

29.4.2019

## **WHO International EMF Project**

### **Report on activities in Finland from June 2018 to April 2019**

#### **General research activities related to EMF health**

The international collaborative cohort study of mobile phone use and health (COSMOS) is on-going and the first analyses of health outcomes are being carried out at Tampere University (TUNI). The study involves approximately 11,000 Finnish participants who filled in the baseline questionnaires and have been followed up since 2009 - 2010. Call data were obtained from the traffic databases of two major mobile network operators. A paper on the association between amount of mobile phone use and headache, tinnitus or hearing loss has been submitted and another evaluating sleep quality is in preparation. Preliminary results were presented at BioEM conference 2018. Data for cancer incidence has also been compiled and will be analysed in 2019.

Researchers at TUNI analysed trends in adult malignant brain tumour incidence in 1999 - 2016 to evaluate whether there is any hint of a relation to the increase in radio frequency (RF) electromagnetic field exposure in the population. Cancer cases were identified from the Finnish cancer registry and histological types defined from the cancer notification forms. Overall, no increasing trend was observed (Natukka et al. Acta Oncol 2019). There was some increase in specific tumour types, though, mainly reflecting a decrease in unspecified tumours. Similar analyses are on-going for meningiomas and childhood brain tumours.

Together with the other Nordic Interphone investigators and coordinated by the International Agency for Research on Cancer (IARC), TUNI analysed the relation between mobile phone use and survival from malignant brain tumours, suggested in a Swedish study. The findings suggested somewhat improved survival associated with amount of call-time, in contrast to the earlier Swedish publication (Olsson et al. J Neuro-Oncol 2019).

TUNI has compiled residential histories for subjects of the Finnish Interphone study to evaluate whether any interaction between RF fields from mobile phone use and mutagenic chemicals in drinking water. This analysis is carried out in collaboration with University of Eastern Finland (UEF).

UEF has conducted experimental and epidemiological studies of intermediate frequency (IF) and RF fields on cancer-related, reproductive, developmental and behavioural/cognitive effects. In addition, a strong research line is ongoing to study induced genomic instability as a mechanistic basis for possible cancer-related effects of extremely low frequency (ELF) magnetic fields. UEF also studies possible enhancing effects of ELF magnetic fields on tumour radiotherapy. UEF has compiled a registry of residential buildings with indoor transformer stations. This registry will allow high-quality epidemiological studies on the health effects of ELF magnetic fields, avoiding methodological limitations of previous studies.

Leena Korpinen (North Karelia Central Hospital) and Rauno Pääkkönen investigated occupational exposure to electric fields during the task 'maintenance of an operating device of circuit breaker from a service platform' at 110 kV substations. At 16 substations, 255 electric field measurements were performed. The highest mean value was 9,6 kV/m. At 63 % of substations the maximum values were over 10,0 kV/m, which is the low action level (AL) according to directive 2013/35/EU. All measured values were below the high AL (20,0 kV/m).

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RF radiation is used in several cosmetic applications for e.g. cellulite treatment or skin rejuvenation. The power levels used in the treatments can be high (> 100 W) and even a short treatment period may result in tissue damage. In Finland treatments exceeding the RF exposure limits are allowed only in health care procedures. STUK (Radiation and Nuclear Safety Authority) has carried out temperature rise measurements in a liquid phantom and numerical simulations to assess the exposure levels during RF treatments with several different equipment. The exposure limits were exceeded in a very short time for part of the equipment under test. The results of the study should be published in the near future.

### **New policies and legislations regarding EMF exposure**

New radiation act (859/2018) was implemented on Finnish legislation on 9.11.2018.

<https://www.finlex.fi/fi/laki/alkup/2018/20180859>

New exposure limits for electromagnetic fields were presented in a decree for non-ionizing radiation (1045/2018) prepared by the Ministry of Social Affairs and Health.

<http://finlex.fi/fi/laki/alkup/2018/20181045>

### **Areas of public concern and national responses**

Possible health effects from base stations have been the main area of public concern during last year. The emerging 5G technology has raised several questions. STUK has been interviewed several times by the media on radiation safety of 5G network. A citizens' initiative to halt the introduction of 5G network was opened on 1.3.2019. If the initiative gets over 50,000 votes, the Finnish parliament will have to consider the initiative.

<https://www.kansalaisaloite.fi/fi/aloite/3844>

Municipal authorities requested statements from STUK on several proposals for a town plan where new residential areas were located near existing power lines or on new power lines planned to be constructed near residential houses. STUK evaluated the magnetic fields near power lines and gave recommendations for spatial planning. STUK recommends that premises where the presence of children is permanent should not be located so that the average magnetic flux density exceeds 0.4 µT.

### **New public information activities**

Information on radiation safety of 5G network was added to STUK's website.

<https://www.stuk.fi/aiheet/matkapuhelimet-ja-tukiasemat/matkapuhelinverkko/5g-verkon-sateilyturvallisuus>