Prevalence of Concurrent Hearing and Visual Impairment in US Adults: The National Health Interview Survey, 1997–2002

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Analysis of data from a nationally representative sample of US adults (n = 195 801) showed that concurrent hearing and visual impairment prevalence rates were highest for participants older than 79 years of age (16.6%); a 3-fold increase in age-adjusted rates of reported hearing and visual impairment was observed for Native Americans compared with Asian Americans. Research on preventing concurrent hearing and visual impairment and countering its consequences is warranted, especially in population subgroups, such as Native and older Americans.(*Am J Public Health.* 2005;95:1940–1942. doi:10.2105/AJPH.2004.056671)

Hearing impairment (HI), visual impairment (VI), and concurrent impairment (HI+VI) have marked effects on cognitive, psychosocial, and functional health and even on the risk of mortality.[1–8] There is some evidence that the presence of more than 1 sensory impairment increases morbidity risk relative to VI or HI alone.[4,9] Despite continued improvements in the health and disability status of older US adults, there is no evidence that VI or HI rates reported by adults are declining.[10,11] Unfortunately, prevalence estimates of HI+VI determined via clinical assessment are not available for the US population. This article uses nationally representative data from the National Health Interview Survey (NHIS) to assess the prevalence of HI+VI in community-residing US adults, aged 18 years and older.

METHODS

The NHIS is an annual, continuous, multipurpose, and multistage probability cross-sectional survey of the US civilian noninstitutionalized population and is conducted by the National Center for Health Statistics.[12,13] A probability sample of households is selected with family members interviewed by trained personnel; 1 adult from each household is selected at random and administered a health-oriented questionnaire (i.e., "the adult core"), which includes questions about HI and VI. Annual response rates to the 1997 to 2002 adult core ranged from 70% (in 1999) to 80% (in 1997).[14–19] More than 195 000 adult participants of the 1997 to 2002 NHIS were administered the following questions: (1) "Do you have any trouble seeing, even when wearing glasses or contact lenses?"; (2) "Are you blind or unable to see at all?"; and (3) "Which statement best describes your hearing (without a hearing aid): good, a little trouble, a lot of trouble, deaf." Participants responding yes to either of the first 2 questions were considered to be visually impaired. Participants reporting a little trouble, a lot of trouble, or that they were deaf were classified as hearing impaired.

Analyses were completed using the Software for the Statistical Analysis of Correlated Data (Research Triangle Institute, Research Triangle Park, NC) package to take into account sample weights and design effects.[20] Sample weights were adjusted to account for the aggregation of data over multiple survey years.[21] Subgroup prevalence rates were compared using approximate *Z* tests; trend analyses were used for age-group-specific rates. When comparing more than 2 groups, *P* values were adjusted using Bonferroni's approach for multiple comparisons. Age-adjusted rates of VI only, HI only, and HI+VI were calculated by the direct method using the 2000 US Census population as the standard.[22]

RESULTS

Overall prevalence rates of HI only were approximately twice as those of VI only (Table 1, 13.1 vs 6.0). The overall prevalence of HI+VI was 3.3% and increased from 1.3% for participants aged 18–44 years to 16.6% for participants aged 80 years or older (*P* for trend <.01). Age-adjusted rates of HI+VI were slightly but significantly higher in men versus women (3.6% vs 3.2%; $P<.001$), in adults with less than a 12th grade education versus adults with more than a 12th grade education (4.9% vs 2.8%; $P<0.001$), and in nonmarried versus married adults (4.1% vs 2.9%; $P<.001$). Aleut, Eskimo, and American Indians reported more than 3 times the rate of HI+VI relative to Asian/Pacific Islander Americans (6.3% vs 1.8%; $P<.001$); rates for Aleut, Eskimo, and American Indians were also significantly greater than for any of the other race groups (all *P* values <.01).

DISCUSSION

The NHIS is limited by the self-reported nature of hearing and vision impairment ascertainment. However, the sensitivity and specificity of self-reported measures of HI range from 56% to 93% and 56% to 82%, respectively, when using pure tone audiometric findings as the "gold standard."[23] Overall VI assessed by either 1 or 2 items within the National Eye Institute Visual Function Questionnaire is significantly correlated with clinically assessed visual acuity (range of correlations, 0.65–0.68).[24,25] Nonresponse to the "adult core" interview where impairment questions were administered represents another possible study limitation because of the potential biasing effects of systematic nonresponse.

More than 16% of adults aged 80 years or older report HI+VI, and census projections indicate that the size of this segment of the US population will increase 25% in the next 15 years.[26] Therefore, these impairments will pose important challenges for increasing numbers of families and family caregivers in the coming years.[27] The correction of visual and hearing deficits improves quality of life and is associated with reduced risk of mortality,[2,28,29] yet routine coverage for many of these services is not provided by Medicare (e.g., corrective lenses and hearing aids). Policymakers should vigorously pursue expansion of such coverage.

Finally, it is unknown why Aleut, Eskimo, and Native Americans have significantly higher rates of HI+VI, but this may be because of limited health care access,[30] possibly in combination with increased risks of

TABLE 1—Prevalence (%) of Hearing Impairment Only, and Visual Impairment Only, and Concurrent Hearing and Visual Impairment by Different Subgroups, Among 1997–2002 National Health Interview Survey Participants 18 Years of Age and Older

		Visual Impairment Only				Hearing Impairment Only				Concurrent Hearing and Visual Impairment			
Subgroups	Total N†	Prevalence	95% CI	Age-Adjusted Prevalence *	95% CI	Prevalence	95% CI	Age-Adjusted Prevalence *	95% CI	Prevalence	95% CI	Age-Adjusted Prevalence *	95% CI
TOTAL	195,801	6.0	[5.8,6.1]	6.0	[5.9,6.2]	13.1	[12.9,13.4]	13.3	[13.1,13.6]	3.3	[3.2,3.4]	3.4	[3.3,3.5]
Age Group													
18-44	101,357	4.5	[4.4,4.7]			6.8	[6.6,7.1]			1.3	[1.2,1.3]		
45-64	57,066	7.6	[7.3,7.8]			15.6	[15.2,15.9]			3.7	[3.5,3.9]		
65-79	27,979	7.7	[7.4,8.1]			27.6	[27.0,28.3]			7.3	[6.9,7.6]		
80 and older	9,399	9.0	[8.3,9.7]			36.5	[35.5,37.5]			16.6	[15.8,17.5]		
Gender													
Male	84,746	4.5	[4.3,4.7]	4.5	[4.4,4.7]	16.5	[16.1,16.8]	17.3	[16.9,17.6]	3.4	[3.2,3.5]	3.6	[3.5,3.8]
Female	111,055	7.4	[7.2,7.6]	7.3	[7.1,7.5]	10.1	[9.8,10.3]	9.9	[9.7,10.1]	3.3	[3.1,3.4]	3.2	[3.1,3.3]
Marital Status													
Married	94,450	5.5	[5.3,5.6]	5.4	[5.2,5.5]	14.3	[14.0,14.6]	14.2	[13.9,14.5]	3.0	[2.8,3.1]	2.9	[2.8,3.1]
Other	101,351	6.7	[6.5,6.9]	7.1	[6.9,7.3]	11.5	[11.2,11.7]	12.0	[11.8,12.3]	3.8	[3.7,4.0]	4.1	[3.9,4.2]
Education													
Less than 12th Grade	40,680	8.0	[7.6,8.3]	7.6	[7.3,8.0]	14.8	[14.3,15.3]	12.4	[12.0,12.9]	6.0	[5.7,6.3]	4.9	[4.6,5.2]
12th Grade	56,503	6.0	[5.8,6.2]	6.0	[5.8,6.2]	14.5	[14.1,14.9]	14.3	[13.9,14.7]	3.3	[3.1,3.5]	3.2	[3.0,3.4]
Above 12th Grade	96,684	5.3	[5.2,5.5]	5.4	[5.3,5.6]	11.8	[11.5,12.1]	13.3	[13.0,13.6]	2.4	[2.3,2.5]	2.8	[2.7,3.0]
Race													
Aleut, Eskimo, or American Indian	1,421	8.0	[6.3,9.6]	8.2	[6.5,9.9]	16.6	[14.1,19.0]	18.4	[15.7,21.0]	5.2	[3.8,6.5]	6.3	[4.7,8.0]
Asian / Pacific Islander	5,300	4.5	[3.7,5.3]	5.1	[4.1,6.1]	7.4	[6.6,8.2]	9.5	[8.6,10.5]	1.4	[1.0,1.7]	1.8	[1.4,2.2]
Black	27,415	7.5	[7.1,7.9]	8.0	[7.6,8.4]	6.1	[5.8,6.5]	6.9	[6.5,7.3]	2.6	[2.3,2.8]	3.0	[2.8,3.3]
White	154,067	5.8	[5.6,5.9]	5.8	[5.6,5.9]	14.5	[14.2,14.8]	14.4	[14.1,14.6]	3.5	[3.4,3.6]	3.5	[3.3,3.6]
Other	7,598	7.3	[6.6,8.0]	8.9	[7.8,9.9]	6.4	[5.6,7.1]	8.1	[7.2,9.1]	2.0	[1.7,2.4]	3.0	[2.4,3.6]
Hispanic													
Non-Hispanic	163,702	6.0	[5.9,6.2]	6.0	[5.9,6.1]	13.9	[13.7,14.2]	13.9	[13.6,14.1]	3.5	[3.4,3.6]	3.5	[3.3,3.6]
Mexican	18,502	5.1	[4.7,5.5]	6.1	[5.6,6.6]	6.2	[5.7,6.7]	8.4	[7.8,9.0]	1.9	[1.6,2.1]	2.9	[2.5,3.2]
Puerto Rican	3,356	8.0	[6.7,9.2]	8.6	[7.2,9.9]	5.9	[5.0,6.9]	6.5	[5.4,7.5]	2.5	[1.7,3.2]	2.9	[2.1,3.7]
Cuban	1,897	5.4	[3.8,7.1]	4.8	[3.5,6.1]	5.1	[4.0,6.2]	4.3	[3.3,5.3]	1.5	[0.7,2.3]	1.2	[0.6,1.8]
Other Hispanic	8,344	6.3	[5.6,6.9]	7.4	[6.6,8.2]	6.3	[5.4,7.2]	8.4	[7.3,9.5]	1.8	[1.5,2.1]	2.6	[2.2,3.1]

†Column subtotals may not equal the total sample size due to item non-response.
*Age-adjusted by the direct method using the 2000 US census population as the standard

auditory disorders[31–33] and angle closure glaucoma.[34,35] Additional research in this race group is clearly warranted given the paucity of studies on these impairments in this diverse and understudied race group.[36–38] ■

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Contributors

A.J. Caban, D.J. Lee, and B.L. Lam originated the study and led the writing of this paper. O. Gomez-Marin and D.D. Zheng managed the data and performed statistical analyses. All authors helped conceptualize ideas, interpret findings, and provide critical review of this paper.

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Human Participant Protection

The protocol was reviewed and approved for exemption by the institutional review board of the University of

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