Introduction: Fragility fractures are a primary cause of morbidity in the elderly, often driven by a complex interplay of sensory and musculoskeletal factors. While hearing loss (HL) is a known contributor to fall risk, its specific impact on fracture incidence at a population level remains debated. With over 50 million Americans affected by hearing impairment, our aim was to determine if HL significantly increases the risk of sustaining fragility fractures in the elderly American population.

Methods: We conducted a population-level retrospective cohort study using a large-scale national claims-based database. To isolate the independent effect of auditory impairment, 210,493 patients aged 65 years or older with a formal diagnosis of HL were matched to a control cohort using 1:1 propensity scoring. Matching adjusted for age, sex, Charlson Comorbidity Index (CCI), osteoporosis, obesity, diabetes, and substance use history. The proportion of fragility fractures was analyzed over a 14-year span (2010–2023). An odds ratio (OR) with a 95% confidence interval (CI) was calculated to compare between the HL and non-HL cohorts.

Results: A total of 420,986 patients were included after matching (210,493 per group; largest age group 70–74 years; 50.2% male). The proportion of fragility fracture diagnoses was significantly higher in the HL cohort compared to the non-HL cohort (16.5% vs 15.1%). Patients with HL demonstrated a significantly increased odds of sustaining a fragility fracture (OR 1.11; 95% CI 1.09 - 1.13; $p < 0.0001$).

Conclusion: HL is a significant and independent risk factor for fragility fractures in the elderly population. Even after adjusting for significant confounders like osteoporosis and age, hearing-impaired patients faced an 11% increase in the odds of fracture. These findings suggest that auditory impairment should be integrated into fracture risk assessment, and that hearing-related interventions may play a role in fracture prevention strategies.