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Trends in Vision and Hearing Among Older Americans

By Mayur Desai, Ph.D.
Laura A. Pratt, Ph.D.
Harold Lentzner, Ph.D.
Kristen N. Robinson, Ph.D.

Highlights

- **Nineteen percent of persons 70 years of age and older had visual impairments. Visual impairments, including blindness, increased with age; the level of blindness among older Americans has remained constant between 1984 and 1995.**
- **Hearing impairments were widespread—one-third of all persons 70 years of age and older were hearing impaired, a level that has remained constant between 1984 and 1995.**
- **As the older population increases over the next 30 years, the number of older persons with visual and hearing impairments may increase significantly.**
- **Early detection and treatment can prevent or at least postpone some serious impairments, and there is much room for growth in the use of aids and devices to lessen the effects of impairments.**

Overview

For the elderly, sensory impairments increase vulnerability and limit the quality of life. Dimming eyesight and failing hearing can reduce physical, functional, emotional, and social well-being. Visual and hearing impairments decrease independence in performing the activities of daily living, getting from place to place, or communicating with others. Isolation, depression, and poorer social relationships often accompany sight and hearing loss.^{1,2,3}

Older persons are disproportionately affected by sensory impairments. Although those 65 and over make up only 12.8 percent of the U.S. population, they account for roughly 37 percent of all hearing-impaired individuals and 30 percent of all visually-impaired individuals. Moreover, nearly 37 percent of all visits to physicians' offices for eye care are made by persons 65 years of age and older.

This report explores the levels of vision and hearing impairments among the elderly, the changes in those levels over the last decade, common devices and procedures used to reduce the impact of these impairments, and the potential for future reductions.

continued

¹ Keller BK, Morton JL, Thomas VS, Potter JF. The effect of visual and hearing impairments on functional status. *J Am Geriatr Soc.* 47:1319-1325, 1999.

² Rovner BW, Ganguli M. Depression and disability associated with impaired vision: the MoVIES Project. *J Am Geriatr Soc.* 46:617-619, 1998.

³ Tinetti ME, Inouye SK, Gill TM, Doucette JT. Shared risk factors for falls, incontinence, and functional dependence: unifying the approach to geriatric syndromes. *JAMA.* 273:1348-1353, 1995.

⁴ Chan KM, Pang WS, Ee CH, Ding YY, Choo P. Epidemiology of falls among the elderly community dwellers in Singapore. Singapore Med J. 38:427-431, 1997.

⁵ Ivers RQ, Cumming RG, Mitchell P, Attebo K. Visual impairment and falls in older adults: the Blue Mountains Eye Study. J Am Geriatr Soc. 46:58-64, 1998.

This new series of reports features information to help monitor the health of our aging population

Older Americans can expect to live longer than ever before. Under existing conditions, women who live to age 65 can expect to live about 19 years longer, men about 16 years longer. Whether the added years at the end of the life cycle are healthy, enjoyable, and productive depends, in part, upon preventing and controlling a number of chronic diseases and conditions.

This report is one of a series undertaken by the National Center for Health Statistics, with support from the National Institute on Aging, to help meet the challenge of extending and improving life. By monitoring the health of the elderly, using information compiled from a variety of sources, we hope to help focus research on the most effective ways to use resources and craft health policy.

Visual impairment limits the elderly

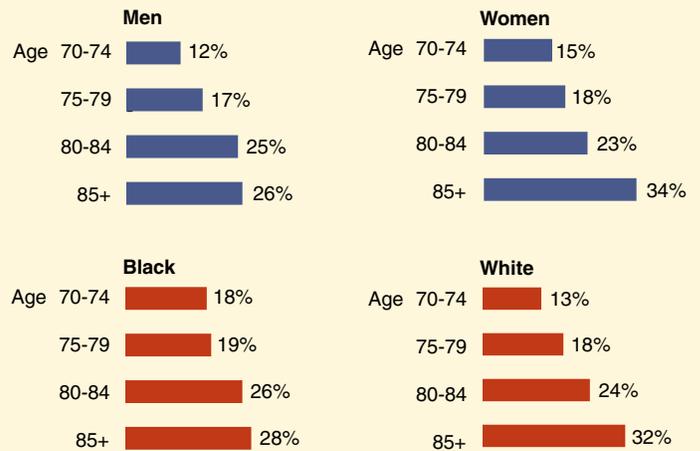
Visual impairment is an important cause of activity limitation and disability among the elderly. Approximately 1.8 million noninstitutionalized elderly report some difficulty with basic activities such as bathing, dressing, and walking around the house, in part because they are visually impaired. Visual impairment increases the risk of falls and fractures, making it more likely that an older person will be admitted to a hospital or nursing home, be disabled, or die prematurely.^{4,5}

Visual impairment, defined as vision loss that cannot be corrected by glasses or contact lenses alone, increased with age

Prescription lenses were almost universal among older persons. Ninety-two percent of persons 70 years of age and older wore glasses. Eighteen percent also used a magnifying glass for reading and close work. Trouble seeing even

when wearing glasses increased steadily, from 14 percent among persons 70-74 years of age to 32 percent for those 85 years of age and older. Fewer than 2 percent of persons 70 years of age and older with a visual impairment reported using other equipment to help them overcome their disability such as telescopic lenses, braille, readers, canes, or computer equipment.

Percent of elderly who reported being visually impaired by age, sex, and race, 1995

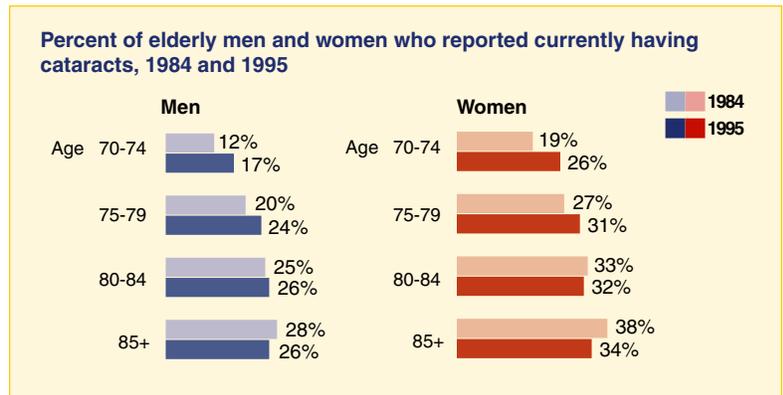


The prevalence of blindness also increased with age, reaching its peak at 85 years of age and older. In 1995, the prevalence of blindness in both eyes was about 1 percent among persons 70-74 years of age compared with 2.4 percent among those 85 years of age and older. The prevalence of blindness in the population 70 years of age and older changed little between 1984 and 1995. At both points in time, there were no differences in rates of blindness between men and women or between black and white elderly.

Visual impairment and blindness have four main causes: cataracts, age-related macular degeneration, glaucoma, and diabetic retinopathy

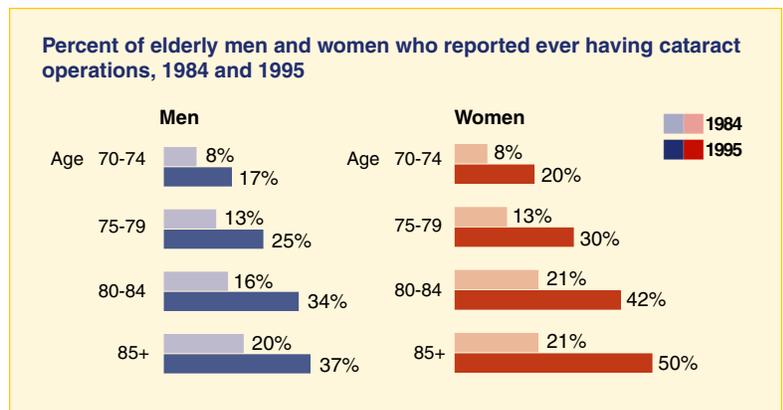
Cataracts were most prevalent among older women Cataracts, a clouding of the lens of the eye, are a leading cause of visual impairment in the elderly. According to the National Eye Institute, over half of all Americans aged 65 years and older have cataracts. In the early stages, they do not seriously impair vision. Then as vision begins to worsen, corrective lenses can often be used to improve vision. If vision becomes too impaired, cataract removal surgery is performed. Cataract surgery is one of the most common surgeries performed in America, approximately 1.5 million surgeries per year. Cataract surgery is generally an outpatient procedure and is very successful; 90% of patients have improved vision after recovering from their surgery.

Approximately one-fourth of the noninstitutionalized population 70 years of age and older reported currently having cataracts in 1995. Cataracts were more common among women than men. The number of persons reporting currently having cataracts was similar in 1984 and 1995, 23% and 26% respectively.



Cataract surgery to reverse the impairment more than doubled between 1984 and 1995.

Among the youngest (70-74 years of age), the percent who had ever had cataract surgery increased from about 8 percent in 1984 to 18 percent in 1995. In 1995, almost half of those 85 years of age and older reported ever having had cataract surgery,



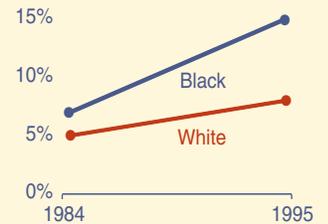
up from about one-fifth a decade earlier. In 1984, the rate of cataract operations was similar for men and women. By 1995, however, women were more likely than men to report having had operations for cataracts.

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Age-related macular degeneration (AMD) was the leading cause of irreversible visual impairment in the elderly More common than either glaucoma or diabetic retinopathy (which will be discussed in the following sections), early or late stage AMD affected roughly one-quarter of persons 70 years of age and older or approximately 3.6 million elderly persons. As with cataracts, the early stages of the disease may not greatly impair vision. The rate of AMD increased sharply with age, from 18 percent among persons 70-74 years of age to 47 percent among persons 85 and older. In the adult population (18 years and older) the prevalence of AMD was similar for black and white persons and for both sexes. For the group 70 years and older, however, AMD was more common in women than in men and in white than in black older persons. Unlike cataracts, the most common potential cause of visual impairment, there is currently no treatment to save the sight of a person with AMD.

Glaucoma was twice as common among black elderly as it was among white elderly Glaucoma is irreversible damage to the optic nerve caused by increased pressure in the eye. It is an insidious, slow-progressing disease that if left untreated can cause irreversible blindness. In 1984, about 5 percent of the non-institutionalized elderly population reported having glaucoma. In 1995, the rate had risen to approximately 8 percent. The National Eye Institute (NEI) estimates that half the people who have glaucoma are unaware of their condition.

Percent of elderly who reported having glaucoma by race, 1984 and 1995



▶ Measuring diabetic retinopathy and age-related macular degeneration:

Diabetic retinopathy and age-related macular degeneration are both diseases of the retina of the eye. During the examination portion of the third National Health and Nutrition Examination Survey (NHANES III), each participant had a photograph of one eye taken with the pupil fully dilated. This technique is called fundus photography. Later, experienced laboratory professionals assessed the presence and degree of these retinal diseases. Diabetic retinopathy was graded as none, mild, moderate, and proliferative and macular degeneration as none, early, and late.

Older blacks were twice as likely to have glaucoma as older whites (15 percent versus 7 percent). This racial differential, which characterized both men and women, has widened considerably since 1984 when the prevalence rates were 7.5 percent for blacks and 5 percent for whites. The prevalence of glaucoma among elderly black persons doubled in the decade between 1984 and 1995.

Diabetic retinopathy, a complication of diabetes, causes visual impairment and can result in blindness

In contrast to cataracts and AMD, diabetic retinopathy is not clearly related to advanced age. Almost half of those with AMD were 70 years of age and older, but only 25 percent

of persons with diabetic retinopathy were over 70 years of age. Approximately 4 percent of men and 6 percent of women 70 years of age and older had diabetic retinopathy. The prevalence among black elderly 70 years of age and older was 7 percent, while among white elderly of the same age it was 5 percent.

⁶ Mulrow CD, Aguilar C, Endicott JE, Tuley MR, Velez R, Charlip WS, Rhodes MC, Hill JA, DeNino LA. Quality-of-life changes and hearing impairment: a randomized trial. *Ann Intern Med.* 113:188-194, 1990.

⁷ Carabellese C, Appollonio I, Rozzini R, Bianchetti A, Frisoni GB, Frattola L, Trabucchi M. Sensory impairment and quality of life in a community elderly population. *J Am Geriatr Soc.* 41:401-407, 1993.

⁸ Appollonio I, Carabellese C, Frattola L, Trabucchi M. Effects of sensory aids on the quality of life and mortality of elderly people: a multivariate analysis. *Age and Aging.* 25:89-96, 1996.

⁹ Peters CA, Potter JF, Scholer SG. Hearing impairment as a predictor of cognitive decline in dementia. *J Am Geriatr Soc.* 36:981-986, 1988.

¹⁰ Bess FH, Lichtenstein MJ, Logan SA, Burger MC, Nelson E. Hearing impairment as a determinant of function in the elderly. *J Am Geriatr Soc.* 37:123-128, 1989.

Hearing impairment also limits the elderly

Like visual impairment, hearing impairment diminishes the quality of life for older individuals.^{6,7} Uncorrected hearing impairment can lead to social isolation,⁸ cognitive decline,⁹ and decreased mobility.¹⁰

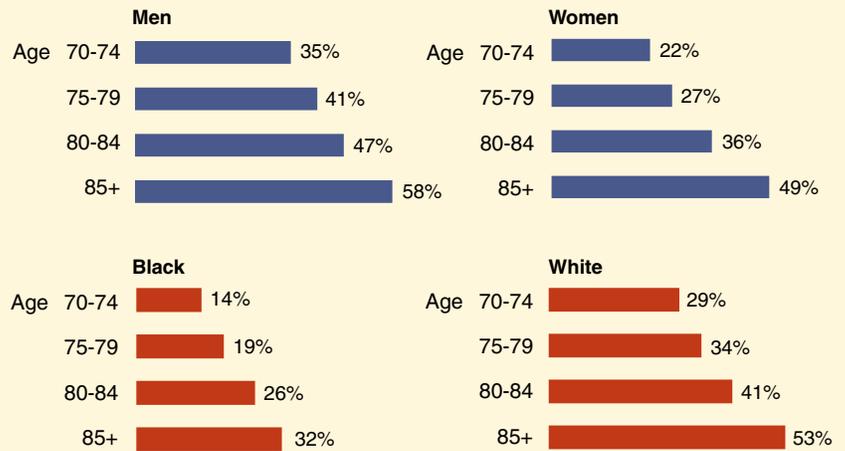
One-third of the elderly were hearing impaired; older white men were at highest risk

In 1995, one-third of all noninstitutionalized elderly persons 70 years of age and older, or about 7 million people, were hearing impaired; that is, they were deaf or had trouble hearing with one or both ears. Just over one-quarter of those 70-74 years of age were hearing impaired, but this increased to almost half of those 85 years of age and older.

Elderly men at all ages were more likely than elderly women to be hearing impaired; white men and women were more likely than black men and women to report hearing problems. At the extremes, approximately 61 percent of elderly white men 85 years and older were hearing impaired, while

less than 15 percent of black women 70-74 years of age reported similar problems.

Percent of elderly who reported currently having hearing impairments by age, sex, and race, 1995



Complete deafness in both ears accounted for a little over 20 percent of all hearing impairment in the elderly. In 1995, approximately 5 percent of persons 70-74 years of age were deaf compared with 17 percent among those 85 years of age and older. The level of deafness was about the same in 1995 as it was in 1984 (5.9 percent in 1984 and 7.5 percent in 1995).

The elderly were less likely to have hearing evaluations and to use hearing aids than they were to have visual evaluations and to wear glasses

Approximately one-third of noninstitutionalized older persons with hearing problems, about 2.5 million in 1995, reported having used a hearing aid within the past year. Only 76 percent of persons 70-74 years old with hearing impairments had seen a doctor about their problems with hearing; this increased to 84 percent for those 85 years of age

¹¹ Noorhassim I, Rampal KG. Multiplicative effect of smoking and age on hearing impairment. *Amer J Otolaryngology*. 19:240-243, 1998.

¹² Moore JA. Comparison of risk of conductive hearing loss among three ethnic groups of Arctic audiology patients. *J Speech, Lang, Hear Res*. 42:1311-1322, 1999.

¹³ Burg JR, Gist GL. Health effects of environmental contaminant exposure: an intrafile comparison of the trichloroethylene subregistry. *Arch Environ Health*. 54: 231-241, 1999.

¹⁴ Wallhagen MI, Strawbridge WJ, Cohen RD, Kaplan GA. An increasing prevalence of hearing impairment and associated risk factors over three decades of the Alameda County Study. *Am J Public Health*. 87:440-442, 1997.

and older. In contrast, 98 percent of those with visual impairments had seen a doctor about their visual problems.

Another assistive device for those with hearing problems is a built-in telephone amplifier. In 1995 approximately 11 percent of older persons with a hearing impairment reported using a telephone amplifier. Again, many more people could potentially benefit from a telephone amplifier than actually use them. Fewer than 1 percent of the elderly with hearing problems used TTY's or computer links, closed-caption TV, or assistive listening devices in 1995.

Percent of elderly (age 70 and older) who saw a doctor about visual or hearing problems or sought other help for their impairment

- Percentage of those with a visual problem who:
 - have seen a doctor 98.6%
 - wear glasses 93.0%
- Percentage of those with a hearing problem who:
 - have seen a doctor 76.4%
 - use a hearing aid 34.0%

Although the cause of much age-related hearing loss is unknown, some risk factors have been identified.

Hearing loss can be caused by:

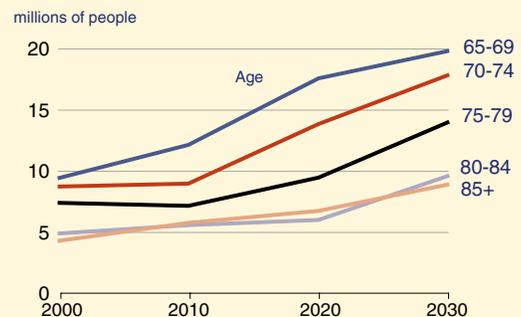
- Exposure to loud noises over long periods of time
- Smoking¹¹
- A history of middle ear infections¹²
- Certain chemicals. For example, long duration of exposure to trichloroethylene has been linked to hearing loss.¹³

As the older population increases, the number of elderly persons with visual and hearing impairments may increase significantly

Population growth will be fastest in the age groups 80-84 and 85 years and older, according to Census Bureau projections. Because the rates of cataract and age-related macular degeneration were highest in these age groups, the number of people with these conditions may be expected to more than double.

Some evidence points to an increase in the prevalence of hearing impairment among persons 45-69 years of age, especially among men.¹⁴ As these groups age, rates of hearing impairment will rise as will demand for services and assistive devices.

U.S. elderly population, 2000 to 2030, ages 65 and older



¹⁵ Appollonio I, Carabellese C, Frattola L, Trabucchi M. Effects of sensory aids on the quality of life and mortality of elderly people: a multivariate analysis. *Age and Aging*. 25:89-96, 1996.

Early detection and treatment can prevent or at least postpone some serious impairments, and there is much room for growth in the use of aids and devices to improve functioning

Many causes of sensory impairment can be prevented, or the impairments' progress slowed. There are also devices that can help individuals compensate for their hearing or visual loss. Studies have shown that correcting sensory impairment can decrease problems with mood and social and functional impairments.¹⁵

Blindness due to cataracts is uncommon in this country as an increasing percent of the elderly have cataract surgery. Glaucoma and diabetic retinopathy can be treated and their progression slowed if they are identified early enough. Unfortunately, more than 50 percent of people with these conditions are unaware that they have them. Better screening for these conditions will be important to limit the impairments they cause.

By the year 2030, age-related macular degeneration will cause more blindness in the U.S. than glaucoma and diabetic retinopathy combined. Unfortunately, there is no treatment available in the vast majority of cases. Research into prevention and cure of macular degeneration will be extremely important to eliminate this major cause of impairment.

While some hearing loss can be prevented by limiting exposure to loud noise, using safety earplugs, not smoking, and avoiding certain chemicals, more research is needed to fully understand the etiology of hearing loss and how it can be prevented. More research is also needed in the development of treatment options for hearing impairment. We know that hearing aids, telephone amplifiers, and medical evaluations can help individuals with hearing impairment avoid social isolation and other problems associated with hearing difficulties. However, these options are not being used by the majority of elderly who could potentially benefit.

Visual and hearing impairments are directly related to quality of life. An increase in medical evaluations and the use of special equipment could greatly improve the quality of life for older people and decrease the level of disability associated with these impairments.

¹⁶ Tielsch JM, Javitt JM, Coleman A, Katz J, Sommer A. The prevalence of blindness and visual impairment among nursing home residents in Baltimore. *NEJM*.332:1205-1209, 1995.

About the data

The information in this report was collected as part of a number of studies conducted by the National Center for Health Statistics. Specifically, the data come from the 1984 National Health Interview Survey Supplement on Aging; the 1994 National Health Interview Survey Supplement on Disability; the 1995 Second Supplement on Aging (a survey of respondents 70 years and older); the 1997 National Health Interview Survey; the National Health and Nutrition Examination Survey III, 1988-1994 (NHANES III); and the 1998 National Ambulatory Medical Care Survey (NAMCS).

NAMCS collects data from a random sample of visits to office-based physicians in the United States. The data on physician office visits for eye care cited on page 1 are based on this survey. NHANES is an examination survey of the noninstitutionalized population. The rates of diabetic retinopathy and age-related macular degeneration are based on the examinations.

The remainder of the data in this report are based on the 1984 National Health Interview Survey Supplement on Aging, the 1994 National Health Interview Survey Supplement on Disability, the 1995 Second Supplement on Aging (a survey of respondents 70 years and older), and the 1997 National Health Interview Survey. Respondents are selected through a complex, multi-stage sample design that provides national estimates of the health status of the U.S. civilian noninstitutionalized population. Information is collected through household interviews, so data from these surveys are either self-reported or reported by another household member.

Additional information about these surveys is available from the NCHS website at www.cdc.gov/nchs.

The data cited here represent the non-institutionalized elderly. As the elderly in nursing homes have higher rates of sensory impairment,¹⁶ surveys that include both groups may report slightly higher prevalence rates. For further information on sensory impairment among nursing home residents, see the report *The Changing Profile of Nursing Home Residents: 1985-1997*, which is also accessed through the NCHS Trends in Health and Aging website, www.cdc.gov/nchs/agingact.htm.

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