

**Midcourse  
Review**



# Vision and Hearing **28**

**Lead Agency:**

National Institutes of Health

**Contents**

Goal . . . . .	28-3
Introduction . . . . .	28-3
Modifications to Objectives and Subobjectives . . . . .	28-3
Progress Toward Healthy People 2010 Targets . . . . .	28-4
Progress Toward Elimination of Health Disparities . . . . .	28-7
Opportunities and Challenges . . . . .	28-8
Emerging Issues . . . . .	28-8
Progress Quotient Chart . . . . .	28-10
Disparities Table . . . . .	28-11
Objectives and Subobjectives . . . . .	28-13
References . . . . .	28-30
Related Objectives From Other Focus Areas . . . . .	28-32



# **Goal: Improve the visual and hearing health of the Nation through prevention, early detection, treatment, and rehabilitation.**

---

## **Introduction\***

People depend on vision and hearing to provide the primary cues for conducting the basic activities of daily life. Vision and hearing permit people to navigate and stay oriented within their environment. These senses provide the portals for language, whether spoken, signed, or read. They are critical to most work and recreation and allow people to interact more fully. Moreover, there is reason for encouragement. The Nation's commitment to improving vision and hearing health has led to improved methods of prevention, early detection, treatment, and rehabilitation for diseases and disorders of the eye and ear. Accordingly, the day when no individual's financial security or quality of life will be needlessly reduced by a lack of vision or hearing is closer than ever before.

For these reasons, vision and hearing are defining elements of the quality of life, one of the two overarching Healthy People 2010 goals. Either or both of these senses may be diminished or lost because of heredity, aging, injury, or disease. Such loss may occur at birth, or gradually over the course of a lifetime, or instantaneously due to trauma. Prevention of vision or hearing loss and associated disabling conditions through improved disease prevention, detection, treatment, and rehabilitation methods is a public health priority. Some progress has been made since the launch of Healthy People 2010 in preventing and treating hearing and vision problems. For example, a reduction in the overall cases of blindness and visual impairment in children and adolescents aged 17 years and under occurred in 2003. An increase was noted in infants who received hearing screenings before 1 month of age. However, continuing efforts are needed. Expanded data collection has provided better understanding of the extent of hearing and vision issues in certain populations, including racial and ethnic populations. This understanding, in turn, enables the development of specific programs or initiatives designed to eliminate potential disparities.

## **Modifications to Objectives and Subobjectives**

The following discussion highlights the modifications, including changes, additions, and deletions, to this focus area's objectives and subobjectives as a result of the midcourse review.

As stated in *Healthy People 2010*: "Most developmental objectives have a potential data source with a reasonable expectation of data points by the year 2004 to facilitate setting 2010 targets in the mid-decade review. Developmental objectives with no baseline at the midcourse will be dropped." Accordingly, at the midcourse review some developmental objectives and subobjectives were deleted due to lack of a data

---

\* Unless otherwise noted, data referenced in this focus area come from Healthy People 2010 and can be located at <http://wonder.cdc.gov/data2010>. See the section on DATA2010 in the Technical Appendix for more information.

source. However, the U.S. Department of Health and Human Services (HHS) and the agencies that serve as the leads for the Healthy People 2010 initiative will consider ways to ensure these public health issues retain prominence despite their current lack of data.

Among the 10 vision objectives (28-1 through 28-10), only objective 28-4 was measurable at the beginning of the decade. The remaining nine objectives became measurable as data sources were identified. The 2002 National Health Interview Survey (NHIS) provided baseline data for seven of these objectives: dilated eye examinations (28-1), vision screening for children aged 5 years and under (28-2), impairment due to diabetic retinopathy (28-5), impairment due to glaucoma (28-6), impairment due to cataract (28-7), protective eyewear (28-9), and vision rehabilitation services and devices (28-10). Baseline data for impairment due to refractive errors (28-3) were obtained from the 1999–2000 National Health and Nutrition Examination Survey (NHANES). Baseline data sources for occupational eye injuries (28-8) were from the 2002 Annual Survey of Occupational Injuries and Illnesses<sup>1</sup> and the 1999 National Electronic Injury Surveillance System.<sup>2</sup> Objectives for occupational eye injuries (28-8) and protective eyewear (28-9) were divided into subobjectives to better reflect the data collected.

Of the eight hearing objectives (28-11 through 28-18), one was measurable at the beginning of the decade. Among the remaining seven, one—hearing evaluation and treatment referrals (28-15)—was deleted due to lack of a nationally representative data source, and six became measurable. Four objectives were divided into a total of 12 subobjectives to better reflect the data collected. These objectives included newborn hearing screening, evaluation, and intervention (28-11); hearing aids, assistive listening devices, and cochlear implants (28-13); hearing examination (28-14); and hearing protection (28-16).

The data source changed for hearing protection (28-16) from NHIS to NHANES. NHIS was dropped for hearing examination (28-14) and noise-induced hearing loss in adults (28-18) because more appropriate data are anticipated from NHANES.

Four hearing objectives were reworded. The change for hearing aids, assistive listening devices, and cochlear implants (28-13) allows for measurement of the most common devices used for rehabilitation of deafness and moderate-to-severe hearing impairment. Hearing protection (28-16) will measure only hearing protection devices used in noisy environments. Revised text for noise-induced hearing loss in adolescents aged 12 to 19 years (28-17) and in adults aged 20 to 69 years (28-18) will measure noise-induced hearing loss that can be tracked over time.

## **Progress Toward Healthy People 2010 Targets**

The following discussion highlights objectives that met or exceeded their 2010 targets; moved toward the targets, demonstrated no change, or moved away from the targets; and those that lacked data to assess progress. Progress is illustrated in the Progress Quotient bar chart (see Figure 28-1), which displays the percent of targeted change achieved for objectives and subobjectives with sufficient data to assess progress.

Data were available to assess progress for vision impairment in children and adolescents (28-4), newborn hearing screening, evaluation, and intervention (28-11a, b, and c), otitis media (28-12), and hearing examination (28-14a and b). One subobjective met its target. Four objectives and subobjectives moved toward their targets, and two subobjectives moved away from their targets. Data were unavailable to assess progress for the remaining 21 objectives and subobjectives.

**Objectives that met or exceeded their targets.** One subobjective—hearing examinations for persons aged 70 years and older (28-14b)—met its target of 40 percent.

**Objectives that moved toward their targets.** Progress was made for blindness and visual impairment in children and adolescents under 18 years of age (28-4), with 50 percent of the targeted change achieved. Several factors may influence meeting the target by 2010. For example, better treatment options may lead to improved compliance in amblyopia, a common eye disorder in children. The increased use of effective amblyopia screening tests will also help ensure that more children are detected and treated at an early stage when therapy is most effective.

Reductions in otitis media (inflammation of the middle ear) in children and adolescents under 18 years of age (28-12) met 82 percent of its targeted change. From a baseline of 345 cases per 1,000 children and adolescents under 18 years of age in 1997, the rate fell to 303 cases in 2002. The introduction of heptavalent pneumococcal conjugate vaccine (PCV7) in the United States in 2000 may have led to a reduction of otitis media in children under 2 years of age.<sup>3,4</sup> Because recent shortages restricted full access to the vaccine, guidelines have been issued to target the available supply to high-risk children (for example, children with sickle cell disease or anatomic asplenia, with chronic illness, or who are immunosuppressed, including those with HIV infection).<sup>5</sup> Contributing to this objective's progress are improved patient and physician education initiatives, such as health information fact sheets written in plain and linguistically appropriate language concerning risk factors for otitis media. A group of primary care physicians and experts in the fields of otolaryngology, epidemiology, and infectious disease has developed the *Clinical Practice Guideline: Diagnosis and Management of Acute Otitis Media* to address pain management, initial observation versus antibacterial treatment, appropriate choices of antibacterials, and preventive measures for acute otitis media (AOM).<sup>6</sup> The guideline lists factors associated with early or recurrent AOM; for example, genetic predisposition, premature birth, male gender, Native American/Inuit ethnicity, family history of recurrent otitis media, presence of siblings in the household, and low socioeconomic status.

Finally, the objective for hearing examinations achieved 20 percent of the targeted change for the population aged 20 to 69 years (28-14a). Initiatives that are contributing to efforts to increase the proportion of adults of all age groups (aged 20 years and older) having had recent hearing examinations (28-14) are the “WISE EARS!”<sup>®</sup> public awareness campaign relating to preventable causes of hearing impairment<sup>7</sup>; informative news articles, such as “Bring Those Babies Back”<sup>8</sup> and “Pointers for Parents,”<sup>9</sup> written in both English and Spanish; and other media coverage on hearing loss and advances in hearing aids, cochlear implants, and other assistive listening devices.

A host of national activities and organizations support the improvement of vision and hearing health. For example, more than 240 organizations belong to the Healthy Vision Consortium,<sup>10</sup> an alliance of organizations committed to the eye health of all Americans by supporting the vision objectives of Healthy People 2010. These organizations consist of key national, State, and local organizations representing the professional, voluntary, and business sectors.

In May 2003, the National Eye Institute (NEI) within HHS established the first annual Healthy Vision Month (HVM) Observance.<sup>11</sup> Each year, HVM focuses on a different Healthy People 2010 vision objective and engages partners in activities to further progress toward the selected objective. Partner activities include community-based programs and events, journal articles and editorials, and web-based information.

**Objectives that demonstrated mixed movement toward and away from their targets.** One objective—newborn hearing screening, evaluation, and intervention (28-11)—showed varying movement toward and away from targeted changes based on individual subobjectives. Newborns who receive a hearing screening before the age of 1 month (28-11a) moved to 71 percent of its targeted change—from a 2001 baseline of 66 percent of this population to 83 percent in 2002. Infants with possible hearing loss who receive audiologic evaluation before 3 months of age (28-11b) and intervention services before 6 months of age (28-11c) both moved away from their targets. The proportion of infants with hearing loss who received an evaluation before age 3 months (28-11b) decreased from 56 percent in 2001 to 52 percent in 2002, while the proportion who received intervention services before age 6 months (28-11c) decreased from 57 percent to 43 percent. In 2002, 46 States provided data for hearing screening before 1 month of age (28-11a), while only 27 States provided data for audiologic evaluation before 3 months of age (28-11b), and 26 States provided data for intervention services before 6 months of age (28-11c). This difference in reporting may affect the comparability of rates.<sup>12</sup> Baseline data did not become available until 2001, and the only other data point available was for 2002. The 1-year interval between the two data points does not provide much time for programs to influence the trend toward the target. With time, many more States are expected to provide information for subobjectives 28-11b and c, which will result in more reliable trend estimation.

Multiple factors have contributed to improvements in newborn hearing screening, evaluation, and intervention. Research and technologic advances have made screening easier and more cost effective. Several Federal agencies have promoted universal newborn hearing screening. For example, the Centers for Disease Control and Prevention's (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.<sup>13</sup> The lack of progress concerning hearing loss evaluation and intervention in infants under 1 year of age suggests the need for improved followup methods and treatment of infants who fail their initial screening.

**Objectives that demonstrated no change.** No vision or hearing objectives remained static at the midcourse review.

**Objectives that moved away from their targets.** Two subobjectives moved away from their targets: receipt of audiologic evaluation before 3 months of age among infants with possible hearing loss (28-11b) and enrollment of infants with confirmed hearing loss for intervention services before 6 months of age (28-11c).

**Objectives that could not be assessed.** Several objectives lacked sufficient data to assess progress: dilated eye examinations (28-1); vision screening for children aged 5 years and under (28-2); vision impairment due to refractive errors (28-3), diabetic retinopathy (28-5), glaucoma (28-6), and cataract (28-7); occupational eye injury (28-8); use of protective eyewear (28-9); vision rehabilitation services and devices (28-10); hearing aids, assistive listening devices, and cochlear implants (28-13); hearing protection (28-16); and noise-induced hearing loss in adolescents aged 12 to 19 years (28-17) and adults aged 20 to 69 years (28-18). Data are anticipated for these objectives by the end of the decade.

## Progress Toward Elimination of Health Disparities

The following discussion highlights progress toward the elimination of health disparities. The disparities are illustrated in the Disparities Table (see Figure 28-2), which displays information about disparities among select populations for which data were available for assessment.

For those vision-related objectives that had significant differences among racial and ethnic populations, the white non-Hispanic population showed the best rates for regular dilated eye examinations (28-1) and for vision impairment rates due to refractive errors (28-3) and glaucoma (28-6). In contrast, the black non-Hispanic population aged 45 years and older had a rate for glaucoma-related vision impairment more than three times the rate of the white non-Hispanic population. The black non-Hispanic population and the Mexican American population also had higher rates for impairment due to refractive error (28-3). The population identifying with two or more races had the best rate for vision screening in children 6 years of age and under (28-2).

Initiatives are under way to counteract these known disparities. For example, the Healthy Vision Community Awards Program provides seed money to organizations that are actively involved in addressing the Healthy People 2010 vision objectives.<sup>14</sup> The program, launched in 2002, has supported 130 community-based programs in more than 35 States and Puerto Rico and has served diverse audiences, including the black non-Hispanic, Hispanic, American Indian, and Alaska Native populations, as well as preschool children through adults over age 65 years, and economically disadvantaged and medically underserved persons.

Males had better rates for the following objectives with significant gender differences: visual impairment due to refractive errors (28-3) and cataracts (28-7), and adult use of protective eyewear (28-9b). Females had better rates for obtaining dilated eye exams at appropriate intervals (28-1) and for reducing occupational eye injuries resulting in emergency department visits (28-8b). Most of these disparities between genders were between 10 percent and 49 percent, with one notable exception: Males had a rate for occupational eye injuries (28-8b) that was more than three times the rate for females.

Among objectives with significant disparities in education level, persons with at least some college had the best group rate for dilated eye exams (28-1). High school graduates had the best rate for impairment due to cataracts among persons aged 65 years and older (28-7).

Among income levels, persons with middle/high incomes had the best rates for uncorrected vision impairment due to refractive errors (28-3); the rates for the poor and near-poor populations were more than 50 percent higher than the best group rate. Limited data were available to examine disparities between persons with and without disabilities. The population without disabilities had a better rate for visual impairment among persons aged 17 years and under (28-4) than the population with disabilities. Although the overall disparity between these two populations remained high (the rate for persons with disabilities was three times that for those without disabilities), the gap narrowed. Between 1997 and 2003, disparity declined by almost 200 percentage points.

For objectives related to hearing, the white non-Hispanic population had the best rate for adults aged 70 years and older who had had a hearing examination in the past 5 years (28-14b). The black non-Hispanic population had the best rate for adults aged 20 to 69 years who had had a hearing examination in

the past 5 years (28-14a). Hispanic outreach meetings, Spanish-language public service announcements, and health information fact sheets may have played a role in the increase in the use of hearing aids, wearing protective devices, and having hearing exams in the Hispanic population.<sup>15, 16</sup>

Males had better rates for two objectives with significant gender differences: recent hearing exams (28-14a and b) and the use of hearing protection devices by noise-exposed persons (28-16a). Females had better rates for obtaining cochlear implants (28-13b). All of these gender disparities were less than 99 percent.

Among objectives with significant disparities in education level, high school graduates had the best rate for hearing aid use by persons aged 20 to 69 years (28-13a). Persons with middle/high incomes also demonstrated the best group rates for recent hearing exams among persons aged 20 years and older (28-14a and b) and for the use of hearing protective devices among noise-exposed persons aged 20 to 69 years (28-16a). Between 1999–2000 and 2001–02, the disparity in receiving hearing exams between the near-poor population and the middle/high-income population increased more than 10 percentage points (28-14a).

Limited data were available to examine disparities between persons with and without disabilities. Persons with disabilities had a better rate for hearing aid use among persons aged 20 to 69 years (28-13a) than among persons without disabilities. The disparity between these two populations was substantial; the rate for persons with disabilities was about six times that of persons without disabilities.

## Opportunities and Challenges

More than 20 million Americans have suffered irreversible damage from noise, and millions more are exposed to dangerous levels of noise each day.<sup>17</sup> The “WISE EARS!”<sup>®</sup>,<sup>7</sup> education effort was launched by a coalition of government agencies headed by the National Institute on Deafness and Other Communication Disorders (NIDCD), within the National Institutes of Health, and CDC’s National Institute for Occupational Safety and Health. To prevent noise-induced hearing loss, they have joined with many organizations in a national effort to educate the public about ear defense. This education effort has a special emphasis on children and persons in the workforce.

In addition, the Occupational Safety & Health Administration (OSHA) mandates that employers provide hearing conservation programs for their employees in workplaces where noise levels equal or exceed 85 decibels for an 8-hour time-weighted average.<sup>18</sup> Many States have OSHA-approved State plans and have adopted their own standards and enforcement policies.

## Emerging Issues

Research coupled with technologic progress is driving advancements in the evaluation and management of hearing impairment and deafness. Research is also contributing to the development of new tools and technologies for the evaluation and modification of intervention programs for deaf or hearing-impaired infants under 1 year of age.<sup>19</sup> New methods to improve current techniques for fitting hearing aids to infants and children under 6 years of age are also being developed.



Research has allowed the Joint Committee on Infant Hearing Screening to issue new practice guidelines to supplement the training of pediatric audiologists involved in hearing screening, evaluation, and intervention programs for infants under 1 year of age. The committee comprises representatives from the American Academy of Audiology, American Academy of Otolaryngology—Head and Neck Surgery, American Academy of Pediatrics, American Speech-Language-Hearing Association, Council on Education of the Deaf, and directors of speech and hearing programs in State health and welfare departments.

Vaccine development for otitis media is a priority and offers the promise of greatly reducing this illness. The recent discovery of bacterial biofilms that remain in the middle-ear space long after the acute infection has been resolved is providing new insight into the pathogenesis of chronic otitis media infections with persistent effusion (fluid) and could lead to new treatment options.<sup>20, 21</sup>

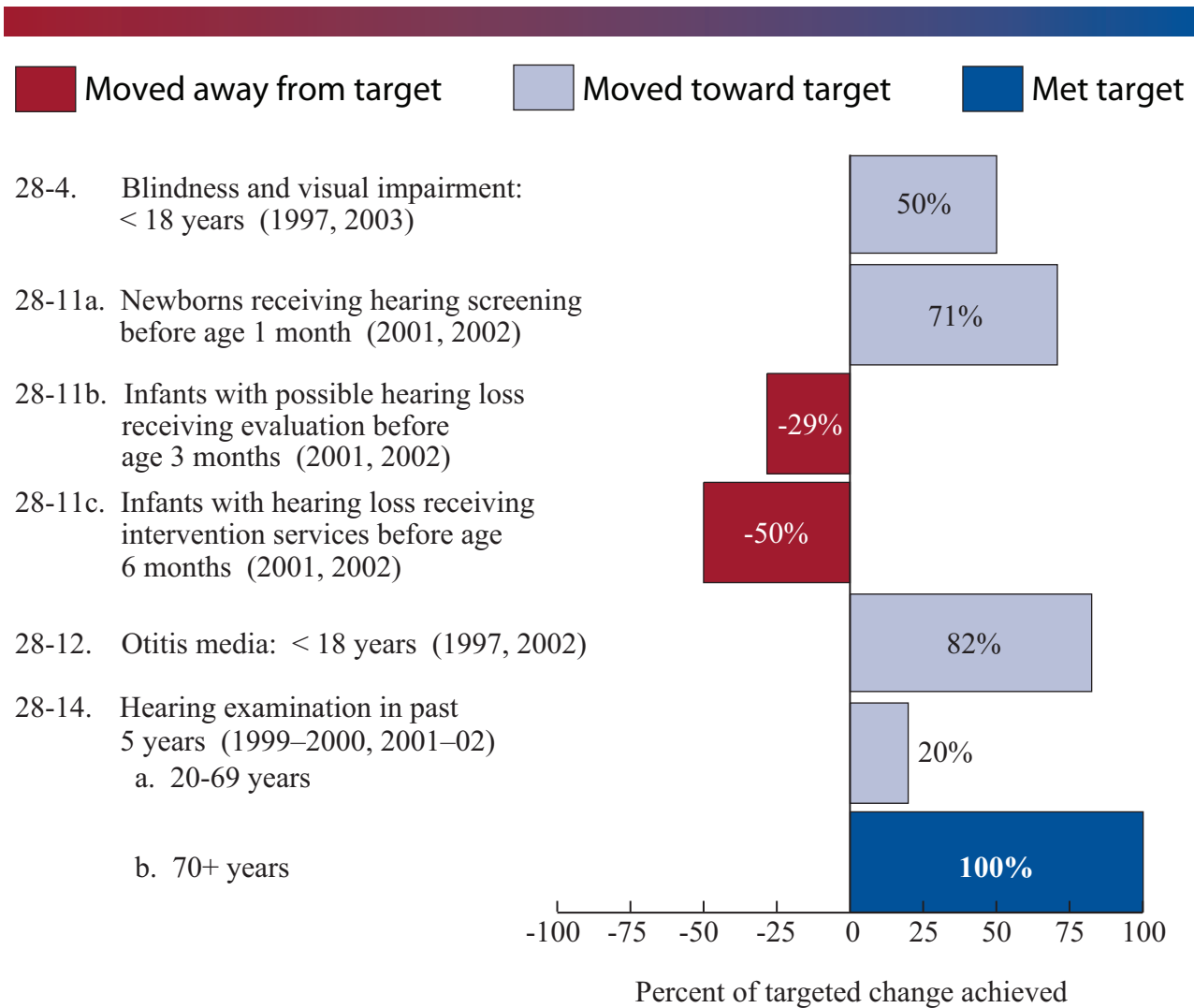
Regarding assistive listening devices, scientists have developed a new, shorter electrode to help persons who are unsuccessful hearing aid users. The short electrode is inserted into the base of the cochlea to restore hearing at the high frequencies, while preserving low-frequency residual hearing in the implanted ear.

Results from the NEI-sponsored Vision in Preschoolers (VIP) Study<sup>22</sup> found that the 11 most commonly used vision screening tests vary widely in identifying children with symptoms of common childhood eye conditions. When highly skilled personnel in a controlled setting used specific tests to screen preschool children, approximately two-thirds of the children (under age 5 years and 5 years and older) with one or more of the targeted disorders were identified. These tests were able to detect 90 percent of the children with the most severe visual impairments. The VIP study will provide State and local agencies with data that will assist them in selecting the most effective vision screening tests for their programs.

Ongoing research continues to highlight clear areas of disparities in vision and hearing among select populations. For example, results from the Los Angeles Latino Eye Study,<sup>23</sup> sponsored by NEI, suggest that this population has some of the highest rates for visual impairment and blindness in the United States. The overall number of cases of visual impairment and blindness in this population increased with age, with women more frequently affected than men. From a socioeconomic perspective, persons of Latino origin who were unemployed, divorced or widowed, or less educated had increased rates for visual impairment and blindness. These data will provide additional information useful in designing interventions relevant to the vision objectives in Healthy People 2010.

Myopia occurs in approximately 25 percent of the U.S. population.<sup>24</sup> A clinical study of myopia in first- and second-generation Hispanic, white, Asian, and black immigrant students in this country has demonstrated that Asian immigrants have a significantly higher number of overall myopia cases.<sup>24</sup> Increased cases of myopia among the Alaska Native population, as well as some American Indian tribes, have also been reported.<sup>25</sup>

**Figure 28-1. Progress Quotient Chart for Focus Area 28: Vision and Hearing**



**Notes:** Tracking data for objectives 28-1, 28-2, 28-3, 28-5, 28-6, 28-7, 28-8a and b, 28-9a and b, 28-10a and b, 28-13a through d, 28-14c, 28-16a and b, 28-17, and 28-18 are unavailable. Objective 28-15 was deleted at the midcourse.

Years in parentheses represent the baseline data year and the most recent data year used to compute the percent of the Healthy People 2010 target achieved.

$$\text{Percent of targeted change achieved} = \left( \frac{\text{Most recent value} - \text{baseline value}}{\text{Year 2010 target} - \text{baseline value}} \right) \times 100$$

**Figure 28-2. Disparities Table for Focus Area 28: Vision and Hearing**

Disparities from the best group rate for each characteristic at the most recent data point and changes in disparity from the baseline to the most recent data point.

Population-based objectives		Characteristics																			
		Race and ethnicity							Gender		Education			Income			Disability				
		American Indian or Alaska Native	Asian	Native Hawaiian or other Pacific Islander	Two or more races	Hispanic or Latino	Black non-Hispanic	White non-Hispanic	Summary index	Female	Male	Less than high school	High school graduate	At least some college	Summary index	Poor	Near poor	Middle/high income	Summary index	Persons with disabilities	Persons without disabilities
28-1.	Dilated eye examinations at appropriate intervals: 18+ years (2002) *						B		B				B								
28-2.	Vision screening: < 6 years (2002) *				B					B						B					
28-3.	Uncorrected visual impairment due to refractive errors (1999-2000) *					I		B		B							B				
28-4.	Blindness and visual impairment: < 18 years (1997, 2003) *																			↓	B
28-5.	Visual impairment due to diabetic retinopathy: 18+ years (2002) *																				
28-6.	Visual impairment due to glaucoma: 45+ years (2002) *							B													
28-7.	Visual impairment due to cataracts: 65+ years (2002) *					b		B		B		B									
28-8b.	Occupational eye injuries treated in emergency departments: full-time workers (1999) †								B												
28-9a.	Protective eyewear use: 6-17 years (2002) *					B				B					B						
28-9b.	Protective eyewear use: 18+ years (2002) *					B				B			B								
28-10a.	Vision rehabilitation services use: 18+ years (2002) *											B									
28-10b.	Visual adaptive devices use: 18+ years (2002) *				B					B			B								
28-12.	Otitis media: < 18 years (1997, 2002) *						2	2		B											
28-13a.	Hearing aid use: 20-69 years (2001) †					I		B		B		B								B	
28-13b.	New cochlear implants (2001) †								B												
28-14a.	Hearing examination in past 5 years: 20-69 years (1999-2000, 2001-02) *					I	B			B						↑	B		B		
28-14b.	Hearing examination in past 5 years: 70+ years (1999-2000, 2001-02) *					I		B		B							B		B		
28-16a.	Hearing protective device use: noise-exposed persons 20-69 years (1999-2000) *					B <sup>1</sup>				B							B				
28-17.	Noise-induced hearing loss: 12-19 years (1988-94) *					I															
28-18.	Noise-induced hearing loss: 20-69 years (1999-2000) *					I															










(continued)

**Figure 28-2. (continued)**

**Notes:** Data for objectives 28-8a, 28-11a, b, and c, 28-13c and d, 28-14c, and 28-16b are unavailable or not applicable. Objective 28-15 was deleted at the midcourse.

Years in parentheses represent the baseline data year and the most recent data year (if available).

Disparity from the best group rate is defined as the percent difference between the best group rate and each of the other group rates for a characteristic (for example, race and ethnicity). The summary index is the average of these percent differences for a characteristic. Change in disparity is estimated by subtracting the disparity at baseline from the disparity at the most recent data point. Change in the summary index is estimated by subtracting the summary index at baseline from the summary index at the most recent data point. See Technical Appendix for more information.

The <b>best group rate</b> at the most recent data point.	 The group with the best rate for specified characteristic.	 Most favorable group rate for specified characteristic, but reliability criterion not met.	 Best group rate reliability criterion not met.
<b>Percent difference from the best group rate</b>			
<b>Disparity from the best group rate</b> at the most recent data point.	 Less than 10 percent or not statistically significant	 10-49 percent	 50-99 percent
			 100 percent or more
<b>Increase in disparity (percentage points)</b>			
<b>Changes in disparity</b> over time are shown when the change is greater than or equal to 10 percentage points and statistically significant, or when the change is greater than or equal to 10 percentage points and estimates of variability were not available.	↑ 10-49	↑↑ 50-99	↑↑↑ 100 or more
	<b>Decrease in disparity (percentage points)</b>		
	↓ 10-49	↓↓ 50-99	↓↓↓ 100 or more
<b>Availability of data.</b>	 Data not available.	 Characteristic not selected for this objective.	

\* The variability of best group rates was assessed, and disparities of  $\geq 10\%$  are statistically significant at the 0.05 level. Changes in disparity over time, noted with arrows, are statistically significant at the 0.05 level. See Technical Appendix.

† Measures of variability were not available. Thus, the variability of best group rates was not assessed, and the statistical significance of disparities and changes in disparity over time could not be tested. See Technical Appendix.

<sup>1</sup> Data are for Mexican Americans.

<sup>2</sup> Data include persons of Hispanic origin.

## Objectives and Subobjectives for Focus Area 28: Vision and Hearing

---

**Goal:** Improve the visual and hearing health of the Nation through prevention, early detection, treatment, and rehabilitation.

As a result of the Healthy People 2010 Midcourse Review, changes were made to the Healthy People 2010 objectives and subobjectives. These changes are specific to the following situations:

- Changes in the wording of an objective to more accurately describe what is being measured.
- Changes to reflect a different data source or new science.
- Changes resulting from the establishment of a baseline and a target (that is, when a formerly developmental objective or subobjective became measurable).
- Deletion of an objective or subobjective that lacked a data source.
- Correction of errors and omissions in *Healthy People 2010*.

Revised baselines and targets for measurable objectives and subobjectives do not fall into any of the above categories and, thus, are not considered a midcourse review change.<sup>1</sup>

When changes were made to an objective, three sections are displayed:

1. In the Original Objective section, the objective as published in *Healthy People 2010* in 2000 is shown.
2. In the Objective With Revisions section, strikethrough indicates text deleted, and underlining is used to show new text.
3. In the Revised Objective section, the objective appears as revised as a result of the midcourse review.

Details of the objectives and subobjectives in this focus area, including any changes made at the midcourse, appear on the following pages.

---

<sup>1</sup> See Technical Appendix for more information on baseline and target revisions.

## Vision

### ORIGINAL OBJECTIVE

**28-1. (Developmental) Increase the proportion of persons who have a dilated eye examination at appropriate intervals.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-1. (Developmental) Increase the proportion of persons who have a dilated eye examination at appropriate intervals.**

**Target:** 58 percent of persons aged 18 years and older.

**Baseline:** 55 percent of persons aged 18 years and older had a dilated eye examination within the past 2 years in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Potential dData source:** National Health Interview Survey (NHIS), CDC, NCHS.

### REVISED OBJECTIVE

**28-1. Increase the proportion of persons who have a dilated eye examination at appropriate intervals.**

**Target:** 58 percent of persons aged 18 years and older.

**Baseline:** 55 percent of persons aged 18 years and older had a dilated eye examination within the past 2 years in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### ORIGINAL OBJECTIVE

**28-2. (Developmental) Increase the proportion of preschool children aged 5 years and under who receive vision screening.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-2. (Developmental) Increase the proportion of preschool children aged 5 years and under who receive vision screening.**

**Target:** 52 percent of preschool children aged 5 years and under.

**Baseline:** 36 percent of children aged 5 years and under had ever had their vision screened in 2002.

**Target setting method:** Better than the best.

**Potential Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### REVISED OBJECTIVE

**28-2. Increase the proportion of preschool children aged 5 years and under who receive vision screening.**

**Target:** 52 percent of preschool children aged 5 years and under.

**Baseline:** 36 percent of children aged 5 years and under had ever had their vision screened in 2002.

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### ORIGINAL OBJECTIVE

**28-3. (Developmental) Reduce uncorrected visual impairment due to refractive errors.**

**Potential data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-3. (Developmental) Reduce uncorrected visual impairment due to refractive errors.**

**Target:** 92.9 per 1,000 persons aged 12 years and older.

**Baseline:** 110.7 per 1,000 persons aged 12 years and older had uncorrected visual impairment due to refractive errors in 1999–2000 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Potential Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## REVISED OBJECTIVE

### 28-3. Reduce uncorrected visual impairment due to refractive errors.

**Target:** 92.9 per 1,000 persons aged 12 years and older.

**Baseline:** 110.7 per 1,000 persons aged 12 years and older had uncorrected visual impairment due to refractive errors in 1999–2000 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## NO CHANGE IN OBJECTIVE (Data updated and footnoted)

### 28-4. Reduce blindness and visual impairment in children and adolescents aged 17 years and under.

**Target:** 18<sup>1</sup> per 1,000 children and adolescents aged 17 years and under.

**Baseline:** 24<sup>2</sup> per 1,000 children and adolescents aged 17 years and under were blind or visually impaired in 1997.

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

<sup>1</sup> Target revised from 20 because of baseline revision after November 2000 publication.

<sup>2</sup> Baseline revised from 25 after November 2000 publication.

## ORIGINAL OBJECTIVE

### 28-5. (Developmental) Reduce visual impairment due to diabetic retinopathy.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## OBJECTIVE WITH REVISIONS

### 28-5. (Developmental) Reduce visual impairment due to diabetic retinopathy.

**Target:** 40.9 per 1,000 persons aged 18 years and older with diabetes.

**Baseline:** 45.8 per 1,000 persons aged 18 years and older with diabetes had trouble seeing and diabetic retinopathy in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.



**OBJECTIVE WITH REVISIONS (continued)**

**Potential Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**REVISED OBJECTIVE**

**28-5. Reduce visual impairment due to diabetic retinopathy.**

**Target:** 40.9 per 1,000 persons aged 18 years and older with diabetes.

**Baseline:** 45.8 per 1,000 persons aged 18 years and older with diabetes had trouble seeing and diabetic retinopathy in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**ORIGINAL OBJECTIVE**

**28-6. (Developmental) Reduce visual impairment due to glaucoma.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**OBJECTIVE WITH REVISIONS**

**28-6. (Developmental) Reduce visual impairment due to glaucoma.**

**Target:** 10.7 per 1,000 persons aged 45 years and older.

**Baseline:** 13.5 per 1,000 persons aged 45 years and older had trouble seeing and glaucoma in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Potential Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**REVISED OBJECTIVE**

**28-6. Reduce visual impairment due to glaucoma.**

**Target:** 10.7 per 1,000 persons aged 45 years and older.

**Baseline:** 13.5 per 1,000 persons aged 45 years and older had trouble seeing and glaucoma in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### ORIGINAL OBJECTIVE

28-7. (Developmental) Reduce visual impairment due to cataract.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

28-7. (~~Developmental~~) Reduce visual impairment due to cataract.

**Target:** 91.4 per 1,000 persons aged 65 years and older.

**Baseline:** 119.3 per 1,000 persons aged 65 years and older reported they had trouble seeing and cataracts in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Potential dData source:** National Health Interview Survey (NHIS), CDC, NCHS.

### REVISED OBJECTIVE

28-7. Reduce visual impairment due to cataract.

**Target:** 91.4 per 1,000 persons aged 65 years and older.

**Baseline:** 119.3 per 1,000 persons aged 65 years and older reported they had trouble seeing and cataracts in 2002 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### ORIGINAL OBJECTIVE

28-8. (Developmental) Reduce occupational eye injury.

**Potential data sources:** Annual Survey of Occupational Injuries and Illnesses (ASOII), U.S. Department of Labor, Bureau of Labor Statistics; National Electronic Injury Surveillance System (NEISS), CPSC, and NIOSH.

### OBJECTIVE WITH REVISIONS

28-8. (~~Developmental~~) Reduce occupational eye injury.

**Target and baseline:**

Objective	Reduction in Occupational Eye Injury	2002 Baseline (unless noted)	2010 Target

## OBJECTIVE WITH REVISIONS *(continued)*

		<i>Per 10,000 Full-Time Workers</i>	
<b>28-8a.</b>	Occupational eye injuries resulting in lost work days	4.8	3.4
<b>28-8b.</b>	Occupational eye injuries treated in emergency departments	21.0 (1999)	14.7

**Target setting method:** 30 percent improvement.

**Potential Data sources:** Annual Survey of Occupational Injuries and Illnesses (ASOII), U.S. Department of Labor, Bureau of Labor Statistics; National Electronic Injury Surveillance System (NEISS), CPSC and CDC, NIOSH.

## REVISED OBJECTIVE

### 28-8. Reduce occupational eye injury.

**Target and baseline:**

Objective	Reduction in Occupational Eye Injury	2002 Baseline (unless noted)	2010 Target
		<i>Per 10,000 Full-Time Workers</i>	
<b>28-8a.</b>	Occupational eye injuries resulting in lost work days	4.8	3.4
<b>28-8b.</b>	Occupational eye injuries treated in emergency departments	21.0 (1999)	14.7

**Target setting method:** 30 percent improvement.

**Data sources:** Survey of Occupational Injuries and Illnesses (SOII), U.S. Department of Labor, Bureau of Labor Statistics; National Electronic Injury Surveillance System (NEISS), CPSC and CDC, NIOSH.

## ORIGINAL OBJECTIVE

### 28-9. (Developmental) Increase the use of appropriate personal protective eyewear in recreational activities and hazardous situations around the home.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## OBJECTIVE WITH REVISIONS

**28-9. (Developmental) Increase the use of appropriate personal protective eyewear in recreational activities and hazardous situations around the home.**

**Target and baseline:**

Objective	Increase in Use of Personal Protective Eyewear at Home	2002 Baseline	2010 Target
		<i>Percent</i>	
<b>28-9a.</b>	Children aged 6 to 17 years	15	20
<b>28-9b.</b>	Adults aged 18 years and older	33*	37

\* Age adjusted to the year 2000 standard population.

**Target setting method:** Better than the best.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## REVISED OBJECTIVE

**28-9. Increase the use of personal protective eyewear in recreational activities and hazardous situations around the home.**

**Target and baseline:**

Objective	Increase in Use of Personal Protective Eyewear at Home	2002 Baseline	2010 Target
		<i>Percent</i>	
<b>28-9a.</b>	Children aged 6 to 17 years	15	20
<b>28-9b.</b>	Adults aged 18 years and older	33*	37

\* Age adjusted to the year 2000 standard population.

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## ORIGINAL OBJECTIVE

**28-10. (Developmental) Increase vision rehabilitation.**

**28-10a.**

Increase the use of rehabilitation services by persons with visual impairments.

**28-10b.**

Increase the use of visual and adaptive devices by persons with visual impairments.

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## OBJECTIVE WITH REVISIONS

### 28-10. ~~(Developmental)~~ Increase vision rehabilitation.

~~28-10a.~~ Increase the use of rehabilitation services by persons with visual impairments:

~~28-10b.~~ Increase the use of visual and adaptive devices by persons with visual impairments:

**Target and baseline:**

Objective	Increase in Vision Rehabilitation	2002 Baseline	2010 Target
		<i>Per 1,000 Population</i>	
<b>28-10a.</b>	Use of vision rehabilitation services by visually impaired persons aged 18 years and older (age adjusted to the year 2000 standard population)	14.0	15.5
		<i>Percent</i>	
<b>28-10b.</b>	Use of visual and adaptive devices by visually impaired persons aged 18 years and older (age adjusted to the year 2000 standard population)	22	26

**Target setting method:** For 28-10a, 10 percent improvement; for 28-10b, better than the best.

**Potential dData source:** National Health Interview Survey (NHIS), CDC, NCHS.

## REVISED OBJECTIVE

### 28-10. Increase vision rehabilitation.

**Target and baseline:**

Objective	Increase in Vision Rehabilitation	2002 Baseline	2010 Target
		<i>Per 1,000 Population</i>	
<b>28-10a.</b>	Use of vision rehabilitation services by visually impaired persons aged 18 years and older (age adjusted to the year 2000 standard population)	14.0	15.5
		<i>Percent</i>	
<b>28-10b.</b>	Use of visual and adaptive devices by visually impaired persons aged 18 years and older (age adjusted to the year 2000 standard population)	22	26

### REVISED OBJECTIVE *(continued)*

**Target setting method:** For 28-10a, 10 percent improvement; for 28-10b, better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

## Hearing

### ORIGINAL OBJECTIVE

**28-11. (Developmental) Increase the proportion of newborns who are screened for hearing loss by age 1 month, have audiologic evaluation by age 3 months, and are enrolled in appropriate intervention services by age 6 months.**

**Potential data sources:** State-based Early Hearing Detection and Intervention (EHDI) Program Network, CDC and/or specific State data.

### OBJECTIVE WITH REVISIONS

**28-11. (Developmental) Increase the proportion of newborns who are screened for hearing loss by age 1 month, have audiologic evaluation by age 3 months, and are enrolled in appropriate intervention services by age 6 months.**

**Target and baseline:**

Objective	Increase in Newborn Screening, Audiologic Evaluation, and Enrollment in Appropriate Intervention Services	2001 Baseline	2010 Target
		<i>Percent</i>	
<b>28-11a.</b>	Screening for hearing loss before age 1 month	66	90
<b>28-11b.</b>	Receipt of audiologic evaluation before age 3 months among infants with possible hearing loss	56	70
<b>28-11c.</b>	Enrollment of infants with confirmed hearing loss for intervention services before age 6 months	57	85

**Target setting method:** For 28-11a, 36 percent improvement; for 28-11b, 25 percent improvement; for 28-11c, 49 percent improvement.

**Potential data sources:** State-based Early Hearing Detection and Intervention (EHDI) Program Network, CDC and/or specific State data.

## REVISED OBJECTIVE

**28-11. Increase the proportion of newborns who are screened for hearing loss by age 1 month, have audiologic evaluation by age 3 months, and are enrolled in appropriate intervention services by age 6 months.**

**Target and baseline:**

Objective	Increase in Newborn Screening, Audiologic Evaluation, and Enrollment in Appropriate Intervention Services	2001 Baseline	2010 Target
		<i>Percent</i>	
<b>28-11a.</b>	Screening for hearing loss before age 1 month	66	90
<b>28-11b.</b>	Receipt of audiologic evaluation before age 3 months among infants with possible hearing loss	56	70
<b>28-11c.</b>	Enrollment of infants with confirmed hearing loss for intervention services before age 6 months	57	85

**Target setting method:** For 28-11a, 36 percent improvement; for 28-11b, 25 percent improvement; for 28-11c, 49 percent improvement.

**Data sources:** State-based Early Hearing Detection and Intervention (EHDI) Program Network, CDC and/or specific State data.

## NO CHANGE IN OBJECTIVE

**28-12. Reduce otitis media in children and adolescents.**

**Target:** 294 visits per 1,000 children and adolescents under age 18 years.

**Baseline:** 344.7 visits per 1,000 children and adolescents under age 18 years were for otitis media in 1997.

**Target setting method:** Better than the best.

**Data sources:** National Ambulatory Medical Care Survey (NAMCS), CDC, NCHS; National Hospital Ambulatory Medical Care Survey (NHAMCS), CDC, NCHS.

## ORIGINAL OBJECTIVE

**28-13. (Developmental) Increase access by persons who have hearing impairments to hearing rehabilitation services and adaptive devices, including hearing aids, cochlear implants, or tactile or other assistive or augmentative devices.**

## ORIGINAL OBJECTIVE *(continued)*

**Potential data sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## OBJECTIVE WITH REVISIONS

**28-13. ~~(Developmental)~~ Increase the proportion of persons with hearing impairments who have ever used a hearing aid or assistive listening devices or who access by persons who have hearing impairments to hearing rehabilitation services and adaptive devices, including hearing aids, cochlear implants, or tactile or other assistive or augmentative devices have cochlear implants.**

**Target and baseline:**

Objective	Increase in Use of Hearing Aids, Cochlear Implants, or Assistive Listening Devices Among Persons With Hearing Loss	2001 Baseline	2010 Target
		<i>Per 1,000</i>	
<b>28-13a.</b>	Adults aged 20 to 69 years with hearing loss who have ever used a hearing aid	149.6	155.0
		<i>Per 10,000</i>	
<b>28-13b.</b>	Persons who are deaf or very hard of hearing and who have new cochlear implants	51	56
<b>28-13c.</b>	Adults aged 70 years and older with hearing loss who have ever used a hearing aid	Developmental	
<b>28-13d.</b>	Adults aged 70 years and older with hearing loss who use assistive listening devices	Developmental	

**Target setting method:** For 28-13a, better than the best; for 28-13b, 10 percent improvement.

**Potential dData sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Healthcare Cost and Utilization Project (HCUP), AHRQ.

## REVISED OBJECTIVE

**28-13. Increase the proportion of persons with hearing impairments who have ever used a hearing aid or assistive listening devices or who have cochlear implants.**

**Target and baseline:**

Objective	Increase in Use of Hearing Aids, Cochlear Implants, or Assistive Listening Devices Among Persons With Hearing Loss	2001 Baseline	2010 Target



### REVISED OBJECTIVE *(continued)*

		<i>Per 1,000</i>	
<b>28-13a.</b>	Adults aged 20 to 69 years with hearing loss who have ever used a hearing aid	149.6	155.0
		<i>Per 10,000</i>	
<b>28-13b.</b>	Persons who are deaf or very hard of hearing and who have new cochlear implants	51	56
<b>28-13c.</b>	Adults aged 70 years and older with hearing loss who have ever used a hearing aid	Developmental	
<b>28-13d.</b>	Adults aged 70 years and older with hearing loss who use assistive listening devices	Developmental	

**Target setting method:** For 28-13a, better than the best; for 28-13b, 10 percent improvement.

**Data sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Healthcare Cost and Utilization Project (HCUP), AHRQ.

### ORIGINAL OBJECTIVE

**28-14. (Developmental) Increase the proportion of persons who have had a hearing examination on schedule.**

**Potential data sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-14. (~~Developmental~~) Increase the proportion of persons who have had a hearing examination on schedule.**

**Target and baseline:**

Objective	Increase in Hearing Examinations	1999–2000 Baseline	2010 Target
		<i>Percent</i>	
<b>28-14a.</b>	Adults aged 20 to 69 years who have had a hearing examination in the past 5 years (age adjusted to the year 2000 standard population)	<u>29</u>	<u>34</u>

### OBJECTIVE WITH REVISIONS *(continued)*

<u>28-14b.</u>	Adults aged 70 years and older who have had a hearing examination in the past 5 years	<u>37</u>	<u>40</u>
<u>28-14c.</u>	Adolescents aged 12 to 19 years who have had a hearing examination in the past 5 years	<u>Developmental</u>	

**Target setting method:** Better than the best.

**Potential dData sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES).

### REVISED OBJECTIVE

**28-14. Increase the proportion of persons who have had a hearing examination on schedule.**

**Target and baseline:**

Objective	Increase in Hearing Examinations	1999–2000 Baseline	2010 Target
		<i>Percent</i>	
<b>28-14a.</b>	Adults aged 20 to 69 years who have had a hearing examination in the past 5 years (age adjusted to the year 2000 standard population)	29	34
<b>28-14b.</b>	Adults aged 70 years and older who have had a hearing examination in the past 5 years	37	40
<b>28-14c.</b>	Adolescents aged 12 to 19 years who have had a hearing examination in the past 5 years	Developmental	

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### OBJECTIVE DELETED

**28-15. *(Objective deleted due to lack of data source)* (Developmental) Increase the number of persons who are referred by their primary care physician for hearing evaluation and treatment.**

### ORIGINAL OBJECTIVE

**28-16. (Developmental) Increase the use of appropriate ear protection devices, equipment, and practices.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-16. (Developmental) Increase the use of appropriate ear protection devices, equipment, and practices.**

**Target and baseline:**

Objective	Increase in Use of Ear Protection Devices	1999–2000 Baseline	2010 Target
		<i>Per 1,000 Population</i>	
<b>28-16a.</b>	Adults aged 20 to 69 years who have ever used hearing protection devices (ear plugs, ear muffs) when exposed to loud sounds or noise (age adjusted to the year 2000 standard population)	457.0	487.0
<b>28-16b.</b>	Adolescents aged 12 to 19 years who have ever used hearing protection devices (ear plugs, ear muffs) when exposed to loud sounds or noise	<u>Developmental</u>	

**Target setting method:** Better than the best.

**Potential dData source:** National Health and Nutrition Examination Survey (NHANES) National Health Interview Survey (NHIS), CDC, NCHS.

### REVISED OBJECTIVE

**28-16. Increase the use of ear protection devices.**

**Target and baseline:**

Objective	Increase in Use of Ear Protection Devices	1999–2000 Baseline	2010 Target
		<i>Per 1,000 Population</i>	
<b>28-16a.</b>	Adults aged 20 to 69 years who have ever used hearing protection devices (ear plugs, ear muffs) when exposed to loud sounds or noise (age adjusted to the year 2000 standard population)	457.0	487.0
<b>28-16b.</b>	Adolescents aged 12 to 19 years who have ever used hearing protection devices (ear plugs, ear muffs) when exposed to loud sounds or noise	Developmental	

### REVISED OBJECTIVE (continued)

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### ORIGINAL OBJECTIVE

**28-17. (Developmental) Reduce noise-induced hearing loss in children and adolescents aged 17 years and under.**

**Potential data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### OBJECTIVE WITH REVISIONS

**28-17. ~~(Developmental) Reduce noise-induced hearing loss in children and adolescents aged 17 years and~~ the proportion of adolescents who have elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss. under.**

**Target:** 34.7 per 1,000 adolescents aged 12 to 19 years.

**Baseline:** 46.4 per 1,000 adolescents aged 12 to 19 years had noise-induced hearing loss in the period 1988–94.

**Target setting method:** Better than the best.

**~~Potential d~~Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

### REVISED OBJECTIVE

**28-17. Reduce the proportion of adolescents who have elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss.**

**Target:** 34.7 per 1,000 adolescents aged 12 to 19 years.

**Baseline:** 46.4 per 1,000 adolescents aged 12 to 19 years had noise-induced hearing loss in the period 1988–94.

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## ORIGINAL OBJECTIVE

**28-18. (Developmental) Reduce adult hearing loss in the noise-exposed public.**

**Potential data sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## OBJECTIVE WITH REVISIONS

**28-18. (Developmental) Reduce adult hearing loss in the noise-exposed public the proportion of adults who have elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss.**

**Target:** 78.3 per 1,000 adults aged 20 to 69 years.

**Baseline:** 117.0 per 1,000 adults aged 20 to 69 years had noise-induced hearing loss in the period 1999–2000 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Potential dData sources:** National Health Interview Survey (NHIS), CDC, NCHS; National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## REVISED OBJECTIVE

**28-18. Reduce the proportion of adults who have elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss.**

**Target:** 78.3 per 1,000 adults aged 20 to 69 years.

**Baseline:** 117.0 per 1,000 adults aged 20 to 69 years had noise-induced hearing loss in the period 1999–2000 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## References

---

- <sup>1</sup> U.S. Department of Labor, Bureau of Labor Statistics, Annual Survey of Occupational Injuries and Illnesses (ASOII). More information available at [www.infouse.com/disabilitydata/workdisability/appendices\\_surveys.php#asoi](http://www.infouse.com/disabilitydata/workdisability/appendices_surveys.php#asoi); accessed October 31, 2006.
- <sup>2</sup> Consumer Product Safety Commission, Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health, and Consumer Product Safety Commission. *National Electronic Injury Surveillance System*. 1999. More information available at [www.cdc.gov/niosh/2001-118e.html](http://www.cdc.gov/niosh/2001-118e.html); accessed October 31, 2006.
- <sup>3</sup> Black, S., et al. Efficacy, safety and immunogenicity of heptavalent pneumococcal conjugate vaccine in children. *Pediatric Infectious Disease Journal* 19:187–195, 2000.
- <sup>4</sup> Fireman, B., et al. Impact of the pneumococcal conjugate vaccine on otitis media. *Pediatric Infectious Disease Journal* 22(1):10–16, 2003.
- <sup>5</sup> Broder, K.R., et al. Who’s calling the shots? Pediatricians’ adherence to the 2001–03 pneumococcal conjugate vaccine-shortage recommendations. *Pediatrics* 115:1479–1487, 2005.
- <sup>6</sup> American Academy of Pediatrics, American Academy of Family Physicians, Subcommittee on Management of Acute Otitis Media. Clinical practice guideline: Diagnosis and management of acute otitis media. *Pediatrics* 113(5):1451–1465, 2004.
- <sup>7</sup> National Institute on Deafness and Other Communication Disorders (NIDCD). *WISE EARS!*<sup>®</sup> More information available at [www.nidcd.nih.gov/health/wise](http://www.nidcd.nih.gov/health/wise); accessed October 31, 2006.
- <sup>8</sup> U.S. Department of Health and Human Services (HHS), NIDCD. *Bring Those Babies Back*. North American Precip Syndicate, Inc., 2003.
- <sup>9</sup> HHS, NIDCD. *Pointers for Parents*. North American Precip Syndicate, Inc., 2002.
- <sup>10</sup> More information available at <http://healthyvision2010.nei.nih.gov/>; accessed October 31, 2006.
- <sup>11</sup> More information available at <http://healthyvision2010.nei.nih.gov/hvm/>; accessed October 31, 2006.
- <sup>12</sup> Gaffney, M. Personal communication by facsimile. Early Hearing Detection and Intervention, CDC. Rockville, MD. December 8, 2006.
- <sup>13</sup> Gaffney, M., et al. Infants tested for hearing loss—United States, 1999–2001. *Morbidity and Mortality Weekly Report* 52(41):981–984, 2003.
- <sup>14</sup> More information available at [www.healthyvision2010.org/news/](http://www.healthyvision2010.org/news/); accessed October 31, 2006.
- <sup>15</sup> HHS, NIDCD. La salud de los niños—¡Traiga los bebés de nuevo! and Consejo para los padres, 2002. [Public service announcement.]

- 
- <sup>16</sup> HHS. *Celebra La Vida con Salud*. More information available at [www.celebralavida.com/html/about\\_celebra.html](http://www.celebralavida.com/html/about_celebra.html); accessed October 31, 2006.
- <sup>17</sup> NIDCD. *Strategic Plan, FY 2006–2008*. More information available at [www.nidcd.nih.gov/StaticResources/about/plans/strategic/strategic06-08.pdf](http://www.nidcd.nih.gov/StaticResources/about/plans/strategic/strategic06-08.pdf); accessed October 31, 2006.
- <sup>18</sup> U.S. Department of Labor, Occupational Safety & Health Administration. *Noise and Hearing Conservation Standards*. Hearing Conservation Program, 1910.95(c)(1) and (2).
- <sup>19</sup> NIDCD. *Third Workshop of the NIDCD Working Group on the Early Identification of Hearing Impairment*. September 2000.
- <sup>20</sup> Dohar, J.E., et al. Mucosal biofilm formation on middle-ear mucosa in a nonhuman primate model of chronic suppurative otitis media. *Laryngoscope* 115(8):1469–1472, 2005.
- <sup>21</sup> Post, C.J. Direct evidence of bacterial biofilms in otitis media. *Laryngoscope* 111(12): 2083–2094, 2001.
- <sup>22</sup> Vision in Preschoolers Study Group. Preschool vision screening tests administered by nurse screeners compared with lay screeners in the Vision in Preschoolers Study. *Investigative Ophthalmology & Visual Science* 46:2639–2648, 2005.
- <sup>23</sup> Varma, R., et al. Los Angeles Latino Eye Study Group. Prevalence and risk indicators of visual impairment and blindness in Latinos: The Los Angeles Latino Eye Study. *Ophthalmology* 111(6):1132–1140, 2004.
- <sup>24</sup> Voo, I., et al. Prevalences of ocular conditions among Hispanic, white, Asian, and black immigrant students examined by the UCLA Mobile Eye Clinic. *Journal of the American Optometric Association* 69(4):255–261, 1998.
- <sup>25</sup> Van Rens, G.H., and Arkell, S.M. Refractive errors and axial length among Alaskan Eskimos. *Acta Ophthalmology (Copenhagen)* 69(1):27–32, 1991.

## **Related Objectives From Other Focus Areas**

---

### **5. Diabetes**

5-13. Annual dilated eye examinations

### **6. Disability and Secondary Conditions**

6-11. Assistive devices and technology

### **20. Occupational Safety and Health**

20-11. Work-related, noise-induced hearing loss