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DISCUSSION



# An overview of World Health Organization guidance aiming to increase global access to critical hearing aid services

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## ABSTRACT

**Objective:** Equitable access to hearing aids and related services remains a global health challenge, particularly in resource-limited settings. A major barrier to access is the lack of diagnostic and rehabilitative services, which is substantially attributable to the persistent shortage of ear and hearing care specialists. This discussion article provides an overview of limitations in the ear and hearing care workforce, the relevance of task sharing to ear and hearing care, and a new, evidence-based World Health Organization (WHO) technical resource aimed at improving access to hearing aids worldwide.

**Design and study sample:** A synthesis of current research and expert opinion.

**Results:** First, this article describes the global shortage of qualified ear and hearing care specialists. Next, it describes how community-based care, supported by task sharing among trained non-specialist providers and qualified ear and hearing care providers, could overcome these workforce limitations, and describes the critical role of qualified ear and hearing care providers in task sharing. Finally, this article provides an overview of a WHO resource which provides practical information for hearing aid service provision in resource-limited settings.

**Conclusion:** Innovative strategies to expand the ear and hearing care workforce are essential to advance efforts towards equitable access to hearing aids and related services.

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## Introduction

The World Health Organization (WHO) estimates that over 430 million people live with disabling hearing loss worldwide, and this number is projected to rise to 700 million by 2050 (World Health Organization 2021a). Access to effective communication is critical to achieve a high quality of life and influences how people across the lifespan effectively participate in society. Hearing is fundamental for the development of speech and language in children and can have negative effects on educational attainment, employment prospects, and mental and physical health in individuals across the lifespan (Olusanya and Newton 2007; Davis et al. 2016; Mukadam et al. 2019; Gupta et al. 2023; Livingston et al. 2024). In addition to its negative effects on individuals, unaddressed hearing loss poses an extremely high cost to society, estimated at 980 billion international dollars per year (McDaid, Park, and Chadha 2021; World Health Organization 2021a).

While hearing loss impacts people worldwide, an estimated 80% of people with hearing loss reside in low- and middle-income countries (World Health Organization 2021a). Moreover, the negative impacts of hearing loss are often exacerbated for people living in limited resource settings. Reasons for this include limited public awareness, limited prioritisation of hearing given competing health priorities, lack of accommodations for hearing loss which could lead to difficulties in educational and employment attainment, and limited access to rehabilitative technology and related services (Bhutta et al. 2019).

It is estimated that over 400 million people worldwide could benefit from timely and effective interventions, such as the use of hearing aids, supported by rehabilitative services. Yet,

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worldwide, less than 20% of those who could benefit from hearing aids receive them (World Health Organization 2021a). This gap is even wider for individuals residing in low- and middle-income countries where only 9% and 15% of people, respectively, who could benefit from hearing aids receive them (World Health Organization 2021a). Several factors limit hearing aid uptake and subsequent use, all of which require attention. These barriers include misperceptions, including stigma, of hearing loss and hearing technology (David and Werner 2016; da Silva et al. 2023; Dillard et al. 2024b) and historically high costs of hearing technology and related services (McPherson 2011). Another key barrier relates to the limited access to ear and hearing services, which is often most pervasive in low- and middle-income countries.

A major limitation to accessing hearing aids, particularly in low- and middle-income countries or other resource-limited settings, is the lack of available diagnostic and rehabilitative services. This limitation is largely attributable to the persistent shortage of specialists in ear and hearing care, including audiologists and ear, nose, throat (ENT) specialists, as well as their poor geographical distribution that rarely extends to resource-limited settings, including rural or remote locations and marginalised communities (Kamenov et al. 2021; World Health Organization 2021a).

Given the important impacts of hearing loss on individuals and society, improving access to hearing aids is a substantial global health challenge and priority that must be addressed. This discussion article presents an overview of i) key limitations in the current ear and hearing care workforce, ii) task sharing and its relevance to ear and hearing care, and iii) a new, evidence-based WHO resource titled "Hearing aid service delivery approaches for low- and middle-income settings," which aims to improve global access to hearing aids and related rehabilitative services, by using task sharing approaches and community-based delivery of hearing health care.

## Key limitations in the current ear and hearing care workforce

Equitable access to hearing services, including those related to hearing aids, requires an adequate health workforce trained in ear and hearing care that provides services across the lifespan and that provides integrated services across primary, secondary, and tertiary levels of care. However, as mentioned above, the required health workforce is currently inadequate, and the coverage of services rarely extends to rural or remote locations and marginalised communities (Kamenov et al. 2021). Furthermore, ear and hearing care, if available at all, is often provided only at secondary and tertiary levels, that is, more specialised levels of care. This means there are often few facilities that offer hearing aid related services, and these services can be difficult to access for several reasons. One of these reasons is the lack of established referral pathways, or complex pathways involving multiple types of providers, that individuals must navigate to receive ear and hearing care.

A previously published study, led by WHO, presents data from 141 countries on the global ear and hearing care workforce, including audiologists, ENT specialists, speech language pathologists, and teachers of the deaf (Kamenov et al. 2021). That study demonstrates the pronounced differences in specialist provider density, which decreases across country income level. While 65% of high-income countries have $>$ 10 audiologists per 1 million population, 93% of low-income countries have $\leq$ 1 audiologist per 1 million population. Similarly, in terms of ENT specialists in high income countries, 52% and 43% of countries have $>$ 50 and $>$ 10 to $\leq$ 50 ENT specialists per 1 million population. In stark contrast, 78% of low-income countries have $\leq$ 1 ENT specialist per 1 million population (Kamenov et al. 2021).

These estimates demonstrate the global dearth of the ear and hearing care workforce. While these shortages are most salient in low- and middle-income countries (Sanders et al. 2015; Thorne et al. 2019; Pillay et al. 2020; Kamenov et al. 2021), the lack of specialist ear and hearing care providers, as well as their imbalanced geographical distribution, has been also described in high-income countries (Bush et al. 2014; Blazer et al. 2016; Coco, Titlow, and Marrone 2018; Hay-McCutcheon, Yuk, and Yang 2021; Nieman et al. 2017, 2022). This reiterates challenges caused by the lack of human resources in ear and hearing care as a global issue.

## Task sharing as a strategy to overcome limitations in human resources

Shortages in human resources can be addressed and overcome through innovative workforce strategies that build the workforce capacity needed to provide greater coverage of ear and hearing care services (World Health Organization 2021a). Task sharing is an established public health strategy employed within diverse fields from HIV/AIDs to chronic disease management (World Health Organization 2008). Task sharing within ear and hearing care is a promising approach that can aid in addressing the critical lack of health care workers to provide ear and hearing care services, including those related to assistive technologies such as hearing aids (Suen et al. 2019; World Health Organization 2021a; Coco et al. 2023; Nieman et al. 2017, 2022; Dillard et al. 2024a).

Task sharing is a team-based approach where specific clinical tasks, or their key components, as well as the required skills and competencies to accomplish those, are shared among different cadres of health workforce teams (World Health Organization 2008). In ear and hearing care, tasks can be shared among highly trained professionals, such as audiologists or ENT specialists, and trained non-specialist providers, such as health or community workers, with shorter training and fewer qualifications, who are given the capacity to take on specific tasks or actions (World Health Organization 2021a, 2024a, 2024b; Dillard et al. 2024a).

Research in other health-related fields, and in audiology, has demonstrated that task sharing is an efficient use of available human resources and can provide equivalent outcomes to traditional approaches, where services are provided only by highly trained specialists (World Health Organization 2008; Martínez-González et al. 2015; Kim et al. 2016). More specifically, task sharing has been successfully implemented in several resource limited settings to deliver key ear and hearing care services spanning the continuum of ear and hearing care, including hearing aid provision (Ekman and Borg 2017; Borg, Ekman, and Östergren 2018; Frisby et al. 2022; Coco et al. 2023; Nieman et al. 2017, 2022).

The training and instruction that trained non-specialist providers receive in resource-limited settings has been summarised in a recent literature review (Dillard et al. 2024a). This review shows that trained non-specialist providers receive formal training in the tasks they perform but are rarely required to have a specialised certificate or degree. Competencies gained from the formal training are verified through formal assessment (Emerson, Job, and Abraham 2013; Ekman and Borg 2017; Borg, Ekman, and Östergren 2018; Frisby et al. 2022; Coco et al. 2023; Nieman et al.

2017, 2022). Importantly, audiologists and ENT specialists play a critical role in the development of training curricula, and in supervising and mentoring the trained non-specialist providers (Nieman et al. 2017; Frisby et al. 2022, Coco et al. 2023). Depending on resource availability and needs, training and supervision can be conducted either in-person and/or remotely using telehealth. In situations where there are few or no ear and hearing care specialists, partnerships with experts in neighbouring countries and/or e-learning technologies can be leveraged to enable remote education and supervision (Frisby et al. 2022, Penteado et al. 2012).

Community-based care, supported by task sharing, which involves providing services near to or in individuals' homes, can overcome several barriers to ear and hearing care services, including workforce shortages, inability to reach physical locations where ear and hearing care services are provided, limited trust in providers, cultural and language barriers, and affordability (Waterworth et al. 2022). Trained non-specialist providers often live in or near the communities in which they are providing services and share characteristics and/or shared lived experiences with those to whom they provide care, reducing barriers related to proximity and/or to trust in providers. Furthermore, community-based care, supported by task sharing, facilitates the use of innovative and low-cost hearing technologies, including preprogrammed or other easy-to-fit hearing aids (Swanepoel 2020, 2023), reducing barriers related to the high costs of traditional ear and hearing care services and hearing devices.

Task sharing must be a component of an overall workforce strategy, including workforce planning, training, and retention, and be preceded by a situation analysis and assessment of currently available human resources for ear and hearing care. All training needs, procedures, and quality assurance mechanisms should be clearly defined, and all processes should comply with the health regulations of the country. Importantly, task sharing strategies could be implemented as a temporary measure during the development or expansion of ear and hearing care services and its specialist workforce. That is, task sharing is not a permanent solution to the issues posed by limited human resources. Long-term solutions require expanding the specialist workforce.

## An evidence-based resource: hearing aid service delivery approaches for low- and middle-income settings

In March 2024, WHO released an evidence-based technical resource, developed through a consultative process, titled "Hearing aid service delivery approaches for low- and middle-income settings" (World Health Organization 2024a). The motivation for developing this resource was to provide strategies to narrow the gap in access to hearing aid services in low- and middle-income countries and other resource limited settings.

Global health organisations, including WHO and ATscale, the Global Partnership for Assistive Technology, recognise the gaps in access to hearing aids and related services as a global health priority. WHO and ATscale have released several resources to improve the access and affordability of ear and hearing care services, including those related to hearing aids (World Health Organization 2017, 2021b; ATscale Global Partnership for Assistive Technology 2019). While these resources provide essential guidance related to global access and affordability of hearing aids, until recently, there was no formal guidance specifically focused on service delivery approaches for hearing aids.

The resource titled "Hearing aid service delivery approaches for low- and middle-income settings" (World Health Organization 2024a), an overview of which is provided below, aims to fill this important gap. The primary audience for this guidance is decision makers involved in the development and/or improvement of ear and hearing care services. Other audiences who may be interested in this guidance include organisations and individuals tasked with improving access to ear and hearing care and/or assistive technologies. The development of this resource was informed by a i) literature review and interviews to gain insight into current practices and opportunities in hearing aid service delivery approaches in low- and middle-income settings (Dillard et al. 2024a; World Health Organization 2024b), ii) continued discussion and engagement with stakeholders and experts in ear and hearing care, including individuals with hearing loss and hearing aid users, and iii) field testing of the approaches discussed below in several sites in India, South Africa, and the United States of America.

This resource provides practical information for service provision of hearing aids and related services at the community or primary levels of care, supported by task sharing among trained non-specialist providers and qualified ear and hearing care providers, to ultimately improve access to essential hearing aid related services. Furthermore, it addresses the factors that should be considered when developing a community-level programme for hearing aid-related services in low- and middle-income settings. Importantly, services must be integrated into local health care systems, all services and hearing devices should be affordable, without affecting the quality, and hearing aids should be recommended when needed, but the final decision on hearing aid fitting rests with the individuals themselves. This resource details service delivery approaches that can be adapted to meet the needs of different socio-cultural and legislative realities across settings (World Health Organization 2024a).

The approaches for hearing aid service delivery outlined in this resource focus on two population groups: i) adults with moderate to severe hearing loss and ii) children aged 5 years or older with mild to moderately severe post-lingual hearing loss. It is recommended that individuals outside of those population groups, such as adults with profound hearing loss, children aged under 5 years, and children with severe to profound or pre-lingual hearing loss, and/or individuals who could not benefit from air conduction hearing aids, seek rehabilitative ear and hearing care services outside of the proposed programme, and be seen by a qualified hearing care provider. Detailed descriptions of the approaches for each of these population groups, as well as considerations for implementation, are provided in the technical resource (World Health Organization 2024a).

A brief overview of key points and processes is provided below. It is important to highlight that the approaches described below are the basis upon which programmes could be developed based on the socio-cultural and legislative realities of a given setting. That is, this approach serves as a framework which can be adapted to fit the needs of a given setting. All of the processes described below, for both adults and children, can occur at the community or primary levels of care and can be supported by task sharing among trained non-specialist providers and qualified ear and hearing care providers. Details on the processes described below, including instructions for completing each procedure or appointment, recommended forms, and required infrastructure and equipment are in the technical resource (World Health Organization 2024a). Additional details on certain techniques, including otoscopy, can additionally be found in the WHO Primary ear and hearing care training manual (World Health Organization 2023) and the Training on assistive products (TAP): Hearing aid module (World Health Organization n.d.).

### Adults

The first population group is adults who experience moderate to severe hearing loss in the better hearing ear, although persons with unilateral and mild hearing loss may be fitted if resources permit. Figure 1 shows an overview of the service delivery approach for adults.

Adults could enter into the programme based on referral from a health care provider, a failed hearing screening, or they could self-refer if they perceive that they have hearing loss. The first appointment should consist of a questionnaire-based basic profile (case history), an otoscopic ear examination and air-conduction audiometry, which is measured, at minimum, at frequencies 500, 1000, 2000 and 4000 Hz (see an example basic profile and documents for recording ear examination and audiometric results in World Health Organization 2024a; Annexe 4). Based on the audiometric results, the grade of hearing loss should be classified according to the WHO hearing loss classification, based on the pure-tone average (PTA) of thresholds at frequencies 500, 1000, 2000, and 4000 Hz. Hearing aid candidacy is defined as moderate to severe hearing loss, although, as mentioned earlier, other individuals (e.g. those with mild or unilateral hearing loss) may be fitted in certain situations. Should the individual meet candidacy for a hearing aid and wish to be fitted, they would undergo the hearing aid fitting and counselling at the first appointment. Throughout this process, referrals for further care (outside of the programme) are based on the indications for referrals which are presented later.

Follow-up appointments should be available on demand, and it is recommended that short-term follow-up appointments occur 2 weeks and 2 months after hearing aid fitting, and that long-term follow-up appointments would occur 2 years after fitting. Short-term follow-up appointments could be in-person or remote (using telehealth), based on individuals' needs and resource availability. At these short-term follow-up appointments, individuals should undergo a questionnaire-based assessment, during which they should be asked questions 1 and 2 of the International Outcome Inventory for Hearing Aids (IOI-HA; Cox and Alexander 2002), which focus on the number of hours of daily use and perceived benefit of hearing aids, respectively. The IOI-HA has been translated and validated in several languages (Cox, Stephens, and Kramer 2002), which facilitates the use of these questions in different regions and countries. When required, individuals should also undergo an ear examination, hearing aid check, and troubleshooting during short-term follow-up appointments. Long-term follow-up appointments should be in person and should consist of the same questionnaire-based assessment, and all individuals should undergo an ear examination and pure-tone air-conduction audiometry. If needed, individuals should undergo hearing aid assessment and adjustment.

### Children

The second population group is children aged 5 years or older who experience postlingual hearing loss that is mild to moderately severe. Figure 2 provides an overview of the service delivery approach for children. Binaural fitting must be provided for children when needed. Many processes are similar to those for adults (Figure 1), and some processes are added for children. Importantly, hearing aid fitting in children is often more demanding and requires a higher level of training for the trained non-specialist provider and greater supervision by the qualified hearing care provider (i.e. audiologist or ENT specialist).

While children could enter into the programme based on referral from a health care provider, it is most likely they will enter after undergoing a hearing screening, either in the community or from a health facility. In children, screening is an important step to reduce the proportion of false positives. If children screen positive for hearing loss, they will attend the first appointment, which should consist of a questionnaire-based basic profile (case history), an otoscopic ear examination, and air-conduction audiometry, measured, at minimum, at frequencies 500, 1000, 2000, and 4000 Hz. For children, tympanometry should be completed where feasible to identify middle-ear conditions, which are most common in children. Should the child meet candidacy for hearing aids, they would undergo the hearing aid fitting and counselling at the first appointment upon parental/caregiver consent. Throughout this process, referrals for further care (outside of the programme) are based on the indications presented later.

Follow-up appointments should be available on demand, and it is recommended that short-term follow-up appointments would occur 2 weeks and 2 months after hearing aid fitting, and that the first long-term follow-up appointment would occur 6 months after fitting, and subsequent long-term appointments would occur once per year after fitting. At short-term follow-up appointments, children should undergo a questionnaire-based assessment, during which they should be asked IOI-HA question 1, to determine the number of hours of daily use (Cox and Alexander 2002). They should also undergo the Ling sounds test, which uses six

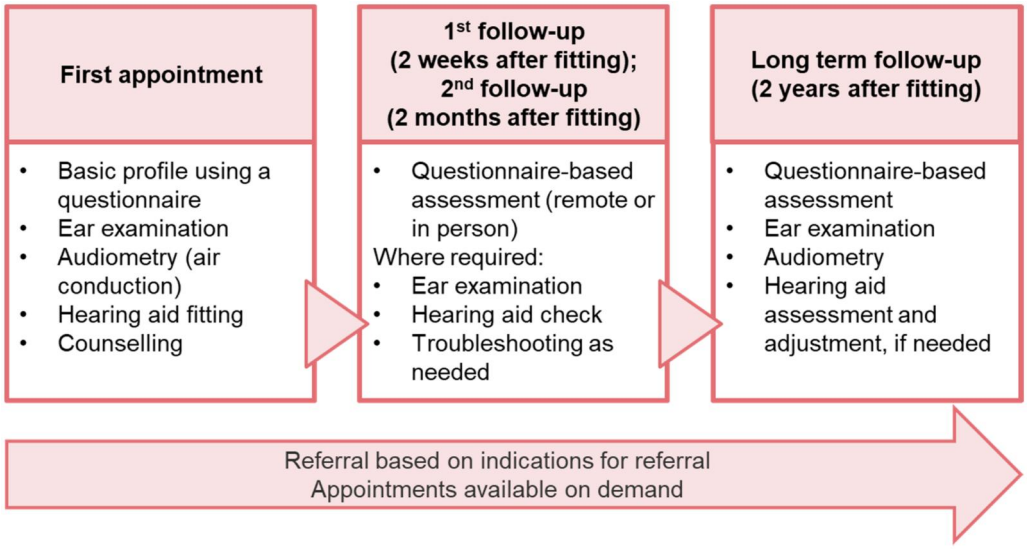


Figure 1. Overview of service delivery approach for adults (adapted from World Health Organization 2024a).

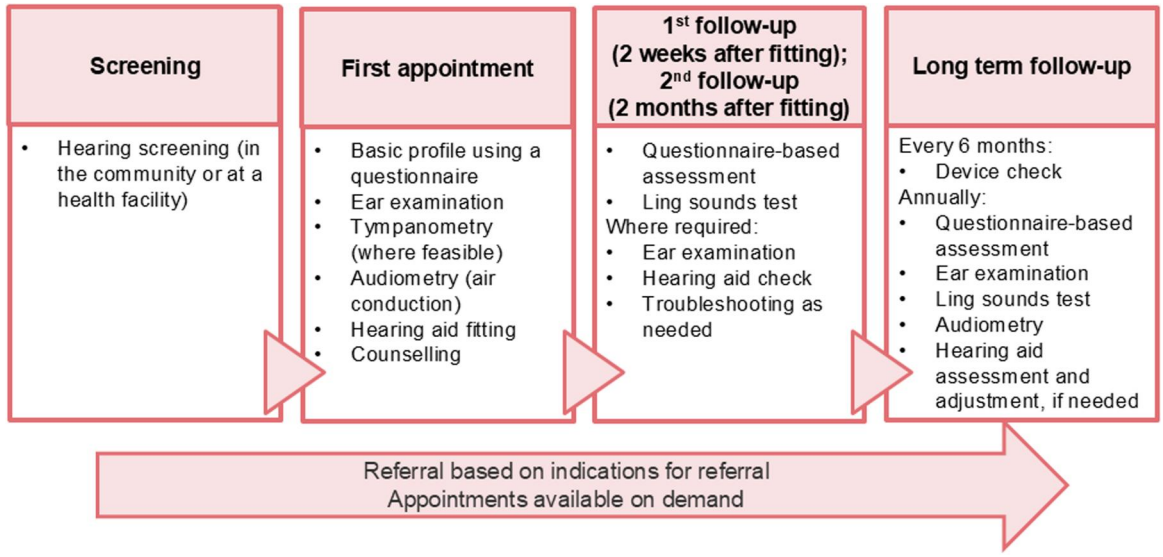


**Figure 2.** Overview of service delivery approach for children (adapted from World Health Organization 2024a).

**Table 1.** Indications for outside referral for adults and children.

| | Adults | Children (≥ 5 years) |
|---|---|---|
| Hearing loss | • Profound or pre-lingual<br>• Sudden onset or rapidly progressive<br>• Unilateral/asymmetric | • Severe, profound or pre-lingual<br>• Sudden onset or rapidly progressive<br>• Unilateral/asymmetric |
| Ear conditions | • Severe malformation of external auditory canal<br>• Ear trauma<br>• History of acute pain, active drainage, or bleeding from ear<br>• Recurrent/chronic otitis media<br>• Perforation of tympanic membrane<br>• Pulsatile tinnitus | • Severe malformation of external auditory canal<br>• Ear trauma<br>• History of acute pain, active drainage, or bleeding from ear<br>• Recurrent/chronic otitis media<br>• Perforation of tympanic membrane<br>• Pulsatile tinnitus |
| Other | | • Unable to follow instructions |

isolated phonemes ([m], [ah], [oo], [ee], [sh], [s]) to determine children's detection, discrimination, and identification of sounds (Ling 1976). When required, children should also undergo an ear examination, hearing aid check, and troubleshooting during short-term follow-up appointments. If the necessary infrastructure and resources are available, some follow-up appointments for children, which do not require hearing aid assessments or audiometric evaluations, could be conducted virtually via telehealth.

Every 6 months, children should undergo an in-person device check to ensure that the hearing aid is working properly. Each year from the time of hearing aid fitting, children should attend a long-term follow-up appointment, during which they should undergo a questionnaire-based assessment, including IOI-HA question 1 to determine number of hours of daily use, an ear examination, the Ling sounds test, pure-tone air-conduction audiometry, and if needed, hearing aid assessment and/or adjustment.

### *Indications for outside referral*

For both adults and children, there are specified indications for referral to an ear and hearing care specialist outside of the programme. Given the potential need to refer to outside specialists, it is imperative that referral pathways to suitable, accessible health facilities are pre-defined when developing hearing aid service delivery approaches. Table 1 reports key indications for outside referral for adults and children. These indications focus on the type and degree of hearing loss, ear conditions, and other reasons for referral. Individuals should also be referred if they require other devices (e.g. bone-conduction hearing aids) or support that cannot be provided in the programme.

### *Considerations for implementation and accompanying resources*

A local implementation protocol should be developed before implementing hearing aid service delivery approaches. All approaches must be appropriate for the local context but remain aligned with the principles of the service delivery approach, as detailed in the technical resource (World Health Organization 2024a). The approach must be implemented following discussion with local stakeholders, including persons with hearing loss, and adapted to the laws and regulations of the country. The hearing aid service delivery approaches should be part of a (sub)national or regional strategy to strengthen ear and hearing care services and should be embedded within existing health systems. This promotes the provision of ear and hearing care services alongside other health services, including eye care, care of older persons, and provision of other assistive technologies (World Health Organization 2021a; World Health Organization 2024c).

Eight key aspects of implementation are briefly described below and are further detailed in the technical resource (World Health Organization 2024a). Planning (1) should ideally be led by the Ministry of Health and should involve local stakeholders to ensure relevance of the programme towards the local context. More specifically, the planning stage should consider the distribution of hearing loss within the region, and current policies for ear and hearing care and rehabilitation, to embed the hearing aid service delivery programme into the health system. Other key planning considerations include sociocultural and legislative realities, required resources (including human resources and training), and referral pathways. Policies and finances (2) must support the scope of this programme, including the certification of trained non-specials providers in delivering ear and hearing

care. The human resources and training requirements (3), including the required number of workers, must be clearly defined. The workforce should consist of qualified ear and hearing care providers, who act in a supervisory role, and trained non-specialist providers. The equipment and infrastructure requirements (4) must be defined and can be adapted according to available resources; the minimum required infrastructure and equipment is defined in the technical resource (World Health Organization 2024a). Importantly, accessible referral pathways (5) must be clearly defined prior to the implementation of a hearing aid service delivery programme. These pathways must include referrals to primary health care providers for management of ear diseases (e.g. otitis media) and centres that provide specialist audiology and otology services. As defined earlier, all processes related to follow-up and counselling (6), including those related to referrals, must be predefined. Moreover, processes related to data management (7), which facilitate effective and efficient care provision, should be predefined. Lastly, WHO proposes the collection of certain indicators (8), including those related to hearing loss diagnosis, and hearing aid access and processes, to promote consistent data collection and monitoring.

This technical resource should be used alongside several other resources provided by WHO and its partners. These resources can provide guidance on screening (World Health Organization 2021c), training and resource requirements for primary ear and hearing care (World Health Organization 2023) and hearing aid related services (World Health Organization, n.d.), as well as integrated care (World Health Organization 2024c). The ATscale Global Partnership for Assistive Technology product narrative for hearing aids, details the market-shaping approach to improve access to high-quality, low-cost hearing aids globally (ATscale Global Partnership for Assistive Technology 2019). Alongside expanding the ear and hearing care workforce, systematic cost reduction of hearing aids is another critical strategy to improve global access to hearing aids and related services. Strategies such as task sharing and innovations to promote low-cost, high quality hearing technology, support the provision of community-based ear and hearing care, which can ultimately improve access to critical services, including those related to hearing aids.

## Conclusions

A key strategy to promoting equitable global access to hearing aids and rehabilitative services, which is currently limited by the global dearth of qualified ear and hearing care specialists, is provision of community-based ear and hearing care. Task sharing, in which tasks can be shared among highly trained professionals, such as audiologists and ENT specialists, and trained non-specialist providers, such as health workers with shorter formal training who are given the capacity to take on specific tasks or actions, is an essential strategy in community-based care and to overcome persistent limitations in the ear and hearing care workforce. The role of audiologists and ENT specialists in task sharing is critical, as their expertise is needed to develop training curricula, and to supervise and mentor trained non-specialist providers to ensure high-quality care. The WHO technical resource "Hearing aid service delivery approaches for low- and middle-income settings" (World Health Organization 2024a) outlines strategies to develop and implement community-based service delivery approaches for hearing aids, supported by task sharing. Such public health-driven approaches could improve global access to essential ear and hearing care services, including hearing aids and rehabilitative services, while embracing the realities of limited resources.

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Author De Wet Swanepoel declares: The relationship between author DS and the HearX Group includes equity, consulting, and potential royalties. Author Carrie Nieman declares: Volunteer membership of the board of directors for the non-profit organisations, Hearing Loss Association of America and Access HEARS. No other authors have competing interests to declare.

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## Data availability statement

No new data were created or analysed in this study.

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