



# CBM Position Paper Audiology

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## Table of content

1. Foreword.....	3
2. Executive Summary.....	4
3. Introduction.....	6
4. Present situation .....	8
5. The International Legal and Political Framework .....	10
6. CBM ´s work in the field of Audiology .....	11
A. Aims and Objectives.....	11
B. Strategies .....	12
C. Areas of action .....	14
7. References .....	16
8. Acknowledgements.....	17

## **1. Foreword**

CBM is an international Christian development organisation, committed to improving the quality of life of persons with disabilities in the poorest countries of the world. CBM's vision is of an inclusive world in which all persons with disabilities enjoy their human rights and achieve their full potential.

CBM supports partners in low and middle income countries, addressing the causes and consequences of disability through primary health care, medical, education, rehabilitation, livelihood and empowerment activities. Emphasis is placed on Community Based Services working with families and self-help groups.

CBM has been actively supporting partners working with persons who are deaf, hard of hearing, deafblind, or those at risk of hearing loss, for over a century. To date, CBM has developed sustainable projects and programmes, trained professionals, collected and shared knowledge and experience in order to improve access to affordable quality services in respect of Ear and Hearing Care and Educational Services.

CBM Position Papers are used to guide CBM and partners to reach the above referred goals. As such, Position Papers are meant for internal use; however, the input of other professionals and international organisations involved in disability and care are invited to provide comment. This approach serves to strengthen the content of the papers and ensures that CBM is providing up to date guidance in each respective mandate area.

This paper should be seen as a reference point for developing strategies and programmes which include a component for Audiological Services.

[Back to top](#)

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## 2. Executive Summary

### **Introduction:**

Audiology is an integral part of the care of persons with hearing loss. It is a discipline which is included in Ear and Hearing Care Services and Educational services for Persons who are Deaf, Hard of Hearing, or Deafblind. Audiology and related services are currently absent or at best underdeveloped in low and middle income countries (LMIC), which may affect the management, intervention, prognosis and opportunities for persons with hearing loss.

As stated in the WHO document “Millions of people in the world have hearing loss that can be treated or prevented” (WHO Press 2013), the estimates indicate that 5.3% of the world’s population has a disabling hearing loss, which is equivalent to 360 million people worldwide.

Given these estimated figures, it is important to develop programmes that allow the detection and diagnosis of hearing loss in order to encourage timely intervention and inclusion in: health, education, society, labour, culture, etc. Currently most audiological related services are based in educational services with fewer based in health services.

### **CBM’s work in the field of Audiology**

Currently CBM supports few Audiological centres worldwide. However, where such services are being supported, they are part of Health Centres, Educational settings, and / or Community Based Rehabilitation (CBR) programmes. CBM has been supporting audiological examinations including screening and diagnostic procedures for babies, children and adults. In terms of equipment, CBM has provided equipment to conduct assessments, hearing and ear screening when appropriate, and supported hearing aid provision where follow up services are in place and skilled professionals available to select and fit them.

Efforts are being made to conduct training courses to develop or upgrade skills in the areas of screening, diagnosis, intervention and re/habilitation, thereby increasing the number of qualified people working in the field.

However, this training needs to go alongside the development and implementation of prevention and early intervention programs at the three different levels.

**Aim:**

To increase the number and improve the quality of audiological services at all levels of service delivery, and to identify, diagnose and manage hearing loss as early as possible, be it medical, social, educational, re/habilitative, audio-prosthetic or other.

**Objectives:**

- Increase the number of trained personnel providing audiology services.
- Increase the detection of hearing losses as early as possible.
- Identify ear health conditions requiring referral for treatment.
- Provide reliable assessment and diagnosis of hearing problems.
- Provide early intervention services for babies, children and adults.
- Promote the provision of affordable hearing aids and related services.
- Provide re/habilitation services including management of hearing aids.
- Provide follow up services for all hearing aids issued in LMIC countries.

**Strategies:**

1. Establish or improve existing audiology centres in LMIC.
2. Attempt formal training for audiology-related professions, where absent.
3. Raise awareness about hearing loss.
4. Establish training programmes for local audiology assistants/technicians.
5. Supply audiological equipment to programmes.
6. Establish hearing screening programmes.
7. Supply hearing aids only to projects with available audiology services.
8. Select a small range of hearing aids' makes and models.
9. Discourage the use of second hand and reconditioned hearing aids.
10. Digital technology is preferred when possible.
11. Establish national or regional ear mould & hearing aid repair laboratories.

**Areas of action**

- Network with NGOs and other organizations.
- Continue active participation with global initiatives.
- Collaborate in awareness campaigns.
- Use the WHO reports about Noise Induced Hearing Loss.

- Organize practical workshops/courses for professional skills development.
- Use WHO Primary Ear & Hearing Care Training Resources.
- Supplement training with Community Ear and Hearing Health Journal.
- Support neonatal screening programs for early diagnosis & intervention.
- Support school ear and hearing screenings.
- Use WHO Guidelines on Hearing Aids & Services for LMIC.
- Support and promote more audiology service initiatives globally.
- Field-test (alongside partners and end-users) the equipment recommended by CBM for Audiological services.

### 3. Introduction

Audiology is an integral part of the care of persons with hearing loss, and it is present in all three levels of prevention. It is a discipline, which is included in Ear and Hearing Care (EHC) services and Educational services for persons who are Deaf, Hard of Hearing or Deafblind. Audiology and related services are currently absent or at best underdeveloped in low and middle income countries, which may affect the management, intervention, prognosis and opportunities for persons with hearing loss.

As stated in the latest WHO estimates<sup>1</sup>, “Millions of people in the world have hearing loss that can be treated or prevented” (WHO Press 2013). The estimates indicate that 5.3% of the world’s population has a disabling hearing loss, which is equivalent to 360 million people worldwide. WHO defines disabling hearing loss to be that which is greater than 40 dBHL in the better ear at age 15 years and above, and greater than 30 dBHL in children 0 to 14 years of age, both levels averaged at 500, 1000, 2000 and 4000 Hz. Given these estimated figures, it is important to develop programmes that allow the detection and diagnosis of hearing loss in order to encourage timely intervention and inclusion in: health, education, society, labour, culture, etc.

Actions in the field of audiology are included within the CBR Matrix, in the health (rehabilitation and assistive devices), social, and educational components. These actions are included to ensure equal access of

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<sup>1</sup> WHO (2012). “WHO global estimates on prevalence of hearing loss”. Retrieved on December 2, 2015 from: [http://www.who.int/pbd/deafness/WHO\\_GE\\_HL.pdf?ua=1](http://www.who.int/pbd/deafness/WHO_GE_HL.pdf?ua=1)

persons with hearing loss. Currently most audiological related services are based in educational services with fewer based in health services.

In this position paper the following terms are used:

- a) Persons with hearing loss:** persons with varying levels of hearing loss
- b) Audiologist:** a health-care professional, who evaluates, diagnoses, treats, and manages hearing loss, tinnitus, and balance disorders in infants, children, and adults. <sup>2</sup> However, it is clear that in CBM supported programmes the role of an audiologist may not cover all these areas, and may be centred in some or all of the following: screening, diagnosis, hearing aid fitting, re/habilitation, counselling, referral and training.
- c) Audiology Officer:** A person who has successfully completed a one-year training at a diploma level, given by a university. Can diagnose, screen, carry out public health programmes, fit hearing aids, and decide who to refer to an audiologist.
- d) Audiology Assistant:** "Person, who, after appropriate training and demonstrated competency, performs tasks that are prescribed, directed and supervised by an audiologist."
- e) Rural Audiology Assistant:** Person, who, after appropriate training and demonstrated competency, performs the necessary audiology tasks in rural areas; his/her level of services offered is dependent on the availability of equipment and ongoing supervision and training.
- f) Audiology Technician:** Also known as a Hearing Technician. Assists an audiologist in performing hearing screenings and preparing patients for an examination or other related audiological service.
- g) Ear mould/hearing aid repair technician:** Person who is trained and supervised to take ear mould impressions, and make earmoulds; undertakes minor hearing aid repairs and maintenance.
- h) Primary ear and hearing care (PEHC) Worker:** Health and/or community worker, who, after appropriate training and demonstrated competency, performs tasks related to Primary Ear and Hearing Care.
- i) Disabling hearing loss:** WHO defines this as hearing loss which is greater than 40 dBHL in the better ear at age 15 years and above, and greater than 30 dBHL in children 0-14 years of age, both levels averaged at 500, 1000, 2000 and 4000 Hz.

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<sup>2</sup> Amended from medicinenet and the American Academy of Audiology. Retrieved on December 4, 2015 from: <http://www.medicinenet.com/script/main/art.asp?articlekey=10752> (Last Editorial Review: 6/14/2012) and <http://www.audiology.org/publications-resources/document-library/scope-practice>

- j) Residual hearing:** Amount of hearing a person has after onset of a hearing loss.
- k) Unilateral hearing loss:** also known as single-sided deafness. Hearing loss affecting only one ear.
- l) Bilateral hearing loss:** hearing loss affecting both ears
- m) Binaural hearing:** Refers to the ability to listen with both ears, hear in noisy environments and to localize sound sources.
- n) Low and middle income countries,** according to currently accepted socio-economic global indicators, as determined by the World Bank.

#### 4. Present situation

- a) Many of the problems leading to hearing loss are preventable. However the majority of the causes of hearing loss remain undetected in low and middle income countries and incidence/prevalence are not usually known.
- b) The degree of accuracy with which hearing tests are carried out is often very poor due to:
  - i. Most hearing tests being carried out in noisy environments
  - ii. Audiological equipment, when available, not being calibrated regularly
  - iii. Standard techniques and procedures not being adhered to.
  - iv. Inadequate training for audiology technicians
  - v. Insufficient numbers of audiologists
- c) Many projects operate hearing screening programmes without adequate diagnostic, referral, follow-up and rehabilitative audiology services. Often, the difference between screening and diagnostic services is not clearly understood.
- d) Lack of infrastructure necessary for quality ENT and audiological services.
- e) Few countries have comprehensive national programmes for the prevention of hearing impairment; because of this, neonatal and school screening programs are non-existent in most places. Detection and diagnosis of ear and hearing problems are frequently conducted late, jeopardizing overall development of the child.
- f) In most LMI countries there are no, or at best, few available, audiological services for underserved populations.
- g) Where available, audiological services are centralised, mainly in large cities. Private clinical services are inaccessible for underserved populations.

- h) Equipment to diagnose younger children and babies is scarce due to its high cost, inadequate access to maintenance services and training requirements.
- i) Many hearing aids fitted in LMI countries are not used properly due to:
  - i. inappropriate prescription for the hearing loss and life style
  - ii. inappropriate programming of the hearing aid;
  - iii. inadequate training, management and counselling on use, care for and maintenance of the hearing aids (i.e. as part of the aural rehabilitation);
  - iv. widespread distribution of second hand and reconditioned hearing aids which are more likely to require short term and frequent maintenance in an environment where expertise to provide the required repairs is unavailable;
  - v. unreliable hearing aids or hearing aids that cannot withstand adverse climatic conditions;
  - vi. insufficient follow up and support for hearing aid recipients.
  - vii. lack of trained personnel to prescribe and fit quality, suitable, affordable hearing aids accurately.
- j) Hearing aids are overpriced and unaffordable in almost all LMI countries.
- k) There are organisations that provide hearing aids free of charge worldwide often without service provision in place or on-going, regular follow-up support.
- l) There are few technicians with the necessary training and skills needed to repair hearing aids and to calibrate the instruments that are needed for audiology and hearing aid repair.
- m) Many ear moulds available in low and middle income countries are of poor quality due to :
  - i. lack of skilled ear mould technicians and ear mould laboratories;
  - ii. ear moulds not being replaced as often as necessary;
  - iii. incorrect techniques being used for taking ear impressions;
  - iv. delays in ear mould manufacture leading to shrinkage of the ear impression;
  - v. hearing aid wearers not being taught how to fit and care for their ear moulds;
  - vi. lack of knowledge about adequate ventilation requirements.
- n) Hearing aid batteries for Behind the Ear (BTE) hearing aids are not widely available in many low and middle income countries.

- o) There is a widespread lack of trained personnel to provide audiology services e.g. audiologists, audiology officers, audiology technicians, audiology assistants, ear mould technicians, hearing aid repair technicians, and a widespread lack of trainers and training courses.
- p) Although cochlear implants are known to be a good option for persons with severe and profound hearing losses, currently CBM does not support implementing the services due to the high cost and the highly specialized services required for surgery and rehabilitation, both of which are rarely available in many low and middle income countries.
- q) Cochlear implants are sometimes being provided through humanitarian efforts, most of which provide little or no re-habilitation services.
- r) Cochlear implant spare parts are expensive and not always available, or provided.

[Back to top](#)

## 5. The International Legal and Political Framework

The **UN Convention on the Rights of Persons with Disabilities** provides a framework for all audiological activities. Specifically it relates to Article #25: Health, (b): ..."including early identification and intervention as appropriate, and services designed to minimize and prevent further disabilities, including among children and older persons".<sup>3</sup>

Also, in *Article #26: Habilitation and rehabilitation* (1a) "... begin at earliest age possible"; (2) "States Parties shall promote the development of initial and continuing training for professionals and staff working in habilitation and rehabilitation services." (3) "States Parties shall promote the availability, knowledge and use of assistive devices and technologies, designed for persons with disabilities, as they relate to habilitation and rehabilitation".<sup>4</sup>

[Back to top](#)

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<sup>3</sup> United Nations (2006). "Convention on the Rights of Persons with Disabilities". Adopted by the General Assembly, December 13, 2006, A/RES/61/106. Retrieved on December 2, 2015 from: <http://www.un.org/disabilities/convention/conventionfull.shtml>

<sup>4</sup> Ibid.

## **6. CBM's work in the field of Audiology**

Currently CBM supports few audiological centres worldwide. However, where such services are being supported, they are part of health centres, educational settings, and / or CBR programmes. CBM has been supporting audiological examinations including screening and diagnostic procedures for babies, children and adults. In terms of equipment, CBM has provided equipment to conduct assessments, hearing and ear screening when appropriate, and supported hearing aid provision where follow up services are in place and skilled professionals available to select and fit them.

Efforts are being made to conduct training courses to develop or upgrade skills in the areas of screening, diagnosis, intervention and re/habilitation, thereby increasing the number of qualified people working in the field.

However, this training needs to go alongside the development and implementation of prevention and early intervention programs at the three different levels.

### **A. Aims and Objectives**

#### **Aim:**

To increase audiological services at all levels of service delivery, and to identify, diagnose and manage hearing loss as early as possible, be it in medical, social, educational, re/habilitative, audio-prosthetic or any other related settings.

#### **Objectives:**

- To increase the number of trained personnel providing audiology services in LMI countries.
- To increase the detection of hearing losses as early as possible in babies, children and adults.
- To identify ear health conditions requiring referral for medical/surgical treatment.
- To provide reliable assessment and diagnosis of hearing problems at all ages.
- To provide early intervention services for babies, children and adults.
- To promote the provision of affordable hearing aids and related services.
- To provide re/habilitation services including management of hearing aids.

- To provide follow up services including repair, quality ear moulds, and hearing aid batteries to be available for all hearing aids issued in low and middle income countries

## **B. Strategies**

1. Establish or improve existing audiology centres in low and middle income countries that can provide:
  - a) high quality services and can also be used as resource / training centres for audiologists, audiology officers, audiology technicians, audiology assistants, ear mould technicians and hearing aid repair technicians;
  - b) practical skills-based programmes which give enough clinical practice for the trainees to become fully competent;
  - c) selected target groups for audiology services depending on the skill levels of the audiologists and the facilities available:
    - i) adults and older children,
    - ii) young children and infants.
2. Where there is no formal training for audiology-related professions, a dual training approach: for a “PEHC Worker” and a more specific “Audiology professional” should be attempted in low and middle income countries, whenever possible. CBM acknowledges the wide diversity amongst low and middle income countries in respect to the number and training level of audiology-related professionals; some may have several levels of “audiology” workers (audiologist, audiology officer, audiology assistants, audiology technicians, ear mould technicians, hearing aid maintenance technicians).
3. Raise awareness about hearing loss by:
  - a) informing parents, health care professionals, teachers (pre-service and in-service) and other community members about preventable causes of hearing loss, referral pathways,
  - b) organise “better hearing campaigns”,
  - c) increase awareness about hearing loss in children through EHC /CBR / Educational programmes to lower the age of diagnosis.<sup>5</sup>.
4. Establish training programmes for local audiology assistants and audiology technicians who can implement basic audiology services in rural areas as part of a CBR programme. Understanding referral processes and knowledge of local / national referral centres

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<sup>5</sup> WHO (2012), “Community-Based Rehabilitation. Promoting ear and hearing care through CBR”. Geneva. Retrieved on December 2, 2015 from: <http://www.who.int/pbd/deafness/news/CBREarHearingCare.pdf?ua=1>

- (audiological and medical) must be an integral part of the training and service provision. Ensure an adequate number of trainers are available to conduct the training programmes that are needed.
5. Supply audiological equipment to programmes including teaching of the skills required to perform and interpret the audiological test results.
  6. Hearing screening programmes should be established when adequate diagnostic, referral and intervention services are available to follow up those who fail their screening tests.
  7. Supply hearing aids **only** to those projects/centres where the required audiology services are available and sustainable (e.g. trained personnel to prescribe and dispense, adequate ear mould and repair laboratory, battery supply and follow up services.). The target population for hearing aids should be those with mild, moderate and severe hearing loss, especially children.
  8. Select a small range of makes and models (which can cover all levels of hearing loss) for ease of prescription, fitting and repair. The type and model of hearing aid supplied reflects local circumstances. CBM has found that the establishment of successful hearing aid services in low and middle income countries is associated more strongly with the training quality of their professional workers and their diagnostic equipment, than with the type of hearing aid provided.
  9. Generally the issuing of second hand and reconditioned hearing aids is to be strongly discouraged and not recommended due to: difficulty in prescribing (those provided are often old, unspecified models); frequent repairs may be required with spare parts being very expensive and inaccessible. However, there may be occasions when reconditioned hearing aids would be recommended such as when a proper repair laboratory, battery supply and follow up services are in place and proper hygiene measures are taken.
  10. Due to the technological benefits that digital hearing aids offer over analogue, digital technology is preferred when possible, as it provides better sound quality and improved patient usage. Digital hearing aids are also easier to maintain and repair, while their range is larger, requiring fewer models of hearing aids.
  11. Establish national or regional ear mould and also in some cases hearing aid repair laboratories (depending on the size of the country) with appropriate, simple distribution systems that can supply high quality ear moulds and fast repair services. These laboratories can be used as centres to train other technicians for the region. Where possible promote the role of an ear mould / repair technician e.g. as

a vocational training opportunity for persons who are deaf or hard of hearing.

[Back to top](#)

### **C. Areas of action**

- a) Network with NGOs and other organizations who may provide hearing aids to CBM programmes.
- b) Continue active participation with global initiatives such as WWHearing<sup>6</sup> and the Coalition for Global Hearing Health (CGHH) to promote access to affordable hearing aids and provide effective and sustainable quality audiological services in a comprehensive, collaborative effort.
- c) Collaborate in awareness campaigns to promote, prevent, and identify ear and hearing problems on a timely basis.
- d) Promote hearing conservation using materials and guidance from the WHO report "Prevention of Noise Induced Hearing Loss"<sup>7</sup> and the "Community noise guidelines."<sup>8</sup>
- e) Organize practical workshops and courses for professional skills development.
- f) Use the WHO Primary Ear and Hearing Care Training Resource to train health workers in ear and hearing care and basic principles for provision of hearing aids.<sup>12</sup>
- g) Supplement training with the Community Ear and Hearing Health Journal.<sup>9</sup>
- h) Where feasible, support neonatal screening programs to target early diagnosis and intervention. Refer to WHO report "Newborn and Infant hearing Screening"<sup>10</sup>
- i) Support school screenings by using guidelines and other documents developed by CBM EHC and WHO, such as the Primary Ear and Hearing Care Training Resource, and other professional bodies.<sup>11</sup>

<sup>6</sup> [www.wwhearing.org](http://www.wwhearing.org)

<sup>7</sup> WHO (1997). "Prevention of noise-induced hearing loss". Report of an informal consultation held at WHO Headquarters on 28-30 October 1979. Geneva. Retrieved on December 2, 2015 from: <http://www.who.int/pbd/deafness/en/noise.pdf>

<sup>8</sup> WHO (1999). "Guidelines for Community Noise". Retrieved on December 11, 2015 from: <http://www.who.int/docstore/peh/noise/guidelines2.html>

<sup>9</sup> <http://disabilitycentre.lshtm.ac.uk/key-publications/cehh-journal/>

<sup>10</sup> WHO (2009). "Newborn and infant hearing screening. Current issues and guiding principles for action". Outcome of a WHO informal consultation held at WHO headquarters, Geneva, Switzerland, 09-10 November 2009. Retrieved on December 2, 2015 from: [http://www.who.int/blindness/publications/Newborn\\_and\\_Infant\\_Hearing\\_Screening\\_Report.pdf](http://www.who.int/blindness/publications/Newborn_and_Infant_Hearing_Screening_Report.pdf)

<sup>11</sup> WHO (2006). "Primary Ear and Hearing Care Training Resource". Geneva. Retrieved on December 2, 2015 from: [http://www.who.int/pbd/deafness/activities/hearing\\_care/en/](http://www.who.int/pbd/deafness/activities/hearing_care/en/)

- j) Promote the use of WHO Guidelines on Hearing Aids and Services for developing countries.<sup>12</sup>
- k) Support and promote more audiology service initiatives globally.
- l) Ensure that all equipment recommended on the CBM Standard List for Audiological services are field tested/evaluated for quality and applicability in selected centres to reflect regional needs.

[Back to top](#)

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<sup>12</sup>WHO (2004). "Guidelines for hearing aids and services for developing countries". Geneva. Retrieved on December 2, 2015 from:  
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[Back to top](#)

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[Back to top](#)



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**CBM is an international Christian development organisation, committed to improving the quality of life of people with disabilities in the poorest communities of the world.**