right to challenge the decisions and actions of the procuring entity if it alleges that they are not complying with the rules of the applicable procurement legislation when contracts are awarded *(36)*. A transparent procurement process occurs when adequate information is provided regarding procurement procedures and contracts. E-procurement on the Internet with tenders available on public domains may be one way to ensure transparency *(37)*.

When the procurement process is less transparent and even secretive, it tends to be perceived as corrupt or unfair *(21)*. In tenders for assistive products, formal

written procedures should be developed and followed throughout the procurement process, from the selection of suppliers, announcement and awarding of bids and monitoring of product(s) and supplier(s). Explicit selection criteria should be developed and used to make procurement decisions. Tracing accountability for all decisions is also valuable. Antifraud or anticorruption software should be used, where it is available.

4.2 Competition

Since supplier competition is key to obtaining optimal/competitive prices, the procuring organization should use competitive methods for all but very small or emergency procurements. This assumes that there are multiple suppliers for the assistive products needed *(21)*. The objective should be to procure good quality assistive products at optimal/competitive prices including reliable servicing.

Asking for greater quantities may encourage competition and lead to lower assistive product prices. Restricted tenders, open tenders and competitive negotiations are the main methods of procurement used for assistive products; they are all based on competition. For more information on competitive methods, see Chapter 6.

4.3 Cost efficiency

Having reliable and dependable forecasts for assistive product needs is critical for accurate purchases to be made in a cost efficient way. Mechanisms should be put in place to ensure reliable financing for procuring assistive products and related services. Good financial management procedures should be followed to maximize the use of financial resources *(21)*.

One aspect of financing sometimes overlooked is funding for the procurement process itself, in addition to the assistive products. Operational costs must be covered, preferably through government budgets (in cases of public procurement) or private budgets (private procurement systems).

Procurement services may be a part of warehouse or distribution operations or set up as a separate office. Procurement may also be the responsibility of health or rehabilitation organizations. Alternatively, assistive products may be added to the menu of items for central medical stores to source. In all cases, salaries and operational costs of the procurement office must be covered.

At least once a year, the procurement office should undergo an audit, both internal and external, to verify procurement accounting records.

5 Actors in the procurement process

Procurement is a specialized professional activity that requires a combination of knowledge, skills and experience *(21)*. The field of assistive products is also specialized and therefore a multidisciplinary procurement team is recommended, combining the experiences of different areas.

The range of tasks include: selection, quantification, addressing user needs, preparing technical requirements, identifying potential suppliers, organizing and running a tendering process, purchase, storage and distribution of assistive products. These should be allocated to different professionals with the appropriate expertise and resources required.

As stated this manual focuses on national level public procurement but the same principles apply to the actors involved at a secondary or primary level (Chapter 2.2).

A ***procurement professional*** is a person engaged or qualified in procurement activities and earns his/her living from procurement activities.

5.1 The procurement office

Responsibility for AT public services may come within a department or directorate of a ministry, such as the department of rehabilitation under the ministry of health. A senior manager at the ministry, at head of department level, should lead the daily work and a procurement office should be established with sufficient resources and funding.

The procurement office could be physically located at a tertiary hospital, health-care or rehabilitation centre. The procurement office is normally responsible for managing the tender process for assistive products, which is explained in Chapter 6.

This office should be responsible for appointing employees to different procurement teams (one team for each assistive product area: for example manual wheelchairs, powered wheelchairs, vision, hearing, etc.). The procurement office should also be responsible for implementing agreed contracts at primary, secondary and tertiary health-care levels.

Senior managers must ensure that the procurement of assistive products and related services is carried out effectively and efficiently, in accordance with national policies, laws, rules and regulations. Within the European Union (EU), public procurement must comply with EU rules and regulations *(38).* It is important to conduct thorough research into local regulations that may be in place.

The procurement office must follow-up on awarded contracts to ensure that assistive product purchases are going ahead in compliance with agreed terms and conditions, including delivery times. Usually the office senior manager will appoint someone to be responsible for this; it is an advantage if they know the area concerned. For more information on follow-up activities, see Chapter 6.7.

5.2 Assistive technology centres

Assistive technology centres ought to be established at the secondary (district) level in existing health-care or rehabilitation centres. These centres should be responsible for purchasing assistive products, based on the contracts agreed with the suppliers; distribution of products to local communities; and, fitting/adjusting and repairing products. Experts from the assistive technology centres should be recruited to the different procurement teams. In Norway, employees at regional centres have so much contact with users, their experience and competence is seen as a great resource by the national procurement teams.

5.3 The procurement teams

The office senior manager will establish procurement teams for upcoming tendering processes; how this is done will depend on the country's needs, but it is generally one team for each product category with a team leader. Each team will work to agree contracts with suppliers to deliver specific assistive products for the whole country *(18)*. Some activities and responsibilities may vary based on national laws and existing systems.

The team leaders should be employed by the procurement office and have expert competence in the rules and regulations of public procurement. They should be given responsibility to lead the process and to finalize and prepare contract(s) for signing by a senior manager in the procurement office.

The teams should consist of professionals with specialized competence in public procurement and have sufficient capacity to accomplish a tendering process in a satisfactory way. As well as logistics, technical and product specific skills, team members must be well versed in assistive product provision (assessment of potential userś needs, selection of appropriate and necessary assistive products, adaptation and adjustments to the products).

For this reason team members should be recruited from regional assistive technology centres and have a mutual responsibility to secure good quality assistive products through the tender process. The teams must accomplish all the steps, from planning to signing, implementation and contract follow up with suppliers. The teams should have physical meetings to plan the procurement process and select assistive products for a contract.

During the tender process questions may come up from suppliers; these should be handled by the relevant procurement team which must ensure that all potential bidders receive the same information.

The procurement teams must work independently from any supplier or other stakeholders that may have an interest in the procurement process. All members of the various procurement teams must declare any conflict of interest. No team member or his/her family can be directly or indirectly related to, or involved in, any activities with any assistive product suppliers or manufacturers that may be of interest for procurement.

The next chapter explains the procurement process and gives more information about activities carried out by the team.

6 The procurement process

Procurement within the EU must be based on competition and tenders are the most preferred method to achieve this *(39)*. This chapter describes tendering in more detail. Readers are also recommended to refer to the United Nations procurement training programme for more information *(40)*.

6.1 Methods of procurement and soliciting bids

In this manual, both open and restricted tenders are included in the term *tender (41)*.

- An open tender (international competitive bidding) is a formal procedure whereby bids are invited from any potential manufacturer or supplier.
- A restricted tender (limited international bidding) is open to a group of pre-selected potential suppliers.

Methods used by the procurement team to request bids from suppliers will vary depending on the value of the order. Box 10 gives an example used in EU directive for public procurement *(42)*.

Invitation to bid is a process of inviting suppliers to submit offers, bids, quotations or proposals for specified assistive products, accessories, spare parts and/or services within the terms and conditions of a competitive document (e.g. announcement of a tender competition).

A ***monopoly*** refers to a market situation in which there is a single supplier.

Price quotation is a formal statement of promise (submitted usually in response to a request for quotation) by a potential supplier to supply assistive products, accessories, spare parts and/or related services.

Sole source acquisition or single source procurement or sole sourcing means the award of a contract, for the purchase of an assistive product or service, to a single supplier/manufacturer (because of its specialized or unique characteristics) after negotiations, but without competitive bidding.

Box 10. Methods for requesting bids in EU directive for public procurement.

Request for quotation (small value procurement with clear technical requirements – between US$ 4000 and US$ 40 000).

Invitation to bid (high value procurement with clear technical requirements – over US$ 40 000).

Request for proposal (medium value procurement for goods that cannot be clearly specified – between US$ 4000 and US$ 40 000).

Direct procurement (very small value procurement – under US$ 4000).

Source: *(42)*

There may be justification for single source procurement in some settings where competition is not available due to monopoly markets.

Simple or low-tech assistive products may be sourced locally/regionally, for example from wholesalers who can provide a full range of requested products. This minimizes the number of suppliers involved and orders issued, which keeps contract management costs low. It also incentivizes bidders as they can be awarded single contracts for a multitude of products rather than a few.

An important aspect of procurement is to incentivize the market to participate in tenders. One way of achieving this may be by pooled procurement, which is explained in Chapter 7.2.

6.2 Activities of a tender procurement process

Fig. 2 gives an overview of the procurement activities carried out for tenders. There are four stages: plan, accomplish, implement (agreed contracts) and follow-up (contract compliance). The tender process described in this chapter is geared to a national level, but as explained, this can also be handled at secondary or primary health-care levels. Tendering processes require significant resources.

In many countries, the tendering process for assistive products can seem overwhelming. Writing specifications, ensuring quality and affordability requires specialist knowledge and this manual is designed to help (Box 11) *(4)*.

Fig. 2. Overview of procurement activities for tenders and who is responsible

Box 11. Supporting procurement teams to overcome challenges

The tendering process, writing specifications, ensuring quality assistive products and affordability all seemed like universal challenges to participants at a procurement workshop for assistive products held by WHO, UNICEF and CHAI in Dushanbe, Tajikistan in November 2019. But there was general optimism about using model assistive product specifications, tested at the workshop, to help to ensure product quality.

Participants felt there were still challenges to making procurement user-centred so that products are appropriate, safe and effective. Many of them saw government support and adequate budgeting as essential for the success and sustainability of public procurement for assistive technology.

Source: *(4)*

6.3 Planning the tender

The procurement office should make a portfolio plan which states when existing contracts will expire and when to start a new tender process for the respective products. The portfolio plan should include:

- which products to procure
- when to start the procurement process (based on when the previous contract expires)
- who will lead the procurement team
- when to have the contracts ready for signing
- when to implement the new contracts.

A timeline for each product area should be established.

The procurement team for each product area should have an initial meeting. If necessary, information about assistive product provision and management should be given to the team members, in addition to relevant national laws, rules and regulations for public procurement in the country.

To ensure that assistive products are available when and where they are needed, the procurement must be carefully planned *(21).* Team members should contribute to the plan and the team leader is responsible for concluding and presenting it to the senior manager of the procurement office for approval.

The plan must include the following:

- establish the objectives of the upcoming tenders and discuss guidelines set by the senior manager (based mostly on portfolio plan, see also 5.1);
- scope of the tender (what to procure);
- classification of the products needed;
- how to organize the team (roles and responsibilities);

- framework (standards, funding etc.);
- determine assistive product and documentation requirements (e.g. technical requirements including product variations);
- decide what must be included (assistive products, accessories, spare parts);
- which services should be included in the contracts?
- what the supplier must deliver in addition to the product itself (e.g. split drawings of the products (needed by technicians to carry out repairs), warranty, certificates and other requirements);
- timeline with key milestones;
- risk analysis;
- a plan for communication with relevant stakeholders.

The procurement team should collect information about the relevant product area. Factors such as access to suppliers, funding availability, time and resource constraints affecting procurement functions such as assistive product selection, tendering and contracting, should be considered.

A ***warranty*** is a commitment made by the supplier to replace goods like assistive products, associated spare parts and accessories within a certain period of time at no additional cost, when a quality or performance issue arises.

6.4 Developing a procurement specification

Determining product and service requirements at the planning stage of a procurement process is essential to its success. These requirements will be expressed in a procurement specification that forms the basis for a tender announcement; it is what suppliers will use to formulate their bids and is used again by the procurement team to evaluate bids received.

To help guide procurement teams in developing assistive product specifications (APS), WHO has developed a model template setting out the key information required (Annex 1). It is divided into three sections covering the product description, mandatory product requirements, and supply and service requirements.

Twenty-seven priority assistive product specifications have been developed by WHO, based on this template, and are available in the publication, *Assistive product specifications and how to use them (43)*. They contain technical information intended to be used as a model for procurement teams when preparing tenders on a wide range of products including wheelchairs, spectacles and hearing aids.

A procurement specification should give enough technical detail to identify the product function and characteristics but be generic and not biased towards any particular brand or design. This encourages competition and gives suppliers the opportunity to offer innovate assistive products that may be new to the market *(19)*.

6.5 Accomplishing the tender process

The procurement team is responsible for making an announcement about the upcoming tender, usually called an invitation to bid. After approval by the procurement office, the tender is announced according to national laws and rules.

Tender announcement/invitation to bid

The tender announcement should set out the requirements that the suppliers must fulfil. It should include:

- terms of the tender;
- qualification requirements (if there is no preselection process);
- user needs;
- technical requirements including testing requirements;
- configuration (set-up) of the assistive products;
- selection criteria;
- terms of delivery and other terms of the contract;
- deadline for delivering bids (should be at a specific time on a specific date).
- how the bid should be delivered (online, by mail or by personal delivery).

Risk management principles are recommended wherever applicable in the process. Compliance with relevant international, regional or national assistive product standards should be required to minimize the risk of unexpected breakdowns or failures *(43)*.

A proof of product quality, or compliance with the technical requirements (for example, a declaration of conformity or a test report issued by a testing laboratory[3] according to the applicable standards), should be required in the bid.

The announcement should also include information about the volume of relevant assistive product purchases in the previous year, to give some indication of potential demand to the bidders. Quality assurance and approval of the draft announcement text should be carried out by the senior manager at the procurement office before publishing.

It is critical that potential suppliers are made aware of any relevant tenders that are ongoing. This can be achieved through:

- publication of an expression of interest, or request for information, in the public domain such as a website or national newspaper;
- use of market research to find suppliers who may wish to submit a bid.

3 Examples of testing laboratories are: Beneficial Designs, USA (http://www.beneficialdesigns.com/); Ammer Consulting, USA (http://www.ammerconsulting.com/); Novitatech́ s Test Laboratory, Australia (https://novitatech.com.au/about-test-lab/); TUV Rheinland, Sweden (https://www.tuv.com/sweden/en/wheelchair-scooter-tests.html) and National Supervision & Testing Center of Quality for Rehabilitation Instrument, China (http://www.cadtc.org.cn/english/b5de108da8d74590a9ea1512713e4852.htm).

It is advisable to register potential suppliers or ask them to register themselves in an e-tender portal, such as the Doffin portal used in Norway. Then potential suppliers can be notified and considered more quickly for any future rounds of procurement *(44)*.

Answer questions from potential suppliers

After the announcement is published, potential suppliers should be given the opportunity to ask questions clarifying the tender before submitting their bids (for example, if any aspect of the text is unclear). The procurement team should answer in a transparent and fair manner with the same information shared with all interested bidders.

Establish criteria for selecting assistive products

The procurement team needs to establish the criteria it will use to evaluate which assistive products/bids to select. These should be based on the procurement specification which was published in the announcement. Price should not be the only criteria; quality and functionality are also important for assistive products and specific selection criteria for these should be established in advance. All team members should participate in this exercise.

Box 12 gives an example of selection criteria used in Norway for manual wheelchairs. Based on these criteria, each product is given a total score. In Norway, the price for manual wheelchairs is usually rated 35–40% of the total and quality/functionality 60–65%. As a result, assistive products of very good quality/functionality are offered a contract. Many products within each category get high and equal scores, which means in many cases the price is the only factor/criteria that differentiates the various assistive products.

Box 12. An example of selection criteria for manual wheelchairs

These selection criteria were established in discussions with experienced assistive technology professionals in Norway. Some criteria are objective while others are subjective. The subjective criteria must be assessed by AT therapists and technicians familiar with provision and repairing/maintaining manual wheelchairs.

Quality was rated 65% and price 35%.

Weight

Active users should be able to lift the wheelchair, for example into a car.

6–10 kg maximum (weight without armrests).

User friendly

- When using the wheelchair, to what degree is it stable in the driving direction?
- Does the wheelchair have light, high pressure tyres, narrow back-wheel tyres, < 3 cm width? Is about 1 cm of the tyre width in contact with the ground surface?
- Castor size: 4–5 inches (must be little roll resistance; larger castors make an active wheelchair heavier).
- To what degree are the brakes easy for the user to operate?
- To what degree is there any risk of trapping (e.g. the hand)?

Comfort

- To what degree does the backrest give the user good support?
- If appropriate, to what degree is the backrest easy to adjust? Does the backrest have a velcro band for adjustments?
- To what degree does the seating unit give the user good support? Is the seating surface flat or like a hammock?
- To what degree are the foot supports and armrests adjustable to obtain a good sitting position for the user? (The weight of the body must be distributed to the buttocks and back of the thighs and the armrests should not be too high or too low).
- To what degree does the wheelchair provide a good position for the user to operate it?

The way the wheelchair is designed for the user group

- To what degree can the wheelchair be adapted to users with low (lumbar), middle (thoracic) and high (cervical) spinal cord injuries?

The criteria (formulated as questions) are rated on a five-point scale, ranging from 1 = poor to 5 = excellent. Each manual wheelchair is assessed and gets a total score.

Evaluate bids

Bids must be delivered by the time specified in the announcement and must be opened with the procurement team present (all participating suppliers may also be present). In cases when the bids come in two parts, (technical and financial documents), first review the technical part and then check the financial documents. Separate teams should be considered to do this.

At the opening, bids must fulfil the requirements set out in the announcement. Minor corrections that do not affect the substance of the bid may be made at this time. The procurer can reject a bid at this stage if:

- the bidder is not qualified
- the bidder does not accept a required minor correction
- the bid is not fully responsive (does not cover everything requested in the tender)
- the bid is abnormally low
- unfair competitive advantage or conflict of interest is found *(16).*

Evaluating bids includes the following activities:

- qualify the suppliers (if they have not been pre-qualified)
- qualify the assistive products offered in the bids
- evaluate the various assistive products according to the set selection criteria
- make an evaluation report to document the selection decisions.

To facilitate the evaluation, a table should be drawn up showing the volume, price of the assistive product (and services if applicable), international commercial terms (Incoterms®), place of delivery and lead time.

The evaluation should be performed according to guidelines set by the senior manager, which includes the selection criteria. Depending on the number of offers, an evaluation meeting may take 2–3 days on average for a thorough appraisal of the different assistive products to be conducted.

From a practical point of view, samples of all relevant assistive products in the bids should be available for inspection and try-outs by the procurement team. This should be organized so all products are viewed at the same time, for example in a sports hall on a specific date, so it is easier to compare them. This also makes the selection process more efficient and less time consuming for the procurement team.

Team members must rate each model independently and according to the selection criteria. The procurement team is collectively responsible for the final rating of each assistive product in the bids, and the team leader should ensure the quality of the selection process. The goal must be to achieve consensus among team members through discussion about which products to include/exclude.

Develop an evaluation report

Once all the assistive products in the bids have been inspected and decisions made, it is essential that the product selection is justified with written evidence *(16).* An evaluation report should set out the reasons why different assistive products have been accepted or rejected. The evaluation

report should be approved by the senior manager of the procurement office before suppliers are notified of the results.

Decision letters to the bidders

It is recommended, but not mandatory, that a decision letter be sent to the tender bidders. The team leader is responsible for writing a letter which should give a description of the evaluation process and reasoning for the selections made. Team members may assist the team leader in this work. Letters should be sent to all suppliers regardless of whether their assistive products were selected for a contract or not. The letters should be signed by the senior manager of the procurement office.

Handle complaints

Suppliers have a right to challenge an act or decision of a procuring entity. There are no acts or decisions in the procurement procedure that are exempt from this mechanism *(35).* Suppliers of assistive products who have not been selected, may feel that the procurement team has come to the wrong conclusions and want to complain. The team leader together with other team members is responsible for giving explanations of the team´s decisions. The procurement team must have the final say in these matters. The suppliers may appeal against a decision and/or take the case to court.

The contract

A customized contract that addresses all the relevant issues should be prepared. A model agreement may serve as a starting point for drafting the contract which can then be modified in line with the specific details. The following list is an example of what should be included in a contract *(45):*

- identification of the parties and their duties
- order of precedence[4]
- product specifications
- place of delivery (Incoterms®)
- duration/term of contract
- delivery time
- responsibilities of the supplier
- responsibilities of the buyer
- contract monitoring and supervision
- reporting requirements
- payment terms (Incoterms®)
- payment methods
- a clause on when and how to adjust prices during the contract period, for example due to changes in exchange rates on imported products

[4] To secure a variety of products to meet a wide spectrum of user needs, parallel contracts within each category of assistive products can be established. The order of precedence included in the contract indicates the priority products to be purchased.

- security/safety considerations
- additional insurance requirements
- warranties
- notice provisions
- how to handle breach of contract
- how to handle disputes
- signature of the parties.

The responsibility for the assistive products is dependent on the agreed terms of delivery (Incoterms®). Preferably, the supplier should have responsibility for the assistive products until they have reached a clearly defined delivery point, e.g. at a specific warehouse. This should be defined in a contract with the supplier.

Each item in the above list should be carefully considered and appropriate language included in the contract to ensure protection for both the procurer and the supplier. Failure to address common issues and establish a plan for unforeseen circumstances may lead to lengthy court proceedings and substantial financial loss. In addition to the above, all the elements of the technical requirements should be dealt with in the contract. So should relevant statistics, which ought to be provided by the supplier (for example sales/deliveries per month/quarter/year).

Contracts should include a clause for rejecting or refusing assistive products that do not conform to the specifications set out in the tender announcement. Also, they should state how long spare parts for repairs and maintenance should be available after termination of the contract (preferably at least five years) *(16).*

Contract duration can vary from a few months to four years depending on the volatility of the market. Entering into long-term contracts when it is expected that prices may decrease could be unwise.

Long-term contracts may prohibit the use of new innovative products. On the other hand, organizing tender-based contracts requires considerable resources and therefore it is difficult to repeat the process for each assistive product category each year. A two year contract with the opportunity to extend the term by one year up to a maximum of four years, is generally a good compromise. A manual published by UN provides comprehensive information on procurement in general *(45).*

Avoiding monopoly situations

It is very important to avoid a monopoly situation where there is only one supplier within a specific product category, which means the price of the product is likely to increase dramatically. To avoid this, a tender can be divided into several competitions so there is a chance that products from different suppliers will win the different competitions. This also makes it more likely that the user's needs will be met. The ongoing business means that several suppliers are likely to be able to bid in the next round of future tenders.

Another way to achieve a 'lively' market is to select a winning product, a number two and number three within each competition. In most cases, three different suppliers will deliver these products.

Box 13 shows how it is possible to create several tenders within one product category, which helps to create a competitive market *(46)*.

Box 13. How to create several tenders within one product category

Norway has a national system for assistive technology and must comply with the EU rules and regulations for public procurement. Based on contracts agreed centrally with suppliers (by tendering), assistive products are purchased on equal terms all over the country.

Individual users have different needs and therefore a variety of assistive products within each category are required. Each category is divided into several sub-categories and a tender competition is set up for each one. For example, the following sub-categories were selected in the last tender for rollators:

- rollators for indoor use, limited outdoor use
- rollators for indoor use, limited outdoor use, heavy duty rollators
- rollators for outdoor use
- rollators for outdoor use, heavy duty rollators
- rollators for children, to be pushed in front of them
- rollators for children and youth, indoor use, to be pulled
- rollators for children and youth, outdoor use, to be pulled.

A winner, a second and third product are selected for each sub-category, which means there are 7 x 3 = 21 different rollators to choose from when meeting user needs. The contracts last for two years, with the possibility of extending this to four.

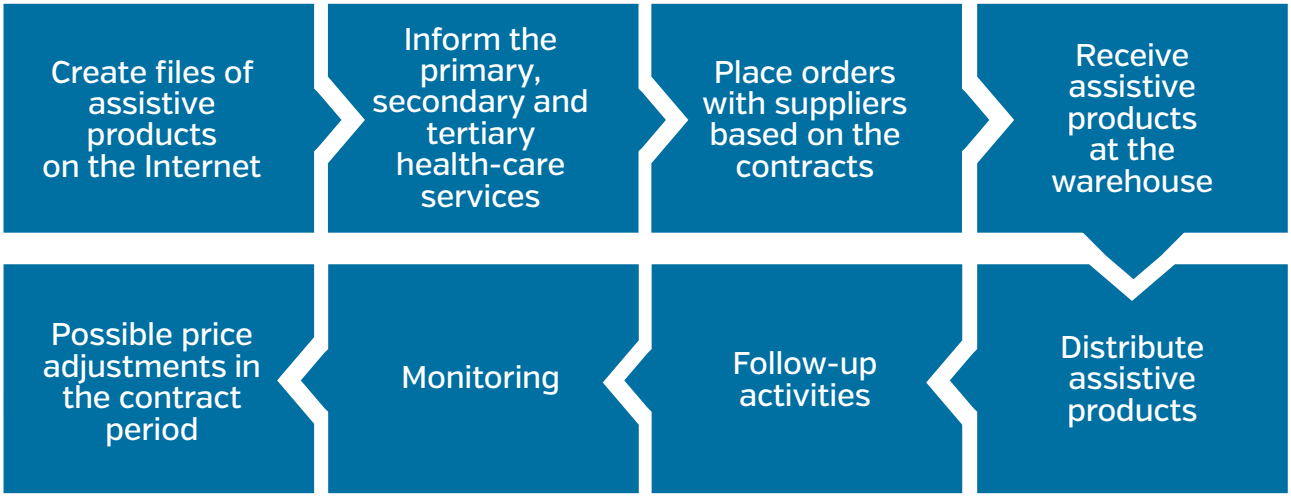
The contracts do not promise the purchase of a specific number of rollators within each sub-category. The purchases must be based on individual need for assistive products. The annual past consumption (purchases) of the relevant assistive product is stated in the announcement and these remain mostly stable from one year to another. Experiences have shown that assistive products rated as 'number one' achieved 50–60%, number two 25–30% and number three 15–20% of the purchases. The percentages have varied between the different sub-categories.

Source*: (46)*

6.6 Contract implementation

The objective is to make the new contracts and their content known to professionals at district and local level who are going to make orders for assistive products as a result. The key steps are shown in Fig. 3. The importance of making purchases in compliance with the contracts should be emphasized. For example, the contract states the terms of delivery and which Incoterm® rule is applicable.

Fig. 3. Contract implementation and follow-up activities



Create files of assistive products on the Internet

Information about the accepted assistive products and suppliers must be available on the procurement office homepage on the Internet. This should include the name of the products, technical requirements and prices, together with contact information for the suppliers (name, email address and telephone number). A picture of the assistive products would also be helpful. Relevant Incoterms® should be presented *(23)*.

Inform the primary, secondary and tertiary health-care systems

The procurement team leader is responsible for making professionals at the primary, secondary and tertiary health-care systems aware of the new contracts and products. In addition to the Internet, information about the new contracts should be presented in videoconference meetings that all team members can access.

The products and relevant information should also be presented on a database established for this purpose. Preferably, this should be part of the The Global Assistive Technology Network (Eastin) or an equivalent *(47)*.

Place orders based on contracts with the suppliers

National contracts with the suppliers give the district assistive technology centres (at the secondary level) the opportunity to place orders and receive assistive products. The contracts state which assistive products are available for purchase and the orders are based on user needs.

Internal control measures require that ordering and receiving assistive products should be performed by two separate individuals at the assistive technology centre, thereby segregating responsibilities which is important to prevent misuse or fraud.

Receiving the assistive products at the warehouse

Timely delivery means that the assistive products were delivered as ordered and arrived at the place specified by the buyer at the expected time. If delivery is delayed past the agreed time, or if the assistive products do not match those ordered (non-compliance), action must be taken against the supplier responsible according to the tendering specifications and the contracts/ invoices.

On arrival at the warehouse the assistive products should be checked for possible breakages. Also, the number and type of assistive products received should be checked against those ordered. If any discrepancies are found, the supplier must be notified immediately and it is recommended that the central procurement office takes charge of this.

After the checking stage is complete, the assistive products should be registered in the warehouse information system and put in the appropriate location and shelf. The shipping documents should follow the assistive products from the supplier to the warehouse.

Distribution of assistive products

The procurement and distribution systems must be set up to ensure timely delivery of appropriate quantities to warehouses at the tertiary or secondary levels, and adequate distribution to health facilities *(24).*

The assistive technology centres should be responsible for transporting the assistive products from their warehouses in fairly large quantities to local health facilities, from where they are distributed to users in the local community. Separate contracts should be made with a transport agency based on a tender. Annex 2 gives examples of the main headings included in such a contract.

At the primary level, people identified for the task should sign for the assistive products when received. The user should do the same. These data should be entered in the information system, where it should be possible to track the assistive product all the way from the supplier/ manufacturer to the end user *(45).*

6.7 Contract follow up

Establish a plan for contract follow up

It is important to make sure that the terms of the contract are complied with. To achieve this, the procurement team must establish a plan to follow up on each contract; this should include evaluation of the deliveries of assistive products (see Monitoring), and must be approved by the senior manager of the procurement office. Managers at the primary, secondary and tertiary levels of the health-care system are responsible for following up on the plan, and the procurement office should make sure that this takes place.

Professionals at the secondary and primary levels should comply with all the procurement contracts agreed with suppliers. Random checks should be carried out by the procurement office. Most importantly, the user must be provided with an assistive product that is necessary and appropriate. If for some reason, a user cannot take up a product supplied through the contract and must be provided with something different that is not included in the contract, an application is needed from the provider/user to the assistive technology centre stating why. The application must be registered in the information system at the assistive technology centre to satisfy random checks/transparency requirements (Chapter 4).

Monitoring

Monitoring is particularly important in procurement systems where prices are negotiated at a national level and ordering is done by individual health facilities. Suppliers who do not win a contract in a national competitive tender, may try to offer more competitive prices on a short-term basis to achieve sales at local level. It is important that products supplied through agreed contracts are used and therefore all purchases, deliveries and distributions to users must be monitored. The same applies to repair and maintenance services.

A reliable information management system is one of the most important elements in planning and managing procurement processes. Not having such a system, or the capacity to use it properly, is a key cause of failure to procure assistive products effectively *(48).* A wide range of indicators can be routinely tracked over time using a specific monitoring system. For example:

- assistive product selection in accordance with contracts made with the suppliers;
- procurement efficiency in terms of pricing and supplier performance;
- quality control in terms of breakages;
- distribution and inventory control in terms of loss, and minimum and maximum stock levels (are the set levels contributing to efficiency?) *(16).*

The procurement office should be responsible for analysing the data. It is important that all agreements made with the various suppliers, with or without a contract, are registered in the information management system, together with all assistive product distributions to users.

The system should register all repairs and maintenance carried out to assistive products and track all orders placed, payments made and volumes purchased compared with estimates.

Evaluating the supplier is an integral part of follow-up activities. Relevant performance indicators include:

- Are the assistive products, accessories and spare parts delivered in an acceptable condition (number and percentage of consignments received in good/not good condition. Good = no damage/breakage).
- Are deliveries full and complete (number and percentage of complete/not complete deliveries. Complete = according to the order, nothing is missing).
- Are complaints handled appropriately (complaints accepted and dealt with by the supplier in a good way. Good = the reason for the complaint has been fixed).
- Are responses to breakdowns dealt with efficiently (number or percentage of repairs executed within a set number of days, for example seven days).

Data should be collected continuously throughout the period of the procurement contract, and for each consignment *(16)*. The procuring organization should write regular reports on the above indicators and inform suppliers when there is a need to improve their performance.

Consignment is a shipment of a certain amount of goods to a consignee.

Price adjustments

It is important to track price adjustments as part of the follow-up process. For example in response to significant changes in exchange rates for imported assistive products.

7 Other means of acquiring assistive products

Assistive products can also be accessed in other ways using local production, pooled procurement, donations from UN and nongovernmental organizations, and by refurbishing used assistive products.

7.1 Local production

- Assistive products can be produced or assembled locally, using indigenous materials and local labour *(49)*. Possible advantages of local production include:
- The assistive products are usually built to be suitable for the environment where they will be used.
- There is usually a short delivery time.
- Spare parts are easily accessible and users should not be without their assistive product for long when being repaired.
- The assistive product can be customized easily because the users live locally.

However, locally produced, quality assistive products can be more expensive as there are no economies of scale. Low volumes may present a problem for continuous production *(22)*. Countries like Albania, Costa Rica, Lebanon and Malaysia are currently importing components for prostheses and orthoses and then assembling the products according to individual requirements *(29)*.

Countries such as El Salvador, India, Indonesia, the Islamic Republic of Iran, Kenya, South Africa and Viet Nam are pursuing both approaches *(29)*. Wherever the assistive products are produced or procured, technical standards relevant to local needs and the environment should be applied to ensure that they are of good quality and safe to use.

Local production must be based on commitment and support from national authorities, as it will be hard to succeed without this.

7.2 Pooled procurement

Pooled procurement works by grouping assistive products into one tender to increase supply volume for bidders, or by incentivizing bidders to participate by awarding a quantity to guarantee volume. Pooled procurement is also a mechanism that combines several buyers into a single entity to procure goods on behalf of those buyers *(50,51)*.

For example, several countries within a region can combine their requests for certain assistive products or a range of assistive products. Pooling several requests leads to a greater total request. With the increased volume of purchase, countries in the pool may have a better chance of negotiating a lower unit price for the product *(51)*.

Countries can use another entity as the procurement agent to manage a range of activities in the procurement process, from drafting product specifications to managing the contract. This can be an international or nongovernmental organization, or a private entity. For countries with limited technical expertise in assistive products, pooled procurement through such an entity is a way to access skills in this area. Pooled procurement of medicines and vaccines has been practiced with success by international organization such as GAVI, The Global Fund and UNICEF *(52–55)*.

Above the packing area at UNICEF's global warehouse in Copenhagen, Denmark, as warehouse staff work to assemble items for UNICEF's response to Cyclone Idai in 2019.

7.3 Donations

Assistive products are donated in many countries. For example in Tajikistan, UN agencies and international nongovernmental organizations make important contributions to the AT sector through direct provision of products and by supporting public providers with training and equipment *(22)*.

The problem is that the assistive products usually require repairs at some point and spare parts are often not available. This means the products in question become unusable. To avoid this, resources should be provided to help organize a lasting spare parts and service delivery system in countries that do not have their own procurement service. There may well be national or donor regulations in place governing this type of procurement *(56)*.

There are good examples of nongovernmental organizations cooperating well with authorities in some countries. Box 14 gives an example from Papua New Guinea (PNG) *(57)*.

Box 14. Ensuring appropriate wheelchair donations in Papua New Guinea

The National Orthotics and Prosthetics Centre (NOPS) is headquartered at Port Moresby General Hospital and has developed a strong relationship with The Church of Jesus Christ of Latter-day Saints (LDS) over many years.

Through its international humanitarian welfare programme, LDS is donating wheelchairs for the citizens of PNG and is committed to ensuring that they are provided through a service delivery system. NOPS and LDS have worked together (with input from a development partner) to select appropriate wheelchairs which LDS procures and ships to NOPS.

In each donation, there is a range of different product types and sizes with sufficient spare parts. All donated wheelchairs have been previously trialled in PNG and found to be suitable. To continue strengthening the relationship, NOPS has provided the donor with statistical information about the wheelchairs provided. Joint home visits have also taken place, (with permission from wheelchair users), so that LDS can see the wheelchairs have been given to those in need through the service delivery system.

Source: *(57)*

7.4 Refurbished assistive products

Refurbished assistive products have been previously used, but taken out of service for renewal work (repairs, servicing and/or renovation). Usually, these assistive products are returned because the users do not need them anymore. The main difference between refurbished and used assistive products is that refurbished products have been checked to ensure they function properly, are free of defects and safe to use, while *used* assistive products may or may not be defective.

Refurbishing assistive products can save significant expense; however, great care should be taken in specifying the age, condition, back-up technical service and spare part supply to make sure they are acceptable and appropriate for the new owners. The technical quality of the refurbished assistive products must be assured.

Experiences from Norway over the last 10 years show that, on average, about 30% of all assistive products provided in a year are refurbished. Without this service, the country would have to spend an extra US$ 82 million buying brand new products *(58)*.

8 Conclusion

The main objective of procuring assistive products is to enable people with functional limitations to lead inclusive, dignified lives by accessing appropriate, affordable, quality products. To achieve this, clear strategic objectives for efficient assistive product procurement, an effective procurement process and a robust management system is needed.

Procurement should be based on the core principles of integrity, fairness and transparency and the procurement process should be based on competition. Using a tendering system run by procurement teams can achieve this goal. Assistive product procurement should follow national laws, rules and regulations.

Commitment is needed at all levels to establish a sustainable system for assistive product procurement. This is most important at the national, governmental level, where the necessary funding and resources are allocated that are critical for success.

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Annex 1. Model template for an assistive product specification (APS)[5]

SECTION 1. PRODUCT DESCRIPTION		
This section provides key information about the group of assistive products included in the specification so they can be easily identified.		
1.1	Name of product	Provides the name of the product, as described in the national assistive product list (if available), or refers to a commonly used product name.
1.2	International Organization of Standardization (ISO) 9999 code	If applicable, provides the ISO classification and terminology for the product (or group of products), as described in ISO 9999:2016 *(4)*.
1.3	Description and intended use	Gives a general description of the product and how a person may use the product to address their needs.
1.4	General features	Summarizes the key characteristics of the product.
1.5	Inclusion	Lists the products included in the APS.
1.6	Exclusion	Lists the products not included in the APS.
1.7	Keywords	Lists important searchable words related to the product(s).

SECTION 2. PRODUCT REQUIREMENTS		
This section details the requirements for each assistive product included in the specification. Each requirement is mandatory. This means a supplier must ensure the product meets all requirements.		
2.1	Functional requirements	Describes the functional requirements of each product, including the typical user or typical use (e.g. body function, daily activities, living environment), specific characteristics of the product (in addition to the general features in 1.4), and the standard configuration.
2.2	General design requirements	Describes general product performance requirements and overall qualities (e.g. stability, strength, durability, water resistance).
2.3	Standards	States the standards with which the product must comply, including international standards (e.g. ISO and International Electrotechnical Commission (IEC)), and relevant national and regional standards.
2.4	Certificate of conformity	Refers to a certificate of conformity – a legal document signed by the supplier to confirm a product conforms to applicable national or international regulations in the country where it is procured or to the procurement specification.

[5] This template is taken from the *Assistive product specifications and how to use them. Geneva: World Health Organization; 2021*. It aims to serve as a model template to cover the key information required in a successful procurement specification.

2.5	Size and weight	Describes information the supplier should provide about the dimensions of the product in its standard configuration, when folded (for storage) and any adjustment range. Information about adjustment should include the minimum and maximum adjusted dimensions, and the adjustment increments. Typical dimensions include overall width, height, length and weight of the assistive product. Wherever necessary, an instruction on how to measure the width, height, length and weight should be provided to the supplier.
2.6	Technical information (for service providers)	Describes the minimum information the supplier should provide about how to maintain, repair or refurbish the product.
2.7	Instructions for use (for users and caregivers)	Describes the minimum user instructions the supplier should provide.
2.8	Environment of use	Describes the weather and other environmental conditions that the assistive product should be able to withstand. This information typically includes acceptable lower and upper limits for temperature and humidity, and whether the product can be used in rain, snow or direct sunshine.
2.9	Warranty	Specifies the duration and details of the product warranty.
2.10	Lifespan	Specifies the expected lifespan in years of the assistive product.
2.11	Packaging, labelling and state of assembly	Describes packaging requirements, including how products should be packaged, the state of assembly, and package labelling.
2.12	Accessories and spare parts	Lists the required accessories and spare parts that should be procured to ensure the assistive product can be maintained and, if necessary, repaired.
2.13	Other product requirements	States any additional product requirements not covered in previous subsections.

SECTION 3. SUPPLY AND SERVICE REQUIREMENTS		
This section describes the supply and service requirements the supplier must meet.		
3.1	Transportation	Specifies the information the supplier must provide about how the assistive product will be transported to the place of delivery.
3.2	Delivery time	Specifies the time between placing an order and receiving delivery of the assistive product (e.g. that it should not exceed 30 days for internal domestic orders).
3.3	Maintenance	If applicable, describes required maintenance services the supplier should provide, including timeframe and frequency.
3.4	Repair	If applicable, describes required repair services the supplier should provide, including timeframe and frequency.
3.5	Refurbishing	If applicable, describes required refurbishing services the supplier should provide, including timeframe and frequency.
3.6	Training for service providers	Specifies whether training is required for service providers, who needs to be trained, and what training the supplier should provide. Indicates key elements included in the training (e.g. selection, assembly, fitting, user training, maintenance and repair of the assistive product). Refers to detailed training materials, if applicable and available.

3.7	Training for users	Specifies whether training is required for users and, if so, what the supplier should provide. Indicates key elements included in the training (e.g. use, care and maintenance of the assistive product). Refers to detailed training materials, if applicable and available.
3.8	Other supply and service requirements	Describes any other information about supply and service requirements.

Annex 2. Example headlines for an assistive product transport contract[6]

(All contracts must be entered into according to the relevant national laws, rules and regulations).

General terms of the contract	
Content of the contract	
Duration and termination of the contract	
Interpretations and ranking (which principles should apply where there is "conflict")	
The responsibilities of the parties	
The supplierś personnel	
Execution of orders based on the contract	
Ownership	
Staffing	
Temporary termination of services	
Cancellation	
Changes to the contract during the contract period	
(e.g. for various reasons, the supplier must accept a reduction in purchased volume of maximum 15% of the agreed volume)	
The duties of the parties	
The duties of the supplier	The responsibility and competence of the supplier
	The responsibility of a possible sub-contractor
	Collaboration with third parties
	Special terms related to salary and working conditions
	The supplieŕ s ethical guidelines
	Advertising
The duties of the customer	Participation
	Safety
	Meetings
	Security
	Responsibility for communication and documentation
	Confidentiality

[6] The template is based on internal douments of the Norwegian Labour and Welfare Service (NAV) and an interview with the responsible officer of NAV Assitive Technology Center, Oppland, Gjøvik, Norway.

Remuneration and payment terms	
Prices	
Invoices and payment	
Possible price changes	
Rate for delayed payments	
Breach of contract	
Interpretation of the term *breach*	
The supplier's breach of contract	Delays
	Fine
	The terms of the contract are not met
	Price reduction
	Termination of the contract
	Compensation
	Claims to the customer from third parties
	Duty to solve disputes with third parties
	Duty to solve legal deficiencies
	Compensations to third parties
The customer's breach of contract	Restriction on the supplieŕ s right to withhold assistive products
	Payments in cases of breach of contract
	Cancellation of contract
	Compensations
Other terms	
Insurance	
Transfer of rights and obligations (see Incoterms® 2010)	
Bankruptcy and compulsory composition	
Force majeure	
Disputes	
National court	
Negotiations and mediations	
Court proceedings	

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Global Disability Innovation Hub