

Night-time noise: results of a European project

Sleeping, like eating and drinking, it is a biological necessity and is considered a fundamental human right under the European Convention on Human Rights.

In some EU countries a part of the population may be exposed to night noise levels dangerous to the health and well-being. For example, in a study conducted in the Netherlands in 2003, 25% of people said that their sleep is highly disturbed by outside noise, compared with a rate of 17% in 1998. This confirms that the urban areas tend to be more noisy, and the outlook for the future is bleak: the nocturnal air and rail traffic is expected to increase significantly by 2030.

Although it is known to all the importance of a good rest, so far the impact on health in the short and long-term sleep disorders had not been systematically evaluated and organic. To do so is a project initiated in 2003 by the Regional Office for Europe of WHO and co-sponsored by the European Union.

The final report of the project "Guidelines on the night-time noise for Europe" is the result of the audit work of the scientific literature of a group of experts selected from 17 institutions from 12 European countries. For Italy participated in the project are the University of Rome "La Sapienza" and the provincial Department of ARPA Pisa Tuscany. The project results give important information to governments to change the laws on noise at night.

Main effects of bad sleep

First, the document is considered the most accurate indicators to estimate the consequences of bad sleep. The long-term effects, such as cardiovascular problems were related to indicators such as the "annual average of the noise level at night", which sum the acoustic situation for a long period of time. Flash effects, such as waking up in the middle of the night, were described instead with the "maximum noise level per event", where event is the movement of a truck, a plane, a train, etc..

The review of the available scientific evidence has led the working group to these conclusions:

- sleep is a biological necessity, and disturbed sleep is associated with numerous adverse effects
- there is sufficient evidence of the biological effects of noise during sleep, including: increased heart rate, excitement, phase changes of sleep, hormonal changes and sudden awakenings
- there is sufficient evidence that exposure to noise at night causes it to report sleep disturbances, increases in medication use, increased body movements and insomnia
- sleep disorders have an impact on future health and well-being of the whole person
- There is limited evidence that poor sleep causes chronic fatigue, accidents and reduced work performance and intellectual
- There is limited evidence that the night noises cause clinical conditions such as cardiovascular disease, depression and other mental disorders. These effects still little investigated, however, seem plausible

- children, the elderly, pregnant women and shift workers are the most vulnerable to noise at night and therefore more at risk.

Decibel and health consequences

That is, roughly speaking, the correlation between the levels of noise at night outside and the health effects according to the report:

- up to 30 decibels: not observed substantial biological effects
- between 30 and 40 decibels increase the body's movements, arousals, sleep disturbance, excitement. The effects seem modest, but it is not inconceivable that vulnerable groups are affected to a greater extent
- between 40 and 55 decibels: there is a marked increase in adverse effects, the majority of people exposed is affected and suitable to live with the noise. Vulnerable groups at this level of exposure, are severely affected
- above 55 decibels: the situation is considered dangerous in terms of public health. Adverse effects are frequent and the cardiovascular system begins to be under stress. Cardiovascular stress is the dominant effect.

Final Recommendations

For primary prevention of sub-clinical side effects of night-time noise, the report recommends that the population should not be exposed to levels that exceed 30 decibels during the night, which is considered the maximum threshold to protect the citizens, including the most vulnerable groups. All nations are encouraged to reduce gradually as effectively as possible, the proportion of the population exposed to noise levels that exceed 55 and, then, the 40 decibels. This European project provides the basis for updating the WHO guidelines for night noise, which date back to 2000. Current guidelines consider as maximum noise level of 45 decibels bearable, but this figure is based on different indicators and assessed on the basis of scientific knowledge then available. In the light of new evidence, the project suggests a safety limit lower.

Download the full document: [Guidelines on the night-time noise for Europe](#) (pdf 4,66 Mb).

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