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Near Vision but not Hearing Loss is Associated with Lacking a Usual Source of Health Care

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Abstract

Objectives: Sensory loss may be a barrier to accessing health care services, and this study seeks to examine the association of sensory loss with whether older adults report having a usual source of health care.

Methods: Our study included 7,548 older adults who participated in the National Health and Aging Trends Study in 2015. Having a self-reported usual source of health care was our outcome, and hearing and vision loss were our primary independent variables.

Results: In multivariate analysis accounting for demographics, socioeconomic, health status, and environmental covariates, near vision loss but not distance vision or hearing loss was associated with decreased odds of having a usual source of health care.

Discussion: That older adults with near vision loss were less likely to report having a usual source of health care is concerning. Examining barriers to care is needed to identify sensory loss-relevant processes to optimize and intervene upon.

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Keywords

Functional loss; primary care services; health services utilization; epidemiology

Objective

Auditory and visual sensory loss are common worldwide and increase in prevalence with advancing age (Bourne et al., 2018; Goman & Lin, 2016; Guthrie et al., 2018; Stevens et al., 2013). These sensory losses can negatively affect physical, cognitive, and social functioning and are associated with poor health outcomes, worse quality of life and mental health, suboptimal care, and increased difficulties in accessing health services and information (Cupples, Hart, Johnston, & Jackson, 2012; Goman & Lin, 2018; Mikkola et al., 2016; Miller, Deere, & Cox, 2017; Pandhi, Schumacher, Barnett, & Smith, 2011; Pratt, 2018; Adam Simning, Fox, Barnett, Sorensen, & Conwell, 2019; Spencer, Frick, Gower, Kempen, & Wolff, 2009; Swenor, Lee, Varadaraj, Whitson, & Ramulu, 2020; Zheng et al., 2012). Sensory loss often goes unrecognized, and people with sensory loss may have to manage physical, communication, and procedural (e.g., completing forms) barriers to accessing primary care services (de Vries McClintock et al., 2016; Miller et al., 2017; Pratt, 2018).

Auditory and visual sensory loss can contribute to functional impairment and disabilities (Goman & Lin, 2018; Guthrie et al., 2018; Mikkola et al., 2016; Swenor et al., 2020). People with disabilities are at risk of having unmet health care needs, in part because they may have more difficulties in accessing primary care clinics, difficulties that are worsened among older adults (Popplewell, Rechel, & Abel, 2014). Similarly, worsening functional impairment is associated with increased difficulties in obtaining necessary health care (McClintock et al., 2017). Transportation issues and having medical offices that are accessible are particularly salient barriers for accessing health services among people with disabilities residing in rural communities who may live far away from their health care providers (Iezzoni, Killeen, & O'Day, 2006). Given the relationship between sensory loss and disability, there is concern that older adults with hearing and vision loss may have decreased access to routine medical care such as having a regular medical provider. The limited available survey data indicate, however, that sensory loss may not be associated with decreased access to general health services. For instance, other than increased use of mental health services, a Finnish survey from 2000–2001 did not find evidence that hearing loss was associated with general health services use among older adults (Mikkola et al., 2016). Additionally, data from the Medical Expenditure Panel Survey from 2002–2004 found that people aged 40 and older with vision loss in the United States did not have lower rates of having a usual source of health care compared to those without vision loss (Spencer et al., 2009). Whether the Finnish study findings are generalizable to other populations and health care systems is uncertain, however, and the United States study did not focus specifically on older adults. Because sensory loss may contribute to disability and, more than a third of people aged 65 and older in the United States have a disability (Kraus, Lauer, Coleman, & Houtenville, 2018), considering the potential impact of sensory loss on accessing health care services among older adults is warranted.

Identifying whether a person has a usual source of health care is a way to measure health care access (Tipirneni et al., 2020). This health care access marker is relevant because people with a usual health care provider are more likely to receive preventative services, have greater satisfaction with their care, receive better quality of care, and have lower health care costs (Friedberg, Hussey, & Schneider, 2010). For instance, adults with a usual source of care were more likely to receive treatment for hypertension and hypercholesterolemia and have lower mortality following an acute myocardial infarction (Spatz, Ross, Desai, Canavan, & Krumholz, 2010; Spatz et al., 2014). The presence of a usual source of care can be transitory, however, with one study finding that older adults can lose and regain a usual source of care over six years of follow-up (Nothelle, Boyd, Sheehan, & Wolff, 2018). This is potentially concerning because observational studies show that increasing continuity of care (from both generalist and specialist doctors) is associated with lower mortality rates (Pereira Gray, Sidaway-Lee, White, Thorne, & Evans, 2018). Although the presence of a usual source of care appears to have a meaningful effect on disease management and outcomes, we know relatively little about how auditory and visual sensory loss may affect whether older adults in the United States have a usual source of care.

To help address this gap, our study's objective was to use a national cohort of older adult Medicare beneficiaries in the United States to examine the association of auditory and visual sensory loss with whether an older adult reported having a usual source of care to manage their health needs. We hypothesized that 1) the presence of auditory and visual sensory loss function as a barrier to health care access and are associated with decreased odds of having a usual source of health care, and 2) older adults with sensory loss rely more on others to access their usual source of health care.

Method

Participants and Study Design

The National Health and Aging Trends Study (NHATS) commenced in 2011 and longitudinally examines a nationally representative cohort of United States Medicare beneficiaries aged 65 years and older with annual in-person interviews (Kasper & Freedman, 2018). NHATS is administered in English and Spanish, recruits disproportionately higher levels of Black older adults and from older age groups, and is publicly available at www.nhats.org. For this article, we examined participants who were interviewed in 2015 (Round 5), which was when the original NHATS cohort was replenished with new participants. The 2015 interview year had an unweighted response rate of 76.8% (Kasper & Freedman, 2018). Of the 7,548 participants included in our study sample, 7,052, 423, and 73 were dwelling in the community, non-nursing home residential care settings, and nursing homes, respectively. NHATS was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Usual Source of Health Care Variables

Our primary outcome (binary: present, absent) was determined by this question: "Is there a doctor that you think of as your regular doctor, that is, a doctor you usually go to when you are sick and need advice about your health?" ("National Health & Aging Trends Study,"

2020). Similar to others, we used this survey question to indicate whether a usual source of health care was present, the presence of which has been associated with the absence of depressive symptoms, more medical comorbidity, and Medicaid insurance (Nothelle et al., 2018). For participants who reported seeing their usual source of health care or another doctor in the past year, we examined whether these older adults drove themselves to their appointments or were driven by others and whether anyone sat in with them during their doctor visits. Among participants that had someone attend the doctor's appointment with them, we examined the type of assistance they received (e.g., whether others helped them prepare for the physical exam, reminded them about things they wanted to tell or ask the doctor, asked or shared information with the doctor for them, and helped them understand what the doctor was saying)("National Health & Aging Trends Study," 2020).

Auditory and Visual Loss

Our primary independent variables were the presence of auditory and visual sensory loss (binary: present, absent), which we determined using sensory items available in the NHATS questionnaire (see Supplemental Figures 1 and 2 for operationalization of NHATS survey items). Hearing loss was present if the participant (even if a hearing aid was used) was unable to "hear well enough to carry on a conversation in a room with a radio or TV playing," was unable to "hear well enough to carry on a conversation in quiet room," was unable to "hear well enough to use the telephone," or reported being Deaf (N=10). Near vision loss was present if the participant (even if glasses, contacts, or vision aids were used) was unable to "see well enough to read newspaper print" or reported being blind (N=51). Distance vision loss was present if the participant (even if glasses, contacts, or vision aids were used) was unable to "see well enough to recognize someone across the street," was unable to "see well enough to watch television across the room," or was blind ("National Health & Aging Trends Study," 2020). Of note, self-reported hearing and vision loss are often under-reported when compared to objective auditory and visual exams, the underreporting of which can vary by sociodemographic characteristics (Goman, Reed, Lin, & Willink, 2020; Whillans & Nazroo, 2014).

Covariates

Study covariates included demographics, socioeconomic, health status, and environmental domains that may be associated with sensory loss or affect an older adult's ability to access health care services (James et al., 2018; Riverin, Strumpf, Naimi, & Li, 2018; Adam Simning et al., 2019; A. Simning et al., 2020). Demographics included age (65–74, 75–84, 85+), sex (male, female), race and ethnicity (non-Hispanic White; non-Hispanic Black; Hispanic and other; other includes American Indian, Asian, Native Hawaiian, Pacific Islander, and other), marital status (married or living with a partner; separated or divorced; widowed or never married), and number of close social contacts (0 to 5). Socioeconomic status included formal education (high school degree or less, some college or vocational training, college degree or higher) and Medicaid status (present, absent) (Kasper & Freedman, 2018; "National Health & Aging Trends Study," 2020). Health status variables included medical comorbidity, which was grouped by quartile (higher quartiles indicating worsening medical comorbidity) and consisted of the total number of the following conditions: heart attack, heart disease, high blood pressure, arthritis,

osteoporosis, diabetes, lung disease, stroke, and cancer; dementia (probable, possible, no dementia)(Kasper, Freedman, & Spillman, 2013; Spillman & Skehan, 2013); instrumental activities of daily living impairment (IADLs; present, absent) that included preparing meals, doing laundry, doing light housework, shopping for groceries, managing money, taking medicine, or making phone calls; activities of daily living impairments (ADLs; present, absent) that included eating, transferring out of bed, transferring out of chairs, walking inside, going outside, dressing, bathing, or toileting; and a depression screen (PHQ-2; positive, negative)(Kroenke, Spitzer, & Williams, 2003). NHATS modified the PHQ-2 scale to assess the prior one month (rather than two weeks), which was scored from 2 to 8 (Kasper & Freedman, 2018), with scores of 5 or higher indicating a positive depression screen. Probable dementia was present when survey participants or proxies reported a doctor had told the participants that they had dementia or participants had scores on cognitive testing that met criteria for likely dementia. Possible dementia was present for those not reporting a dementia diagnosis who had cognitive testing that did not meet criteria for likely dementia but indicated some impairment was present (Kasper et al., 2013; Spillman & Skehan, 2013). Environmental variables included whether there were stairs (present, absent) or a ramp (present, absent) at the participants' primary entrance.

Statistical Analyses

To examine differences in usual source of health care use, demographics, socioeconomic status, and health status domains by auditory or visual sensory loss status, we first conducted bivariate analyses and used the Rao-Scott F adjusted chi-square statistic (a statistic that is recommended for complex survey data because it yields a more conservative interpretation than the Wald chi-square)(National Center for Health Statistics, 2020). We also examined the association of doctor visit assistance with sensory loss across age groups due to concern that age could confound this association. To examine the association of hearing and vision loss with having a usual source of health care, we next conducted one unadjusted and one adjusted logistic regression analysis (models included hearing, near vision, and distance vision loss concurrently) with the presence of a usual source of health care (1=present, 0=absent) as our outcome. Adjusted regression analyses included all of the covariates in the demographics, socioeconomic status, and health status variables. We did not include those with proxy interviews (N=457) in the adjusted analyses because NHATS did not ask proxy respondents about close social contacts (Kasper & Freedman, 2018). Following NHATS technical guidance (Kasper & Freedman, 2018), we used SAS survey procedures (version 9.4, SAS Institute, Inc., Cary, NC) to account for sampling design and nonresponse and calculate population-weighted adjusted estimates, and all prevalence estimates are based on population-weighted data. To account for participants with missing data, we used SAS survey procedures' "not missing completely at random" (i.e., nomcar) option.

Results

Bivariate Analyses

Among our cohort of older adult Medicare beneficiaries, 12.5% (N=1,051) reported hearing loss, 4.7% (N=488) reported near vision loss, and 6.5% (N=612) reported distance vision loss. Those with near vision loss but not hearing or distance vision loss were less likely

to report having a usual source of health care compared to those without hearing or vision loss, respectively (Table 1). Additionally, older adults with either hearing or vision loss were much more likely to have others drive them to their doctor appointments and receive assistance from others during the visit. Of note, this association of doctor visit assistance with sensory loss largely persisted across age groups (Table 2). Those with sensory loss were also more likely to be older, non-White, widowed or never married, have fewer close social contacts, have less formal education, have Medicaid, have more medical comorbidity, have probable or possible dementia, be functionally impaired, have depression symptoms, and entrance ramps compared to those without hearing or vision loss, respectively (Table 1). The association of sex varied by sensory status, however, with disproportionately more males reporting hearing loss and disproportionately more females endorsing vision loss.

Multivariate Analyses

In the unadjusted logistic regression analysis, hearing loss (odds ratio, OR=0.96, 95% confidence interval, CI: 0.67–1.38) and distance vision loss (OR=1.23, 95% CI: 0.80–1.88) did not have an association with having a usual source of health care, while near vision loss was associated with decreased odds of having a usual source of health care (OR=0.52, 95% CI: 0.30–0.91). A similar relationship was observed in the multivariate logistic regression analysis adjusted for covariates (hearing loss: OR=0.94, 95% CI: 0.59–1.49; distance vision loss: OR=1.63, 95% CI: 0.84–3.17; and near vision loss: OR=0.46, 95% CI: 0.25–0.83). Other characteristics also were associated with decreased odds of having a usual source of health care were younger age, separated or divorced marital status, fewer close social contacts, less medical comorbidity, possible dementia, and presence of depressive symptoms (Table 3).

Discussion

Approximately 1 in 10 the cohort of 7,548 Medicare beneficiaries reported hearing loss and about 1 in 20 reported near and distance vision loss. Consistent with concerns that vision loss may increase difficulties in accessing health care services (Cupples et al., 2012), and in partial support of our hypothesis, near vision (but not hearing or distance vision) loss was associated with decreased odds of having a usual source of health care. More specifically, older adults who were unable to see well enough to read newspaper print (even with visual aids), had 54% decreased odds for having a usual source of health care, even after accounting for potentially confounding demographic, socioeconomic status, health status, and environmental factors. Our findings suggest that the type of vision loss matters because distance vision loss (unable to recognize someone across the street) was not associated with decreased odds of having a usual source of health care. That hearing loss had no association with having a usual source of health care is congruent with findings that the use of non-mental health medical services did not vary by hearing loss status among a Finnish cohort of older adults (Mikkola et al., 2016).

In support of our second hypothesis (i.e., that older adults with sensory loss relied more on others to access their usual source of health care), compared to those without sensory loss, older adults with either auditory or visual sensory loss were much more likely to have others

drive them to their doctor appointments and receive assistance from others during the visit. Perhaps unsurprisingly, those with near vision loss (67.8%) and distance vision loss (67.5%) relied even more heavily on others to drive them to the appointment than those with hearing loss (44.9%). People with near vision loss also were more likely to have others join them at the appointment compared to those with hearing loss (67.9% versus 57.0%). These findings suggest that the support of others in accessing a usual health care provider is important for both hearing and vision loss, but especially so for those with vision loss. Additionally, transportation issues (e.g., ability to drive or public transportation accessibility) may be important environmental factors to consider that could affect the ability of a person with sensory loss to access health care.

In addition to vision loss, other characteristics were associated with not having a usual source of health care such as having fewer close social contacts and depressive symptoms. That having fewer close social contacts was associated with a higher risk of not having a usual source of health care is pertinent to people with vision loss with our data suggesting that these people have smaller social networks and because they may be more reliant on their support networks in accessing health care services (Cupples et al., 2012). That depressive symptoms were associated with a greater risk of not having a usual source of health care is concerning in the context of hearing and vision loss because these sensory losses are associated with an increased risk for depressive symptoms (Guthrie et al., 2018; Swenor et al., 2020).

Worsening severity of auditory and visual sensory loss is associated with substantially increased medical and non-medical costs, with heavy reliance on informal caregiving (Chuvarayan, Finger, & Köberlein-Neu, 2020; Deardorff et al., 2019; Köberlein, Beifus, Schaffert, & Finger, 2013). Although there are increased costs associated with higher utilization of some medical services, evidence suggests that access to and satisfaction with healthcare services is inadequate for many with sensory impairment (Assi et al., 2020; Cabral, Muhr, & Savageau, 2013; Nolan, Mathos, Fusco, & Post, 2015; Sharts-Hopko, Smeltzer, Ott, Zimmerman, & Duffin, 2010; van der Aa et al., 2015). To help address issues related to healthcare access and satisfaction with care among people with sensory impairment, there are a variety of approaches that medical offices could implement to better serve their patients with sensory loss. These approaches include training staff on the prevalence and impact of sensory loss, systematically flagging patients' medical records to help identify sensory loss and alert staff and providers, environmental modifications (e.g., improved signage and lighted walkways), improved use of sensory assistive devices (e.g., hearing aids), using larger font on paperwork provided to the patients, and community outreach (Miller et al., 2017; Pratt, 2018). Although many approaches have been suggested, research on organizational approaches to improve access to primary care services among vulnerable populations is limited and empirical evidence is lacking (Khanassov et al., 2016). An additional challenge to addressing sensory loss is that doing so can be expensive, especially since most insurance programs do not cover hearing aids and vision care (e.g., to pay for glasses) often requires supplemental insurance in the United States (Goman & Lin, 2018).

Study Strengths and Limitations

Notable strengths of our study include the examination of a nationally representative population of older Medicare beneficiaries, concurrent examination of three different groupings of sensory impairment, and accounting for many characteristics spanning demographic, socioeconomic status, and health status domains. Our study also has several limitations. First, reliance on the term "doctor" in identifying a usual source of health care is a narrow descriptor that excludes other primary care providers such as nurse practitioners and physician assistants. Second, the identification of having a usual source of health care was based on participant self-report and not determined by examination of medical records, which could introduce error into the analyses. An examination of the NHATS dataset, however, found that older adults were able to accurately report the use of medical services (rehabilitation use) over the past year (Freedman, Kasper, & Jette, 2018). Third, we did not examine the participants' use of specialist medical services (e.g., perhaps some participants had a team of specialists that deliver "usual care" while lacking a single usual care provider?). Fourth, these analyses were based on cross-sectional data, which makes examining causal relationships difficult. Fifth, our determination of hearing and vision loss was based on self-reported sensory functional measures rather than objective auditory and visual examinations, which therefore represents the prevalence of self-reported sensory loss rather than the prevalence of objective hearing or vision loss. Although older adults typically under-report sensory loss, another concern is that people with moderate or good sensory function may report sensory loss (Zimdars, Nazroo, & Gjonça, 2012). We suspect that these misclassification errors could weaken the association between sensory loss and usual care providers in our analyses and bias our findings toward the null hypothesis. Possible options to address this issue could be to use medical diagnoses of sensory loss or objective sensory assessments. However, as screening for sensory loss is highly variable and incomplete (National Center for Health Statistics, 1997), we would recommend that future studies consider relying on objective sensory assessments to reduce issues related to misclassification error. Sixth, our study had potential power limitations. For instance, we did not have sufficient power to examine those with more severe sensory loss (e.g., only 91 were unable to hear well enough to carry on a conversation in a quiet room) or to examine people with dual sensory loss. We believe this is a topic worthy of future investigation as people with dual sensory loss may have more barriers to accessing healthcare services than those with single or no sensory loss. Lastly, our study did not account for the use of American Sign Language (10 participants identified as being Deaf) and only partially considered possible compensatory strategies that older adults with sensory loss may rely upon to access healthcare services and are issues that could be more rigorously examined.

Conclusion

Auditory and visual sensory loss are common among older adults. Our finding that those with near vision loss were less likely to report having a usual source of health care is concerning because having a regular care provider is associated with better health care quality, improved patient satisfaction, and reduced costs (Friedberg et al., 2010). It is unclear what factors were contributing to this reported lack of a usual source of health care (e.g., perhaps text-based outpatient communications and information are ineffective for older

adults with near vision loss?). We also found that older adults with any sensory loss were more likely to rely on others to help them travel to doctor appointments and to assist them during these appointments, which suggests that the presence of a caregiver and informal support networks may be especially important to older adults with sensory loss. Future efforts examining potential barriers such as medical office accessibility, including issues with transportation, handicap accessibility, and communication (e.g., are accommodations made for patients who are unable to read?), may identify sensory loss-relevant processes to optimize and intervene upon.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Usual Source of Health Care Services, Demographics, Socioeconomic Status, and Health Status Characteristics of Medicare Beneficiaries Aged 65 Years and Older Stratified by the Presence of Hearing or Vision Loss.

	Hearing Loss							Near Vision Loss							Distance Vision Loss						
	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]
	N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE	
Interview Type																					
Proxy, yes	284	3.1	0.2	189	13.3	1.4	<0.001	345	3.5	0.3	117	19.8	2.0	<0.001	297	3.0	0.3	151	20.2	2.1	<0.001
Usual Source of Health Care Services																					
Have usual source of health care, yes	6,144	94.7	0.4	984	94.3	0.9	0.614	6,697	94.8	0.4	451	91.6	1.8	0.032	6,538	94.7	0.4	569	94.3	1.0	0.666
Drove self to appointment, yes	4,043	75.5	0.7	438	53.8	2.0	<0.001	4,415	75.2	0.7	79	23.1	2.8	<0.001	4,370	76.0	0.7	118	27.8	2.5	<0.001
Others drove to appointment, yes	2,032	25.9	0.7	516	44.9	1.8	<0.001	2,220	26.4	0.6	330	67.8	2.9	<0.001	2,107	25.4	0.7	418	67.5	2.3	<0.001
Attended doctor appointment with others, yes	2,296	32.5	0.9	595	57.0	1.8	<0.001	2,567	34.0	0.8	323	67.9	3.4	<0.001	2,470	33.4	0.9	397	64.7	2.7	<0.001
Others helped prepare for doctor exam, yes	380	14.8	0.9	169	25.9	1.8	<0.001	441	15.5	0.9	105	32.7	3.3	<0.001	410	15.1	0.9	127	28.8	2.5	<0.001
Others reminded participant during doctor visit, yes	1,278	53.8	1.4	388	67.5	2.4	<0.001	1,462	55.9	1.3	205	64.7	3.3	0.016	1,411	55.7	1.3	245	63.7	2.6	0.006
Others asked or shared information at doctor visit, yes	1,311	52.1	1.3	425	68.8	2.5	<0.001	1,487	53.8	1.3	243	71.6	3.3	<0.001	1,419	52.9	1.3	293	71.7	3.1	<0.001
Others helped understand information at doctor visit, yes	1,221	46.3	1.4	454	73.9	2.1	<0.001	1,415	49.4	1.2	250	74.9	3.0	<0.001	1,361	48.7	1.1	289	73.5	2.8	<0.001
Demographics																					
Age in years							<0.001							<0.001							<0.001
65–74	2,559	57.9	0.6	237	41.1	1.7		2,704	56.8	0.6	99	35.6	2.9		2,669	57.2	0.6	128	37.2	3.0	

	Hearing Loss							Near Vision Loss							Distance Vision Loss						
	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]
	N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE	
75–84	2,599	31.1	0.5	373	31.9	1.6		2,815	31.2	0.5	169	32.5	2.2		2,774	31.4	0.5	197	30.3	2.0	
85+	1,322	11.0	0.3	441	27.0	1.1		1,541	12.0	0.3	220	32.0	1.9		1,454	11.5	0.3	287	32.5	2.4	
Sex, Female	3,798	56.3	0.7	573	50.2	2.0	0.008	4,072	55.1	0.7	303	61.8	2.3	0.012	3,922	54.6	0.7	426	67.7	2.6	<0.001
Race and ethnicity							<0.001							<0.001							<0.001
White, non-Hispanic	4,383	80.7	1.0	742	76.7	2.1		4,893	81.0	1.0	250	64.3	3.4		4,740	80.9	1.0	373	70.4	2.8	
Black, non-Hispanic	1,426	9.0	0.5	132	4.5	0.6		1,406	8.1	0.4	148	14.4	1.6		1,416	8.4	0.4	130	9.2	1.2	
Hispanic or Other	513	10.3	0.8	157	18.8	2.0		598	10.9	0.9	74	21.3	3.2		579	10.8	0.9	93	20.4	2.7	
Marital Status							<0.001							<0.001							<0.001
Married or living with a partner	3,180	57.3	0.8	453	51.8	1.9		3,491	57.6	0.8	156	38.4	2.7		3,447	57.9	0.8	186	39.3	2.0	
Separated or divorced	929	14.8	0.6	109	11.4	1.3		981	14.3	0.6	57	14.9	2.3		961	14.4	0.5	75	13.9	1.6	
Widowed or never married	2,366	27.9	0.6	488	36.8	1.4		2,584	28.1	0.6	273	46.7	2.4		2,484	27.7	0.6	350	46.9	2.3	
Number of close social contacts	6,196	2.22	0.03	862	2.01	0.06	<0.001	6,715	2.21	0.03	371	1.79	0.06	<0.001	6,600	2.21	0.03	461	2.00	0.07	0.006
Socioeconomic Status																					
Education							<0.001							<0.001							<0.001
High school degree or equivalent or less	2,975	41.1	1.2	621	58.3	2.1		3,267	42.0	1.2	334	70.5	2.7		3,209	42.0	1.2	369	61.5	2.7	
Some college or vocational training	1,398	23.7	0.6	185	19.4	1.2		1,516	23.6	0.7	70	14.5	2.1		1,464	23.4	0.7	114	19.6	1.9	
College degree	1,950	35.2	1.2	218	22.2	1.6		2,111	34.4	1.2	65	15.0	2.0		2,062	34.6	1.2	108	18.9	2.1	
Medicaid, present	885	11.1	0.5	212	20.8	1.7	<0.001	942	11.4	0.5	151	31.3	2.7	<0.001	940	11.4	0.5	151	25.6	2.2	<0.001
Health Status																					
Medical comorbidity							<0.001							<0.001							<0.001

	Hearing Loss							Near Vision Loss							Distance Vision Loss						
	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]	Absent			Present			*P value* [a]
	N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE	
1st Quartile	1,485	28.8	0.6	164	18.9	1.6		1,581	28.1	0.6	72	17.0	2.5		1,564	28.3	0.6	81	16.8	2.2	
2st Quartile	1,545	25.2	0.8	195	19.8	1.3		1,666	24.9	0.7	82	17.4	2.2		1,624	24.8	0.7	115	20.3	2.4	
3rd Quartile	1,495	21.9	0.6	223	22.8	1.5		1,607	21.9	0.6	111	22.3	2.2		1,592	22.2	0.6	123	19.2	2.0	
4th Quartile	1,878	24.2	0.5	449	38.5	1.8		2,115	25.1	0.6	216	43.3	3.0		2,033	24.7	0.5	281	43.7	2.6	
Dementia or Alzheimer's							<0.001							<0.001							<0.001
Probable	650	6.5	0.3	283	21.8	1.6		736	7.2	0.3	188	32.1	2.5		703	6.8	0.3	206	29.1	2.4	
Possible	632	7.7	0.3	138	11.4	1.1		682	7.8	0.3	93	17.8	1.8		680	7.8	0.3	86	12.8	1.2	
No dementia	5,176	85.8	0.4	618	66.8	1.8		5,619	85.0	0.4	197	50.2	2.8		5,494	85.4	0.4	309	58.0	2.1	
IADL impairment, present	1,438	17.6	0.5	485	41.2	2.1	<0.001	1,595	18.3	0.5	327	66.4	3.3	<0.001	1,501	17.7	0.5	394	59.7	2.7	<0.001
ADL impairment, present	1,062	12.8	0.5	393	31.8	1.7	<0.001	1,204	13.5	0.4	248	48.4	2.7	<0.001	1,118	12.9	0.5	308	44.3	2.8	<0.001
Depression symptoms, present	777	10.7	0.4	254	25.6	1.5	<0.001	888	11.6	0.5	143	31.6	3.2	<0.001	843	11.2	0.4	182	31.3	2.6	<0.001
Environment																					
Entrance stairs, present	4,849	76.4	0.9	731	72.5	1.8	0.024	5,283	76.5	0.9	307	65.7	2.3	<0.001	5,192	76.7	0.9	386	65.9	2.3	<0.001
Entrance ramp, present	670	9.0	0.5	171	14.3	1.1	<0.001	745	9.3	0.5	96	17.5	2.1	<0.001	718	9.2	0.5	116	15.9	1.9	<0.001

Note. SE = standard error; IADL = instrumental activities of daily living; ADL = activities of daily living. Prevalence estimates are based on population-weighted data.

[a] *P values* determined by Rao-Scott F adjusted chi-square statistic for categorical variables or *F*-test statistic for continuous variables.

Table 2.

Health Care Services Assistance by the Presence of Hearing or Vision Loss Grouping, Stratified by Age Group.

	Hearing Loss							Near Vision Loss							Distance Vision Loss						
	Absent			Present			*P value a*	Absent			Present			*P value a*	Absent			Present			*P value a*
	N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE	
Health Care Services Assistance, Age 65–74																					
Drove self to appointment, yes	1,888	84.3	0.9	157	71.3	3.5	<0.001	2,018	84.4	0.9	30	36.1	5.9	<0.001	1,996	84.7	0.9	51	45.4	5.6	<0.001
Others drove to appointment, yes	478	17.3	0.9	68	29.7	3.3	<0.001	496	17.4	0.8	53	55.9	6.3	<0.001	477	16.8	0.8	68	55.3	5.4	<0.001
Attended doctor appointment with others, yes	616	24.5	1.2	97	46.3	3.3	<0.001	665	25.6	1.1	52	58.9	6.9	<0.001	651	25.3	1.2	62	53.6	6.3	<0.001
Others helped prepare for doctor exam, yes	82	12.5	1.5	20	22.5	4.0	0.005	90	13.0	1.6	14	32.5	7.3	0.002	85	12.8	1.6	16	25.3	5.4	0.012
Others reminded participant during doctor visit, yes	312	49.2	2.7	68	69.7	5.5	0.004	350	51.8	2.6	34	66.4	8.0	0.113	344	52.0	2.5	39	62.6	6.8	0.151
Others asked or shared information at doctor visit, yes	292	44.8	2.3	57	60.3	5.6	0.017	317	46.3	2.3	33	59.7	7.6	0.122	306	45.2	2.3	41	65.0	7.0	0.019
Others helped understand information at doctor visit, yes	241	34.8	2.6	61	64.2	5.2	<0.001	268	37.6	2.5	35	67.1	6.9	<0.001	261	36.6	2.2	41	72.0	6.6	<0.001
Usual Source of Health Care Services, Age 75–84																					
Drove self to appointment, yes	1,635	70.0	0.9	182	54.6	3.0	<0.001	1,789	70.1	1.0	35	25.7	4.8	<0.001	1,770	70.7	0.9	51	30.3	4.1	<0.001
Others drove to appointment, yes	851	31.6	1.0	170	46.6	2.7	<0.001	909	31.6	1.0	114	69.1	4.1	<0.001	885	30.9	1.0	131	69.3	3.8	<0.001
Attended doctor appointment with others, yes	974	39.0	1.3	194	56.3	3.0	<0.001	1,063	39.8	1.2	104	65.2	5.1	<0.001	1,041	39.3	1.2	119	65.2	3.7	<0.001

	Hearing Loss							Near Vision Loss							Distance Vision Loss						
	Absent			Present			*P value a*	Absent			Present			*P value a*	Absent			Present			*P value a*
	N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE		N	% or mean	SE	N	% or mean	SE	
Others helped prepare for doctor exam, yes	147	15.1	1.2	47	22.2	3.8	0.054	163	15.0	1.3	29	32.0	6.7	0.004	162	15.1	1.1	30	26.4	4.9	0.007
Others reminded participant during doctor visit, yes	536	55.3	1.9	120	64.1	3.9	0.076	587	56.1	1.6	69	65.9	5.6	0.103	582	56.0	1.6	70	63.2	4.4	0.127
Others asked or shared information at doctor visit, yes	540	53.2	1.8	132	67.7	3.9	0.002	589	53.9	1.8	82	79.0	4.6	<0.001	578	53.7	1.8	87	73.3	4.9	0.002
Others helped understand information at doctor visit, yes	509	49.7	1.8	139	71.1	3.7	<0.001	563	51.4	1.8	83	76.8	5.3	<0.001	561	51.6	1.7	79	67.1	5.1	0.005
Usual Source of Health Care Services, Age 85+																					
Drove self to appointment, yes	520	45.7	1.7	99	25.8	1.9	<0.001	608	45.2	1.5	14	6.0	1.9	<0.001	604	48.2	1.6	16	5.6	1.6	<0.001
Others drove to appointment, yes	703	54.4	1.6	278	66.4	2.1	<0.001	815	54.5	1.6	163	79.6	3.1	<0.001	745	52.7	1.6	219	79.6	2.5	<0.001
Attended doctor appointment with others, yes	706	55.9	1.5	304	74.4	2.7	<0.001	839	57.9	1.4	167	80.7	3.2	<0.001	778	57.3	1.5	216	76.7	2.5	<0.001
Others helped prepare for doctor exam, yes	151	19.5	1.8	102	32.6	2.9	<0.001	188	21.7	1.5	62	33.4	3.4	0.002	163	20.4	1.7	81	33.5	3.2	<0.001
Others reminded participant during doctor visit, yes	430	61.3	1.7	200	68.3	2.7	0.033	525	63.9	1.7	102	62.3	4.2	0.730	485	63.3	1.7	136	64.9	3.7	0.703
Others asked or shared information at doctor visit, yes	479	66.7	2.2	236	78.0	2.4	0.001	581	69.0	1.9	128	75.3	4.0	0.178	535	68.2	1.9	165	75.6	3.2	0.051
Others helped understand information at doctor visit, yes	471	66.0	2.1	254	85.8	1.8	<0.001	584	70.2	1.8	132	79.7	3.1	0.017	539	69.4	1.9	169	79.7	2.5	0.001

Note. SE = standard error. Prevalence estimates are based on population-weighted data.

[a]P values determined by Rao-Scott F adjusted chi-square statistic for categorical variables.

Table 3.

Logistic Regression Analyses Examining the Association of Hearing and Vision Loss, Demographic, Socioeconomic Status, Health Status, and Environmental Characteristics with having a Usual Source of Health Care

	Unadjusted Model, N = 7,441			Adjusted Model, N = 6,463		
	OR	95% CI[a]	*P value*	OR	95% CI[a]	*P value*
Sensory Loss						
Hearing loss, present	0.96	0.67–1.38	0.804	0.94	0.59–1.49	0.786
Near vision loss, present	0.52	0.30–0.91	0.022	0.46	0.25–0.83	0.012
Distance vision loss, present	1.23	0.80–1.88	0.348	1.63	0.84–3.17	0.145
Demographics						
Age in years (ref=65–74)						
75–84				1.35	0.99–1.83	0.057
85+				1.66	1.15–2.38	0.007
Sex, Female				1.04	0.76–1.43	0.798
Race and ethnicity (ref=White, non-Hispanic)						
Black, non-Hispanic				0.69	0.47–1.01	0.054
Hispanic or Other				1.44	0.90–2.30	0.123
Marital Status (ref=married or living with a partner)						
Separated or divorced				0.65	0.45–0.95	0.026
Widowed or never married				0.77	0.55–1.09	0.141
Number of close social contacts				1.15	1.00–1.31	0.046
Socioeconomic Status						
Education (ref=college degree)						
High school degree or equivalent or less				0.80	0.56–1.15	0.228
Some college or vocational training				0.81	0.54–1.20	0.287
Medicaid, present				0.97	0.65–1.45	0.875
Health Status						
Medical comorbidity quartile (ref=1st quartile)						
2nd Quartile				2.94	1.96–4.41	<0.001
3rd Quartile				4.11	2.72–6.23	<0.001
4th Quartile				5.12	3.19–8.20	<0.001
Dementia or Alzheimer's (ref=no dementia)						
Probable				0.99	0.54–1.82	0.977
Possible				0.56	0.37–0.83	0.005
IADL impairment, present				0.80	0.51–1.24	0.307
ADL impairment, present				1.21	0.73–2.02	0.449
Depression symptoms, present				0.56	0.37–0.86	0.008
Environment						
Entrance stairs, present				1.11	0.77–1.60	0.562
Entrance ramp, present				0.86	0.53–1.41	0.542

Note. Unadjusted model includes both hearing and vision loss concurrently; proxy respondents are excluded in the adjusted model. SAS survey procedures accounted for sampling design and nonresponse to calculate population-weighted adjusted estimates.

[a]Intervals based on 95% Wald confidence limits.