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WHO International EMF Project
Report on activities in Finland from June 2020 to June 2021

General research activities related to EMF health

The international collaborative cohort study of mobile phone use and health (COSMOS) is on-going and the Finnish participant is 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 with two repeat questionnaire rounds and linkages to various registers performed or on-going. Call data have been obtained repeatedly from mobile network operators traffic databases. The first results from international collaborative analyses of headache, tinnitus, hearing loss and sleeping problems have been published and showed no clear association with amount of mobile phone use after adjustment for other risk factors. Cancer incidence has also been compiled for several participating cohorts, but data availability has been a challenge in some countries.

Analyses of brain tumour incidence in the past two decades to evaluate whether there is any hint of a relation to the increase in radiofrequency (RF) electromagnetic field exposure in the population are on-going at TUNI. No increasing trend was found for gliomas (Natukka et al. Acta Oncol 2019). Analyses of incidence trends of vestibular schwannoma (acoustic neuroma) and childhood brain tumors are being finalized.

Aalto University has conducted computational modelling studies of human exposure to electromagnetic fields in the ELF and intermediate frequency ranges. The studies have focused on the inter-individual variability of induced electric fields due to normal anatomical variability, and uncertainty in dosimetric quantities caused by different computational approaches or uncertain electric conductivity values. A new project has started aiming to estimate the conductivity of human tissues in vivo using magnetic resonance imaging data and impedance measurements. Aalto has also participated in an international literature review of computational dosimetry studies of human exposure to radio-frequency energy at frequencies above 6 GHz and an international intercomparison study in the same frequency range.

University of Eastern Finland (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.

STUK (Radiation and Nuclear Safety Authority) and UEF started a project called Empirical studies on the link between environmental extremely low frequency magnetic fields and Alzheimer's disease (ELFMAD) in 2019. This project investigates the possible causal relationship between extremely low frequency (ELF) magnetic fields and Alzheimer's disease with new types of experimental models combined with an advanced hypothesis of an interaction mechanism. In addition, this is combined with an epidemiological research. The aim is 1) to investigate whether exposure to ELF magnetic fields has a significant effect on Alzheimer's disease development processes in a cell model utilizing human astrocytes derived from pluripotent stem cells from Alzheimer's disease patients or healthy controls; 2) to confirm the results of the cell experiments in

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an animal model taking into account the results of the cell experiments and the latest information on the effects of environmental factors on the development of Alzheimer's disease, 3) to elucidate a mechanism that could explain the association between ELF magnetic fields and Alzheimer's disease, and 4) to investigate the association between exposure to ELF magnetic fields of indoor transformer stations and the emergence of Alzheimer's disease.

New policies and legislations regarding EMF exposure

No new policies or legislations

Areas of public concern and national responses

STUK has responded to several questions on EMF health effects. The radiation safety of base stations was the main area of public concern during the last year.

A citizens' initiative to halt the introduction of 5G network was opened on 27 May 2020. If an initiative gets at least 50,000 signatures within its 6-month collecting period, the Finnish parliament will have to consider the initiative. The initiative lapsed since it was signed by 16020 citizens.

New public information activities

No new public information activities