



More than 1.5 billion people experience some degree of hearing loss, which can significantly impact their lives, their families, society and countries.

## 1.3 DECLINE IN HEARING CAPACITY

### 1.3.1 DEFINITION AND TYPES OF HEARING LOSS (148)

A person is said to have hearing loss if their hearing capacity is reduced and they are not able to hear as well as someone with normal hearing. “Normal” hearing typically refers to hearing thresholds of 20 dB or better in both ears (see Table 1.3).

Those with a hearing threshold above 20 dB may be considered “hard of hearing” or “deaf” depending upon the severity of their hearing loss. The term “hard of hearing” is used to describe the condition of people with mild to severe hearing loss as they cannot hear as well as those with normal hearing. The term “deaf” is used to describe the condition of people with severe or profound hearing loss in both ears who can hear only very loud sounds or hear nothing at all.

Different types of hearing loss include:

- *Conductive hearing loss*: This term is used when hearing loss is caused by problems located in the ear canal or the middle ear which make it difficult for sound to be “conducted” through to the inner ear.
- *Sensorineural hearing loss*: This term is used when the cause of hearing loss is located in the cochlea or the hearing nerve, or sometimes both. “Sensory-” relates to the cochlea which is a “sense organ”; “neural” relates to the hearing nerve.
- *Mixed hearing loss*: This term is used when both conductive and sensorineural hearing loss are found in the same ear.

### 1.3.2 ASSESSING HEARING CAPACITY

Hearing capacity refers to the ability to perceive sounds and is commonly measured through pure tone audiometry (PTA) – considered the gold standard test of assessment. Audiometric threshold shifts help to define the nature of hearing loss, which may be conductive, sensorineural or mixed in type; and range from mild to complete in severity.

Assessment of hearing capacity through PTA is essential, both for epidemiological purposes and to guide rehabilitation. However, PTA assessment should not be the sole determinant for rehabilitation, mainly because audiometric shifts do not provide information on how sounds are processed by the central auditory system, and therefore offer only limited insight into “real-world” functioning (149). For example, a person with an audiogram<sup>8</sup> test result of “normal” may face problems in difficult listening environments, such as in noisy situations (85, 150). Even when hearing loss is mild and therefore may not be considered significant, a person may experience limitations in everyday functioning which would not be reflected through the sole assessment of an audiogram (151, 152). Children and adults may have a normal audiogram but have a deficit in processing auditory information in the brain and limitations in hearing – referred to as central auditory processing disorder (149, 153). Some of these limitations can be addressed through speech tests such as “speech discrimination” and “speech-in-noise” tests (149). It is therefore important to take a holistic view of a person’s audiological profile and hearing experiences to ensure that limitations in activity, participation in quiet and noisy environments, and communication needs and preferences, are all addressed (8, 154). These considerations are elaborated in Section 2.

### 1.3.3 AUDITORY PROCESSING DISORDERS

Some children and adults may experience hearing difficulties in the absence of any substantial audiometric findings. These may have an auditory processing disorder (APD) – a generic term for hearing disorders that result from the poor processing of auditory information in the brain (149, 153). This may manifest as poor hearing and auditory comprehension in some circumstances, despite normal hearing thresholds for pure tones. Prevalence estimates of APD in children range from 2–10% with frequent co-occurrence in children with other learning or developmental disabilities (153, 155). APD can affect psychosocial development, academic achievement, social participation, and career opportunities. Age-related APD is also a common contributor to hearing difficulties in older age.

### 1.3.4 GRADES OF HEARING LOSS

To standardize the way in which severity of hearing loss is reported, WHO has adopted a grading system based on audiometric measurements. This system is a revision of an earlier approach adopted by WHO, and differs from the earlier system in that measurement of onset of mild hearing loss is lowered from 26 dB to 20 dB; hearing loss is categorized as mild, moderate, moderately-severe, severe, profound or complete; and unilateral hearing loss has been added. In addition to the classifications, the revised system provides a description of the functional

<sup>8</sup> Audiograms show the minimum intensity, in decibels, a person can hear at different frequencies of sound. This is typically depicted in graph form following a hearing test, as measured by an audiometer.

consequences for communication that are likely to accompany each level of severity (148). This revised grading system is presented in Table 1.3 below.

**Table 1.3 Grades of hearing loss and related hearing experience\***

| <b>Grade</b>                                   | <b>Hearing threshold<sup>‡</sup> in better hearing ear in decibels (dB)</b> | <b>Hearing experience in a quiet environment for most adults</b>   | <b>Hearing experience in a noisy environment for most adults</b>                           |
|--|---|--|--|
| <b>Normal hearing</b>                          | Less than 20 dB   | No problem hearing sounds  | No or minimal problem hearing sounds   |
| <b>Mild hearing loss</b>                       | 20 to < 35 dB   | Does not have problems hearing conversational speech   | May have difficulty hearing conversational speech  |
| <b>Moderate hearing loss</b>                   | 35 to < 50 dB   | May have difficulty hearing conversational speech  | Difficulty hearing and taking part in conversation   |
| <b>Moderately severe hearing loss</b>          | 50 to < 65 dB   | Difficulty hearing conversational speech; can hear raised voices without difficulty                      | Difficulty hearing most speech and taking part in conversation                             |
| <b>Severe hearing loss</b>                     | 65 to < 80 dB   | Does not hear most conversational speech; may have difficulty hearing and understanding raised voices    | Extreme difficulty hearing speech and taking part in conversation                          |
| <b>Profound hearing loss</b>                   | 80 to < 95 dB   | Extreme difficulty hearing raised voices   | Conversational speech cannot be heard  |
| <b>Complete or total hearing loss/deafness</b> | 95 dB or greater  | Cannot hear speech and most environmental sounds   | Cannot hear speech and most environmental sounds   |
| <b>Unilateral</b>                              | < 20 dB in the better ear, 35 dB or greater in the worse ear                | May not have problem unless sound is near the poorer hearing ear. May have difficulty in locating sounds | May have difficulty hearing speech and taking part in conversation, and in locating sounds |

\* The classification and grades are for epidemiological use and applicable to adults. The following points must be kept in mind while applying this classification:

- While audiometric descriptors (e.g. category, pure-tone average) provide a useful summary of an individual's hearing thresholds, they should not be used as the sole determinant in the assessment of disability or the provision of intervention(s) including hearing aids or cochlear implants.
- The ability to detect pure tones using earphones in a quiet environment is not, in itself, a reliable indicator of hearing disability. Audiometric descriptors alone should not be used as the measure of difficulty experienced with communication in background noise, the primary complaint of individuals with hearing loss.

Unilateral hearing loss can pose a significant challenge for an individual at any level of asymmetry. It therefore requires suitable attention and intervention based on the difficulty experienced by the person.

‡ "Hearing threshold" refers to the minimum sound intensity that an ear can detect as an average of values at 500, 1000, 2000, 4000 Hz in the better ear (148, 156, 157).

The classifications used in Table 1.3 follow the recommendations of the International Classification of Functioning, Disability and Health (ICF) proposed by WHO in 2001. As stated in the ICF, a person with the slightest reduction in hearing sensitivity has a potentially “disabling” condition. The ICF defines a person’s state of health along three dimensions which are outlined in Box 1.1 (158). According to the ICF, the disability experienced is determined not only by the individual’s hearing loss but also by the physical, social and attitudinal environment in which the person lives, and the possibility of accessing quality EHC services. Therefore, a person with hearing loss who does not have access to hearing care, is likely to experience far greater limitations in day-to-day functioning and thus higher degrees of disability.

### **Box 1.1 International Classification of Functioning, Disability and Health (158)**

The International Classification of Functioning, Disability and Health (ICF) is the WHO framework for measuring health and disability at both individual and population levels. The ICF defines a person’s state of health across three dimensions:

- (i) *Impairment*: which relates to the body-level function or shape (referred to as “hearing loss” in the case of hearing).
- (ii) *Activity limitation*: which relates to personal level of function (formerly termed as “disability”).
- (iii) *Participation restriction*: which relates to psychosocial function (termed as “handicap” in earlier versions of the ICF).

The term “disability” encompasses all problems or difficulties a person with hearing loss may encounter when carrying out everyday activities or situations, such as self-care, or going to school or work. “Disability” in terms of hearing loss refers to the impairments, limitations and restrictions (physical, social, or attitudinal) experienced. As functioning and disability are influenced by context, the ICF also includes a list of environmental factors that contribute to the difficulties experienced by people with hearing loss.

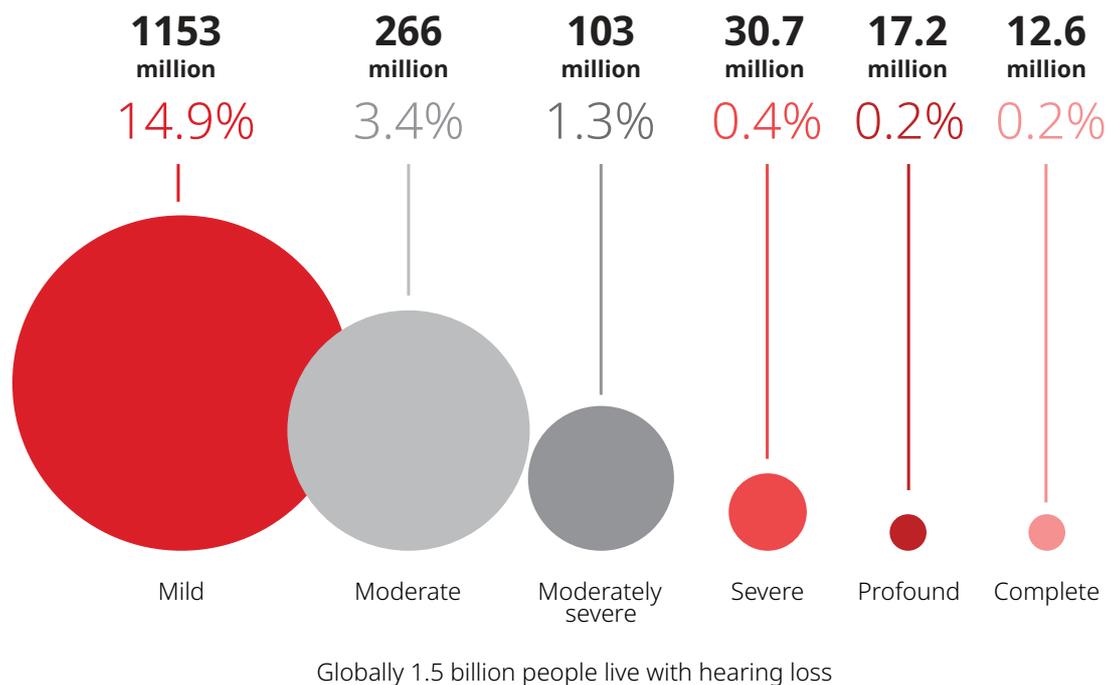
### 1.3.5 ESTIMATES OF HEARING LOSS<sup>9</sup>

Hearing loss currently affects more than 1.5 billion people or 20% of the global population; the majority of these (1.16 billion) have mild hearing loss. However, a substantial portion, or 430 million<sup>10</sup> people (i.e. 5.5% of the global population) experience moderate or higher levels of hearing loss which, if unaddressed, will most likely impact their daily activities and quality of life. More detailed information about the severity and distribution of hearing loss is presented in the following data.

#### HEARING LOSS ACCORDING TO SEVERITY

Besides the 1.16 billion people worldwide with mild hearing loss, about 400 million live with hearing loss that ranges from moderate to severe; nearly 30 million have profound or complete hearing loss in both ears (Figure 1.5).

**Figure 1.5 Number of people and percentage prevalence according to grades of hearing loss**



<sup>9</sup> GBD 2019 Hearing Loss Collaborators. Hearing loss prevalence and years lived with disability, 1990–2019: findings from the Global Burden of Disease Study 2019. *The Lancet*. (2021). doi: 10.1016/S0140-6736(21)00516-X.

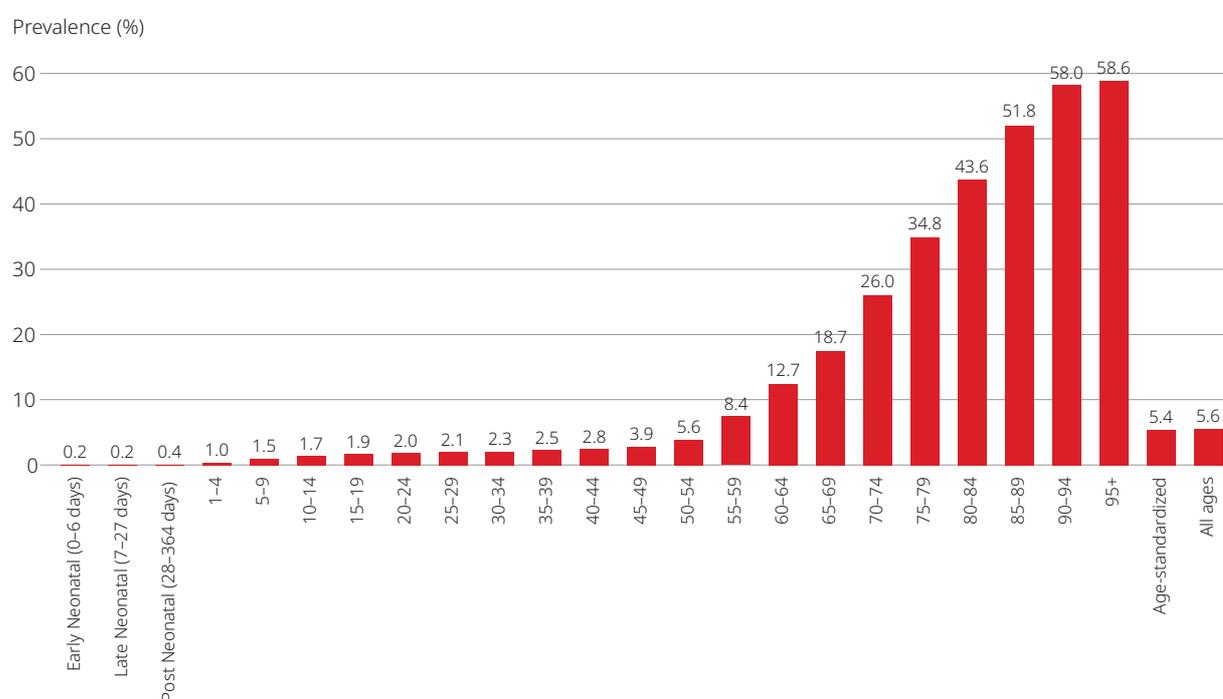
<sup>10</sup> Refers to number of people with hearing threshold higher than 35 dB in the better hearing ear.

## AGE AND GENDER DIFFERENCES IN HEARING LOSS

The global prevalence of moderate or higher grades of hearing loss increases with age, rising from 12.7% at the age of 60 years to over 58% at 90 years (Figure 1.6). Notable is that over 58% of moderate or higher grade hearing loss is experienced by adults above the age of 60 years.

In terms of gender differences, global prevalence of moderate or higher levels of hearing loss is slightly higher among males than among females, with 217 million males (5.6%) living with hearing loss compared with 211 million females (5.5%).

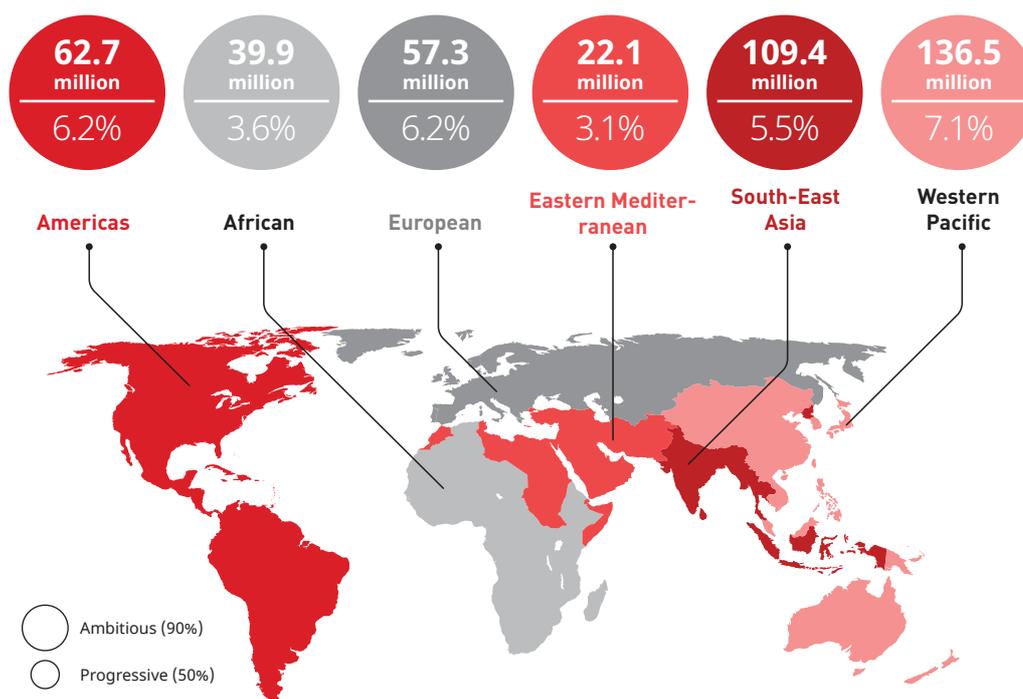
**Figure 1.6 Global prevalence of hearing loss (of moderate or higher grade) according to age**



## DISTRIBUTION OF HEARING LOSS ACROSS WHO REGIONS

The prevalence of hearing loss varies across the six WHO regions, from 3.1% in the Eastern Mediterranean Region, to 7.1% in the Western Pacific Region. The maximum share is contributed by the Western Pacific Region, followed by the South-East Asia Region (Figure 1.7).

**Figure 1.7 Prevalence of hearing loss (of moderate or higher grade) across WHO regions**

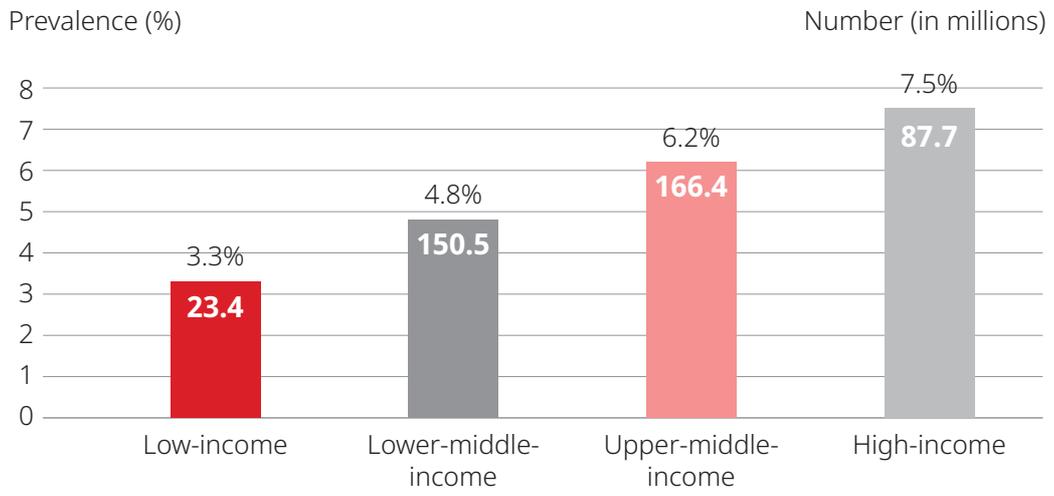


Note: This illustration represents WHO regions, not country boundaries.

## PREVALENCE OF HEARING LOSS ACROSS INCOME GROUPS

The prevalence of hearing loss varies greatly across World Bank income groups worldwide, from 3.3% in low-income countries, to 7.5% in high-income countries. The maximum share of people with hearing loss is contributed by lower-middle-income and upper-middle-income countries (approximately 320 million). As a share of the total number of people with moderate or higher levels of hearing loss, nearly 80% live in low-income and middle-income countries of the world, as opposed to 20% in high-income countries (Figure 1.8).

**Figure 1.8 Global prevalence of hearing loss (of moderate or higher grade) according to income group**



Children with hearing loss are identified and included in an early intervention programme through newborn hearing screening conducted at national level by the CRRCHSI