

## Commentary

# Epidemiology of Childhood and Adult Deafness and the strategies for Prevention and Control in India

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## Abstract

Deafness is a major public health problem in India and worldwide. Around 63(6.3%) million people suffer from significant hearing loss in India and hearing disability is the second most common disability here. The most common causes of reversible deafness are ear wax (15.9%), aging and presbycusis (10.3%), chronic suppurative otitis media (5.2%) and serous otitis media (3%). Half of the causes of deafness are totally preventable and around 30% though not preventable are treatable or can be managed with assistive devices. However, there is an acute shortage of human resources to address the issue in India. The estimated number of ear, nose and throat (ENT) specialists and otologists in India are only 7000 and 2000, respectively. The audiometrist: population ratio is 1:500,000 and ratio of speech therapist to the deaf population is 1:200. There is also a skewed distribution of personnel as more people are located in urban than rural areas. There is also a need for "universal newborn hearing screening" program in India for early identification of deafness in children for improved outcomes. There is need to strengthen the primary health care system for provision and implementation of prevention of deafness and hearing loss.

## INTRODUCTION

World Health Organization (WHO) definition of deafness refers to complete loss of hearing ability in one or both ears. The cases included in this category are those having hearing loss of more than 90 dB in better ear (profound impairment) or total loss of hearing in both ears. 'Hearing impairment' defined by WHO refers to both complete and partial loss of ability to hear [1]. The statistics of hearing impairment or deafness is staggering- 360 million people in the world suffer from disabling hearing loss which constitutes 5.3% of the world's population. Hearing loss is second most common cause of years lived with disability (YLD) accounting for 4.7% of the total YLD. The estimated prevalence of deafness in South-East Asia region is substantially high ranging from 4.6% to 8.8% [2].

In India, 63 million (6.3%) people suffer from significant hearing loss according to population based surveys [2]. Four in every 1000 children suffer from severe to profound hearing loss and 100,000 babies are born with hearing deficiencies every year [3]. The estimated prevalence of childhood-onset deafness was found to be 2% and adult-onset deafness to be 7.6% [3]. According to National Sample Survey (NSS), hearing disability is the second most common cause of disability and most common

cause of sensory deficit [4]. It was estimated that number of person with hearing disability per 100,000 persons was 291; higher in rural regions (310) compared with urban (236). In the same survey, 32% of the people had profound (person could not hear at all or could hear only loud sounds), and 39% had severe hearing disability (person could hear only shouted words) out of which 7% of the people were born with a hearing disability. The magnitude of milder or unilateral hearing loss would be much larger than these estimates for bilateral hearing loss [5].

In India, according to WHO surveys [2], ear wax (15.9%) is the most common cause of reversible hearing loss, of which 91% constitute adults and 9% children. Noninfectious causes such as ageing and presbycusis are the second most common (10.3%) causes of auditory impairment in India. Middle ear infections such as chronic suppurative otitis media (5.2%) and serous otitis media (3%) are next leading causes. The other causes include dry perforation of tympanic membrane (0.5%) and bilateral genetic and congenital deafness (0.2%). Approximately 50% of all congenital hearing loss cases are attributable to environmental factors such as congenital hyperbilirubinemia, ototoxic medication exposure, neonatal hypoxia, viral infections, and meningitis and rest 50% are thought to be inherited i.e. having genetic causes. Of these hereditary cases, 30% are

classified as syndromic. About 400 known syndromes are associated with hearing loss, the associated auditory loss is quite variable- sensorineural or conductive, unilateral and bilateral and progressive or stable. The other 70% of hereditary cases are classified as non-syndromic. This group is the otherwise normal child with the exception of hearing loss [2].

Half of the causes of deafness are totally preventable and around 30% though not preventable are treatable or can be managed with assistive devices as estimated by the WHO. Thus, 80% of the all deafness can said to be avoidable. However, there is an acute shortage of human resources to address the issue as mentioned by WHO. The estimated number of ear, nose and throat (ENT) specialists and otologists in India are only 7000 and 2000, respectively. The audimetrist: population ratio is 1:500,000 and ratio of speech therapist to the deaf population is 1:200. There is also a skewed distribution of personnel as more people are located in urban than rural areas [2].

A probable strategy to ensure that children with hearing loss are identified and treated early is to ensure that every baby is screened for possible hearing loss at birth. Early detection and consequent treatment lead to better speech development and enhanced scholastic achievement in school. This strategy has been implemented in countries such as USA, Singapore, Australia and UK and many more. Currently, India doesn't have such a program in place and there is clearly a need for "universal newborn hearing screening" program in India.

Considering the enormous impact of deafness on social, economic and productive life in India due to its burden and also the large gaps in human resources to meet this challenge, primary healthcare remains the strategy of choice for the provision and implementation of prevention of deafness and hearing loss. The government of India initiated the National Program for Prevention and Control of Deafness in the year 2006 [6]. It was initially started as a pilot project and was implemented in 25 districts in 10 states and one union territory. It was up scaled to include 203 districts in all states and union territories in the eleventh

five year plan (2007-12). The program aims to cover three levels of prevention and care: primary, secondary and tertiary ear care by provision of an appropriate response at these levels. It aims at preventing avoidable hearing loss on account of disease or injury, identifying early and treating major ear problems, and medically rehabilitating persons with deafness of all age groups. For the preventing of auditory impairments, it promotes outreach activities and public awareness through innovative and effective information, education and communication strategies. The program has been integrated along with the umbrella health mission of government of India- the National Health Mission (NHM) - at state and districts levels.

Burden of hearing impairment and deafness is huge in India and requires concerted efforts. In the years to come, institutional building as well as team building may be the key elements that could influence the early detection and rehabilitation scenario. Teams comprising medical experts, experts from basic and hearing sciences, and technology may work together to evolve strategies that could for addressing the issues in hearing impairment from different perspectives. Early detection is the key to address the problem of deafness in India.

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