
The State Secretary's letter

The President of the Health Council received the following request from the State Secretary for Housing, Spatial Planning and the Environment in a letter dated 3 February 2003, reference no. LMV 2003003076.

I am writing to ask the Health Council to prepare an advisory report on exposure to night-time noise. The background to this request is outlined below. Following the outline, you will find a list of the specific questions that I would like the Council's advisory report to address.

Background

In several earlier reports, the Council has directly or indirectly addressed the issue of night-time noise. To a certain extent, therefore, this request is prompted by the possibility that new information may have become available, which can confirm or shed new light on advice given in the past.

In its first report on this topic in 1972, the Council unequivocally stated that 'Sufficient undisturbed sleep is extremely important to health.' In 1991, the Council turned its focus specifically to the question of aircraft noise in a report that was prompted by the heated debate then in progress concerning the proposed expansion of Maastricht Airport (*Airplane noise and sleep. Sleep disturbance by airplane noise at night*). The conclusion of the latter report was that 'Although not all the results lend themselves to clear interpretation, the indications are that the regular disturbance of sleep by noise has an adverse effect on health and well-being.'

The very thorough advisory report *Noise and Health* (1994) stated that there was sufficient evidence to attribute a number of phenomena to exposure to noise when sleeping. The phenomena in question were

changes in heart rate, changes in sleeping pattern, awakening, sleep stage changes and changes in the subjective quality of sleep. In relation to each of these effects, 'observed effects levels' – exposure levels at and above which effects were demonstrable – were calculated from the published data. Where other phenomena were concerned, the evidence for a causal relationship was less convincing, or an observation threshold could not be calculated.

The advisory report *Assessing Noise Exposure for Public Health Purposes* (1997) recommended that the index *LAeq* (covering an eight-hour overnight period) should be used when assessing (the seriousness of) night-time exposure to noise. However, the exposure-response relationships presented in the report for sleep disturbance and awakening attributable to traffic noise and noise from stationary sources were qualified as 'provisional'.

Finally, the advisory report entitled *Public Health Impact of Large Airports* (1999) devoted considerable attention to the question of sleep disturbance. Although on the basis of recent research the Council described the evidence for a causal relationship between exposure to night-time noise and changes in stress hormone levels as limited, it was felt that there was sufficient reason to view sleep disturbance as a 'moderately serious' effect on health, similar to increasing respiratory illness. It was estimated that 'a considerable proportion of exposed individuals' were affected.

Recent developments

This request leads on directly or indirectly from a number of recent developments.

- The European Directive 2002/49 relating to the assessment and management of environmental noise (2002)* has been published, defining a separate index of night-time exposure to noise: the *LAeq* for an eight-hour period (*Lnight*). This index should at least be used for the compulsory strategic noise maps.
- The European Commission has completed a study of dose-effect relationships for the *Lnight*.
- The question of how best to quantify night-time exposure has also become topical in the context of the modernisation of the noise regulation policy tool set.
- In November 2002, the results of the field study of aviation noise-related sleep disturbance in the vicinity of Schiphol Airport** was published; a number of relevant studies have been reported by researchers in other countries***,****.

* Position paper on dose response relationships between transportation noise and annoyance, Luxembourg: Office for Official Publications of the European Communities, 2002, ISBN 92-894-3894-0, European Communities, 2002

** Sleep disturbance by aviation noise, TNO/RIVM, 2002

*** Epidemiological research on stress caused by road traffic noise and its effects on health 1 - Results for hypertension, Maschke, UBA, 2002

**** Nachfluglarmwirkungen, Forschungsbericht 26, DLR, Grezner, 2001

Specific questions

In view of the matters outlined above, I would like the Council to respond to the following questions in its advisory report:

- 1 What are the effects (expressed in quantitative terms as far as possible) of exposure to noise when sleeping?
- 2 How do such effects compare with other effects on health, in terms of seriousness and magnitude?
- 3 Is it necessary to take special account of any population groups that are at particular risk?
- 4 In view of the effects referred to, would it be advisable to introduce special rules, similar to those contained in Directive 2002/49 and the Aviation Act, for night-time noise from sources other than air traffic?
- 5 If so, is it sufficient for such rules to be based on *Lnight*, or are additional indexes of exposure required, with a view to regulating impulse-like noises and situations involving relatively infrequent but high-intensity noise events.
- 6 Could the public be protected by the use of a. performance-related or design requirements for residential buildings, b. personal protective gear, c. rules regarding sound pressure levels outside buildings, d. rules relating to vehicles and machinery, or e. a combination of these measures?

Timetable

I would be very grateful if the Council could present its advisory report in autumn 2003 or thereabouts.

Yours sincerely,

(signed)

PLBA van Geel,

State Secretary for Housing, Spatial Planning and the Environment