World Health Organization
European Region

Assistive technology market assessment report

Tajikistan

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Abstract

The market assessment report in Tajikistan provides an in-depth evaluation of the assistive technology market, focusing on three key segments: wheelchairs, hearing aids and prosthetics and orthotics. The study applied a market-shaping framework to assess demand, supply, cost and quality standards, and it identified challenges, including regulatory processes and financial constraints. The report highlights Tajikistan's centrally managed health system and the Government's ongoing efforts to improve assistive technology access within budgetary limitations. While coverage remains a challenge, the Government has increased funding and continues to explore strategies to enhance availability. The market is evolving, with opportunities to strengthen coordination, improve quality standards and expand affordability. Key recommendations to consider include data-driven procurement strategies, enhanced collaboration among service providers, regional partnerships for cost-effective solutions and the development of sustainable financing mechanisms. The findings aim to support policy initiatives and reforms to further improve access to essential assistive products and services, ultimately benefiting people with disabilities in Tajikistan.

Keywords

SELF-HELP DEVICES, PERSONS WITH DISABILITIES, TAJIKISTAN

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WHO thanks all individuals and assistive technology users who generously shared their knowledge and experiences related to assistive technology markets and their shaping.

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Abbreviations

ICRC	International Committee of the Red Cross
ISO	International Organization for Standardization
NGO	nongovernmental organization
NOC	National Orthopaedic Centre (formerly the State Enterprise of Orthotics and Prosthetics)
P/O	prosthetics and orthotics

Executive summary

This market assessment report in Tajikistan provides a comprehensive analysis of the assistive technology market, focusing on three key product categories: wheelchairs, hearing aids, and prosthetics and orthotics (P/O). The report evaluates demand, supply, cost and quality standards to identify gaps and opportunities for strengthening access to assistive products in Tajikistan. The study, conducted through literature reviews, stakeholder interviews and site visits, aims to support policy development and enhance service provision for individuals requiring assistive technology.

Key findings

Tajikistan's centrally managed health system has made progress in expanding access to assistive products, but coverage remains limited by financial and regulatory challenges. The Government has increased funding for assistive technology and yet procurement remains fragmented and market inefficiencies persist. There is limited local production and so many assistive products are imported, and there is no national quality framework to ensure product standards. Additionally, out-of-pocket costs remain a significant barrier for many individuals.

The wheelchair market is underdeveloped, with low supply and limited variety to meet different user needs. Most available wheelchairs are basic imported models that lack customization options. There is also no national standard for wheelchair quality, leading to inconsistencies in product safety and usability.

The hearing aid market faces similar challenges, with low awareness of hearing loss, limited availability of audiology services and high costs making access difficult. The Government currently provides amplifiers, but these are not always suitable alternatives to digital hearing aids. Specialized services are scarce, with only one certified audiologist in the country.

The P/O market benefits from Government support through the National Orthopaedic Centre, but supply constraints and limited capacity hinder broader access. Most P/O devices are imported, and local production remains small scale. Specialized training and workforce development are needed to improve service quality and expand coverage.

Key considerations

The market analysis yielded eight overarching considerations:

1. collect data on the importation of assistive technology to understand market segments and fill gaps in national data;
2. promote cooperation among service providers by sharing updated data and facilitating collaboration;
3. encourage public–private sector cooperation to improve pricing and include user associations in consultations;
4. develop national quality reference standards for assistive products to assess cost–effectiveness and improve resource allocation;
5. explore the use of subsidizing price differences for critical products such as wheelchairs, hearing aids and P/O for better quality;
6. consider implementing a voucher system for cost-effective procurement of assistive technology;
7. launch an awareness campaign to increase understanding and demand for assistive technology; and
8. leverage Uzbekistan's proximity for cost-effective procurement and use a consortium approach to help in negotiating better pricing.

1. Introduction

This report shares the processes and outcomes of an analysis of the assistive technology market in Tajikistan. While the assistive technology market represents a wide range of assistive products, this study focused on three market segments as representative of the overall health of the wider assistive technology market: wheelchairs, hearing aids and prosthetics and orthotics (P/O).

The market analysis described in this report involved the conceptual design of a market-shaping framework, reviewing existing literature and collecting data through site visits and stakeholder interviews in Tajikistan. The study aimed to identify market shortcomings, such as regulatory and financial barriers in the assistive technology market, and to tailor recommendations for consideration to support the Tajikistan Government in improving access to assistive technology through their procurement and programming efforts.

1.1 Background

Tajikistan's health system is a centrally organized, State-owned and State-administered system, with most health facilities almost exclusively operating in the public sector. The Government budget for Tajikistan in 2022 reached 33.6 billion somoni (US$ 3 billion), of which it allocated approximately 9% for health, representing 2.8 billion somoni (US$ 263 million), and 13% for social protection, a total of 4.3 billion somoni (US$ 395 million) *(1)*.

Health expenditure in Tajikistan remains one of the lowest in the WHO European Region, with recent reports indicating US$ 351 per capita in 2021. Although health expenditure has been increasing steadily since 2015, at a compound annual growth rate of 7.4% a year, it remains less than half the average expenditure in central Asia *(2)*. This represents 21% of the European and central Asian average of US$ 1660 for low- to middle-income countries. Tajikistan also has one of the lowest ratios of health workers to population, with relatively few doctors and nurses *(3)*.

In 2005 Tajikistan introduced the Basic Benefit Package for public health services, revised in 2007, focusing on essential primary and emergency care. The Basic Benefit Package includes a copayment structure, covering 50–70% of costs based on need, and by 2022 it extended to 31 of 65 districts. Certain groups, such as war veterans, people with disabilities and children under-1 year of age receive free services. Despite this, access is still limited by poor programme capacity, underfunding and high eligibility requirements, leading to high out-of-pocket costs to users of assistive technology.

While assistive technology is not financed through the Basic Benefit Package, Tajikistan's Ministry of Health and Social Protection funds it via the disability programme *(1)*. The Basic Benefit Package covers physiotherapy at the primary health-care level but does not cover higher-level rehabilitation, such as assistive technology services. Disability determination is required to receive funded assistive products, leading to long waiting times and care gaps that negatively affect health and function. Additionally, specialized private services are also limited, such as specialist consultations, diagnostics, ambulatory care and hearing care.

1.2 Assistive technology market overview

Tajikistan signed the United Nations Convention on the Rights of Persons with Disabilities in 2018, committing to providing better access for people with disabilities. Despite this intention, the assistive technology market in Tajikistan is fragmented, with limited revenue to support a diverse range of assistive technology suppliers and services.

In 2018 Tajikistan's Ministry of Health and Social Protection and stakeholders developed an approved product list of 41 essential assistive products *(4)*. While the National Programme on Rehabilitation for People with Disabilities (2017–2020) and the Strategy on Health Care to 2030 provide guidance on rehabilitation and assistive technology, they lack an action plan for implementation, targets and costing. In December 2023 the Ministry of Health and Social Protection created action plans on rehabilitation and assistive technology, aiming to increase assistive technology access over 3 years by strengthening the assistive technology ecosystem using the WHO Global Cooperation on Assistive Technology 5P framework: people, policy, products, provision and personnel *(5)*. To better facilitate this, 10 new products were added to the approved product list in early 2024 and are awaiting parliamentary approval.

Tajikistan does not reference national quality standards for medical devices, which should comply with International Organization for Standardization (ISO) standard ISO 13485:2016 *(6)*.[1] Coordination of rehabilitation and assistive technology is fragmented, with multiple ministries involved and lacking harmonization. This hampers a cohesive approach to improving rehabilitation and assistive technology capacities, as assistive products are only available at selected sites for eligible people with disabilities, creating access barriers for others, such as older adults (Table 1).

Table 1. Assessment of needs versus supply

Assistive product	Annual needs[a]	Estimated needs per year[b]	Rapid assistive technology assessment, average	Estimated coverage data provided in 2023	Estimated coverage (%)[c]
Wheelchairs (% population)	1.3	–	2.0	–	–
Wheelchairs estimated numbers	85 500	17 100	130 290	2000–2500	12–15
Hearing aids (% population)	3.0	–	2.0	–	–
Hearing aids estimated numbers	281 645	56 329	156 550	1 145	2
P/O (% population)	0.3	–	1.2	–	–
P/O estimated numbers	27 441	9 390	115 140	6 203	66

[a] Data on needs taken from WHO Regional Office for Europe *(5)*.
[b] Wheelchair survey results estimated a total of 17 100 (11 700 manual + 5400 intermediate) per year and, based on a 5-year replacement, this would be 85 500 over 5 years; hearing aids survey estimated 56 329 (one unit per person), so 281 645 over 5 years; P/O figures are rough estimates based on occurrence of various conditions.
[c] Estimate coverage based on number of assistive products supplied in 2023 gathered from all sources.

1 The ISO, established in 1946, sets the international standards for agreed best practice, whether making a product or managing a process. International standards ensure that the products and services are safe, reliable and of high quality, and guide businesses in adopting sustainable and ethical practices *(7)*.

WHO estimates approximately one in four people could benefit from rehabilitation in Tajikistan, which equates to 2.4 million people *(8)*. While the Government identifies approximately 158 000 people needing assistive technology, there are an additional estimated 1 million people who could benefit from assistive products, including older adults and people without specified disabilities. For example, the Government identified a growing need for assistive products related to the increasing incidence of diabetes (and neuropathy-related limb loss), while approximately 5000 patients with stroke and/or chronic heart conditions could also benefit from assistive products.

The need for assistive products in Tajikistan must be viewed as extending beyond just individuals with diagnosed and/or visible disabilities. In practice, this is more complex because, in Tajikistan, eligibility for Government-funded assistive products requires a disability certificate from the Agency for Medical and Social Examination, which restricts access for those without a disability. Assistive products provided by the Government are free of charge (financed from the State budget), and the State reimburses travel costs for individuals coming from rural areas. Unfortunately, assistive technology users who do not have a Government disability status are unable to access this coverage.

These data align with research findings that only a small fraction of people in Tajikistan have access to assistive technology. WHO's 2021 survey found that 76.9% of respondents paid for their assistive products out of pocket or with assistance from family and friends.[2] Despite varying coverage estimates, there is a clear need to expand the provision of assistive products and address funding and resource challenges. The 2021 survey also found that the current public provision of assistive products was inadequate in quantity, quality and range to meet the demand.

From a pragmatic perspective, framing access beyond tangible markers of need – such as diagnostic criteria or varying levels of functional impairment – is also difficult in terms of identifying the full scope of need and demand, the current levels of supply and any gaps between them. At present, there are few data and little oversight that identify the real-time needs of all people, disaggregation by age or gender, nor that outline the demand on the market for assistive products in Tajikistan.

Data demonstrating the needs of people who use assistive technology or potential users who would benefit from assistive technology are also limited and are currently fragmented from different sources rather than a national dataset. An estimate of people with disabilities in Tajikistan (Table 2) derived from Government data of those registered with a disability is 1.6% of the population *(1)*. However, as this only represents people identified by the Government as having a disability, it will not capture the number of people who are not registered. Therefore, statistical representation of assistive technology need is likely underreported and not representative of the actual need, particularly when considering that not all assistive technology users have a disability as defined by the Government.

Table 2. People with disability, Tajikistan May 2022

Description	Number
Adults, group I[a]	16 981
Adults, group II[a]	76 160
Adults, group III[a]	33 379
Children (under 18 years of age)	31 939
Total	**158 459**

Source: Government of Tajikistan *(9)*.

[a] Groups are determined through a process of disability determination, based on the individual's health condition and severity of disability. Group allocation determines eligibility for products and services.

2 Assistive technology household survey in Tajikistan 2021: results and recommendations. World Health Organization, unpublished data.

To obtain the most accurate and up-to-date information, such data need to be pooled using third-party market research and mapping and in consultation with all regional stakeholders and global sources. Information can be obtained from a wide range of sources. For example, hospitals, rehabilitation centres and health-care professionals can offer service provision insights and contribute to the current demand for assistive products and the avenues individuals take to obtain them. Likewise, all medical equipment suppliers, distributors or stores that include assistive products could provide details on the types of assistive product available, pricing, models and any special features. Disability support organizations and user associations that focus on disability, advocacy and support may have data on user need. Social service organizations and social workers can provide information on available resources for individuals with the need for assistive products. Online platforms, forums or websites that cater to the local disability community's needs in Tajikistan will have shared experiences and recommendations on dealing with needs for assistive technology. Finally, as local retailers and pharmacies that specialize in health-care products are one of the main suppliers of assistive products, they are also recommended as a potential data source to comprehensively map user needs.

Without these data, the ability to accurately supply and distribute assistive products is limited. For example, manufacturers typically only produce and sell products after receiving orders because of limitations linked to financial capital or resources; often they need revenue from sales first before producing the item. For suppliers, the purchasing of a large stock requires significant capital and, therefore, poses a financial risk if adequate sales of these purchased products are not met. In Tajikistan, suppliers, therefore, avoid stocking extra products because of uncertainty around demand, as well as the significant costs to procure, ship and transport assistive products.

Compounding these challenges, Tajikistan's integration within global value chains is limited due to challenges in the business environment and investment climate and limitations around public service effectiveness and regulatory standards *(10)*. The small banking sector with significant State-directed lending has fragile asset quality, making financial sector reform a priority. Despite challenges in accessing foreign currency, remittance flows have grown, reaching a record US$ 79 billion in 2022 and accounting for 51% of gross domestic product *(11)*. However, customs and border procedures, access to foreign markets, competitiveness and external integration remain problematic, adding high costs and procurement challenges for businesses.

Out-of-pocket costs for the end user for assistive products are also important to consider in relation to the average national income per household in Tajikistan. Estimates cite the average monthly income as approximately 2000 somoni (US$ 180), although this market assessment found public pay as low as US$ 50 per month *(12)*. On a daily scale, it is estimated that 19.5% of the population lives on less than US$ 1.90 a day and 56.6% lives on less than US$ 3.10 a day *(12)*. These figures suggest that financial barriers to accessing assistive technology remain significant if Governmental coverage is insufficient for a wide scope of individual need beyond the lens of disability.

To compensate for the cost of assistive products in relation to income, the Government allocated a budget of 9.14 million somoni (US$ 835 000) for assistive products in 2023. The following year, the budget was increased by 32% to total 12.13 million somoni (US$ 1.1 million), of which 27% was allocated for staff costs. A quarter of the budget was allocated for assistive technology procurement, which increased by 50% from 2023: from 2 million somoni (US$ 182 000) to 3 million somoni (US$ 273 000) (Table 3).

Table 3. Government budget for assistive products 2023–2024

Budget	2023	2024	Increase on 2023 (%)	Share in 2024 (%)
	9 138 079	12 138 079	33	
Staff costs	2 741 362	3 272 756	19	27
Assistive products (ready made)	2 000 000	3 000 000	50	25
Products and materials for footwear production	717 580	942 228	31	8
Items and materials for prosthetics	2 914 877	3 983 038	37	33

Source: data provided by the Government of Tajikistan.

In 2023 Tajikistan imported assistive products worth 167.2 million somoni (US$ 15.7 million), primarily from the surrounding region. The imports included 45.8 million somoni (US$ 4.3 million) each from China and the Russian Federation, 36.2 million somoni (US$ 3.4 million) from Türkiye, 10.6 million somoni (US$ 1 million) from Uzbekistan and 28.7 million somoni (US$ 2.7 million) from other countries. As one example, the Government allocated 8% of the budget for the procurement of materials and equipment to produce P/O, representing 942 000 somoni (US$ 86 000), and 4 million somoni (US$ 365 000) for footwear and prosthetics, respectively. Broadly speaking, these allocations represent a major increase in Government spending on rehabilitation and assistive technology from 1.3 million somoni (US$ 120 000) in 2018 *(4)*.

1.3 Assistive technology market assessment approach

There are several specific attributes or determinants that can be used to evaluate the current health of the assistive technology market or a specific segment of the market. An assessment of each determinant can isolate the critical areas where there may be shortcomings or challenges, which can guide the shaping of markets for improved performance. Outlined in Table 4 are eight market determinants, which summarize the critical attributes affecting both the supply and demand of a market and which can be used to highlight any market shortcomings.

Table 4. Assistive technology market determinants

Determinant	Characteristics
Acceptability/utilization	The extent to which available products or services meet the end-user needs, norms, choice and ease of use
Affordability	The extent to which prices are affordable, including for those below the poverty line
Availability	The capacity and reliability of supply to meet demand at points of service delivery
Competition	The level of competition/product choice from suppliers to sustain supply; includes consideration of whether the market is dominated by a single source or group of suppliers that dictate market dynamics and operations
Delivery	Whether the supply chain/distribution system and delivery capacity is cost–effective and efficient; includes the need for specialized services, warehousing and last-mile delivery
Finance	Whether long-term and reliable funding or access to financing is available and sufficiently covers the needs
Quality	Whether products are consistently safe and effective, with reference to standard measures of quality, control and criteria, technical specifications, good manufacturing practices; with recognized national regulatory authority approval
Coverage	The extent to which supply equitably meets the needs

A healthy market framework helps to structure and coordinate discussions with key stakeholders on what a market should (or could) look like, such as guiding all involved to understand the issues and to plan supply-based solutions. For example, the framework considers whether there are rules ensuring product and service quality; if buyers can afford essential products and services; if manufacturers produce quality standard products; if end users are able to access and choose products and services; and if buyers can source essential products and services. The framework (visualized in Fig. 1) is a broad outline of a market assessment and not representative of the specific Tajikistan market context. The framework moves upwards from a baseline of articulating demand. A traffic light colour coding system can differentiate between met and unmet needs (green: needs met; orange: partially met/issues to be improved; red: not met).

Fig. 1. The healthy market framework

5th tier: addresses longer-term achievements, sustainability and product innovation
4th tier: reflects issues that can be addressed by risk mitigation through quality assurance, standards and other interventions
3rd tier: where users have their basic preferences and affordability ranges met
2nd tier: the foundational building block of a healthy market, where supply can meet the demand regardless of quality standards
1st tier: does the market (supply) meet basic demand regardless of quality standards?
Baseline: demand must be clear and substantiated; it is the foundational pillar and, although hard to articulate, is the first step

Source: adapted from UNICEF.

1.4 Methodology

The following sections report the findings of this market assessment in Tajikistan, which focused on the specific assistive technology market segments for wheelchairs, hearing aids and P/O. The market assessment approach in this context was guided by the WHO reference guide on assistive products specifications, which relays procurement and provision information and describes minimum safety requirements *(13)*. Each section will begin with a summary describing the assistive products market determinants using the healthy market framework (Fig. 1) but with the traffic light colours to indicate the overall health of that market segment.

2. The wheelchair market

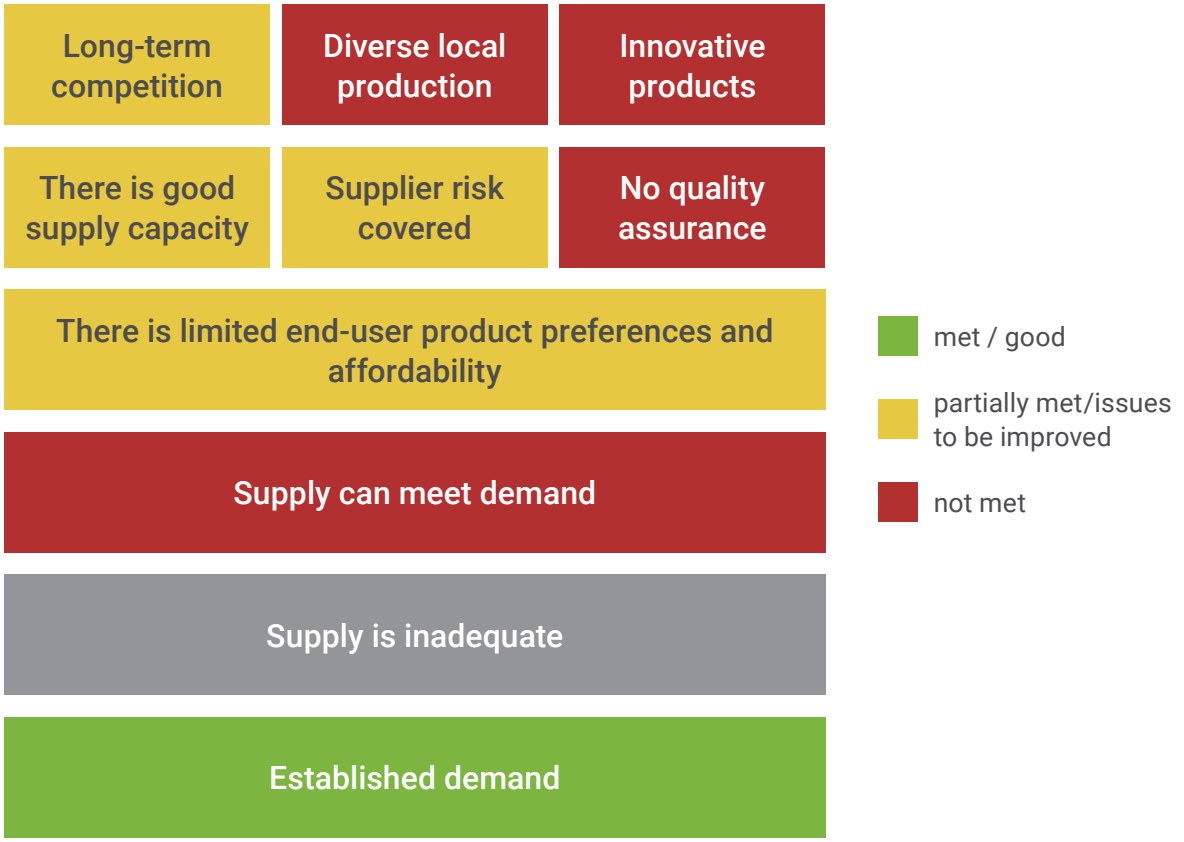
The current market in Tajikistan is not able to meet the needs of all wheelchair users or those who would benefit from using a wheelchair. The ranges and volume of wheelchairs and the sources users acquire them from are limited. Most wheelchairs are imported from China and Türkiye, with very few models being considered appropriate in quality, safety and cost. Additionally, most wheelchairs available are basic models, which do not appropriately meet the needs of all users. Finally, there are currently no national quality reference standards; therefore, quality standards are left to the judgement of suppliers who import the products *(14)*. The market determinants (as outlined in Table 4) are identified for wheelchair in Tajikistan (Table 5).

Table 5. Market determinants for wheelchairs

Determinant	Characteristics
Acceptability/utilization	The market only offers a limited choice of products that can meet end-user needs and that are adapted to their profile
Affordability	Most products are low-cost options with mainly out-of-pocket payments
Availability	There is a limited range of products available to meet demand at points of service delivery
Competition	There is very little competition in the market; product choices are based on low-cost options and dominated by small and medium-sized enterprises, which have full influence over market
Delivery	There is supply chain, distribution system and capacity to deliver products to reach all regions but there are no specialized fitting services
Finance	The market is heavily reliant on Government funding support to cover the known needs and demand
Quality	There are no national regulatory reference standards or measures to ensure product safety, quality and technical specifications; these are subject to supplier considerations
Coverage	Coverage is low with significant gaps per model type; an assessment of equitable coverage is not possible as data not disaggregated

While comprehensive data on volume and value remain limited, the data that do exist indicate private sector suppliers and the Government provide an estimated 2000–2500 wheelchairs a year on average. This figure does not capture all procurement, as there are some wheelchairs also being procured and imported by individuals buying products privately and with out-of-pocket payments. Fig. 2 outlines the wheelchair market using the healthy market framework assessment (shown in Fig. 1).

Fig. 2. Assessment of the wheelchair market in Tajikistan using the healthy market framework



As mentioned above, the quality of wheelchairs currently available is generally not consistent with international quality standards. Wheelchair provision should be tailored to the user according to need, with selection and adjustment of style and size, and seating customization. As there are no regulations to define or govern the type of wheelchairs provided in Tajikistan, product choice is subjected to the decisions made by the importer or manufacturer of the product, predominantly based on the cost thresholds they can afford. Essentially, decisions are heavily influenced by the private sector, with no regulatory reference to any recognized quality standards, such as those of the ISO. This results in limited product choices available to the end user and a high likelihood of barriers to the provision of the appropriate assistive products.

Without reference to quality standards, it is not possible to objectively judge the quality of a product in consideration of cost, effectiveness or efficiency. Without a baseline reference of quality or normative standards, the quality of a product is subjective, with little consumer protection should a wheelchair be experienced as low quality. Similarly, without established standards there is high financial risk to suppliers, with negative impact on their operation, funding or reputation due to issues or challenges related to supply chain disruptions or quality and performance issues.

2.1 Demand

Existing data are not disaggregated and, therefore, do not distinguish between need for different models of wheelchairs, such as power versus manual. The absence of consistent data on market demand poses a significant obstacle to the development of effective assistive technology policies. According to the Wheelchair Foundation, user demand is estimated to be 1% of people in developed countries and 2% of people in developing countries, with an overall 1.85% globally *(15)*. It is additionally estimated that only 10% of people in low-income countries who need a wheelchair have access to one.

In Tajikistan, 1.29% of the population is estimated to need a wheelchair, equating to approximately 128 390 people. This assessment focuses on the specific needs of people with disability (not all who may need a wheelchair). Of the estimated 158 459 people with a registered disability in Tajikistan, 53% require a wheelchair, or approximately 85 500 people, of which 58 500 use a standard manual wheelchair and 27 000 use a manual wheelchair with postural support *(4)*. Based on a 5-year replacement assumption, this equates to an annual need of approximately 11 700 manual wheelchairs and 5400 manual wheelchairs with postural support (Table 6).

Table 6. Wheelchairs needed for persons with disabilities, annually (2019)

Wheelchair type	Number with need
Manual wheelchairs	11 700
Manual wheelchairs with postural support	5 400
Total	**17 100**

Source: WHO *(4)*.

2.2 Supply

Between 2000 and 2500 wheelchairs (representing between 12 and 15% of the known demand) are provided to people with disability in Tajikistan through all sources each year. Surprisingly, only 11% of these wheelchairs are provided by the public sector. The market assessment indicates 44.4% of wheelchairs are reportedly sourced from friends and family, 22.2% by nongovernmental organizations (NGOs) and 11.1% are self-made, representing 77.7% of wheelchair users.[3] However, wheelchairs sourced privately and covered through out-of-pocket payment are difficult to quantify and, therefore, these figures may be underrepresentative.

2.2.1 Procurement channels

The market assessment identified four major outlets which import medical equipment, including wheelchairs and mobility products, in Tajikistan. Generally, these suppliers are not dedicated wheelchair providers, as they do not rely on the import and resale of these products or assistive products in general for their business models. Rather, these are market segments complementing a need and sell higher-end digital and electronic medical equipment for the health industry and hospitals.

Retailers report that they often provide their wheelchairs at discount rates, given the frequent high needs of their clients. Only an estimated 10–20% of sales are made at full price, as retailers consider both the cultural practice of charitable giving and the need for corporate social responsibility to their community. There is also some social pressure for retailers to make charitable donations, for example related to Friday prayer. Retailers estimate that 50–80% of the sales they make include heavy discounts of anywhere between 20 and 50% on a case-by-case basis for community members in need.

Some of these suppliers include Zuhro LLC, Clinic Orthopedia Muosir (a clinic that is part of a wider pharmaceutical chain selling approximately 100 wheelchairs a year), Lavozmoti Tibbi (which provides between 500 and 600 wheelchairs a year) and Tib Tajhizot (which sells between 600 and 700 a year). Generally, it is reported that there is little cooperation between them, although they do refer to each other if sold out of a particular product.

Businesses import various wheelchair models, including manual, power and paediatric models and wheeled commodes. They also offer a limited range of user-assisted, assistant-controlled and electric-powered wheelchairs, but no models for active users or all-terrain use. Wheelchair prices range from 1000 to 5000 somoni (US$ 91–456) for powered models. Imports are valued at approximately 860 400 somoni (US$ 78 500), with a weighted average price of 1229 somoni (US$ 112). Transport and shipping costs from China account for 40% of the value, leaving a cost per wheelchair of 600 somoni (US$ 54). Retail prices are close to the lowest possible range due to these factors.

There are also sources of wheelchairs available through online platforms such as Somon.tj *(16)* with prices for basic manual wheelchairs starting from 1200 somoni (US$ 112), as well as through Ubuy.tj *(17)* with prices from 1500 somoni (US$ 140) for a manual wheelchair and from 9330 somoni (US$ 874) for electric-powered models. However, these products may be located outside Tajikistan and so incur shipping fees, and they do not reference international quality for the product or manufacturing standards.

Additionally, as mentioned above, a significant number of users acquire their wheelchairs through private purchases or NGOs. Previously, an organization called Operation Mercy occasionally imported and donated different styles of wheelchair to those in need, but they are no longer in operation in Tajikistan. There were two small-scale producers of wheelchairs in Tajikistan located in Vakhsh Region and Khujand Region, producing fewer than 150 wheelchairs since 2015 *(18)*. Their wheelchairs cost approximately US$ 160 to

3 Assistive technology household survey in Tajikistan 2021: results and recommendations. World Health Organization, unpublished data.

US$ 240 to produce, but they inevitably could not compete with lower-cost products imported from China and no longer provide these products.

In Tajikistan, digital assistive technology is taxed at 15%, while wheelchairs are exempt from tax. However, wheelchair suppliers cite still facing tax charges due to discrepancies between import and export codes (which ultimately negatively impacts quality if suppliers base their decisions on cost–effectiveness). Additionally, suppliers require an import licence, but there are no regulations on the types of product they can import. They reportedly assess product quality based on cost, their own evaluations and the application of ISO standards or CE marking (Conformité Européene from the European Commission). User feedback on product quality and sales performance are also considered. Large import orders are around 200–300 units, fitting into a 20-foot container. Delivery takes 1–2 months, with costs between US$ 4000 and US$ 5000 for shipping from China. Despite different models, wheelchairs generally are of the same category and standard, lacking specialized guidance for users based on their activity level or living environment.

Most wheelchair sales in Tajikistan are made through direct cash transfers, with few purchases using bank financing. Bank loans for importing higher quality wheelchairs have interest rates around 12% per annum, although rates decreased to 9.25% in 2024. However, these lower rates are not typically offered to commercial clients, further constraining the purchasing power of businesses when considering costs of higher quality wheelchairs *(19)*. Retail outlets offer warranties of 3–6 months for manual wheelchairs and 1 year for electric wheelchairs, both insufficient for effective use. Suppliers in Tajikistan do not use tenders for assistive products, relying on direct orders through contacts. Due to limited cooperation, there is little interest in aggregating demand or coordering to save costs unless incentivized. Suppliers pay 30% of procurement costs on order placement, with the balance due before shipment. Orders are placed two to three times a year, depending on sales. The two largest retailers sell 500–700 units annually, while others sell about 100 units each.

2.2.2 Government procurement

The Government procures wheelchairs through annual tenders, usually awarded to local suppliers. Few international suppliers bid through difficulties in accessing the required information. The Government provided 990 wheelchairs in 2023, covering less than 10% of the estimated annual need. Of these, most were basic manual models without postural support. Wheelchairs are imported from China at an estimated cost of 1200 somoni (US$ 110) per unit, with 70% of the cost being the product value (841 somoni or US$ 77) and 30% for transport and shipping (355 somoni or US$ 32.5). The total spend is 1.2 million somoni (US$ 108 000). Procurement is driven by need and budget availability, which has been increasing over time.

In terms of sourcing, the market assessment indicates that assistive products are historically provided through different channels, with the Government providing 27%: 17% through local departments of social protection and 10% through the National Orthopaedic Centre (NOC; formerly the State Enterprise of Orthotics and Prosthetics) (Table 7).

If the 990 wheelchairs provided by the Government represent 27% of the supplied demand, the data suggest that an estimated 3666 wheelchairs are sourced nationally through various channels, covering 22% of the annual need of 17 100. Increasing the number of wheelchairs supplied by the Government would require significant investment to expand distribution capacity and enhanced technical oversight.

Table 7. Wheelchair sources

Source	Percentage
Local departments of social protection plus NOC	27
NGOs	22
Retail outlets	13
Health facilities from another country	12
National health-care facilities	9
Pharmacies	8
Individuals from abroad	4
Other sources	6

2.2.3 Tib Tajhizot

Tib Tajhizot is one of the main suppliers in Tajikistan, providing approximately 600–700 wheelchairs a year in the region. Of this quantity, they sell between 100 and 150 wheelchairs directly to Dushanbe's City Health Department through a programme providing free wheelchairs to people in need who cannot afford them. They sell any remaining chairs directly to individuals, often based on a referral from doctors.

Suppliers often sell wheelchairs at little to no profit due to demand for discounts. Wheelchairs account for only 10–20% of their business and revenue, yielding small returns. This is reportedly common among private sector importers of assistive products, as it is a minor part of their broader business model and assistive products sales alone are insufficient to sustain a business unless scaled to a much large capacity. As such, some manufacturers are uninterested in business arrangements if procurement volumes are too small. Most suppliers procure and import wheelchairs and other assistive products based on stock levels, off-take and perceived needs, without actively pursuing market growth due to a lack of demand-driving programmes. Tib Tajhizot collaborates with a Tajikistan broker who negotiates prices with manufacturers for a 5% commission.

Tib Tajhizot imports four types of wheelchair from China, which they procure at a cost of approximately 584 somoni (US$ 55) and transport overland by rail via Kazakhstan. The estimated cost of transport is 616 somoni (US$ 58) per wheelchair, of which the supplier reports an estimated 5% loss in imports due to damage. Given transport considerations, this equates to a landed cost per chair of 1200 somoni (US$ 112). Tib Tajhizot reportedly sells the wheelchairs at a range between 1500 and 3000 somoni (US$ 141–282), with an average price of 1700 somoni (US$ 160), representing a cost increase and mark-up of over 300%.

In 2023 Tib Tajhizot imported two types of wheelchair from the Islamic Republic of Iran, costing between 531 and 743 somoni (US$ 50–70). Despite tax exemptions and the manufacturer covering some transport costs, the supplier pays a 15% import tax, 5% registration fee and 2–3% customs fee, adding about 23% to the cost, for a landed cost of 876–1137 somoni (US$ 82–107) per wheelchair. These basic, one-size models lack adjustable parts and fail to meet national or international quality standards.

2.2.4 The NOC

The NOC is the main provider of rehabilitation products and services in Tajikistan across five locations (Dushanbe, the Districts of Republican Subordination and the Regions of Sughd, Khatlon and Gorno-Badakhshan). In 2023 the NOC produced four lightweight manual wheelchairs and distributed 990 imported wheelchairs across the different regions. Dushanbe, the capital city, only received 10% of the wheelchairs they provided, while Khatlon and the Districts of Republican Subordination received 70% of the allocation (Table 8).

Table 8. Wheelchair distribution across the regions in 2023

Region	Wheelchairs distributed
Khatlon	442
Districts of Republican Subordination	249
Sughd	151
Dushanbe City	105
Gorno-Badakhshan	43

The NOC provided only 6% of the annual need for 17 100 wheelchairs in Tajikistan, with a waiting list exceeding 1000 people. The Government plans to increase coverage by involving private sector suppliers. Despite the private sector's limited capacity, collaboration could result in procuring 2000–2500 wheelchairs, covering 12–15% of the demand. The Government could explore joint procurement and data-sharing with industry stakeholders to lower costs and improve quality. Additionally, a subsidy scheme could help to provide wheelchairs to the most vulnerable, with a sliding scale for those with modest incomes. Higher quality wheelchairs, although more expensive, offer better value due to their longer lifespan.

Recently, the Government changed its mandate and legal structure to become the national centre for all assistive technology rehabilitation products and services beyond the P/O and mobility products it was previously limited to. The national action plans on rehabilitation and assistive technology were approved by the Government and include intent to develop both assistive technology provision services and assistive technology repair and maintenance services in primary health care.

2.2.5 Supply in Uzbekistan

Most wheelchairs in Tajikistan are imported from China, but many people also obtain them privately from the Russian Federation (such as through relatives living abroad). Due to the ease of travel to Uzbekistan, which is developing a modern health system, many Tajikistan residents privately source their wheelchairs from there. However, the informal nature of these transactions makes it difficult to quantify the volume and value of private sales *(20)*.

Uzbekistan is actively developing its health-care sector and systems under the Concept of Health System Development 2019–2025 *(21),* promoting the emergence of medical tourism and organizational changes to position their health care as a leading sector within central Asia *(22)*. Despite being an ambitious and ongoing effort, Uzbekistan's health-care development could become a major procurement source for assistive technology in the region. Given the proximity and ease of crossing the border from Tajikistan, the presence of assistive technology service providers, wholesalers and agents of specialized assistive technology in Uzbekistan could be leveraged as a resource to strengthen the Tajikistan assistive technology market.

Additionally, Uzbekistan has established national product standards and a testing facility with 25 different test standards for wheelchairs. The country has at least three local wheelchair producers with a combined annual production capacity of about 35 000 wheelchairs, which can be increased to 70 000. This high number reflects the size of the Uzbekistan population, 35 million. With about 1% of the population needing a wheelchair, this equates to 350 000 people. Since a wheelchair roughly lasts about 5 years, Uzbekistan needs around 70 000 wheelchairs annually. However, the country only meets about 60% of this demand, providing around 18 000 to 20 000 wheelchairs per year.

Established in 2001 Sayqal is Uzbekistan's largest wheelchair producer, making approximately 30 000 units annually and supported by a staff of 60 and the adoption of laser-cutting technology and robots. Of this production, 60% of sales are through the Government's Social Protection Agency, Inson centres, with 32–35% sold in their own branches and 5% exported to Kyrgyzstan and Tajikistan. Sayqal produces one basic manual wheelchair model for 1.6 million Uzbek som (US$ 125) and plans to expand the product range, offering discounts on large orders.

Another manufacturer produces 50–300 wheelchairs annually (averaging 70) with a staff of five. Their basic folding wheelchairs cost 1.9–1.7 million som (US$ 150–135) and lack adjustability or support. These are sold through national pharmaceutical chains and can be bought with Government vouchers. Finally, a third producer makes about 700 units per year, offering one paediatric manual wheelchair with postural support and one manual adult model, both costing 1.6 million som (US$ 125).

2.3 Cost

Regardless of supplier, the key driver for those procuring wheelchairs in Tajikistan is cost: to secure products at low prices and, therefore, source as many products as possible. This market assessment estimated a breakdown of cost equating to roughly 60% for the product at 720 somoni (US$ 67) and 40% for the transport of products at 480 somoni (US$ 45). These are extremely low-cost wheelchairs, which may not adhere to international quality standards, so while cost makes them more accessible for users, the quality may not ensure a good return on investment.

Transport and shipping costs can significantly impact the total cost of wheelchairs, which are not centrally stocked but sourced globally. For Tajikistan, transport and shipping costs are crucial because of the modest regional connectivity and high transport costs. It is important to compare landed costs (product plus transport/shipping fees) rather than only evaluating product costs. Locally or regionally procured products may be cheaper overall when considering transport costs. Consolidating assistive technology importation and leveraging better discount rates through public–private cooperation could yield significant economic gains.

Most wheelchairs imported into Tajikistan are basic manual models from China, Iran (Islamic Republic of) and Türkiye, costing 531–5000 somoni (US$ 50–456) per unit. With transport costs adding 223–616 somoni (US$ 21–58), the weighted average price is 1200 somoni (US$ 112). A minimum quality wheelchair costs 1919 somoni (US$ 175) and full coverage of 17 100 wheelchairs annually would require 32 million somoni (US$ 3 million). Current procurement of 990 wheelchairs at 1200 somoni (US$ 112) costs 1.2 million somoni (US$ 112 000); therefore, upgrading to higher quality would cost 1.9 million somoni (US$ 178 000). In comparison, WHO and the United Nations Children's Fund can offer quality-approved wheelchairs ranging from 1863 to 5472 somoni (US$ 175–515) *(23)*.

2.4 Quality standards

The current wheelchair market in Tajikistan does not offer wheelchairs suited to individual needs and lacks national quality standards. The quality of products procured is, therefore, often based on the subjective judgements of suppliers, which may lack the technical expertise to determine appropriate standards. This ultimately limits the range of products available and the provision of suitable wheelchairs to meet the unique needs of all individuals. One potential strategy to mitigate this is to consider implementing WHO's four-step wheelchair provision guidelines *(24)*.

Measuring costs and implementation against reference standards is crucial for identifying discrepancies, enabling corrective actions and ensuring expected outcomes. Standards serve as benchmarks for budgeting and forecasting, helping to predict future expenses and allocate resources effectively. Evaluating costs against standards also assesses efficiency, performance and quality criteria. ISO 9001-2015 is a widely used quality management standard that helps organizations to improve performance, meet customer expectations and demonstrate commitment to quality *(25)*. The ISO lists 47 different standards for wheelchairs, covering all aspects of design and dimensions *(26)*. The application of minimum quality standards would likely incur cost increases for some products, including those locally produced.

2.5 Overview of the wheelchair market

The current level of estimated supply of 2000–2500 wheelchairs needs to be further mapped to the extent possible. The data on demand, need and users should be disaggregated to capture age, gender and elements related to user profile to distinguish and differentiate the different type of wheelchair models needed, as this is currently very difficult to assess based on the existing data.

Tajikistan could adopt minimum reference standards for wheelchair types and models and service standards for proper customization, such as postural support. Additionally, the Government could form a consortium with service providers and suppliers to plan annual procurement needs. By pooling demand, they could negotiate better prices from manufacturers, particularly in Uzbekistan, reducing transport and freight costs. This would help with cost efficiency and effectiveness.

Tajikistan needs to increase its supply of wheelchairs and diversify the number of models it offers to ensure users have a more diversified range of wheelchairs, which should include light weight and active user models. Users will need help to understand the differences in wheelchairs and the support needed for active users. Data need to be captured covering age and gender of users to identify the different categories of need. Additionally, increasing technical staff capacity can ensure that wheelchair provision is fitted to the users appropriately, including wheelchair model, size and individual customization.

Sustainable procurement involves considering social, economic and environmental impacts when buying products and services. It goes beyond just focusing on environmental benefits. The goal is to support local development, reduce environmental harm and get the best value for money (Box 1).

BOX 1.

Sustainable procurement

WHO aims to encourage green manufacturing and the consideration of social and economic factors in purchasing decisions, while also helping local industries to grow. However, balancing these three aspects can be challenging, particularly when social impacts are harder to measure. Making decisions without enough evidence and prioritizing one aspect over another are key difficulties. Therefore, solutions need to be tailored to each situation, based on readiness, market influence and specific goals. Such initiatives support the United Nations Sustainable Development Goals, particularly Goal 12, which promotes sustainable consumption and production.

Tajikistan can improve coverage and reduce costs by minimizing equipment loss through recovery approaches, adopting sustainable recycling practices to reuse, repair and recondition wheelchairs that are no longer needed by their users. A loan-based service provision model requires the provider to retain ownership of the wheelchairs, which are to be returned when no longer needed so that they can be reconditioned and reissued to a new user. This is particularly useful for users who only require a wheelchair under temporary circumstances, such as recovering from an illness or injury, during palliative care or when anticipated to undergo changes in their body size or posture (such as children or bariatric patients). This model operates at the municipal level and could be implemented in collaboration with community care programmes or community-based NGOs.

2.6 Wheelchair market recommendations

- Pool national demand
  - » Collaboration through a consortium approach based on minimum reference standards to pool national demand is recommended to defragment the market and increase from individual small orders. As national demand is currently estimated at 2000–2500 wheelchairs annually, this larger volume of procurement would help in negotiating diversified product offerings and pricing discounts with manufacturers.
  - » Visualizing demand at subregional or regional levels would support future procurement planning.
- Diversify models
  - » The Government programme can be used to promote a diverse range of wheelchairs, including lightweight and active models and to educate users on the differences between wheelchairs.
  - » Capturing demographic data to verify user needs across different categories is useful for establishing demand in the future.
- Return, refurbish, repair and reuse
  - » Adoption of sustainable practices where service providers offer assistive products to users for temporary use, to be returned for reconditioning, repair and recycling, helps to avoid waste. Examples from programmes that currently operate through a loan model demonstrate that this approach works best with high-quality wheelchairs that can maintain their value over time. This approach, therefore, has a long-term cost benefit to improve coverage rates, develop a business model for wheelchair provision and create skills development opportunities for people with disabilities in the NOC.
  - » Regular maintenance and collaboration with municipal community care programmes and organizations can support implementation of this approach.
- Product rental
  - » Temporary rental services are useful for people with a temporary need for a wheelchair or assistive product. This model is common in small-scale businesses but could be an affordable option to adopt within this context in Tajikistan. A rental model or a rent-to-own model could be piloted as a startup or an extension of an existing assistive products retailer.

- Product leasing
  - » In addition to the rental concept, product offerings could be expanded through leasing. Leasing allows users to acquire higher quality wheelchairs with instalment payments, easing the cost burden. Though Tajikistan's cash-based economy may not favour leasing, it offers a viable option for those with limited capital who need regular equipment upgrades or modifications.
  - » Leasing equipment offers several advantages, including lower initial costs and minimal impact on cash flow. Users can also upgrade and replace equipment, as the owner assumes the risk of outdated or broken equipment. This arrangement can increase product choice and quality, with options for maintenance and repair services. For the Government, leasing can lead to significant cost savings and increased distribution of wheelchairs, while retaining ownership and expanding product choices.
  - » Leasing requires a long-term commitment, resulting in higher overall costs, and users ultimately do not own the equipment. Despite this, the lack of ownership can be beneficial, as obsolete equipment can be traded in and, in turn, repaired and recycled by the owner.

3. The hearing aid market

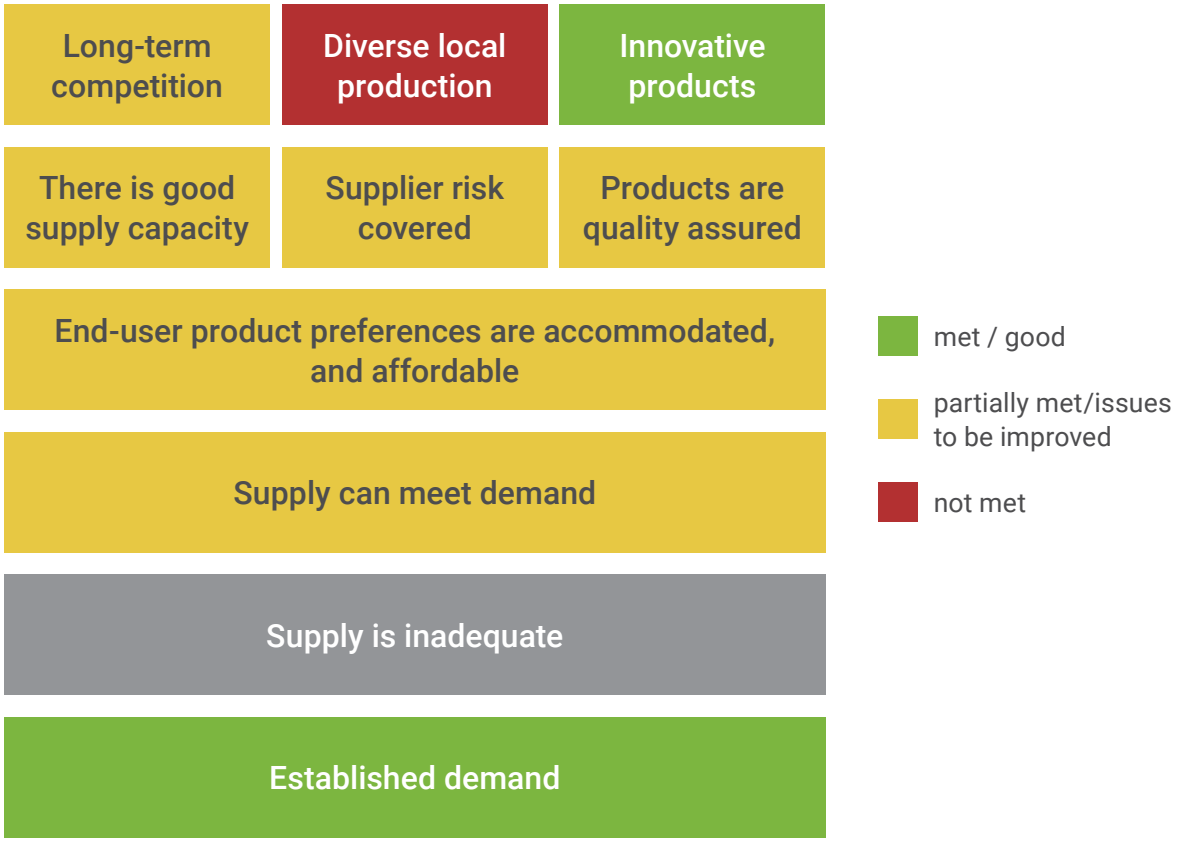
There appears to be a very limited range of hearing aids and hearing aid-related services and specialists in Tajikistan. For example, it is reported there is only one certified audiologist. Additionally, the capacity of hearing aid suppliers is very limited, but this may reflect the low demand from the market. Reasons for this low demand could include the high associated out-of-pocket costs to the user and low purchasing power of the average person (as a digital hearing aid product is two to three times the national salary) and low awareness and knowledge of hearing loss and related treatment. The market determinants were identified for hearing aids in Tajikistan (Table 9).

Table 9. Market determinants for hearing aids

Determinant	Characteristics
Acceptability/utilization	The market only offers a limited choice of products that can meet end-user needs and that are adapted to their profile
Affordability	There is a limited range of product prices available, including low-cost options, with few financing models
Availability	There is a limited range of products available to meet user demand at all points of service delivery
Competition	There is very little competition in the market; product choices are based on low-cost options and dominated by suppliers with full influence over market
Delivery	The supply chain and distribution system and capacity to deliver for products do not have reach into all regions and there are no specialized fitting services
Finance	The market is heavily reliant on Government funding support to cover the known needs and demand
Quality	There are no national regulatory reference standards or measures to ensure product safety, quality and technical specifications; these are subject to supplier oversight and judgement
Coverage	Coverage is low with significant gaps according to model type; an assessment of equitable coverage is not possible as existing data are not currently disaggregated

Additionally, there are currently no national quality reference standards for hearing aids in Tajikistan. However, many of the digital hearing products on the market are imported from recognized manufacturers in countries such as Denmark, Germany, Switzerland and the United States of America, and less expensive products from China, Iran (Islamic Republic of) and the Russian Federation. There are other hearing products marketed and sold as hearing aids, such as amplifiers, which are significantly less expensive, available over the counter and supplied by the Government. Fig. 3 outlines the hearing aid market in Tajikistan using the healthy market framework assessment (shown in Fig. 1).

Fig. 3. Assessment of the hearing aid market in Tajikistan using the healthy market framework



Personal sound amplification products (amplifiers), hearables and hearing aid applications are alternatives to hearing aids. They are often more affordable and accessible as they do not require a specialized workforce and equipment. However, their effectiveness, benefits and limitations require careful investigation *(27)*. For example, if not adjusted to safe levels, these alternatives can cause hearing damage. Therefore, WHO recommends hearing aids that meet users' amplification needs, comply with quality standards and align with WHO's preferred profile for hearing-aid technology suitable for low- and middle-income countries *(28)*.

Within the hearing aid market, there is no single service provider dominating the market. Each supplier has an equal share, including the Government, which provides a limited quantity of amplifiers. All hearing aid service providers require an importation licence for medical equipment and a licence for service provision, both issued by the Ministry of Health and Social Protection. All service providers reported a significant need for improved access to information for users, service providers and medical professionals to address common misunderstandings of hearing loss, how to address it and where to seek help.

3.1 Demand

Recent assessments in Tajikistan identified 56 329 people needing hearing aids, based on the prevalence of deafness in those over 65 years. An estimated 2–3% of the population may need a hearing aid, but only those with moderate-to-severe hearing loss seek devices. Market data show only 1145 people seek hearing aid services annually, representing 0.4% of those affected (281 645 people) or 2% of the annual demand (56 329). In addition to these figures, there may be a larger yet unquantified number of people sourcing hearing aids privately, often from Uzbekistan.

Private clinics dominate the hearing care sector in Tajikistan and require a skilled workforce. Professionals need to understand hearing loss assessment, various hearing aid technologies, audiogram use for device configuration, custom ear moulds and battery technology. Additionally, skilled technicians are required to treat infants, children and nonverbal individuals. The necessary skills for hearing care are not taught in Tajikistan, so the workforce is trained abroad and often funded by private clinics or product manufacturers rather than educational institutions. Most training for Tajikistan's hearing aid service providers occurs in Iran (Islamic Republic of), the Russian Federation and western Europe.

3.2 Supply

Tajikistan has a modest but sufficient variety of hearing aids, although not all are appropriate. In addition to digital devices, amplifiers are also prevalent and can be bought over the counter in many pharmacies or provided by the Government via the NOC. It is important to inform users about the limitations of these devices and their potential to cause harm if used inappropriately. WHO has published guiding documentation on preferred profiles for hearing-aid technology suitable for low- and middle-income countries, which could be useful for Tajikistan *(28)*.

There are at least three specialized clinics in Tajikistan providing services for hearing loss, digital hearing aids and custom ear moulds. Through the process of this market assessment, the two suppliers Somea and Sino Clinic were both successfully contacted, while attempts to reach a representative from Audifon failed. Suppliers reported they must pay 15% tax on digital assistive technology, which includes hearing aids.

3.2.1 Somea

Somea is a private clinic treating 10–15 patients monthly or 120–180 annually, with 60% adults and 40% children up to age 15 years. The clinic estimates that 150 000 people in Tajikistan need hearing aids, but only a third (50 000) seek them. The clinic representative thought that the Government should focus on children with congenital hearing loss and older adults.

Somea supplies eight products from three well-known hearing aid manufacturers: Aurica, Oticon and Signia. These manufacturers are based in Denmark and the Russian Federation and source their products through private contacts and networks. Products range from 2630 to 9000 somoni (US$ 240–823), while custom moulds range between 200 and 400 somoni (US$ 18–36) and take 5–7 days to fit. Additionally, discounts of 20–30% are available depending on individual circumstances.

The clinic reports keeping up to date with advancements in hearing aid technology through the Internet and sourcing their products primarily through networking at trade fairs and expositions in China and Dubai. The clinic orders once or twice each year depending on stock levels, maintaining an average of 200 units in stock at any given time, which represents a year's supply. It also orders hearing aid products from the Russian Federation directly and through a wholesaler based in Uzbekistan. The wholesaler supplies the region through a regional office and is an agent for many international hearing manufacturers, such as Danish and German brands. Most products are shipped overland take 2–3 days to arrive from Uzbekistan or 1 business day via air.

3.2.2 Sino Clinic

An Iranian private hospital's hearing aid clinic treats nearly 20 patients monthly, totalling around 240 annually. The Clinic estimated that 1–2% of Tajikistan's population, or 100 000–200 000 people, need hearing aids. Demand mainly comes from those with severe hearing loss because issues of cost, awareness or stigma may prevent those with less severe hearing loss from seeking treatment. Sino Clinic cites approximately 20% of patients are unable to afford the full cost of hearing aids, resulting in 20–30% who require a discount, and 40–50% who are able to pay in full.

Sino Clinic employs Tajikistan's only certified audiologist, who was trained in the Islamic Republic of Iran. Devices are sourced through Iranian networks: ordering approximately 30 hearing aids per quarter from the Islamic Republic of Iran and offering eight products from Oticon (Denmark), Signia (Denmark), Phonak (Switzerland) and Unitron (Switzerland). Prices range from 2500 to 7000 somoni (US$ 228–638) with a 1-year guarantee and a 5-year service period, while custom moulds cost between 150 and 200 somoni (US$ 14–18). The Clinic also offers cochlear implant surgery in the Islamic Republic of Iran, using implants costing from 65 000 to 117 000 somoni (US$ 9000–11 000).

3.2.3 Lavozmoti Tibbi

Lavozmoti Tibbi is a supplier that sells approximately 500 units annually and imports two types of hearing aid amplifier: one behind-the-ear model and an in-the-canal model, priced from 1062 to 2124 somoni (US$ 100–200).

3.2.4 NOC

The NOC provides approximately 225 amplifiers through the Government. Of these, 164 devices (73%) were supplied to the Districts of Republican Subordination and Khatlon. These data suggest that half of the 1145 hearing aids supplied in Tajikistan are amplifiers rather than digital hearing aids.

3.2.5 Supply in Uzbekistan

Uzbekistan has over 15 hearing aid service providers, with five to six suppliers holding a significant market share and selling 500–600 units annually. The country has one of the largest mould manufacturers, which produces approximately 5000 moulds annually, and several pharmaceutical chains providing 1500–3000 amplifiers each year. The largest hearing aid provider in Uzbekistan is Acoustic Centre of Hearing/ Euro Hearing, established in 2006. It supplies around 25 000 units yearly with 50% provided through Government vouchers, representing 60–85% of the market. It offers a full range of products and services, with hearing aids starting at 1.5 million som (US$ 115), and it supplies about 26 different hearing aid products from manufacturers such as Audifon, Oticon, ReSound, Signia and Widex. Some manufacturers, such as Signia (WS Audiology), exclusively use Acoustic Centre of Hearing due to its significant market share. Other manufacturers such as Phonak and Bernafon are also present, along with products from the Russian Federation. Bernafon and Audifon (Kind Group) have independent outlets in Uzbekistan.

3.3 Cost

This market assessment found that hearing aid products in Tajikistan ranged in cost from 2500 to 9000 somoni (US$ 240–823). Custom moulds cost between 150 and 400 somoni (US$ 14–36), bringing the total price to 2650–9400 somoni (US$ 254–859). With a 30% discount offered by clinics, prices can be reduced to a minimum of 1855 somoni (US$ 170), which is still relatively expensive compared with the national average wage in Tajikistan (2000 somoni or US$ 180).

This high cost contributes to the low coverage rate, estimated at only 0.4% of those needing hearing aids. Over-the-counter amplifiers imported from China and the Russian Federation and priced between 100 and 200 somoni (US$ 9–18) offer a more affordable alternative to users who lack coverage. These amplifiers are often procured by the NOC and the Government and may be more financially accessible to users but do not require customized fitting and carry a high risk if not used correctly.

Overall, the need for greater information, guidance and awareness in hearing care in Tajikistan is evident. WHO and the United Nations Children's Fund offer guidelines on quality-approved hearing aids through their approved product list, which lists hearing products from 649 to 2769 somoni (US$ 61–260) and include various accessories. Listed prices exclude transport, shipping and delivery costs.

3.4 Quality standards

There are no national minimum reference quality standards and guidelines for hearing aids in Tajikistan. This creates issues with access and cost, as people may choose other products marketed and sold as hearing aids, such as amplifiers or other over-the-counter products that may be affordable but inappropriate for their needs.

Irrespective of established standardized quality standards, most digital hearing products on the market are manufactured to a high degree of quality by recognized producers in Denmark, Germany and the United States. Additionally, products from China, Iran (Islamic Republic of) and the Russian Federation are also high quality and can accommodate user product preferences.

3.5 Overview of the hearing aid market

The assessment of the hearing aid sector underscores the need to scale up service delivery, raise awareness and capacity, and improve financial access. The public is generally unaware of hearing loss and the differences between hearing aids and amplifiers, and there is a pervasive stigma related to using these products. With only one trained audiologist and three technicians, there is a critical need to enhance skills and service capacity, requiring significant investment.

Additionally, cost remains a major barrier to accessing hearing care and hearing devices. Collaborative discussions among hearing aid service providers could help to harmonize service costs. One idea is for service providers to form a consortium to pool annual demand and seek quotations from suppliers to leverage better product pricing. Increasing demand through awareness campaigns and collaboration between clinics and the health-care system could support skills training expansion. Additionally, engaging with agents in Uzbekistan to leverage their price discounts could also help to supply affordable products to the market.

3.6 Hearing aid market recommendations

The assessment of the hearing aid sector highlights the need to scale up service delivery and demand, address high costs and low coverage and improve awareness and capacity.

- Information awareness
  - » Raising awareness about hearing loss is crucial to combat stigma and highlight risks of over-the-counter products such as amplifiers, as well as to generate demand-driven supply. A major awareness campaign is needed to address the lack of understanding about hearing issues. This effort would generate demand, driving supply and warn against the risks of amplifiers.
- Coverage
  - » The Government presently only provides coverage for amplifiers, which are less expensive but not customized and can cause harm if used incorrectly. It should consider adopting digital hearing aids within its funding programme to facilitate access to more comprehensive hearing care and essential digital hearing products.
- Skills training
  - » As there is only one audiologist and three technicians in Tajikistan, there is a critical need to scale up the current skills and service capacity delivery to provide hearing services. This inevitably requires additional investment for both training and recruitment of skilled hearing care professionals.
- Private–public partnership
  - » There are several dominant operators in the subregion offering cost-effective hearing aid services. The Government could consider forming partnerships with these providers to expand hearing care coverage, focusing on raising awareness and training in audiology.
  - » Setting minimum quality standards and encouraging access to low-cost underused options (even if they are older models) can help to build demand from untapped customers. These new users can become repeat customers, upgrading their devices over time, while suppliers build customer relationships. The goal is to avoid prohibitive entry costs and make the market more appealing in order to strengthen it.

4. The P/O market

The current market in Tajikistan does not fully meet the needs of individuals requiring P/O, offering only a basic range of products. Most P/O products are imported from China and deemed appropriate based on budget and affordability, targeting basic user needs. However, there are no national quality reference standards, leaving quality judgements up to the manufacturers and importers. The market determinants (as outlined in Table 4) were identified for P/O in Tajikistan (Table 10) and Fig. 4 outlines the market using the healthy market framework.

Table 10. Market determinants for P/O

Determinant	Characteristics
Acceptability/utilization	The market only offers a limited selection of customizable products to meet end users' needs
Affordability	There is a limited range of product prices available, including low-cost options, with few payment modalities
Availability	There is a limited range of products available to meet demand at all points of service delivery
Competition	The market is highly competitive and limited, with product choices primarily driven by low-cost pricing; suppliers hold significant influence over the market
Delivery	The supply chain and distribution system and their capacity to deliver products and specialized services reaches all regions
Finance	The market is heavily reliant on Government financial support to cover all known user needs and product demand
Quality	There are no regulatory standards or measures in place to ensure product safety, quality and technical specifications; these aspects are left to the oversight and judgement of suppliers
Coverage	Overall coverage is low, with significant gaps across different model types; assessing equitable coverage is challenging due to the lack of disaggregated data

Fig. 4. Assessment of the P/O market in Tajikistan using the healthy market framework

Regarding volume and value, the coverage of needs generally reaches 22% of people with disability or 66% based on needs per year. As the market is already focused on low-cost products, there is little room to manoeuvre on pricing. Rather, there may be room to consider wider regional cooperation to pool substantiated demand and leverage these data to negotiate prices discounts on larger volume orders. Every year, Tajikistan plans the production of P/O equipment, which it meets; consequently, need is currently based on what can be achieved within the defined budget allocated.

4.1 Demand

This market assessment found an annual need for 194 222 units of various P/O products in Tajikistan. Foot devices make up the largest group of assistive products, representing 38 123 units, while prostheses represented 1062 units and orthoses represented 9085 units. These data reflect the number of products – not individuals – as one person may require multiple assistive products. The figures are based on the incidence and prevalence of related conditions, not actual cases in Tajikistan, but they provide a good estimate of demand (Table 11).

Table 11. P/O needs

Assistive technology	Unit
Prostheses	
Upper limb	162
Lower limb	900
Total protheses	**1 062**
Foot devices	
Orthopaedic shoes	3 500
Club foot braces	245
Protective footwear	34 378
Total foot devices	**38 123**
Orthoses	
Upper limb	223
Lower limb	3 659
Spinal	4 203
Total orthoses	**8 085**
Mobility devices	
Rollators	4 650
Walkers	3 300
Standing frames	3 150
Total mobility devices	**11 100**

Source: data provided by the NOC.

4.2 Supply

4.2.1 NOC

The NOC was founded 80 years ago and serves as the primary provider of specialist rehabilitation products and services for people with disabilities in Tajikistan, producing many assistive products locally through its five centres. The NOC's primary focus in P/O work is on foot-related devices such as orthopaedic shoes, which is based on identified demand. In 2023 the NOC produced assistive products for 6691 people, including 2608 children (38%), at a cost of 7.1 million somoni (US$ 654 000) (Table 12). Of these, 4805 (71%) were for foot-related devices. In 2024 it provided 61 prosthetics and 25 orthoses and offered 114 clinical assessments and 31 repairs.

Table 12. People assisted by the NOC, 2023

Assistive technology	Unit	Adults	Children	Total
Orthopaedic shoes	People	2 921	717	**3 638**
Repair of P/O	People	428	481	**909**
Foot orthoses	People	47	650	**697**
Foot prothesis	People	344	102	**446**
Elbow crutches	People	286	75	**361**
Walkers	People	–	72	**72**
Belts	People	8	43	**51**
Hand prothesis	People	32	7	**39**
Chairs and tables	People	–	36	**36**
Waist orthoses	People	1	25	**26**
Clubfoot	People	–	24	**24**
Hip abduction braces	People	–	24	**24**
Orthopaedic neck braces	People	–	24	**24**
Incontinence products	Units	–	300	**300**
Soothing cushions	Units	4	8	**12**
Handrails	Units	3	7	**10**
Standing frames	Units	3	7	**10**
Fixation devices	People	2	6	**8**
Small-sized wheelchairs	People	4	–	**4**
Total	**People**	**4 083**	**2 608**	**6 691**

Source: data provided by the NOC.

The NOC is planning a major redevelopment with cost projections up to 32 million somoni (US$ 3 million) to expand its capacity, technical services and product offerings. Currently, it serves an estimated 15 000 people annually, with plans to double this capacity with the addition of a new centre and expanded specialized services. More specific to P/O, each NOC workshop plans to produce 5–25 prosthetics per month.

While the NOC reportedly considered the possibility of expanding the national approved product list from 30 to 41 essential assistive products, an expansion pressurizes its already limited budget. In this context,

adding high-priority products may require removing lower-priority assistive products to allow expansion of coverage for those with the highest user need. Unfortunately, effective evaluation requires access to user demand and supply data, which, as noted throughout this report, were limited. There is potential to build competencies in assistive technology of health staff at the district level to advance understand of existing products and user needs.

4.2.2 Rehabilitation centres

Tajikistan has at least 59 residential centres and 52 daycare centres treating people with disabilities and other conditions requiring various assistive technology equipment. These centres address a wide range of mental development disorders and cognitive issues, including Down syndrome, epilepsy, spina bifida, muscular dystrophy, poliomyelitis and autism.

Specialist staff at these centres provide rehabilitation services to patients after receiving referrals from a primary health-care provider. One strategy for rehabilitation centres is to receive support through partnerships with the private sector, an approach encouraged by the Government. For example, a construction company might adopt and sponsor a rehabilitation centre, providing necessary funding for critical needs, services and equipment. These public–private partnerships can significantly advance the provision of assistive technology through funding. However, if these data are not adequately mapped, it will be difficult to quantify and track coverage of needs.

4.2.3 The International Committee of the Red Cross

Due to the presence of landmines along the Tajikistan–Afghanistan border, the International Committee of the Red Cross (ICRC) supports the NOC with capacity-building, physical therapy, product development and training for equipment technicians across all NOC centres. The ICRC also provides a limited number of prostheses imported from Rehab'Impulse, a Swiss P/O technology manufacturer. These components meet international standards but are not as affordable as the products procured by the NOC from Nobel in China. The ICRC imports materials overland using a 40-foot container at a cost of 10 000 Swiss francs (US$ 11 000) and treats approximately 400 patients annually. The ICRC estimates that it covers 0.5% of the need for P/O, equating to 80 000 people, compared with WHO's assessment of 10 209 people in need.

The ICRC employs local technical staff from the Afghan community, but recent labour law changes favour hiring of local Tajiks. This change limits foreign workers to 5-year stays in Tajikistan without family dependents and requires them to accept local contracts with low monthly salaries (545–645 somoni or US$ 50–60). These conditions are unattractive to recruit and maintain skilled foreign workers and, in addition, many Tajik workers also seek higher-paying opportunities elsewhere given the low national average salary. Rehab'Impulse currently does not supply components outside ICRC programmes, meaning local procurement will be unavailable once ICRC ends its programme.

4.2.4 Supply in Uzbekistan

Uzbekistan lacks a national technical training facility and certification for P/O, relying instead on supplier training and apprenticeships. Approximately 10 companies provide P/O products and services. Previously, the Government supported P/O services through 11 national centres of rehabilitation and prosthetics, each with an affiliated workshop. In 2023 these P/O service units were privatized, forming a single company with a central facility in Tashkent and 10 regional branches.

In the first 6 months of its first year, the new company treated 550 people for lower limb support, 135 for upper limbs, 345 for breast prostheses, 56 for knee–ankle–foot orthotics and 201 for lower limb orthotics. The company employs 13 staff in Tashkent and one assistant in each branch. Most P/O products are imported from China, Taiwan China or Germany, with prices subject to high inflation. As of 1 May 2024, the Government reimbursement rate was up to 32 million som (US$ 2500) for above-knee prostheses and 14 million som (US$ 1100) for below-knee prostheses.

4.3 Cost

In 2023 an estimated 4277 people received assistive products through Government tender and 6691 received assistive products produced by the NOC, totalling 10 968 units. Including the beneficiaries of 990 wheelchairs and 225 hearing aids, 12 183 people with disabilities were assisted in Tajikistan (representing 6% of the total number of people with disabilities in need). This was based on a budget of 5.6 million somoni (US$ 525 000), excluding salary costs, resulting in a per capita cost of 459 somoni (US$ 42) per person. The Government could use this reference to estimate the budgetary needs for the estimated 158 459 people with disabilities, excluding wheelchairs and hearing aids.

For P/O, the market assessment could not accurately determine costs due to the breadth of diverse P/O products, parts and materials and their corresponding wide range of price points. There is also a need to establish consistency regarding which products should be categorized as P/O. Existing data from 2023 indicate that the NOC produced assistive products for 6691 people, including 2608 children (38%), at a cost of 7.1 million somoni (US$ 654 000). Of these, 4805 (71%) were for foot-related devices, resulting in a per capita cost of 10 741 somoni (US$ 1000) per person. Assessing current coverage rates against the number of people in need to achieve universal coverage would require a deeper level of analysis.

4.4 Quality standards

Tajikistan lacks reference quality standards and minimum regulatory requirements for P/O. These standards are determined by service providers and suppliers. Implementing regulatory compliance would add complexity and costs to the development, manufacturing and distribution of P/O, given the wide range of products and technologies.

However, most manufacturers of critical prosthetic components comply with ISO 13485:2016 for medical devices and quality management systems *(6)*, as well as ISO 9001 for quality management systems (Table 13) *(25)*. Any compliance with regulatory requirements would likely add complexity and costs to the development, manufacturing and distribution of P/O.

Table 13. Manufacturers of P/O components

Supplier	Country of origin	Registration with EU or FDA	ISO 13485	ISO 9001
Alps South	United States	Yes	Yes	–
College Park Industries	United States	Yes	Yes	–
Nobel China	China	No	Yes	Yes
Ortotek	Türkiye	No	Yes	Yes
Ortpar	Türkiye	No	Yes	Yes
Ottobok	Germany	Yes	Yes	–
Proted	Türkiye	No	Yes	Yes
Regal Prosthesis	China	Yes	Yes	Yes

EU: European Union; FDA: United States Food and Drug Administration.
Note: green colour highlights where formal compliance exists.
Source: WHO

4.5 Overview of the P/O market

The P/O market is highly fragmented, featuring a broad and specialized range of products, components, materials and suppliers. This market segment requires highly specialized skills and expertise and currently has a small caseload and limited coverage for products. The market's complexity arises from several factors, including rapid technological advancements in material science, mechanics and robotics, which necessitate continuous investment and adaptation by manufacturers and health-care providers. The high cost of specialized components, compounded by increasing importation costs and limited budgets, restricts demand for P/O, which in turn restricts expansion of coverage for P/O.

Additionally, the high level of customization and personalization required to meet each patient's unique needs, anatomy, lifestyle and cosmetic preferences layer further complexities to the design and manufacturing process of P/O. As P/O products are commonly imported from international manufacturers to keep costs low, different regulatory environments, health-care systems and cultural norms of manufacturing countries further complicate supply chains and distribution networks.

To address these challenges, collaboration among manufacturers, health-care providers, regulators and patients is crucial to ensure access to high-quality, personalized devices. The Tajikistan Government could pool demand with neighbouring countries to leverage volume and pricing discounts from suppliers. This is a gradual process, requiring collaborative negotiations and procurement arrangements.

Tajikistan's annual tender for assistive technology needs could benefit from increased visibility around P/O product demand. Service providers could form a consortium to present a combined demand for imported P/O products, materials and components. This would help the Government to understand sourcing, volumes, values and countries of origin, potentially influencing price discounts. Pooling demand data would provide a comprehensive view of Tajikistan's national demand, helping to identify supply gaps and assess economies of scale.

Service providers currently procure independently on a case-by-case basis, but pooling procurement data from the past 3–4 years could reveal trends and inform future strategies. Data should be aggregated to yield insights on stakeholders and suppliers, which can support discussions on price discounts and corporate social responsibility considerations. Through collaborating, service providers can expand market coverage and demand, benefiting users and the industry.

4.6 P/O market recommendations

- Pool information on demand across product segments
  - » The market currently in Tajikistan is fragmented and so articulating and pooling an overview of the full scope of P/O products procured from different service providers would enable a consortium approach to fulfilling demand.
  - » Analysing data on where products are sourced can help to identify ways to leverage greater price discounts from key suppliers and is integral to clarifying assistive technology demand at a subregional level for regional considerations.
- Insurance and the Basic Benefit Package
  - » The Government could consider discussing with prominent health insurance companies in Tajikistan the possibility of offering insurance options to cover assistive technology, particularly for P/O.
  - » Including P/O in the Government's financing for the Basic Benefit Package would improve access for people not registered as disabled but who would still benefit from using assistive products.

5. Overall assistive technology market recommendations

The overall assistive technology market in Tajikistan is small and fragmented and requires a customized approach to strengthen it, as identified market shortcomings cannot be addressed through a consumerist approach. The assistive technology market is highly dependent on Government budgets and funding; therefore, it is not driven by commercial gain for its stakeholders (such as manufacturers and suppliers) who currently bear significant financial risk.

The market analysis yielded eight overarching recommendations, described further below, which can address some of the critical challenges identified in this study. Specific recommendations for each market segment examined (wheelchairs, hearing aids and P/O) have been outlined within the relevant sections above.

- Data collection
  - » Information on the importation of assistive technology within Tajikistan (specifically the number of units, value and country of origin) would provide a comprehensive understanding of the total assistive technology market segments. Importation data can be used to compare with Government-funded programmes or can be combined with a wider mapping of the known sources of the provision of assistive products.
  - » Additionally, it is recommended that Tajikistan improves the mapping of user needs and the corresponding demand for assistive products, rather than relying on the quantification of incidence and prevalence of disability. This is particularly pertinent as not all who need assistive technology have an identified disability. Therefore, it is likely that existing data do not accurately represent all user needs, such as those of older adults and people with chronic health conditions. There is an existing gap in national data, which if filled could highlight potential versus proven market demand and the challenges preventing access and availability.
- Closer cooperation between service providers
  - » To improve cooperation among assistive technology stakeholders in Tajikistan, it is essential to have a comprehensive understanding of the needs, demand and coverage. Currently, service providers lack this understanding and available data are often not disaggregated by age, gender or market segment.
  - » Regularly sharing baseline programme information can ensure that everyone has access to updated data. If the Government collects such data, a portal to facilitate sharing and collaboration with diverse stakeholders across the assistive technology market could enhance understanding of various assistive technology segments within Government and among stakeholders.
- Industry consultation
  - » Advocating for public and private sector cooperation, rather than competition, aligns with corporate social responsibility principles and the President's call to care for the vulnerable. This collaboration can enhance pricing structures and formalize price reductions, making budgets more effective.
  - » Including local user associations and people with disabilities in consultations can provide valuable insights and contributions.

- Quality standards
  - » Developing national reference standards and specifications for priority assistive technology products in Tajikistan is crucial for assessing cost–effectiveness. Comparing costs against these standards helps to identify discrepancies and allows for corrective actions in programme implementation and expenses.
  - » These benchmark standards aid in budgeting and forecasting, enabling stakeholders to predict future expenses and allocate resources more effectively.
  - » Evaluating costs against standards also helps to assess efficiency, performance and quality criteria.
- Matching funds
  - » Given Government budget constraints and the current focus on quantity over quality, opportunities should be explored to subsidize the price difference for critical assistive products, such as wheelchairs, hearing aids and P/O. This could allow people needing access to these products to obtain more expensive products over time, ensuring better quality while managing costs.
- Voucher system
  - » The Government could explore the options and advantages of establishing a voucher system with countries such as Georgia or Uzbekistan. This approach could be more cost-effective than the current tender system for assistive technology procurement.
- Information awareness
  - » A major awareness and information campaign is needed to address the lack of understanding of assistive technology and its related supports and services among the public, assistive technology users and health system stakeholders, such as health-care staff and policy leaders.
  - » This effort could broadly aid in increasing access by way of increasing awareness, as well as generate increased product demand, which, in turn, would drive supply.
- Uzbekistan as a source
  - » Uzbekistan's proximity and plans to develop its health sector, including assistive products production, make it a viable procurement source due to lower transport costs. Tajikistan could pool assistive products data to negotiate better pricing through a consortium approach. However, Uzbekistan currently also lacks national or ISO reference standards for its products.

6. Conclusions

This report shares findings from an assessment of the assistive technology market in Tajikistan, which aimed to better understand the wheelchair, hearing aid and P/O market segments. A broad summary of the overall assistive technology network and stakeholders in Tajikistan has been described, as well as current gaps within access to assistive technology. Market assessment fundamentals, including market determinants and a healthy market framework, were outlined and applied to support descriptions of market demand, supply, quality and costs, and provision of overarching observations and recommendations for these market segments were outlined for consideration. The results of the study gave rise to the suggestion of eight ways in which the assistive technology market in Tajikistan could be improved to enhance access to essential assistive products for its citizens.

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