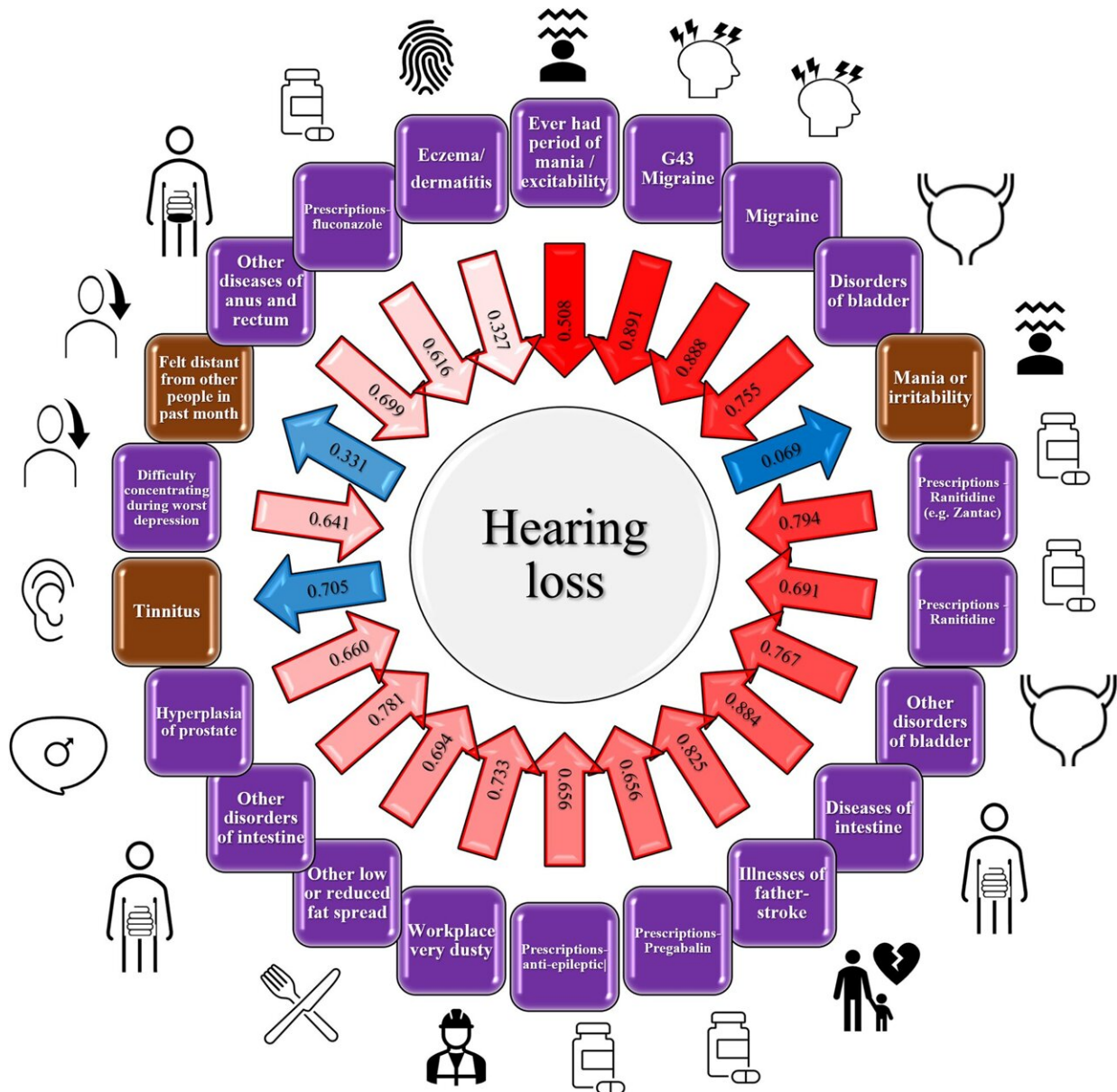


# Study pinpoints why some adults develop hearing problems

May 16 2023, by Christopher Gardner



Visual representation of the 22 Bonferroni-significant putative causal effects identified through the latent causal variable analysis. Brown labels: HP has causative effect on the trait in the label. Purple labels: Trait in the label has causative effect on HP. The absolute gcp (genetic causality proportion) value for each association is reported within the arrow, and the directions refer to the cause-effect relationship (Blue: HP causes Trait; Red: Trait causes HP). The shade intensity of the arrows is proportional to the statistical significance (i.e.,  $-\log_{10}[\text{p-value}]$ ) of the gcp estimates. Credit: *Genome Medicine* (2023). DOI: 10.1186/s13073-023-01186-3

A new study led by Yale School of Medicine scientists has pinpointed why some adults—by some estimates, at least 50% of the population after 75 years of age—develop hearing problems.

While congenital hearing impairment—usually presenting in childhood—result from rare mutations, [hearing problems](#) in adults are likely due to the cumulative effect of polygenic risk and [environmental factors](#).

Recent genome-wide association studies have uncovered several risk genes that are implicated in hearing problems in adults, however some factors still have not adequately been investigated by large-scale [genetic studies](#).

For instance, there is limited information about why hearing problems among older adults are more common, more severe, and with earlier onset in men than in women. It is uncertain how hearing-related polygenic risk translates among people of diverse ancestral backgrounds.

While environmental risk factors such as noise exposure and tobacco smoking are known to increase the risk of hearing problems, the [molecular mechanisms](#) underlying these associations are unclear.

The study, a collaboration between researchers at Yale, Harvard University, and University of California San Diego, greatly expands the understanding of a person's predisposition to age-related hearing problems.

Researchers sampled nearly 750,000 adults and identified 54 risk variants—including 12 novel variants—that could contribute to hearing problems. They also highlighted how hormonal regulation may play a role in the differences between hearing problems in men and women.

Analyzing multiple ancestry groups, the researchers demonstrated that polygenic risk in hearing problems is shared across human populations. They also determined genes involved in [brain development](#) interact with sex, noise pollution, and [tobacco smoking](#) in relation to their associations with hearing problems.

"Our results support that large-scale genetic studies are useful instruments to understand the biology and the epidemiology of hearing problems in adults," said Renato Polimanti, Ph.D., associate professor of psychiatry at Yale School of Medicine and senior author of the study.

Overall, the findings, published in *Genome Medicine*, contribute to identifying possible molecular targets for drug development and define novel strategies to identify older adults at risk of losing their hearing.

The study could lead to changes in how [older adults](#) with hearing problems are assessed and treated. Hearing loss can impair communications, and that can result in social isolation with major health, psychosocial, and economic consequences, reducing the quality of life of those affected.

**More information:** Flavio De Angelis et al, Sex differences in the polygenic architecture of hearing problems in adults, *Genome Medicine*

(2023). [DOI: 10.1186/s13073-023-01186-3](https://doi.org/10.1186/s13073-023-01186-3)

Provided by Yale University

Citation: Study pinpoints why some adults develop hearing problems (2023, May 16) retrieved 4 May 2024 from <https://medicalxpress.com/news/2023-05-adults-problems.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.