

## The Analysis of Noise Harmfulness in Public Utility Facilities

**Authors :** Monika Sobolewska, Aleksandra Majchrzak, Bartłomiej Chojnacki, Katarzyna Baruch, Adam Pilch

**Abstract :** The main purpose of the study is to perform the measurement and analysis of noise harmfulness in public utility facilities. The World Health Organization reports that the number of people suffering from hearing impairment is constantly increasing. The most alarming is the number of young people occurring in the statistics. The majority of scientific research in the field of hearing protection and noise prevention concern industrial and road traffic noise as the source of health problems. As the result, corresponding standards and regulations defining noise level limits are enforced. However, there is another field uncovered by profound research - leisure time. Public utility facilities such as clubs, shopping malls, sport facilities or concert halls - they all generate high-level noise, being out of proper juridical control. Among European Union Member States, the highest legislative act concerning noise prevention is the Environmental Noise Directive 2002/49/EC. However, it omits the problem discussed above and even for traffic, railway and aircraft noise it does not set limits or target values, leaving these issues to the discretion of the Member State authorities. Without explicit and uniform regulations, noise level control at places designed for relaxation and entertainment is often in the responsibility of people having little knowledge of hearing protection, unaware of the risk the noise pollution poses. Exposure to high sound levels in clubs, cinemas, at concerts and sports events may result in a progressive hearing loss, especially among young people, being the main target group of such facilities and events. The first step to change this situation and to raise the general awareness is to perform reliable measurements the results of which will emphasize the significance of the problem. This project presents the results of more than hundred measurements, performed in most types of public utility facilities in Poland. As the most suitable measuring instrument for such a research, personal noise dosimeters were used to collect the data. Each measurement is presented in the form of numerical results including equivalent and peak sound pressure levels and a detailed description considering the type of the sound source, size and furnishing of the room and the subjective sound level evaluation. In the absence of a straight reference point for the interpretation of the data, the limits specified in EU Directive 2003/10/EC were used for comparison. They set the maximum sound level values for workers in relation to their working time length. The analysis of the examined problem leads to the conclusion that during leisure time, people are exposed to noise levels significantly exceeding safe values. As the hearing problems are gradually progressing, most people underplay the problem, ignoring the first symptoms. Therefore, an effort has to be made to specify the noise regulations for public utility facilities. Without any action, in the foreseeable future the majority of Europeans will be dealing with serious hearing damage, which will have a negative impact on the whole societies.

**Keywords :** hearing protection, noise level limits, noise prevention, noise regulations, public utility facilities

**Conference Title :** ICAA 2018 : International Conference on Acoustics and Applications

**Conference Location :** Copenhagen, Denmark

**Conference Dates :** June 11-12, 2018