



Vision and Hearing

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PROGRESS REVIEW



In the 26th session of the second series of assessments of *Healthy People 2010*, Assistant Secretary for Health ADM Joxel Garcia convened a Progress Review on Vision and Hearing. He was assisted by staff of the lead Agency for this *Healthy People 2010* focus area, the National Institutes of Health (NIH), whose principal research and outreach efforts directed at vision and hearing are centered in the National Eye Institute (NEI) and the National Institute on Deafness and Other Communication Disorders (NIDCD), respectively. Also participating in the review were representatives from other agencies and offices within the U.S. Department of Health and Human Services (HHS) and from the U.S. Department of Education and the U.S. Department of Veterans Affairs. Drawing on his experience as Deputy Director of the Pan American Health Organization, ADM Garcia noted the stark contrast between the general level of eye health in the United States and that prevailing in Central America, for instance, whose health officials have been very grateful for our assistance with cataract surgery and other areas of concern. However, even in relatively wealthy U.S. States, such as Connecticut, where ADM Garcia served as Commissioner of Public Health, there remain pockets of poverty with limited access to vision and hearing screening and treatment services. ADM Garcia stressed that, as much as our scientific achievements in these fields should be commended, these advances must be harnessed to a greater degree to their practical application. At this point, ADM Garcia withdrew from the meeting to keep another appointment, and Principal Deputy Assistant Secretary for Health Donald Wright assumed the role of Chair of the Progress Review.

The complete November 2000 text for the Vision and Hearing focus area of *Healthy People 2010* is available online at www.healthypeople.gov/document/html/volume2/28vision.htm. Revisions to the focus area chapter that were made after the January 2005 Midcourse Review are available at www.healthypeople.gov/data/midcourse/html/focusareas/fa28toc.htm. For comparison with the current state of the focus area, the report on the first-round Progress Review (held on October 20, 2004) is archived at www.healthypeople.gov/data/2010prog/focus28/2004fa28.htm. The meeting agenda, tabulated data for all focus area objectives, charts, and other materials used in the Progress Review can be found at a companion site maintained by the National Center for Health Statistics (NCHS)/Centers for Disease Control and Prevention: www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa28-vision2.htm. That site has a link to wonder.cdc.gov/data2010, which provides access to detailed definitions for the objectives in all 28 *Healthy People 2010* focus areas and periodic updates to their data.

Data Trends

Richard Klein, Chief of the NCHS Health Promotion Statistics Branch, presented an overview of data that relate to the Vision and

Hearing objectives. He noted that about 21 million adults in the United States are visually impaired, and about 36 million (17 percent) have

some degree of hearing loss. On average, lifetime costs associated with visual impairment are \$601,000 per person (in 2003 dollars), and with severe to profound hearing loss, more than \$1 million per person. Early diagnosis, treatment, and use of protective devices are highly effective in preventing vision and hearing loss. Of the focus area objectives and subobjectives that were retained after the 2005 *Healthy People 2010* Midcourse Review, one has surpassed its target, three are moving toward their targets, two are getting worse, seven show little or no change, nine have baseline data only, and three lack any data. Mr. Klein then provided a more detailed examination of objectives the focus area workgroup selected to highlight at the Progress Review:

(Obj. 28-4): In 2007, the rate of blindness and visual impairment among children and adolescents aged 17 years and less was 25 per 1,000 population, virtually unchanged since the baseline year and with little difference evident among racial and ethnic groups and between genders. The 2007 rate for children and adolescents from families whose income falls below the Federal poverty level was 40 per 1,000. The 2010 target for all population groups is 18 per 1,000.

(Obj. 28-2): In 2002, the baseline year and the most recent year for which data are available, 36 percent of children aged 5 years and less had received vision screening. Among children in that age group who had a disability, 64 percent had received such screening, compared with 35 percent of those without a disability. The target for all population groups is 52 percent.

(Obj. 28-1): In 2002, the baseline year and the most recent year for which data are available, 55 percent of adults aged 18 years and older (age-adjusted) were receiving dilated eye examinations at appropriate intervals—that is, every 2 years. The target for all groups is 58 percent, a target met by females in 2002 and surpassed (at 62 percent) by persons with at least some college. In 2002, 57 percent of adults who had diabetes had received dilated eye examinations

within the previous year, compared with 37 percent of adults without diabetes. A related objective in the Diabetes focus area has a target of 76 percent for the proportion of adults who have diabetes and who have received a dilated eye examination in the preceding 12 months.

(Obj. 28-8a): In 2006, the rate of occupational eye injuries resulting in lost work days was 3.9 per 10,000 full-time workers in private industry, compared with 4.8 per 10,000 in 2002. The rate per 10,000 for females in 2006 was 1.8, compared with 5.3 for males. The target is 3.4 for all population groups.

(Objs. 28-9a, b): In 2002, the baseline year and the most recent year for which data are available, 15 percent of children aged 6 to 17 years always or most of the time used protective eyewear at home. The proportion of such use for females was 11 percent, compared with 17 percent for males. The target is 20 percent for all population groups. In 2002, 33 percent of adults aged 18 years and older (age-adjusted) always or most of the time used protective eyewear at home, with females by a proportion of 26 percent and males by 36 percent. Percentage of use showed little variation by educational level. The target is 37 percent.

(Obj. 28-12): Office visits for otitis media by children and adolescents aged less than 18 years decreased from 344.7 per 1,000 in 1997 to 233.0 per 1,000 in 2006. Both racial groups, black and white, for whom data were available in 2006, as well as both genders, surpassed the target of 294 per 1,000. However, children aged less than 3 years are still far short of the target, with an office visit rate of 840.1 per 1,000 in 2006.

(Objs. 28-14a, b): In the period 2003–2004, 29 percent of adults aged 20 to 69 years (age-adjusted) had received a hearing examination in the previous 5 years, little changed from the 30 percent who had done so in the period 1999–2002. The proportion of

females who had received the service in 2003–2004 was 21 percent, compared with 36 percent of males, who surpass the target of 35 percent. In the period 2003–2004, 38 percent of adults aged 70 years and older had received a hearing examination in the previous 5 years, the same proportion as in 1999–2002. The proportion of females in this age group who had received the service in 2003–2004 was 36 percent, compared with 42 percent of males, which surpasses the target of 41 percent. In 2003–2004, 47 percent of persons aged 80 years and older had received a hearing examination in the previous 5 years.

(Objs. 28-13a, c): In 2006, preliminary data indicate that 162.7 per 1,000 adults with hearing loss and aged 20 to 69 years (age-adjusted) used hearing aids. In 2007, preliminary data indicate that 289.1 per 1,000 adults with hearing loss and aged 70 years and more used hearing aids. The targets for these two subobjectives have not been determined.

(Obj. 28-18): In the period 2003–2004, 121.4 per 1,000 adults aged 20 to 69 years (age-adjusted) had noise-induced hearing loss, compared with 119.0 per 1,000 in 1999–2002. Among racial and ethnic groups for whom data were available, and by gender, the rates per 1,000 for adults who had noise-induced hearing loss in 2003–2004 were as follows: non-Hispanic blacks, 85.4; non-Hispanic whites, 133.3; Mexican Americans, 140.9; females, 72.5 (below target rate); and males, 176.2. The target for all population groups is 88.1 per 1,000.

(Obj. 28-16a): In the period 2003–2004, 483.0 per 1,000 adults aged 20 to 69 years (age-adjusted) who were exposed to loud noises used ear protective devices. Among females so exposed, the rate of use was 253.8 per 1,000, compared with a use rate of 597.4 among males, which surpasses the target rate of 514.5 per 1,000. The rates of use per 1,000 in 2003–2004 by source of the loud sounds were as follows: at work, 505.1; from firearms outside of work, 600.9; and from other loud noises outside of work, 328.4.

Key Challenges and Current Strategies

NEI Acting Deputy Director Lore Anne McNicol and NIDCD Director James Battey made presentations on the principal themes of the Progress Review. Their statements, the discussion that ensued, and Progress Review briefing materials prepared by an interagency workgroup identified a number of barriers to achieving the objectives, as well as activities under way to meet these challenges, including the following:

Barriers

Vision

- Vision problems in children have been associated with developmental delays and the need for special educational, vocational, and social services. Eye conditions with onset in childhood have the potential to create visual impairment that lasts a lifetime.
- Vision disorders are the fourth most prevalent class of disability in the United States and the most prevalent

cause of handicapping conditions in childhood.

The most common vision disorders are amblyopia, strabismus, and significant refractive error.

- Only 42 percent of vision-impaired Americans without health insurance seek medical attention for their eye problems.
- Eye injuries are the leading cause of blindness in children in the United States. Many are sports-related injuries, which account for 100,000 physician visits yearly at a cost of \$175 million.
- Age-related eye diseases and conditions—such as macular degeneration, glaucoma, diabetic retinopathy, and cataracts—are the leading causes of vision impairment and blindness in people over age 65. Nearly 63 percent of persons aged 60 and older have refractive errors. With Americans living longer than ever before and the aging of the baby-boomer

generation, the number of people who are blind or have low vision is projected to increase substantially by the year 2020.

- Each day, more than 2,000 adult workers in the United States receive medical treatment because of work-related eye injuries. Eye injuries are common in all industries, but workers in the fields of construction, mining, agriculture, and manufacturing have the highest rates of eye injuries on the job.
- The NEI-sponsored Los Angeles Latino Eye Study suggests that this population has some of the highest rates for visual impairment and blindness in the United States, with women affected more frequently than men.

Hearing

- As with vision problems, the number of U.S. adults with hearing loss is expected to increase significantly as the population ages, because hearing loss and aging are related to a high degree. Hearing loss is one of the three most prevalent chronic conditions in older Americans, ranking just after hypertension and arthritis. More than 90 percent of adult hearing loss is sensorineural; that is, the sensory cells in the inner ear, called hair cells, or the auditory nerve cells are permanently damaged.
- Hearing screening studies in newborns have shown that congenital hearing loss affects between 1 and 3 of every 1,000 babies born in the United States. About one-half of congenital hearing loss is genetic; the other half is related to environmental factors.
- Increases in hearing loss prevalence occur earlier in life among persons who smoke, are exposed to elevated noise levels, or are at risk for cardiovascular disease. Recently published data also suggest that hearing impairment may be a largely unrecognized complication of diabetes.
- The most reliable study suggests that around 4 to 6 percent of youth aged 6 to 19 years have already

experienced some type of hearing deficit due to noise-induced hearing loss (NIHL). Despite its prevalence, most young people report that they haven't heard, read, or seen anything related to NIHL. Even many young people who are aware of the risks of NIHL may not take preventive action.

- Only one in five of the adults in need of a hearing aid have one. Stigma appears to have a significant effect on the decision of many individuals not to wear hearing aids. Also, the cost of a state-of-the-art hearing aid is in the neighborhood of \$6,000.
- Members of the U.S. military are at particularly high risk for noise-induced hearing loss due to the increased intensity and magnitude of current operations and extended training and tours of duty. One-third of soldiers and Marines returning from Afghanistan and Iraq in 2004 were referred to audiologists for hearing evaluations due to acute acoustic blast exposure. Among those referred, hearing loss was identified in 72 percent.

Activities and Outcomes

Vision

- Ninety percent of sports-related eye injuries in children can be prevented with the use of protective eyewear.
- A variety of vision rehabilitation services are available to help people cope with vision loss. These services include clinical assessments, vision rehabilitation therapy, orientation and mobility training, counseling, and other support services.
- Cheaper vision screening methods have been developed that compare well with the standard procedures offered by ophthalmologists.
- NEI's National Eye Health Education Program promotes and conducts research, synthesizes and disseminates scientific knowledge, and fosters the adoption and implementation of evidence-based eye health programs, interventions, and policies among Federal, State, and local service agencies and

professional organizations in the effort to improve the eye health of all Americans. NEI has a Web site at www.nei.nih.gov.

- The American Academy of Ophthalmology's *EyeSmart* public awareness campaign emphasizes the need for Americans to know their risk factors for eye diseases, infections, and injuries, and how ophthalmologists can help prevent, diagnose, and treat eye conditions.
- NEI has awarded seed money to 21 community organizations to develop programs designed to help reduce uncorrected visual impairment due to refractive error through the Healthy Vision 2010 Community Awards.
- The Lions Clubs International Foundation and Johnson & Johnson Vision Care have collaborated to develop *Sight for Kids*, a program that provides vision screenings and eye health education for children. More than 6 million children have been screened through the program; 203,930 have been referred to physicians for further evaluation; 41,818 have received glasses; and 35,374 have been treated for various eye conditions.
- In May 2003, NEI established the first annual Healthy Vision Month Observance. Healthy Vision Month 2008 focused on the importance of using protective eyewear during sports-related activities among children.
- The basic requirements for eye protection in the workplace are set by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA). The National Institute for Occupational Safety and Health (NIOSH)/Centers for Disease Control and Prevention (CDC) provides a variety of resources on workplace eye safety. The CDC Workplace Health and Safety Web page at www.cdc.gov/workplace includes a link to eye safety resources.

Hearing

- Since 1999, NIDCD has led a coalition of Government agencies and other partnering organizations in the *WISE EARS!*[®] initiative in a national effort to educate the public about ear defense against NIHL. The effort places a special emphasis on children and persons in the workforce. NIDCD has a Web site at www.nidcd.nih.gov.
- The prevalence of hearing screening of newborns has improved, so that about 90 percent of infants born in hospitals now receive screening.
- CDC's *Early Hearing Detection and Intervention Program* has worked cooperatively with the States to track progress in the implementation of universal newborn hearing screening.
- Hearing clinics now are located in some national discount chains, a trend which improves access to diagnosis and treatment of hearing loss.
- OSHA regulations mandate that employers provide hearing screenings and ear protective devices for employees in workplaces where noise levels equal or exceed 85 decibels for an 8-hour time-weighted average.
- In October 2008, NIDCD launched *It's a Noisy Planet: Protect Their Hearing*, a new public education campaign designed to increase awareness of parents of children, aged 8 to 12 years, about the causes and prevention of NIHL. With this information, parents and other adults can encourage children to adopt healthy hearing habits before and during the time that they develop listening, leisure, and working habits.
- The Joint Committee on Infant Hearing Screening, comprising representatives from professional associations and affinity organizations, has issued practice guidelines to supplement the training of pediatric audiologists involved in hearing screening, evaluation, and intervention programs for infants less than 1 year of age.

- Further research conducted or funded by NIDCD promises to advance the development and refinement of hearing aid microphones that permit directional amplification. These devices could then be tailored to the hearing challenges of individuals in their daily communication settings and thus be better able to approximate normal hearing.
- NIDCD-funded clinical trials will soon be under way, in which researchers will test the ability of nutrients, such as vitamins and minerals, to prevent NIHL in military personnel and college students.

What Needs To Be Done

Participants in the Progress Review made the following suggestions for public health professionals and policymakers to consider as steps to enable further progress toward achieving the objectives for Vision and Hearing:

Vision

- Give greater attention to eliminating or reducing disparities in eye health among population groups; for instance, myopia is highly prevalent among Chinese Americans.
- Increase efforts to expand screening for visual problems among preschool children; currently, only 22 percent are screened.
- Take steps to ensure that all vision screening guidelines for use in schools include examinations for astigmatism, which has been shown to have a negative effect on school performance.
- Seek new ways to overcome the barriers that low income and lack of insurance place against receipt of eye examinations and corrective eyewear.
- Explore alternative means of communicating with seasonal migrant workers, a group who are at

increased risk for eye injuries and difficult to reach with health protection information.

- Broaden public awareness that standard prescriptive eyeglasses do not provide adequate eye protection.

Hearing

- Improve tracking and communication associated with infants referred from newborn hearing screening programs. Only one-half of referrals are now receiving appropriate follow-up services.
- Establish protocols for a well-defined, scientifically based approach for the selection and fitting of hearing aids in infants and young children.
- Strive to address better the reasons for many individuals' reluctance to wear hearing aids, which are continually being improved in form and functionality, although at a cost.
- Accelerate the application of new research findings about the causes of NIHL and the preventive and therapeutic measures that can be taken against it.
- Seek to enlarge the share of clinical trials that receive public funding, rather than continue to rely to such a large degree on funding from parties that have a financial interest in the outcome of the trials and the application of research results.
- Direct additional research toward precisely defining the influence of diabetes on age-related hearing loss.

Vision and Hearing

- Consult with stakeholders, and endeavor to reach some measure of consensus on the place and role that vision and hearing concerns should have in *Healthy People 2020*.

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[Signed December 23, 2008]

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