nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☒	☐	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	n/a
Data analysis	Data analysis was conducted in SAS version 9.4 software. Code is not publicly available due to institutional restrictions and the sensitive nature of the data and associated analysis code. The code can be made available from the corresponding author upon reasonable request.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

Data are not publicly available to protect privacy of study participants. Deidentified participant data are available upon reasonable request to the corresponding author under a data use agreement.

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	Participants reported sex assigned at birth as male or female. Sex-specific analyses are presented.
Population characteristics	Participants' mean baseline age was 63.1 (SD 14.9; range 18-89+), 57.7% were female, and 17.8% were Minority (17.1% of the sample was Black or African American).
Recruitment	Participants are continuously enrolled into the cohort and are recruited from the community through advertisements and subject referral. They must be aged 18 years or older, and in good general health with no evidence of conductive hearing loss or active otologic or neurologic disease.
Ethics oversight	All protocols for this study were approved by the Institutional Review Board at MUSC (approval ID: E-607R), and data were collected under informed written consent.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Quantitative longitudinal study conducted in a community-based sample of the general population
Research sample	Participants were from the MUSC Longitudinal Cohort Study of Age-related Hearing Loss. Participants' mean baseline age was 63.1 (SD 14.9; range 18-89+), 57.7% were female, and 17.8% were Minority (17.1% of the sample was Black or African American).
Sampling strategy	Sample sizes of this cohort study were sufficient for these analyses.
Data collection	Pure-tone thresholds at frequencies 250, 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz were measured with a clinical audiometer equipped with TDH-39 headphones (Telephonics Corporation, Farmingdale, NY) in a sound-treated booth. Participants reported age, sex assigned at birth (female/male), and race according to US Census Bureau classifications.
Timing	Data collection for this cohort began in 1988 and is ongoing.
Data exclusions	To be included in this longitudinal study, participants must have had audiometric data from at least two time points. A total of 340 participants were excluded. Participants included in this study (vs not included) were more likely to be older ($p<0.01$), White ($p<0.01$) and have a higher (worse) PTA ($p=0.02$) but did not differ by sex ($p>0.05$).
Non-participation	n/a
Randomization	n/a

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging