

# Patients with untreated hearing loss incur higher health care costs over time

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Older adults with untreated hearing loss incur substantially higher total health care costs compared to those who don't have hearing loss—an average of 46 percent, totaling \$22,434 per person over a decade, according to a new study led by researchers at the Johns Hopkins Bloomberg School of Public Health. This is one of the largest studies to

look at this issue, following many individuals for a full 10 years. The project was done in collaboration with AARP, University of California San Francisco and OptumLabs.

The differences between the two groups were evident as early as two years after diagnosis. Compared to the patients without [hearing loss](#), patients with the condition generated nearly 26 percent more in total health care costs within two years, a gap that widened to 46 percent by 10 years, amounting to \$22,434 per individual (\$20,403 incurred by the health plan, \$2,030 by the individual in out-of-pocket costs). The study did not include patients with hearing loss who had evidence of hearing aid use.

The findings, to be published Nov. 8 in *JAMA Otolaryngology-Head and Neck Surgery*, add to a growing body of research from Johns Hopkins and elsewhere showing the detriments of untreated hearing loss, which include a higher risk of dementia and cognitive decline, falls, depression and lower quality of life. In a companion paper published in the same issue, a study led by Bloomberg School researchers suggests a link between untreated hearing loss and significantly greater morbidity, affirming early studies.

Hearing loss affects 38 million Americans, a number that's expected to double by 2060, with current aging population trends. An estimated one in three people in the U.S. between the ages of 65 and 74 currently has hearing loss, and two-thirds of adults age 70 years and older have a clinically significant hearing loss.

It's unclear how hearing loss has translated into longitudinal trends of health care utilization and costs, particularly for those whose hearing loss remains untreated, says study lead Nicholas S. Reed, AuD, a member of the core faculty of the Cochlear Center for Hearing and Public Health at the Bloomberg School and an instructor of audiology in the Department

of Otolaryngology-Head and Neck Surgery at the Johns Hopkins University School of Medicine.

To investigate these questions, Reed and his colleagues mined information from the OptumLabs Data Warehouse, a large de-identified health care dataset including administrative claims from 1999 to 2016 for people enrolled in large, private U.S. health plans and Medicare Advantage plans. The researchers used diagnosis codes to identify more than 77,000 patients with likely age-related untreated hearing loss, excluding those whose claims data indicated they used a hearing aid or whose hearing loss was secondary to a medical condition or toxic agent such as chemotherapy.

The research team then matched each of these patients with other patients in the claims database on more than 25 factors including demographic characteristics, baseline health conditions and measures of health care utilization, such as inpatient hospitalizations and readmissions within 30 days, emergency department visits, days with at least one outpatient visit and health care costs. The researchers analyzed health care cost and utilization outcomes and trends at two-, five- and 10-year follow-up points.

At the 10-year mark, patients with untreated hearing loss experienced about 50 percent more hospital stays, had about a 44 percent higher risk for hospital readmission within 30 days, were 17 percent more likely to have an emergency department visit and had about 52 more outpatient visits compared to those without hearing loss.

When the researchers calculated how much of the extra \$22,434 in total health care costs were likely due solely to hearing loss-related services, the total was only about \$600 over 10 years.

The study results do not indicate exactly why untreated hearing loss

drives up health care utilization. Reed and his colleagues have a few ideas. One of them is hearing loss' relationship with other serious health issues.

In the companion paper, using the same OptumLabs dataset, Jennifer A. Deal, Ph.D., assistant scientist in the Bloomberg School's Department of Epidemiology, and her colleagues show that untreated hearing loss is independently associated with significantly greater morbidity. For example, compared to those without hearing loss, those with untreated hearing loss had 3.2 more dementia diagnoses, 3.6 more falls and 6.9 more depression diagnoses per 100 people over 10 years. Over 10 years, those with untreated hearing loss had an estimated 50 percent greater risk of dementia, 40 percent greater risk of depression, and almost 30 percent higher risk for falls compared to those without hearing loss.

"We don't yet know if treating hearing loss could help prevent these problems," Deal says. "But it's important for us to figure out, because over two-thirds of adults age 70 years and older have clinically significant hearing loss that may impact everyday quality of life. We need to better understand these relationships to determine if treatment for hearing loss could potentially reduce risk and help maintain health in older adults."

Deal also noted that the depression finding is important. "There aren't a lot of studies using objectively measured hearing loss showing this association, even though it seems pretty intuitive."

Another possibility for the link between hearing loss and greater health care cost and utilization is that hearing loss might hamper patient-provider communication, says Reed, one of the paper's co-authors. Patients who can't hear their doctors may have trouble communicating their symptoms, participating in conversations to develop a recommended plan for their health or following discharge

instructions—key elements in participating in their own care.

To help improve communication for patients with hearing loss at Johns Hopkins Bayview Medical Center, Reed and others developed a multi-element pilot program to provide extra training to doctors, improve signage or provide hearing amplification devices. The researchers are currently collecting outcomes data associated with these interventions to determine whether they result in better care.

Across the U.S adults with hearing loss will be able to access hearing amplification devices more easily in 2020, when a federal law authorizing certain types of over-the-counter hearing aids will go into effect.

"Knowing that untreated [hearing](#) loss dramatically drives up [health care](#) utilization and costs will hopefully be a call to action among [health](#) systems and insurers to find ways to better serve these patients," says Reed.

**More information:** "Trends in Healthcare Costs and Utilization Associated with Untreated Hearing Loss Over 10 Years" *JAMA Otolaryngology-Head and Neck Surgery*, 2018. [jamanetwork.com/journals/jamaoto ... 01/jamaoto.2018.2875](http://jamanetwork.com/journals/jamaoto...01/jamaoto.2018.2875)

"Incident Hearing Loss and Subsequent Comorbidity: a Longitudinal Administrative Claims Study" *JAMA Otolaryngology-Head and Neck Surgery*, 2018. [jamanetwork.com/journals/jamaoto ... 01/jamaoto.2018.2876](http://jamanetwork.com/journals/jamaoto...01/jamaoto.2018.2876)

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