Report on the

Regional consultation on establishing guidelines for prevention and care of hearing impairment

Cairo, Egypt
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World Health Organization
Regional Office for the Eastern Mediterranean
1. INTRODUCTION

The World Health Organization (WHO) Regional Office for the Eastern Mediterranean (EMRO) held a regional consultation to establish guidelines for the prevention and care of hearing impairment, in Cairo, Egypt, from 11 to 13, June 2006. The consultation was attended by temporary advisers from six countries of the Eastern Mediterranean Region and by WHO staff from the Regional Office and the field.

The objectives of the consultation were to:

- review the national strategies for hearing impairment prevention and hearing and ear care;
- discuss integration of hearing impairment prevention and ear and hearing care into health care systems on the primary care level in countries of the Eastern Mediterranean Region; and
- develop regional guidelines for prevention of hearing impairment and deafness and find ways to implement these guidelines.

The consultation was opened by Dr Haifa Madi, Director, Health Protection and Promotion, who delivered the opening message of Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean. Dr Gezairy said that hearing impairment and deafness were serious disabilities that could impose a heavy social and economic burden on individuals, families, communities and countries. Children with hearing impairment often experienced delayed development of speech, language and cognitive skills, which may result in slow learning and difficulty progressing in school. In adults, hearing impairment and deafness often made it difficult to obtain, perform and keep employment. Both children and adults may suffer from social stigmatization and isolation as a result of hearing impairment.

Dr Gezairy noted that the number of people worldwide with all levels of hearing impairment was rising, mainly due to a growing global population and longer life expectancies. According to WHO estimates (2005), 278 million people worldwide had moderate to profound hearing loss in both ears; 80% of deaf and hearing-impaired people lived in low-income and middle-income countries. In the Eastern Mediterranean Region the most common cause of hearing impairment was chronic middle ear infection which caused mild to moderate hearing impairment.

Dr Gezairy noted that the impact of hearing impairment was heavy, particularly on a child's speech and language development, education and social integration. The level and type of hearing impairment, and the age of onset, especially if it began before the age when speech normally developed, were crucial to the outcome. In developing countries, fewer than 1 in 40 people who would benefit from a hearing aid had one. Current annual production of hearing aids was estimated to meet less than 10% of global needs. The burden of hearing impairment and deafness fell disproportionately on the poor, because they were unable to afford the preventive and routine care necessary to avoid hearing loss, or to afford hearing aids to make the condition manageable. Hearing impairment could make it more difficult to escape poverty by slowing progress in school and the workplace, and placing people in social isolation. The
cost of special education and lost employment due to hearing impairment could also impose a substantial economic burden on countries.

He said it was important to note that many cases of conductive hearing impairment, particularly otitis media, could be prevented from becoming chronic through appropriate detection, followed by appropriate medical or surgical interventions. The increasing availability in the Region of affordable, properly-fitted hearing aids and follow-up services could benefit many people with hearing impairment.

Dr Gezairy reiterated that 50% of deafness and hearing impairment was avoidable through prevention, early diagnosis and management. The Regional Office was looking for practical, cost-effective and affordable solutions to hearing impairment that focused on prevention, early detection and management and rehabilitation.

Professor Ossama Abdel Hamid was elected Chairman and Professor Somaya Tawfik as Rapporteur. The agenda, programme and list of participants are included as Annexes 1, 2 and 3, respectively.

2. TECHNICAL PRESENTATIONS

2.1 Global situation of hearing impairment: chronic diseases prevention and management, and the challenge of hearing impairment

*Dr Andrew Smith, EMRO*

Chronic diseases are the leading causes of death and disability worldwide. Disease rates from these conditions are accelerating globally, in every region and among all socioeconomic classes. WHO estimated in 2002 that mortality, morbidity and disability attributed to major chronic diseases accounted for almost 60% of all deaths, and 43% of the global burden of disease. By 2020 their contribution is expected to rise to 73% of all deaths and 60% of the global burden of disease.

WHO estimated that in 2005, there were 278 million people with disabling hearing impairment in the world. Of these, 210 million were adult-onset and 68 million were child-onset. An additional 364 million people have mild hearing impairment, making a total of 642 million people with any level of hearing impairment (461 million of these were adult-onset and 181 million were child-onset); 80% of these people live in low- and middle-income countries.

The WHO Medium Term Strategic Plan for 2008–2013 addresses chronic diseases in strategic objective 3: “Prevent and reduce disease, disability and premature death from chronic noncommunicable conditions, mental disorders, violence and injuries”. For the first time, hearing impairment has been included within this strategic objective, with the following indicators to measure progress:

- the percentage of targeted countries documenting the burden of hearing impairment;
• the percentage of targeted countries implementing WHO strategies for population prevention of hearing impairment;
• the percentage of targeted countries implementing integrated primary health care strategies;
• the percentage of targeted countries implementing national plans for prevention.

WHO is addressing the following key challenges in order to attain these strategic objectives. More accurate data on the prevalence and causes of these conditions are urgently needed, particularly from developing countries. Countries are using the WHO ear and hearing disorders survey protocol and software to conduct population-based prevalence and cause surveys, so far in 10 countries (range of prevalence of moderate or worse bilateral hearing impairment = 2.1% to 7.8%). Using this standardized methodology enables comparison between surveys conducted in different places, or surveys conducted in the same place at different times.

The data will raise awareness of the size of the problem and predict needs, and hence, help planners to determine programme priorities and select targets and strategies for prevention. The data will help measure costs and benefits of prevention and monitor achievements of interventions. It will improve WHO burden of disease estimates, for global and regional prioritization.

The serious effects of hearing loss on individuals, the size of the problem and the high costs to society are not generally known; many people are unaware that there are good interventions for prevention and management. This causes a lack of political will to address the problem, which leads to a lack of resources for programmes. WHO has recently supported the new independent journal *Community Ear and Hearing Health* as one attempt to raise awareness among health workers and planners in developing countries.

Health professionals and health planners need to reorientate their thinking and actions to include a public health route to address the situation. This would mean targeting, on a large scale, conditions which have, at the same time, a high prevalence and an effective means of prevention or control.

Cost-effective interventions are important such as the provision of hearing aids and services on a large scale where they are most needed. WHO estimates that approximately 35 million hearing aids are required each year in developing countries, but the supply of hearing aids is only 3% of what is actually needed. Even in developed countries, only one-third of hearing aids required are available. This demonstrates the huge need, but also a huge opportunity for manufacturers to expand their market and supply. To address this need, a new, independent global partnership of key stakeholders called WWHearing (Worldwide Hearing Care for Developing Countries), has been created to promote provision of appropriate, affordable hearing aids and services on a very large scale, through public–private partnerships in countries, using the *WHO Guidelines for Hearing Aids and Services for Developing Countries*. WWHearing is currently testing innovative models for provision through the training of community health workers in India and teachers of the deaf in China to fit hearing aids in adults and to follow up on children.
Effective and cost-effective interventions against ear and hearing problems can be implemented at the primary level by trained primary ear and hearing care (PEHC) workers or primary health care workers or their equivalents. Using these interventions on a large scale will have a major impact on the burden of ear disease and hearing loss. Most developing countries do not have PEHC workers and the topic is hardly addressed in the training of primary health care workers and community-based rehabilitation workers.

The WHO primary ear and hearing care training resource provides interactive and culturally appropriate training of village health workers, PEHC, primary health care and community-based rehabilitation workers, and more experienced staff at primary level. Manuals at basic, intermediate and advanced level focus on community involvement and raising awareness, and cover basic measures for prevention and management, including a section on hearing aids.

Most countries have not set up national programmes for deafness and hearing impairment, including prevention, but these are essential to make real progress in this field. The main components of this are shown in the box. Further details are given in the advanced level manual of the training resource. As part of the programme, training in public health otology and audiology and in speech language pathology and special education, tailored for developing countries, would be vital.

2.2 Regional situation of hearing impairment

Dr O Khatib, EMRO

In the Region, chronic diseases account for 52% of all deaths. Deaths from chronic diseases are projected to increase by 25% in the next 10 years. Worldwide, 278 million people are estimated to have moderate to profound hearing loss in both ears, regionally this figure is 38 million. Globally, it is estimated that one quarter of cases of hearing impairment begin during childhood. The regional estimate is that 35% of cases of hearing impairment begin during childhood. 80% of deaf and hearing-impaired people live in low- and middle-income countries. The burden of hearing impairment and deafness falls disproportionately on the poor because they are unable to afford the preventive and routine care necessary to avoid hearing loss, or to afford hearing aids to make the condition manageable. 90% of the population in the Region have no access to prevention and routine care to avoid hearing loss or to afford hearing aids.

The major preventable causes of hearing impairment in low- and middle-income countries are: middle ear infections; excessive noise; inappropriate use of certain drugs; problems during childbirth and vaccine-preventable infections. Detecting and responding to hearing impairment in babies and young children is vital for the development of speech and language. The current annual production of hearing aids is estimated to meet less than 10% of global need. Properly-fitted hearing aids can improve communication in at least 90% of people with hearing impairment. In developing countries, fewer than 1 in 40 people who need a hearing aid receive one.
Simply, immunization against childhood diseases such as measles, meningitis, rubella and mumps is key to preventing hearing impairment. Solutions to hearing impairment focus on prevention, early detection and management, and rehabilitation. WHO’s activities for the prevention and control of hearing impairment and deafness include to assist countries to reduce and eventually eliminate avoidable hearing impairment and disability through appropriate preventive measures. These include:

- developing a global database on deafness and hearing impairment to demonstrate the size and costs of the problem; and
- comparing cost–effectiveness of interventions;
- developing a training model on primary ear and hearing care for primary health care workers;
- raising awareness about prevention;
- encouraging countries to establish national programmes for prevention;
- developing and disseminating guidelines against major preventable causes of hearing impairment;
- building partnerships to provide affordable hearing aids and services to people in need.

The strategic objectives of WHO's Department of Chronic Diseases and Health Promotion (CHP) are to advocate for health promotion and chronic disease prevention and control and to promote health, especially for poor and disadvantaged populations.

Countries are encouraged, with WHO technical support, to conduct random sample, population-based prevalence and cause surveys of deafness and hearing impairment. Surveys are based on a specially developed WHO survey package (protocol, data entry form, coding instructions, dedicated software). The data will be used in planning, determination of priorities, economic analysis and raising awareness. Results will be used at local and national levels, and collated for regional and global levels.

### 2.3 Developing a national programme on hearing loss

*Dr Mohammad Al-Dabae, WHO Temporary Adviser*

In Egypt, many health care problems have been identified: delayed detection of disease; inadequate service regarding diagnosis and treatment; lack of good health care, especially in rural areas; lack of care at the primary care level; and lack of awareness among planners and the general public on the magnitude of the problem and potential needs for management.

The goal of the MoHP is to ensure that all Egyptian residents have access to necessary health care. The Ministry of Finance has provided the necessary funds and the MoHP has also created opportunities for private companies to provide health services in a cost-effective manner.

One major and basic step in the management of hearing loss is building a database for health care. The MoHP and WHO co-sponsored a national survey on hearing impairment in 2004. The implementation of the results requires cooperation between health care

The proposed vision is a society where the prevention, treatment and care of people with hearing loss are of the highest standard and are consistently available. The objectives are: to develop protocols for early detection, prevention and intervention of hearing loss at national level, to promote and advance medical knowledge with particular reference to hearing loss, and to increase the awareness of the public and health authorities.

2.4 Integrated approach for hearing impairment in primary health care

Professor O. Abdul Hamid, WHO Temporary Adviser

Hearing impairment and deafness are a major health problem. Prevalence ranges from between 3% and 15% of the population in the Region. It is known that 50% of the causes of hearing impairment could be prevented. Moreover, it was clearly demonstrated in the Egyptian national survey (2005) that 39% of causes of hearing impairment were managed only with medical treatment. These are two very important points in the management of hearing impairment.

The main goal is to plan for prevention of hearing impairment by reducing and eventually elimination avoidable hearing impairment/deafness. Solutions should be practical, cost effective and affordable. Solutions should focus on prevention and early detection, and include proper treatment and rehabilitation.

Currently, there is a global shift of provision of health care towards the primary level. Therefore, ear and hearing care should be integrated in the primary health care system. This integration will be the strategy of choice for provision and implementation of prevention of hearing impairment and deafness. However, some problems exist with primary health care in the Region, these include:

- primary health care is not uniformly present in countries of the Region;
- information regarding coverage is not available;
- infrastructure/human resources are not available:
  - there is a lack of awareness among primary health care physicians of the benefits of timely detection and treatment of hearing impairment;
  - lack of availability of (ENT) specialists;
  - lack of availability of audiology services and doctors/nurses/technicians;
  - lack of availability of equipment for ENT diagnosis/audiology assessment/hearing aid fitting or management. These are also deficient at the level of many district hospitals.
- referral system for secondary and tertiary levels is not clear;
- lack of services for surgery, hearing aids, rehabilitation;
- lack of economic resources for hearing care at the primary health care level.
Much effort is needed to obtain data, set strategies to solve the problems and monitor objectively the progress of these programmes. Ear care primary health providers are expected to be involved in four functions: prevention, awareness and promotion, diagnosis and treatment and rehabilitation.

For prevention the objectives are: screening, early detection of hearing impairment and implement preventive procedures. The methods include: clinical ear diagnosis with focus on use of otoscopes; detection congenital anomalies; perform simple tuning fork hearing tests; antenatal care; immunization programmes; noise control. These services could be provided by: health workers; volunteers; social workers; school teachers; paramedics; nurses; and doctors.

The objectives of promotion/awareness include: public awareness; community education; developing partnership with national stakeholders. This can be achieved through the use of brochures, the media, leaflets, seminars and fund-raising. The human resources needed for such activities include: health workers; volunteers; social workers; school teachers; and nongovernmental organizations.

The third function is medical management i.e. diagnosis and treatment. Objectives include the early diagnosis of ear and hearing disorders and applying proper treatment. Providers should learn to avoid complication and serious sequelae, treat associated medical diseases presenting with hearing impairment. Hearing evaluation will be done by simple audiological tests such as tuning forks and tympanometers when resources are available. Providers must also learn when to refer patients for further management. Health providers in this category will be doctors, nurses and audio technicians when possible. The methods to implement these objectives includes: staff training: courses, seminars, and teaching minor ENT procedures.

The rehabilitation function objectives are referral to specialized centres and providing hearing care. Methods involved are: well organized referral system, post-referral care, hearing aid care, follow-up after speech/language training. Implementation of such an integrated approach for hearing impairment at the primary health care level requires the following.

- Awareness of hearing impairment prevention and ear care among decision-makers, governmental agencies, nongovernmental organizations, and above all the mass media and community.
- Projects should be realistic and cost effective and simultaneously raise funds for implementation of identified projects.
- Availability of infrastructure and human resources for ear and hearing care. Health education augmented with training programmes for primary ear and hearing care and supported by development of guidelines for preventable causes of hearing impairment.
- Application requires upgrade priority of hearing impairment programmes in the national health development agenda in countries of the Region. National programmes for the prevention of hearing impairment should be developed and strategies for implementation should be founded.
2.5 Developing national plans for diagnosis of ear diseases and hearing disorders at the primary health care level

Professor Ali Jamal El Din, WHO Temporary Adviser

The role played by primary health care service in the diagnosis of hearing loss depends largely on the design of the health care delivery system. In order for the primary health care to play an effective role is to adopt the PHC-centred design. Diagnosis of hearing loss at the primary health care level depends mainly on proper history-taking focusing on high-risk factors. This can be facilitated by the modification of available questionnaires to fit the Region’s cultural and social peculiarities. Physical examination skills should focus on detecting signs of serious scenarios and syndromic features.

Primary health care physicians should be trained to improve their otoscopic skills and use of hand-held hearing devices in order to be able to differentiate between normal and abnormal findings and to spot serious findings. Flow charts and pictures are useful. Serious cases needing full audiological assessment should be referred to the audiologist through the otolaryngologist. Direct referral to an audiologist may be allowed for patients fulfilling certain criteria.

In addition to the required skills and equipment, the attitude of the physician towards hearing loss and the assistive ways of habilitation/rehabilitation need to be addressed. Local studies addressing the validity of physical findings of the otoscopic examination performed by the primary health care physician and audiological testing at the primary health care level are needed before recommending its routine use. This is very important in order to upgrade the role of primary health care from just hearing loss recognition to active participation in the screening and follow-up of cases with hearing loss. Such an outcome is important in areas where there is limited access to ENT and audiology services. The financial issues related to diagnosis and further management options are of major concern for any guideline to survive.

2.6 Audiological evaluation at the primary health care level

Professor Nadia Kamal, WHO Temporary Adviser

Audiologists are professionals who have the special knowledge, scientific background, training and skills for the diagnosis and intervention of disabling hearing loss. The role of primary health care physicians should be expanded to be "gatekeepers" for hearing health care services. Primary health care physicians are expected to constitute individual/family–professional partnership for hearing services delivery. They are primarily involved in counselling and early identification of hearing loss, which is particularly critical for infants and young children. They can play a major role in minimizing communication disorders for the elderly through encouraging them to seek hearing assistance.

Primary health care physicians should develop effective and interactive relationships with audiologists and other hearing professionals to bridge early identification with early intervention. Efforts should be directed toward increasing primary health care physicians’ role in hearing health care services to allow individuals to receive timely and efficacious treatment
for hearing loss. There is a clear need for extensive academic education for physicians in medical schools stressing hearing loss and treatment alternatives.

2.7 National approaches for screening for hearing disorders

*Professor Somayia Tawfique, WHO Temporary Adviser*

Screening for hearing disorders is the only tool for the early identification of hearing loss. Screening measures to be applied should be: rapid, simple, reliable, economic, sensitive and specific. Objective screening methods should include acoustic emission and/or auditory brainstem audiometry.

The objectives of a screening programme are to:

- rule out disease or impairment in a population that consists of both impaired and unimpaired individuals;
- conduct follow-up for hearing-impaired individuals to establish diagnosis and make appropriate referrals.

Criteria of diseases that should be screened are: frequent, serious, amenable to treatment, and the availability of facilities for diagnosis and management. Hearing loss is the most frequent birth defect and the most common disability among the elderly. Hearing loss is serious enough because undetected hearing loss has serious and negative consequences on communication, academic achievement, cognitive ability and psychological stability. Screening for hearing is the only tool for the early identification of hearing loss. Screening should be undertaken for non-symptomatic and symptomatic individuals.

The American Speech and Hearing Association (ASHA) guidelines (2002) suggested that all infants with hearing impairment should be identified before 3 months of age and receive an intervention by 6 months of age. This leads to normal speech, language and social skills development. Newborn hearing screening may be performed on targeted high-risk populations or universally. This depends on the available resources in each country. Criteria for targeted hearing screening (high-risk population): family history of hereditary childhood sensorineural hearing loss; in utero infection; craniofacial anomalies; birth weight less than 1500 grams; hyperbilirubinemia requiring exchange transfusion; ototoxic medications; bacterial meningitis; mechanical ventilation lasting 5 days or longer; stigmata or other findings associated with a syndrome known to include sensorineural and/or conductive hearing loss; and parent/caregiver concern regarding hearing.

Universal newborn hearing screening is very expensive even in developed countries, as an example, only 39 states out of 52 in the USA have legislative mandates related to universal newborn hearing screening. To implement hearing screening programmes in the Region several challenges are encountered. These include lack of financial resources, trained staff and a good system of management. The most important challenge is inadequate public awareness of the great value of early hearing detection.
Recommendations for successful screening necessitate raising the public’s awareness and parents’ acceptance of early detection of hearing loss; training large numbers of personnel, including general practitioners, nurses and technicians in primary health care; keeping a high-risk registry of hearing loss; and raising funds necessary to conduct universal neonatal hearing screening programmes.

2.8 Developing national policies for hearing aids for children

Professor Somayia Tawfique, WHO Temporary Adviser

Paediatric hearing aid fitting should be practised by a trained experienced audiologist because the management of paediatric hearing loss presents many challenges. The key for optimum hearing aid fitting is early and accurate diagnosis. Other stages include hearing aid fitting, verification, follow-up and rehabilitation programmes. Counselling of the family throughout all stages of fitting is mandatory for a successful outcome. It is recommended to implement national programmes for awareness of the importance of early hearing aid fitting especially in paediatric populations and apply guidelines that clearly define the role of physicians, hearing aid agents and families in order to ensure a successful outcome.

Hearing aid fitting should be followed by appropriate rehabilitation and educational programmes; and rehabilitation services should be extended to remote and rural areas. The ultimate goal is that audiologists and other professionals see hearing-impaired children develop speech, language and educational skills comparable to normal hearing peers. This can be achieved by accurate and early interventions and optimum dynamic hearing aid fitting.

2.9 Developing national policies for hearing aids for adults

Professor Nadia Kamal, WHO Temporary Adviser

Hearing aids services entails: selection, fitting and verification of performance of hearing aids. Guided patients acclimatization and extensive counselling for new hearing experience is an essential process for successful fitting. To satisfy a client’s fitting process requires wide experience and scientific knowledge. It entails the process of customizing the available and affordable technological features with a patient’s hearing status and ear conditions with his/her needs and lifestyle. So, it is conducted by an audiologist or a hearing instrument specialist who should receive medical clearance for each patient.

In the twenty first century, we are confronted by the paradox of an increase in the number of individuals experiencing hearing loss, but a decline in the percentage of individuals who elect to improve their hearing and communication skills through the use of hearing instruments. The developing countries which constitute two thirds of the world have less than one quarter of hearing aids distributed. This reflects the severe inefficiency of hearing care services that can be related to poor social stigma and lack of early identification and information of individuals of availability of treatment to achieve better communication skills.
2.10 Integrated national approaches for the prevention of hearing loss in acute and chronic otitis media at the primary health care level

*Professor S. Zagzouk, WHO Temporary Adviser*

Otitis media (middle ear infection) is widespread in developing countries, more so among children with low socioeconomic status, poor hygiene and malnutrition. It is one of the common preventable diseases causing hearing loss. It may take one of three forms: acute (AOM), chronic suppurative otitis media (CSOM) and otitis media with effusion (OME).

Epidemiological studies showed that 90% of children attending school have experienced at least one episode of AOM. AOM usually occurs during viral illness of the upper respiratory tract and predisposes to secondary bacterial infection. Risk factors include: overcrowding; poor hygiene and nutrition; inadequate or unavailable health care; high rate of nasopharyngeal colonization with pathogenic bacteria; passive smoking; ethnicity; genetic predisposition; and mode of infant feeding.

Proper management of upper respiratory tract infections is the key for treatment of AOM and this can be done by health auxiliaries or local general practitioners. It does not require ear specialists if treated at an early stage, i.e. before the rupture of the ear drum.

CSOM is a worldwide disease especially in developing countries despite the use of antibiotics and improvements in public health and medical care. CSOM risk factors include repeated attacks of AOM, low socioeconomic factors, congenital ear anomalies and cleft palate. CSOM can lead to serious complications, including meningitis and brain abscess. The main line of management of CSOM is surgery performed by an ENT specialist at the secondary and or tertiary care levels. Surgical intervention for otitis media should be conducted only by well-trained ear surgeons.

OME is more common among low-income families than higher-income families. Watchful waiting for at least 6 to 9 months is preferred. Early tympanostomy tube placement as compared with delayed tube placement in children with persistent effusion did not result in a significant effect on children’s cognitive or psychosocial development or children’s phonological and auditory processing skills.

Primary prevention with community awareness, participation and involvement for the early detection and management of otitis media and hearing problems should be stressed e.g.: health education through (mass media) television programmes, schools, Internet informing the population about health care and alerting them to the conditions for which they should be seeking medical attention. Increased awareness of sequelae of chronic ear disease among physicians and paediatricians and early proper management of AOM may abort its progression to chronic ear disease. In many countries there is a clear shift for clinical practice from tertiary to primary care settings as disease prevention, health promotion and early intervention are emphasized. The burden on health service providers in the primary health care centres is increasing. Sufficiently trained nurses can help provide primary health care especially for children.
Examination of the ear and hearing assessment in primary health care should use simple tools. Otoscopy is an adequate and inexpensive method of diagnosing different ear problems. It is recommended that all general practitioners and paediatricians should have training in otoscopy by spending some of their training period in an ENT department. Training includes showing various slides, ear models and charts to explain the common diseases of the ear, nose and throat. Health workers at the primary health care level should also be trained in how to remove wax in order to be able to see the drum. Hand held tympanometry can be also added to primary ear care and hearing services whenever the resources allow, it is a simple test that can be taught also to practising nurses.

2.11 Preventive strategies for common hearing loss disorders

Professor Mokhttar Bassiouny, WHO Temporary Adviser

Ototoxicity entails using local ear or systemic drugs which can induce hearing loss. Ototoxicity and noise induced hearing loss are two common causes of hearing loss which can be avoided by following proper preventive strategies. Recommendations for usage of topical antibiotic medications include the following.

- As a general rule, it is better to avoid administration of ototoxic otic drops (neomycin, gentamycin/amikacin, tobramycin, chloramphenicol), in presence of drum perforations. Use instead non-ototoxic ones, e.g., ciprofloxacin, ofloxacin.
- Avoid topical ototoxic drugs in case of perforations with non-inflamed ME, e.g., traumatic perforation of TM.
- In case of otitis media with discharging ear: stop ototoxic local drops once the ear becomes dry and when patients report symptoms associated with ototoxicity.
- Combining dexamethasone with aminoglycoside otic drops helps to buffer partly their ototoxic effect.

Recommendations for the usage of systemic antibiotic medications include the following.

- As a general rule, it is better to avoid administration of ototoxic drugs if other effective medications are available.
- In the following categories of patients, ototoxic antibiotics should be avoided unless absolutely necessary: pregnant women, the elderly, people with preexisting hearing loss, and people with previous history of gentamicin drug intake.
- The lowest effective dosage of ototoxic drugs should be used and levels should be closely monitored.
- If possible before treatment with an ototoxic drug, hearing should be measured and then monitored during treatment; symptoms are not reliable warning signs.
- During ototoxic antibiotherapy, care should be directed to avoid exposure to noise or the concomitant use of other ototoxic substances.
- Changing gentamycin dosage strategies from three times a day to once a day formats.

Recommendations for the prevention of noise-induced hearing loss include the following.
• Noise surveys to determine the degree of hazardous noise exposure by surveying any area in which workers are likely to be exposed to hazardous noise (> 85 dBA). The level of hazard depends on noise intensity, duration of exposure during a typical working day and overall exposure during working life.

• Engineering and administrative controls are undertaken to reduce exposures to < 90 dBA, and include: design of equipment, its location and layout, selection of quieter machines, treatment of noisy rooms, administrative controls, proper isolation of the worker from the source of noise.

• Audiometric tests, by pre-employment and periodic follow-up testing of employers, to help determine employee effects; employee medical history and non-workplace noise exposure should be assessed.

• Company-sponsored education programmes to stress the importance of good hearing conservation practices on and off the job and inform employees about other factors or diseases that may affect their hearing.

• Hearing protection devices to reduce the amount of sound reaching the ear.

2.12 Developing national plans for a referral system for ear and hearing problems

Professor Bader Al Din Mostafa, WHO Temporary Adviser

Ears and hearing problems are not present in the primary health concerns of the health care system. The health care system is multifaceted and integration between different providers is sporadic and irregular. There is no clearly defined systematized pathway for the diagnosis and management of ear problems. It is suggested to stratify the management of ear and hearing problems, and involve all the present actors in a systematized hierarchy.

The primary level includes paediatricians, general practitioners, school health doctors, etc. The secondary level includes specialists plus/minus audiology service, and the tertiary level including consultants and specialized services. Each should have a very well defined scope and place in the management plan. The final goal is to set a clear paradigm for the diagnosis and management of ear and hearing problems by allocating specific tasks for each level and enhancing communication and interaction between them.

Recommendations for the effective diagnosis and management of ear and hearing problems at primary health care level include: education; setting and implementing guidelines; involvement in screening and referral; involvement in public education. At the secondary health care level include: improvement of technical and scientific level; improvement of equipment and resources; better communication with other levels. At the tertiary health care level include: improvement and standardization of care; better equipment and resources; better communication with other levels.
3. COUNTRY PRESENTATIONS

3.1 Egypt

Ossama Hamid, MD

As there are no comprehensive data in Egypt about the magnitude and the distribution of the hearing problem, WHO and the MoHP in Egypt co-sponsored a household survey in 2004 to estimate the prevalence of hearing loss and to study the causes of hearing loss. The sample size was 4000 individuals randomly collected by the multistage stratified clustering technique, and adjusted according to gender and age distribution. The first phase of the survey was a screening field study including full history, otoscopic ear examination, tympanometry for middle ear function and oto-acoustic emission for the hearing. The second phase examined those who failed the screening by advanced diagnostic and audiological tests.

The prevalence of hearing loss was 15.9%, which was higher than expected and higher than the average rates in the Region 3%–8%. The prevalence of advanced hearing loss was 8.3%. Conductive hearing loss (60.56%) was significantly higher than sensorineural hearing loss (38.1%). In terms of age, there were two peaks of higher incidence of hearing loss: 0–4ys (22.4%) and above 65 years (49.3%). The fact that the age group 0–4 years had a high incidence of hearing loss should draw attention to the importance of screening protocol for this age group, which should include neonatal screening and preschool screening. The most common three causes of hearing loss were otitis media with effusion (30.8%), presbycusis (22.7%) and chronic suppurative otitis media (18.4%).

Most of the disease group (39%) needed medical treatment. This directs the attention to the fact that hearing loss is mainly a medical problem. Therefore, prevalence of hearing loss can be decreased by improvement of the diagnostic and treatment abilities of health providers especially at the primary care level. Consequently, the cost needed to attack the problem of hearing loss is not high.

24.8% of hearing impaired subjects needed hearing aids; one third needed unilateral hearing aid, and only 8.8% used them. Patients may have refused to use hearing aids for cosmetic, traditional or cost reasons or aids were not available. People may not be covered by insurance. Remote areas are deprived of hearing aid vendors.

Surgery was the third common management line (22.3%). The commonest age groups were from 15 to 45 years. The commonest indication for surgery was middle ear infections; pressure equalizing tubes for OME and tympanoplasty for CSOM. Needless to say that most middle ear infections could be prevented or the predisposing factors treated early. Therefore, health authorities should improve primary care centres regarding the diagnostics and medical treatment in order to decrease the later need for surgery for chronic middle ear infections.

The area of language and speech training was deficient; the need was 11% and applied was 1.1%. The MoHP should focus on improving the service on speech and language training especially in remote areas.
In conclusion, the MoHP should focus on hearing screening in neonates and preschool children in future health planning. As medical treatment is the mainstay of hearing loss management, improvements in the diagnostic and treatment skills of health service providers, especially at the primary care level, could much improve the incidence of hearing loss. Health authorities should integrate hearing and ear care in the primary care centre programmes. Ear and hearing care will decrease the direct and indirect cost of the hearing impairment problem. The media and nongovernmental organizations should play a role in patient education and awareness of the problem and focus on preventive strategies.

3.2 Morocco
Mohammed Kzadri, MD

Hearing loss can either be congenital or acquired. Bilateral congenital hearing loss has an incidence of 1 to 3 per 100 neonates. Hearing loss has negative effects on communication, on a child’s development and a child’s social integration in the future. Newborn hearing screening must be mandatory in order to allow an earlier management of the hearing loss once diagnosed.

The choice of screening tools is based on acoustic oto-emission and auditory brainstem evoked potential evaluation either in maternity or paediatric units. Genetic research is followed in order to find genetic causes of deafness and to assess the importance of gene therapy, so that cochlear cells can be replaced. In order to start the hearing screening, the cost should be supported by the Ministry of Health and nongovernmental organizations.

3.3 Jordan
Munther Al Labady, MD

There has much progress made in the management and care of hearing loss in Jordan. The Ministry of Health, with the cooperation of WHO, is preparing a national plan for the early diagnosis and prevention of hearing loss through many activities. A survey about deafness and hearing impairment was conducted in 2005. Results are due to be published soon. The results showed 19% hearing loss among the sample of which 2.8% was sensorineural permanent hearing loss. Many workshops on the early detection of deafness for ENT doctors in all hospitals of the Ministry of Health and also for doctors in primary health care centres have been held to increase knowledge and awareness about early detection and control of deafness. In Jordan, there is a well stratified primary care system encompassing 600 units across the country which will be the base for a primary ear and hearing care system. The Ministry of Health is providing every deaf person regardless of his/her age with the most up-to-date hearing aid free-of-charge. The Ministry of Health has also adopted the project of cochlear implants for candidates at the beginning of 2008.

In 2000, the Ministry of Health and Royal Medical Services (RMS) through the Middle East Hearing Association (MEHA) started a screening programme for newborn babies. In 2005, new screening methods were developed within the health services in the Ministry of Health, RMS and the Holy Land Institute for the Deaf through MEHA Project 4 (Early detection and rehabilitation of hearing loss in Jordan). As a preliminary step in implementing
a national neonatal hearing screening programme, the Ministry of Health held a one-month course in neonatal screening of hearing for 40 nurses and midwives. The results of neonatal hearing screening done by oto-acoustic emission (OAE) for babies before discharge from the hospital showed about 84.5% babies pass OAE before discharge, 12.5% are referred and 2.5% could not be tested due to noise. The incidence of hearing impairment increases greatly with consanguinity and among high-risk groups. The incidence of hearing impairment among neonates in Jordan is about 1.2%, which is five times greater than that in Canada, United States of America (USA) and the United Kingdom (UK).

The Ministry of Health is planning to set regulations and legislation to consider the neonatal screening of hearing as one of the compulsory services offered to all newborn babies in all hospitals and birth centres at all health sectors in Jordan. The Ministry of Health has formed a committee including different medical sectors in ENT and audiology specialty to prepare a national plan for the prevention of hearing loss.

3.4 Saudi Arabia

Siraj M. Zakzouk, MD

Since the meeting of a task force on the prevention and control of deafness and hearing impairment at the Regional Office, Alexandria, Egypt, 1992, two committees were formed in the Ministry of Health in Riyadh to put forward and discuss strategies for the prevention of hearing loss particularly at the primary care level. Hearing loss, however, is not a priority for the Ministry of Health.

A third committee was formed to study the feasibility of universal newborn hearing screening in the country. The committee proposes to train nurses in two main birthing hospitals in Riyadh and Jeddah. Otoacoustic emission, tympanometers and ABR machines were supplied by the Society for the Deaf. Military hospitals started their own programme in the Eastern province in Dammam. They screened more than 3000 neonates and the incidence was high at approximately 3.5% with SNHL mainly bilateral–consanguinity of parents very common. According to epidemiological studies in the country the magnitude of the problem of hearing impairment was found to affect 14% of the population. 1.5% with SNHL bilaterally and 10% to 11% with conductive hearing loss which is preventable. Tertiary care hospitals deal with surgeries of chronic otitis media and cochlear implants (more than 500 implants so far mainly in private hospitals). Implants were provided by donation or direct purchasing by the patients. Several authorities take care of the rehabilitation of the hearing impaired; the Ministry of Health, Labour, Social Security and Education. The Ministry of Health also formed another committee to study physical disabilities and rehabilitation programmes. There are several private centres and schools for the deaf, which provide hearing aids, maintenance and speech and auditory training. The Society of the Hearing Impaired provides hearing aids free-of-charge for hearing-impaired children at school only. The Ministry of Education with the Society of the Hearing Impaired, promote awareness among the population about hearing loss during the Week of the Deaf yearly and during national functions. An annual Ear Care Day has also been proposed.
3.5 United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)

Husam Tibi

UNRWA launched a screening programme for hearing impairment among schoolchildren but it was not very successful due to a lack of funds, lack of training of relevant staff (doctors and nurses) and the absence of clear technical instructions and guidelines. Two years ago a screening programme for hearing impairment among new school entrants was implemented which revealed the existence of about 2% of hearing impairment among this group. Also the existence of very efficient antenatal and postnatal services with approximately 85% coverage, in addition to 98% coverage of vaccination of children under 3 years of age, has had an excellent impact in the prevention of hearing impairments.

5. FRAMEWORK FOR REGIONAL GUIDELINES

Professor O. Abdul Hamid, WHO Temporary Adviser

Guidelines are developed to assist decision-making in certain medical conditions to speed up decisions and contain medical costs. Guidelines for clinical conditions treatment of AOM, hypertension, strep throat are better based on systematic reviews and evidence-based medicine whenever applicable. They are not intended to restrict clinical freedom but should consider regional and individual differences. For non-clinical situations, such as epidemiological preventive studies on hearing prevention, it may not be possible to find sufficient evidence-based studies and rather depend on consensus-based guidelines. Many factors should be taken into consideration including: local differences in the prevalence and presentations of the problem; available resources; modification of universal recommendations to be suitable for application.

When establishing guidelines the goals and objectives should be defined. The main goal is to prevent hearing impairment by reducing and eventually elimination avoidable hearing impairment/deafness. Realistic objectives must be chosen for any programme design for prevention of certain problems. This could be achieved by early detection, preventing the progression, minimizing further deterioration and rehabilitation of disability if present. Certain points should be clarified in establishing guidelines. First, the problem must be addressed in terms of epidemiology, prevalence and burden. Definitions should be agreed on according to international standards; in the current guidelines these include hearing loss types, grades and causes.

Although national surveys are essential to obtain all the information about the problem in a certain country, the common available data range in the Region could be safely used. This modification is well accepted because of time constraints. Countries could start implementation guided by the available data range and develop local data to update statistics. Research is mandatory to study and upgrade the local data.

In establishing guidelines, solutions for the problem should be practical, affordable, cost effective and flexible to accommodate for regional and local differences in resources. Guidelines also should focus on prevention and early detection and include proper treatment
and rehabilitation. Guidelines are essential in the management of any problem but implementation is crucial.

The following strategies are important in establishing guidelines:

- developing national plans that conform with the guidelines and accommodate local preferences;
- upgrading the priority of hearing and deafness in the political agenda of the Region;
- creating national legislation for hearing impairment/deafness control programmes;
- raising awareness on all levels (hearing week);
- providing health education, undergraduate curriculum/continuing medical education;
- establishing international, national, inter- and intrasectoral collaboration: nongovernmental organizations, professional societies, national centres, consumer/advocacy groups, hearing aid manufacturers;
- quality assurance: supervision, monitoring and evaluation with changes accordingly;
- national registry: tracking and surveillance system that will minimize loss in follow-up and allow further research.

Primary health care is the cornerstone for the implementation of the guidelines. Upgrading and strengthening the secondary and tertiary levels of care should be undertaken at the same time. Integration of ear and hearing care in primary health care is then a very important step in applying these strategic guidelines. PEHC workers should work on four activities: prevention; awareness/promotion, diagnosis/treatment and rehabilitation.

Implementation of the proposed guidelines must stress detailed procedures and operational steps in the following areas:

- screening;
- diagnostic skills at primary health care;
- audiological skills and procedures and primary health care;
- hearing aid care at primary health care;
- otitis media management;
- drug prescription practice;
- environmental noise control;
- other preventive activities;
- further meetings and discussion groups;
- available models: WHO, Oman, Saudi Arabia.

Implementation of guidelines requires certain measures, these latter may be categorized according to the available evidence into:

- Category I measures. Based on strong clinical studies and evidence-based medicine, and therefore should be widely applied e.g. antibiotic use in AOM.
- Category II measures. Based on strong logical and theoretical data. They could be applied. Screening neonates does not prevent hearing loss and deafness yet it is applied to improve morbidity of the hearing impairment.
• Category III measures. No evidence is present. These measures may be applied. Examples include health worker practising diagnosis and drug prescription, non-audiology staff fitting hearing aids.

Representatives of the countries in the Region also agreed on the development of a regional body “society or committee” for care of ear and hearing disorders, acting as a link between different countries to:

• draft the vision and mission of the society;
• communicate with representative of different states of the Region;
• identify regional and international partners for technical support;
• raise funds for future implementation of identified projects;
• raise awareness for hearing impairment prevention and ear care among partners governmental agencies, nongovernmental organizations, and above all the mass media and community;
• arrange regular society meeting and transfer authority to formal authorities.

6. CONCLUSIONS AND RECOMMENDATIONS

Recognizing that hearing impairment and deafness are serious disabilities that can impose a heavy social and economic burden on individuals, families, communities and countries, the Regional Office held a regional consultation on establishing guidelines for the prevention and care of hearing impairment in Cairo, from 11 to 13 June 2007.

According to 2005 estimates by WHO, 278 million people worldwide have moderate to profound hearing loss in both ears. In the Region it is estimated that 38 million people have moderate to profound hearing loss. 80% of deaf and hearing-impaired people live in low- and middle-income countries. The number of people worldwide with all levels of hearing impairment is rising mainly due to a growing global population and longer life expectancies. The burden of hearing impairment and deafness falls disproportionately on the poor as they are unable to afford the preventive and routine care necessary to avoid hearing loss, or to afford hearing aids to make the condition manageable. The major preventable causes of hearing impairment in low- and middle-income countries are middle ear infections, excessive noise, and inappropriate use of certain drugs, problems during childbirth, consanguinity and vaccine-preventable infections. Half of deafness and hearing impairment is avoidable.

Congenital hearing loss is the most common birth defect. Adult-onset hearing loss ranks fifteenth among the leading causes of the global burden of disease, and second in the leading causes of years lived with a disability (YLD).
To Member States

1. Ensure political commitment in the consideration of hearing impairment as a national health priority.

2. Implement national programmes for the prevention of deafness and hearing impairment where none exist, or strengthen existing programmes. Such programmes should be integrated in a country’s national health programme.

3. Strengthen/develop and implement neonatal screening and also implement school entry and pre-employment at the primary health care level. This requires setting and implementing national strategies.

4. Integrate hearing impairment programmes into primary health care where primary health care physicians are able to see and follow up on patients. This requires proper and continuous training for PHC physicians and paramedical staff. This necessitates establishing adequate human and financial resources. Also, this demands continuous monitoring and evaluation of PEHC programmes and availability of basic evaluation tools for diagnosis (tuning fork test).

5. Increase awareness of hearing impairment among decision-makers, community leaders, parents, teachers and health professionals.

To WHO Regional Office

6. Develop regional guidelines for the management and care of hearing impairment adapted from existing WHO and internationally-approved guidelines. The suggested guidelines should be clear, flexible and adaptable and should acknowledge the priority of using cost-effective management and care and the role of compelling indications and principles that emphasize:

- availability, affordability, and accessibility of health care; and

- set standards for patient management, taking into account potential gains associated with the consistent use of non-invasive technologies;

- which therapies provide the greatest cost–effectiveness for the limited resources available;

- improve the quality of clinical practice and patient care in the Region.
Annex 1

AGENDA

1. Registration
2. Opening session
3. Introduction of participants
4. Election of Officers
5. Regional situation of hearing loss
6. Integrated approach for hearing loss at primary health care
7. Developing national programmes on hearing loss
8. Progress made in the management and care of hearing loss in countries of the Region
9. Developing national plans for diagnosis of ear diseases and hearing disorders at primary health care
10. Audiological evaluation at primary health care
11. National approaches for screening for hearing disorders
12. Developing national policies for hearing aids
13. Integrated approaches for prevention of hearing loss in acute and chronic otitis media at primary health care
14. Preventive strategies for common hearing loss disorders
15. Developing national plans for referral system for ear and hearing problems
16. Framework for regional guidelines
17. Recommendations and conclusions
18. Closing session
Monday, 11 June 2007

08:30–09:00  Registration

09:00–09:30  Opening session
Regional Director’s message, by Dr Haifa Madi, DHP
Election of Chairperson and Rapporteur

10:00–10:15  Global situation of hearing loss, by Dr Andrew Smith, WHO/HQ

10:15–10:30  Regional situation of hearing loss, by Dr O. Khatib, RA/NCD

10:30–10:45  Integrated approach for hearing loss at primary health care,
by Professor O. Abdul Hamid, National WHO Temporary Adviser

10:45–11:00  Discussions

11:00–14:00  Progress made in management and care of hearing loss:
Country presentations
- Jordan
- Morocco
- Oman
13:00–14:00  
- Saudi Arabia
- Sudan
- UNRWA
- Egypt

14:00–15:00  Discussions

15:00–16:00  Round table discussion –
Moderator: Professor Ali Gamal El-Din Zohny, National WHO Temporary Adviser
Developing national plans for diagnosis of ear diseases and hearing disorders at primary health care
Tuesday, 12 June 2007

09:00–10:45  Round table discussion –
Moderator: Professor Nadia Kamal Ibrahim, National WHO Temporary Adviser
Audiological evaluation at primary health care

9:45–10:00  Neonatal screening in Jordan, by Professor Munther Labadi,
WHO Temporary Adviser

10:30–11:30  National approaches for screening for hearing disorders, by
Professor Somaia Tawfik, National WHO Temporary Adviser

11:30–12:30  Developing national policies for hearing aids, by Professor
Somaia Tawfik, National WHO Temporary Adviser and Professor Nadia Kamal Ibrahim,
National WHO Temporary Adviser

12:30–13:00  Integrated national approaches for prevention of hearing loss
in acute and chronic otitis media at primary health care
Professor Serag Zagzouk, WHO Temporary Adviser

14:00–15:00  Preventive strategies for common hearing loss disorders, by
Professor Mokhtar Bassiouny, WHO Temporary Adviser

15:00–16:00  Round table discussion –
Developing national plans for referral system for ear and
hearing problems
Dr Badr Eldin Mostafa, National WHO Temporary Adviser

16:00–16:15  Developing national programme on hearing loss
Dr Mohamed El Dabea, National WHO Temporary Adviser

Wednesday 13 June 2007

09:00–10:00  Framework for regional guidelines, by Professor O. Abdel
Hamid, National WHO Temporary Adviser

10:30–12:30  Recommendations and conclusions
Annex 3

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