

# Hearing in early old age: current perspectives

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i Hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, fredagen den 26 februari 2021, klockan 09:00.

av Maria Hoff

Fakultetsopponent:

Dr. Piers Dawes, Associate professor, Macquarie University, Australien

## Avhandlingen baseras på följande delarbeten

- I. Hoff, M., Tengstrand, T., Sadeghi, A., Skoog, I., & Rosenhall, U. (2018). Improved hearing in Swedish 70-year olds-a cohort comparison over more than four decades (1971-2014). *Age and ageing*, 47(3), 437-444.
- II. Hoff, M., Tengstrand, T., Sadeghi, A., Skoog, I. & Rosenhall, U. (2020). Auditory function and prevalence of specific ear and hearing related pathologies in the general population at age 70. *International Journal of Audiology*, 59(9), 682-693.
- III. Hoff, M., Göthberg, H., Tengstrand, T., Rosenhall, U., Skoog, I., & Sadeghi, A., (2020). Accuracy of Automated Pure-tone Audiometry in Population-based Samples of Old Persons. *Under review in the International Journal of Audiology*.
- IV. Hoff, M., Skoog, J., Hadarsson Bodin, T., Tengstrand, T., Rosenhall, U., Skoog, I. & Sadeghi, A. Hearing loss and cognition in early old age – comparing objective and subjective hearing measures. *Manuscript*

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# Hearing in early old age: current perspectives

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## **Abstract**

Age related hearing loss is a highly prevalent health condition that restricts the possibilities of older persons to lead a healthy, social and active life. This thesis investigates hearing function in a recent birth cohort of 70-year-olds, born in 1944. The data was collected within the H70 Birth Cohort Studies, in which representative samples of the older population in Gothenburg are examined with a wide-ranging test protocol covering multiple aspects of health.

The results from **Paper I** demonstrated that the prevalence of hearing loss has decreased significantly among 70-year-olds in Gothenburg, across a time period of nearly five decades (1971-2014). Reductions in exposure to occupational noise is probably one of the most important factors explaining the findings. In **Paper II**, auditory function was investigated in detail based on a comprehensive audiological test battery performed in a subsample. The results demonstrated that cochlear pathology is the predominant cause of hearing loss at age 70, but that early neural ageing is present, leading to poorer speech recognition in some individuals. In **Paper III**, a comparison was made between automated and conventional pure-tone audiometry in 70-year olds and 85-year olds (born in 1930). The results indicated that automated pure-tone audiometry is a valid test method in the majority of older persons, and that age, hearing loss and cognitive status did not affect the outcomes. Finally, in **Paper IV** it was demonstrated that poorer hearing is associated with poorer cognitive function, but only when considering pure-tone and speech measures, and not self-reported data. Hearing aid use was associated with better cognitive scores.

In conclusion, hearing loss - of various underlying pathology - is a prevalent condition in early old age that is associated with poorer cognition. Given the rapid ageing of populations in Sweden, and worldwide, efforts of prevention, early identification and rehabilitation of age related hearing loss should be considered a public health priority.

**Keywords:** Age related hearing loss, presbycusis, prevalence, cross-sectional, secular trends, cognitive function