



“Are we protecting our ears safely?” and “The Make Listening Safe Workgroup”

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Background

The WHO “Make Listening Safe” workgroup, has the main goal to “Create a world where nobody’s hearing is put in danger due to unsafe listening”.

WHO analysed existing regulations for entertainment values. The highest accepted level is 102dB(A) LAeq, 15 min in current regulations for entertainment venues, while the WHO / ITU-T H-870 Standard states the weekly exposure should not exceed 80dB (A) for 40 hours.

Based on the energy equivalence principle, after 18,8 minutes (or 6 minutes for sensitive users) at 101dB (A) exposure, you would have used your full weekly accepted exposure!

Free earplugs should attenuate the level by +/- 20 dB, in order to be at a safe level. (which is mostly the case), but young people don’t like to use earplugs, since they claim, they are uncomfortable, destroy the sound quality and make understanding speech very difficult. Are these facts or myths?

The study

In this study we evaluated 7 different types of personal hearing protection, and 4 different verification procedures for hearing protection.

Material and methods

Subjects:

41 young, normal hearing subjects participated in this study.

For each subject the following types of personal hearing protection were provided and evaluated:

Custom Made Hearing Protection, with 20 dB flat response music filter.

Umbrella type instant reusable hearing protection systems with a music filters, and without filter

Disposable foam hearing protection system

Verification Procedures:

Audiometric evaluation under headphone

Free Field Speech-audiometry in Noise

Subjective evaluation of Wearing Comfort, Occlusion, Sense of effective protection, Intelligibility of Speech in Quiet, Intelligibility of Speech in Noise, Music Sound Quality, Intelligibility of the lyrics in a song.

Results:

The Audiometric Evaluation replicated the specifications provided by the manufactures

A flat response leads to better perceived intelligibility and sound quality

Hearing Protection does not have a negative impact on Speech-audiometry in Noise



Disposable Foam Hearing Protection has highly variable results, is experienced as very uncomfortable and poor sound quality for music

Conclusions:

The overall conclusion is that custom-made hearing protection with a flat response filter, provides the highest level of user satisfaction, the best intelligibility in noise and the lowest variability in effective protection.

If we want young people to use earplugs and change their behaviour ... handing out free foam disposable earplugs may not be the best idea ... we should find solutions to make re-useable ear plugs with music filters accessible!