

# Deafness – the facts

## How many people are affected?

- Almost 9 million people in the UK, 1 in 7 of the population, suffer from deafness or experience significant hearing difficulty<sup>I</sup>

## Childhood deafness

- It is estimated that there are nearly 35,000 children and young people aged 0 - 25 in the UK with permanent deafness (greater than 40dB).
- 840 babies are born every year with impaired hearing in both ears. The vast majority of these are born to hearing parents. Around half of those children with a permanent deafness have inherited it from one or both of their parents.<sup>II</sup>
- Eight in ten children will have had an ear infection by the time they are three years old.
- About 6 % of young children between two and four years of age have a persistent problem with glue ear.
- Worldwide, the main cause of mild to moderate hearing impairment in children is chronic middle ear infection.<sup>III</sup>

## The cost of deafness

- In the UK, the cost of interventions for deaf and hearing impaired people is approximately £214,000 for every 1,000 people affected, over the course of a lifetime.
- The estimated cost to the UK of untreated hearing loss in adults is €22,000,000,000.<sup>IV</sup>

## Noise and children

- Children's toys can produce sound levels of up to 80-110 decibels or dBA.
- Around 6 % of children are thought to suffer hyperacusis (an over-sensitivity to noise).

## Noise at work

- Over one million people are exposed to potentially damaging noise levels in the workplace.<sup>V</sup>
- According to health and safety regulations, employers must take action if workplace noise exceeds 80 dBA.

## Noise and leisure

- The Medical Research Council's Institute of Hearing Research has found that 18.8 % of young people are exposed to loud music for long enough to constitute a hazard to hearing.
- 70 to 80 % of people who visit nightclubs will experience temporary tinnitus, potentially causing longer-term hearing problems.

## Tinnitus

- About 10% of adults (4.9 million people in the UK) have experienced tinnitus for longer than five minutes. <sup>VI</sup>
- About 5% of UK adults (2.4 million people) have tinnitus which they find severely or moderately annoying.
- About 0.5% of adults in the UK (242,000 people) have tinnitus

which has a severe effect on their ability to lead a normal life.

## Technology

- In the UK there are around 2 million people who have hearing aids but they are only used by 1.4 million.<sup>VII</sup>
- There are cochlear 180,000 implant users in the world, and 6,000 have received bilateral implants. There are about 7,000 cochlear implant users in the UK.<sup>VIII</sup>
- By the end of 2007, there were more than 40,000 Baha (bone anchored hearing aid) users worldwide.<sup>IX</sup>

## Deafness in later life

- Age related hearing loss normally begins at around 50, and 55% of people over 60 are deaf or hard of hearing.<sup>X</sup> Over 70 % of people over 70 have some degree of hearing loss.

## Causes of deafness

- 87% of deafness at all degrees of severity results from damage to the sensitive hair cells within the inner ear or cochlea. This is known as sensorineural deafness.

- Sensorineural deafness can result from exposure to loud noise, viral or bacterial infections, genetic causes, prescribed medicines (including some antibiotics) or simply from old age.

## The social impact of deafness

- People with acquired hearing loss may experience disassociation from their environment due to the absence of everyday background sounds. This feeling of being 'cut off' from the world can lead to depression. Confidence can be eroded causing people to avoid social contact.
- In cases of profound acquired deafness, speech may be affected, adding to communication difficulties.
- Despite legislation, maintaining, or gaining, employment may be problematic.
- Access to public places may be restricted due to a lack of facilities; for example many hearing aid users require a loop system before they can follow a film or participate in a meeting.
- Deaf people may be more at risk in public places due to a lack of visual or tactile alarm systems.

## What is...?

<b>Acoustic neuroma</b>	Growth of tissue on the eighth cranial nerve. Also known as a vestibular schwannoma
<b>Acoustic trauma</b>	Term referring to noise induced hearing loss
<b>Acquired hearing loss</b>	Hearing loss that was not present at birth but developed later, either during childhood or adulthood. See also congenital hearing loss.
<b>Air conduction</b>	The transmission of sound through the air to the ear.
<b>Analogue hearing aids</b>	Hearing aids using traditional sound amplification technology.
<b>Anvil</b>	Common name for the middle bone in the ossicular chain (incus).
<b>Assistive devices</b>	Equipment that can help you in your daily life. For example, amplified telephones, loop systems, flashing or vibrating doorbells or baby monitors.
<b>Atresia</b>	Term referring to the closure or occlusion of the external auditory canal.
<b>Attic</b>	Upper part of the middle ear space.
<b>Audiogram</b>	Chart on which the results of an audiometric test are recorded.
<b>Audiology</b>	The study, professional assessment and management of hearing disorders.
<b>Audiometer</b>	Machine used to measure a patient's hearing.
<b>Audiometric test</b>	A test of hearing acuity.
<b>Auditory nerve</b>	Nerve along which the sensory cells (the hair cells) of the inner ear transmit information to the brain.
<b>Auditory brain-stem response (ABR)</b>	A test used to measure activity in the auditory nerve after presentation of sound stimuli.
<b>Auricle</b>	The outer ear. Also known as the pinna.
<b>Barotrauma</b>	Injury to the ear caused by exposure to sudden pressure changes, for example in flying or diving.
<b>Behind-the-ear</b>	Hearing aid worn behind the ear. Also known as a BTE hearing aid.
<b>Bilateral hearing loss</b>	Hearing loss in both ears.

<b>Body-worn hearing aid</b>	Rectangular hearing aid carried in an individual's pocket, with a cord connecting the aid to the ear.
<b>Bone-anchored hearing aid</b>	Bone conduction hearing aid which is screwed into the skull behind the ear.
<b>Bone conduction</b>	The transmission of sound through the bones of the skull.
<b>BSL</b>	British Sign Language.
<b>Cerumen</b>	Ear wax.
<b>Cholesteatoma</b>	Progressive, abnormal growth of skin in the middle ear.
<b>Cochlea</b>	The snail-shell shaped organ of the inner ear.
<b>Cochlear implant</b>	A device in which electrodes stimulate the auditory nerve directly. Allows a sensation of hearing in people who would not normally be able to hear. Does NOT improve existing hearing ability
<b>Conductive deafness</b>	Term used to describe deafness in the outer or middle ear, where deafness is due to sound transmission being obstructed
<b>Congenital hearing loss</b>	Hearing loss that is thought to have been present at birth, associated with the birth process, or to have developed in the first few days of life.
<b>CROS (Contra lateral routing of signals)</b>	A hearing aid, worn on both ears, for people with a single sided hearing loss. The part worn on the side with hearing loss consists of a microphone to pick up sounds and a transmitter to send them to the hearing aid on the hearing ear.
<b>Cued Speech</b>	A system of hand shapes and placements to aid understanding of spoken language.
<b>Deaf</b>	Generic term used to describe the whole range of people with a hearing loss. Can also mean partially or completely lacking in the sense of hearing. If used with a capital 'D' in the middle of a sentence, it refers to the 'Deaf Community'.
<b>Deafness</b>	The lack or loss of the ability to hear.
<b>Decibel</b>	Unit of sound measurement.
<b>Digital hearing aids</b>	Hearing aids utilising digital sound processing systems, which enable accurate control over the way the sound is reproduced.
<b>Dominant gene</b>	A gene that almost always results in a specific physical characteristic, for example, a disease, even though the patient's genome possesses only one copy.
<b>Eardrum</b>	A thin membrane that separates the outer ear from the middle ear. Its function is to transmit sound from the air to the ossicles inside the middle ear.

<b>Earmould</b>	Part of a hearing aid which is moulded to the shape of the patient's ear and which is used to keep a hearing aid in place
<b>Endolymph</b>	Fluid found in part of the cochlea
<b>ENT</b>	Abbreviation of ear, nose & throat
<b>Eustachian tube</b>	Tube connecting the ear with the nose and the back of the throat.
<b>External Auditory Canal</b>	The canal leading from the pinna to the eardrum
<b>Fenestration</b>	Name given to a once common operation for otosclerosis. Now superseded by stapedectomy
<b>Fingerspelling</b>	System of hand shapes used to form letters, best used when supporting lipreading
<b>Genetic counselling</b>	Information and support for families, for example those affected by inherited deafness
<b>Glue ear</b>	Common name for persistent inflammation of the middle ear. Medical names include otitis media with effusion (OME) and secretory otitis media
<b>Grommet</b>	A tube inserted into the eardrum to maintain an opening. Commonly used to treat glue ear. Also known as ventilation tubes.
<b>Hair cell</b>	Cells in the cochlea which convert incoming sound vibrations into electrical impulses. So called because of tiny hair-like cilia at the tip
<b>Hammer</b>	Common name for the first bone in the ossicular chain (the malleus)
<b>Hard-of-hearing</b>	Traditional term to describe hearing impairment or partial deafness
<b>High frequency hearing loss</b>	Refers to the inability to hear high frequency sounds while still retaining relatively good hearing for low frequencies. This usually impairs speech discrimination. Common in age and noise related deafness
<b>Hyperacusis</b>	Term used to describe oversensitive hearing
<b>Idiopathic</b>	A hearing loss, disease or condition which has no known cause
<b>Incus</b>	Anatomical name for the second bone in the ossicular chain (the anvil)
<b>Induction loop</b>	Device using electromagnetic waves for transmitting sound directly to a hearing aid from an external source such as a microphone, PA system, television or telephone
<b>In-the-ear hearing aid</b>	Small hearing aid which fits into the outer ear shell.

<b>Labyrinth</b>	The balance canals in the inner ear
<b>Low frequency hearing loss</b>	Inability to hear low frequency sounds relative to good hearing at high frequencies
<b>Malleus</b>	Anatomical name for the first bone in the ossicular chain (the hammer)
<b>Mastoid Bone</b>	A bump on the skull which can be felt behind the ear and holds an air cavity to balance pressure changes across the eardrum
<b>Ménière's Syndrome</b>	Form of hearing impairment with hearing loss at low frequencies accompanied by associated tinnitus and vertigo
<b>Middle ear</b>	The part of the ear from the eardrum to the oval window. It includes the ossicles. It is important for transmitting sound from the outer to the inner ear.
<b>Mixed deafness</b>	Involves both outer/middle ear and inner ear
<b>Nerve deafness</b>	Pre-1970 name for sensorineural deafness
<b>Ossicles</b>	Collective name for the three bones of the middle ear
<b>Open-fitting hearing aid</b>	A hearing aid worn behind the ear which does not require an earmould
<b>Otitis externa</b>	Inflammation or infection of the ear canal or outer ear
<b>Otitis media (OM)</b>	Acute infection of the middle ear
<b>Otoacoustic emission</b>	Sounds produced by healthy ears in response to incoming sound
<b>Otology</b>	The study of the organ of hearing
<b>Otosclerosis</b>	Condition in which the middle ear ossicles become immobilised
<b>Ototoxic</b>	Substance poisonous to the hearing mechanism. Ototoxic drugs include some antibiotics
<b>Oval window</b>	Thin elastic membrane between the middle ear and the inner ear (or cochlea). Transmits movement from the ossicles
<b>Peak clipping</b>	A system used in hearing aids to prevent intense sounds from being amplified to uncomfortable levels. It causes some distortion, and in modern hearing aids output limiting is used to achieve a similar effect, but with less distortion
<b>Perilymph</b>	Fluid found in part of the cochlea. Similar to cerebrospinal fluid
<b>Pinna</b>	Anatomical name for the outer ear
<b>Presbycusis</b>	Age-related deafness
<b>Pure-tone</b>	Technique used for measuring hearing accurately across a range

<b>audiometry</b>	of frequencies
<b>Recessive gene</b>	A gene that only results in a specific physical characteristic, or genetic disorder if a person receives two copies of a mutant gene, one from each parent.
<b>Recruitment</b>	A term used to describe the physical discomfort arising from loud noise, which occurs when the range of hearing has been narrowed due to sensorineural hearing loss.
<b>Round window</b>	A membrane-covered in the bony surround of the inner ear
<b>Sensorineural deafness</b>	Hearing loss arising from damage or disease in the inner ear. Previously known as nerve or perceptive deafness
<b>Sign Language</b>	Form of communication used by some deaf people with many properties of spoken languages. Utilises hand shapes and position, gestures and facial expression, Different countries have their own language
<b>SSE (Sign Supported English)</b>	A form of sign language which uses BSL signs and English grammar
<b>Stapedectomy</b>	Surgical procedure used to re-mobilise the stapes bone in patients with otosclerosis
<b>Stapes</b>	The third and final bone in the ossicular chain. Also known as the stirrup
<b>Stirrup</b>	Name given to the stapes due to its shape
<b>Syndromal deafness</b>	Form of inherited deafness where other characteristics (such as sight problems) are present to some degree
<b>Temporal bone</b>	Part of the skull housing the inner ear vestibular system
<b>Threshold of hearing</b>	Minimum level of sound that can be perceived by an individual
<b>Tinnitus</b>	Noises heard in the ear or head which do not have an external source
<b>Tympanosclerosis</b>	The thickening of the eardrum
<b>Tympanum</b>	Anatomical name for the eardrum. Also tympanic membrane
<b>Unilateral hearing loss</b>	Hearing loss in one ear
<b>White noise</b>	Sound without structure which is made up of all audible frequencies at the same level. Used in hearing tests or tinnitus maskers

If you have any questions after reading this factsheet, contact the Deafness Research UK Information Service for further assistance. Our Information team will either answer your enquiry directly or refer it to one of our scientific or medical advisers.

Open: 9.30 a.m. to 5.30 p.m., Monday to Friday (a message can be left at other times).

Freephone: 0808 808 2222

E-mail: [info@deafnessresearch.org.uk](mailto:info@deafnessresearch.org.uk)

or click the 'ask question' option from our website homepage:

[www.deafnessresearch.org.uk](http://www.deafnessresearch.org.uk)

---

<sup>I</sup> Davis, A. (1995), Hearing in Adults. Whurr: London

<sup>II</sup> Watkin, P. in Ballantyne's Deafness, 6th edition (2001). Whurr: London

<sup>III</sup> World Health Organisation <http://www.who.int/mediacentre/factsheets/fs300/en/index.html>

<sup>IV</sup> Hear-it <http://www.hear-it.org/page.dsp?page=5378>

<sup>V</sup> Health and Safety Executive <http://www.hse.gov.uk/noise/>

<sup>VI</sup> Andersson, G., Baguley, D., McKenna, L., McFerran, D., (2005) Tinnitus- A multidisciplinary approach. Whurr : London

<sup>VII</sup> National Institute for Clinical Excellence (2000) Guidelines on Hearing Aid Technology

<sup>VIII</sup> The Ear Foundation, (2008). Cochlear Implants

<sup>IX</sup> The Ear Foundation, (2008). BAHA

<sup>X</sup> Royal National Institute for Deaf People, (1999) Report- Breaking the Sound Barrier.

Deafness Research UK is the only national medical research charity dedicated to helping people with deafness, tinnitus or other hearing problems.

Scientists are now predicting much more effective treatments for tinnitus and that a cure for some forms of deafness is not only possible but likely within the next few years. Deafness Research UK is at the forefront of this work.

You can support us by making a donation. For more information call us on 0207 164 2290 or write to:

Deafness Research UK, 330-332 Gray's Inn Rd, London WC1X8EE

Charity no. 326915

This factsheet has been produced by Deafness Research UK, in consultation with our medical and scientific advisers. Whilst all reasonable efforts have been made to ensure the information and advice given is taken from reputable sources and passed to the public in good faith, no responsibility can be taken on the part of Deafness Research UK or its advisers for any error or omission. You should not act on any advice without first referring to your family doctor or another medically qualified adviser. Reviewed: May 2009