

## Quality of Life Improvement by Early Detection of Hearing Loss Using High-frequency Audiometry

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### Abstract

Extended high-frequency audiometry as a screening method

Hearing loss is currently a great issue referred to as an epidemic of the 21st by the WHO. The early detection and compensation of hearing deficiency enable full involvement of people into economic and social life. The aim of the project (TJ04000059) is to compare hearing loss using high-frequency audiometry, to find a fast, cheap and simple screening method for hearing testing in adults. The project will contribute to more effective prevention, will develop recommendations and guidelines for a hearing loss screening.

The study of health status and hearing threshold has been provided using the cross-sectional design. The inclusion criteria are the population of both sexes in productive age, individual collection of the sample, the Czech nationality and absence of occupational exposure. The volunteers were interviewed using the structured HAIE and HHI questionnaires, Montreal cognitive test and also personal and occupational anamnesis, family history. Hearing threshold examinations consist of tympanometry, conventional pure tone audiometry of frequency 0,125-8 kHz, extended high-frequency audiometry of frequency 9-16 kHz, speech audiometry and transient evoked otoacoustic emissions. Hearing loss was evaluated based on medians. Comparison by sex age and frequency was analysed by Wilcoxon signed-rank test and

Man-Whitney test on the significance level of 5% using the SW Stata v.14.

In the first year of the project, 253 persons aged 18-65 years were examined, out of the sample 69% were women. The age groups were divided into 5 categories from 18-24 and further by 10 years of age. The preliminary results (the data collection has not been finished yet) shows higher hearing loss in men comparing with women and significantly worse results for right ears ( $p < 0.05$ ) in both sexes. Statistically significant difference in high-frequency hearing loss between men and women was confirmed especially in the oldest age group ( $p < 0.05$ ). When comparing differences of hearing loss between the frequency 9 kHz and 14 kHz significantly higher loss was confirmed for the frequency

14 kHz for all age groups and also right and left ears ( $p < 0.01$ ).

Based on the preliminary results, increased hearing threshold values were found in relationship with frequency, sex and age in unexposed population. The results of this study will be used for determination of normative values for hearing loss in high frequencies as a guideline for assessment of hearing loss in workers exposed to noise.

### Abbreviations:

HHI (Hearing Handicap Inventory);  
HAIE (Healthy Aging in Industrial Environment);  
WHO (World Health Organization).

**Keywords:** High frequency audiometry; Hearing loss; General unexposed population.