Summary

Health Council of the Netherlands. Long-term effects of radiofrequency electromagnetic fields. Assessment of the study of D. Adang. The Hague: Health Council of the Netherlands, 2010; publication no. 2010/09.

At the request of the Minister for Housing, Spatial Planning and the Environment, the Electromagnetic Fields Committee of the Health Council of the Netherlands in this advisory report presents an assessment of the results of a study described in the thesis of Dr D. Adang, entitled ‘An Epidemiological Study on Low-level 21-month Microwave Exposure of Rats’. In doing so, it has also considered the scientific publication that has been published on the research in the meantime. In this study, Adang investigated the effects of long-term exposure of rats, for 21 months, two hours a day, seven days a week, to three types of radiofrequency electromagnetic fields: a 970 MHz GSM-like signal, a 970 MHz signal without the pulses characteristic of GSM, and a 9.70 GHz signal; there was also a group that was sham-exposed, in other words: all circumstances were identical to those in the other groups, with the exception of the exposure. The exposure levels were approximately equal to that of the maximum permissible level for the general population for continuous exposure.

The Committee has come to the conclusion that the hypothesis of the research is interesting and relevant, but that the research suffers from methodological deficiencies and the analysis of the data contains several flaws.

Generator breakdown not reported

The fact that the 9.70 GHz generator failed after around six months and that consequently the group of animals concerned was not further exposed, are only described very summarily in the thesis. No mention whatsoever is made of this in the analysis of the data or the associated conclusions, nor in the scientific publication. Given the fact that the generator breakdown impacted the original aim of the experiment, the Committee considers this to be a serious omission.

No obvious effects on blood picture

The Committee cannot endorse Adang's conclusions that clear effects on the blood picture were found. Insofar as significant differences were found between the sham-exposed and the actually exposed groups for certain parameters and at certain times, these do not present any clear pattern. There is no time analysis of these data in the thesis. A graphical analysis carried out by the Committee did not reveal any unequivocal differences. In analysing the blood data, Adang did not use the most appropriate statistical analysis method.

The Committee conducted a literature study of similar experiments. The data in these studies do not support Adang’s conclusions that there are effects on the blood picture.

Behavioural experiments too limited

Adang also carried out behavioural experiments, but only on the group that was exposed to the 970 MHz GSM-like signal. These experiments are insufficiently detailed to allow conclusions to be drawn about the effects of exposure on behaviour.

Analysis of survival data incomplete

Finally, Adang investigated survival in the different groups. The Committee takes the view that here, too, the analysis Adang carried out is incorrect and incomplete. Adang ought to have analysed the survival data over the entire period of 32 weeks for which the animals were studied, and not only over 28 weeks. Adang's conclusion that exposure to a 9.70 GHz electromagnetic field has an effect on survival is incorrect: an analysis carried out on the Committee’s request, comparable to Adang's, but in which the survival data to 32 weeks are

included, does not demonstrate any statistically significant differences between any of the four groups.

Histopathological analysis was only conducted on a few animals and has merely illustrative value.

Finally, the data from an updated literature study offer no support to the hypothesis that long-term exposure to radiofrequency electromagnetic fields might have an effect on survival.

No health problems due to exposure

In earlier reports, the Committee concluded on the basis of the current state of scientific development that no causal link between health problems and exposure to the electromagnetic fields originating from mobile phones or base stations for mobile telephony has been demonstrated. The evaluation of Adang's research described in this report and the current data assembled from the literature by the Committee do not give it cause for modifying its conclusion.