

# Impacts of Hearing Loss and Limited Health Literacy among Older Adults

**Contact Information:**  
 Timothy S. Wells, PhD  
 Associate Research Director  
 Research for Aging Populations  
 Optum  
 Tim.Wells@Optum.com  
 Phone: 517-646-2126



Timothy S. Wells, PhD<sup>1</sup>, Steven Rush, MA<sup>2</sup>, Shirley Musich, PhD<sup>1</sup>, Lorraine Nickels, MS<sup>3</sup>,  
 Lizi Wu, PhD<sup>1</sup>, and Charlotte S. Yeh, MD<sup>4</sup>

<sup>1</sup>Research for Aging Populations, Optum, <sup>2</sup>UnitedHealthcare, <sup>3</sup>UnitedHealthcare Medicare & Retirement, <sup>4</sup>AARP Services, Inc.

## Objectives

- The primary purpose of this study was to explore characteristics associated with limited health literacy.
- A secondary purpose was to determine associations of combined limited health literacy, hearing loss (HL), and hearing aid use with medical costs.

## Background

- Both adequate hearing and health literacy are needed for effective communications between healthcare providers and patients in order to support quality care.
- Health literacy is the ability to obtain, process, and understand health information needed to make informed health decisions.
- Age-related HL affects about a third of U.S. adults age 65-74 years of age and about half of those age 75 and older.
- Those age 65+ also use more services and often have complex medical conditions, making healthcare communications vital.

## Methods

- The study included 19,223 adults aged 65+ with AARP® Medicare Supplement plans insured by UnitedHealthcare who completed a health survey.
  - Individuals were linked to medical claims submitted prior to survey completion.
- Health literacy was assessed by asking: "How confident are you filling out medical forms by yourself?" Responses:
  - "Extremely" or "quite a bit" (adequate health literacy)
  - "Somewhat," "a little bit," or "not at all" (limited health literacy)
- Hearing loss was assessed by asking: "Which statement best describes your hearing without a hearing aid?"
  - "Excellent" and "good" = no HL
  - "A little trouble" = mild HL
  - "Moderate trouble" and "a lot of trouble" = severe HL
- The hearing aid question asked: "In the past 12 months, have you worn a hearing aid at least 5 hours a week?" ("Yes" or "No")
- Hearing loss and hearing aid use were coded into five categories: no HL, unaided mild HL, aided mild HL, unaided severe HL, and aided severe HL.
- Statistical analyses included:
  - Adjusted logistic regression to identify characteristics associated with limited health literacy.
  - Generalized linear modeling to adjust for case mix differences when estimating medical costs.

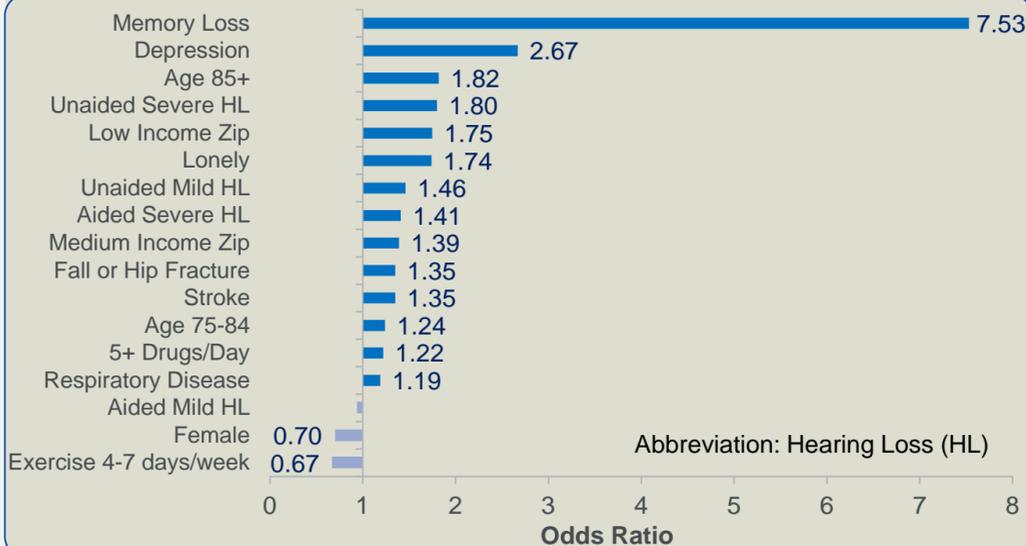
## Results

### Unadjusted Characteristics of Limited Health Literacy



## Results (continued)

### Adjusted Characteristics Associated with Limited Health Literacy



### Notes:

- Characteristics with odds ratios >1 indicate greater risk for limited health literacy, while characteristics with odds ratios <1 indicate less risk for limited health literacy.
- Memory loss, depression, and age were the strongest predictors of limited health literacy. Those with severe HL, regardless of hearing aid use, and those with unaided mild HL were more likely to report limited health literacy.
- Only statistically significant (p<.05) odds ratios are labeled.

### Medical Costs Associated with Hearing Loss and Limited Health Literacy

Category	Number		Adjusted Annual Medical Costs		Cost Difference	P-value
	Limited Health Literacy	Adequate Health Literacy	Limited Health Literacy	Adequate Health Literacy		
No HL	549	10,705	\$13,055	\$10,484	\$2,571	0.031
Unaided Mild HL	296	3,083	\$13,504	\$11,171	\$2,333	0.465
Aided Mild HL	39	619	\$13,037	\$12,383	\$654	1.000
Unaided Severe HL	228	1,417	\$13,680	\$13,014	\$666	1.000
Aided Severe HL	222	1,937	\$15,999	\$11,511	\$4,487	0.012

### Notes:

- Across each HL group, those with limited health literacy had higher annual medical costs than those with adequate health literacy.
- These findings were only statistically significant for the no hearing loss and aided severe hearing loss groups.
- Among those with limited health literacy, those with aided severe hearing loss had the highest medical costs.
- Among those with adequate health literacy, the unaided severe hearing loss group had the highest medical costs.

## Conclusions

- Hearing loss was positively associated with limited health literacy.
- However, wearing hearing aids decreased the risk of having limited health literacy.
- Across each hearing loss group, those with limited health literacy had higher annual medical costs than those with adequate health literacy.
- Those with unaided severe hearing loss and limited health literacy did not have the highest medical costs.

- It may be that these individuals have such poor healthcare communications that they refrain from seeking care when needed.
- Results suggest a need to identify individuals with HL or limited health literacy in the primary healthcare setting and provide interventions as appropriate.
- Potentially viable interventions include referrals to hearing specialists and individually tailored healthcare communications, among others.