

## Cost-Benefit Analysis for the Optimization of Noise Abatement Treatments at the Workplace

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**Abstract :** Cost-effectiveness of noise abatement treatments at the workplace has not yet received adequate consideration. Furthermore, most of the published work is focused on productivity, despite the poor correlation of this quantity with noise levels. There is currently no tool to estimate the social benefit associated to a specific noise abatement treatment, and no comparison among different options is accordingly possible. In this paper, we present an algorithm which has been developed to predict the cost-effectiveness of any planned noise control treatment in a workplace. This algorithm is based the estimates of hearing threshold shifts included in ISO 1999, and on compensations that workers are entitled to once their work-related hearing impairments have been certified. The benefits of a noise abatement treatment are estimated by means of the lower compensation costs which are paid to the impaired workers. Although such benefits have no real meaning in strictly monetary terms, they allow a reliable comparison between different treatments, since actual social costs can be assumed to be proportional to compensation costs. The existing European legislation on occupational exposure to noise it mandates that the noise exposure level be reduced below the upper action limit (85 dBA). There is accordingly little or no motivation for employers to sustain the extra costs required to lower the noise exposure below the lower action limit (80 dBA). In order to make this goal more appealing for employers, the algorithm proposed in this work also includes an ad-hoc element that promotes actions which bring the noise exposure down below 80 dBA. The algorithm has a twofold potential: 1) it can be used as a quality index to promote cost-effective practices; 2) it can be added to the existing criteria used by workers' compensation authorities to evaluate the cost-effectiveness of technical actions, and support dedicated employers.

**Keywords :** cost-effectiveness, noise, occupational exposure, treatment

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