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The English version is a summary of the more extensive situation report bulletin in Finnish.

## Keen Interest in the Potential Health Issues Relating to Electromagnetic Fields from Overhead Power Lines and Underground Cables



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No. 01

### **Editorial**

Once again, my editorial starts with a look at the Directive 2013/35/EU on the "minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields)". The preparation of national regulations implementing the Directive is still underway, but I expect it to be finished soon, as the regulations shall be brought into force in the summer. As to my knowledge, a set of standards and guidelines is also being produced in support of the Directive. I'm looking forward to seeing the outcome of all this effort.



According to the Ministry of Social Affairs and Health (STM) website, Finland is also working on a legislation project relating to non-ionizing radiation, including extremely low-frequency electric and magnetic fields. This work is part of the overall reform of the radiation legislation, having the purpose of transposing the new EU directive on radiation safety into national law. Information as to the progress of the project as well as task descriptions, objectives, timetables, and persons involved can be found on the STM website.

I have again found some interesting publications for this bulletin. The first three are about field exposure and childhood leukemia, with my attention particularly drawn to the publication focusing on magnetic field exposure from underground cables. When reading this paper, an important point to note is that both AC and DC cables are included. The nature of exposure is, therefore, at least to some extent, different than that in the vicinity of conventional overhead power lines.

I found the last four papers on occupational exposure so interesting that I did not want to leave any of them out. This time, the focus is on acute myeloid leukemia, Parkinson's disease, and ALS, and the studies were conducted in the Nordic countries and Switzerland.

I hope you enjoy reading this summary in English!

Leena Korpinen  
Editor-in-chief, Situation Report Bulletin  
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The Finnish situation report bulletin includes summaries of the following publications,  
preceded by the editor-in-chief's comments.



No. 02

### ***Population Mixing and the Risk of Childhood Leukemia in Switzerland: a Census-Based Cohort Study***

Editor-in-chief's comment: The research group investigated associations between population mixing and childhood leukemia in Switzerland, using the Swiss National Cohort, which links records from national censuses with mortality records, and the Swiss Childhood Cancer Registry. All children aged under 16 years old were included. The results showed a decreased risk of leukemia in urban municipalities experiencing population growth and a higher risk in municipalities with negative growth. The analyses performed did not reveal any other associations and, therefore, did not provide evidence for the hypothesized link between population mixing and the risk of childhood leukemia.

Source:

Lupatsch JE, Kuehni CE, Niggli F, Ammann RA, Egger M, Spycher BD. Population mixing and the risk of childhood leukaemia in Switzerland: a census-based cohort study. *European Journal of Epidemiology*. DOI 10.1007/s10654-015-0042-5.

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No. 03

### ***Magnetic Fields and Childhood Cancer: an Epidemiological Investigation of the Effects of High-Voltage Underground Cables***

Editor-in-chief's comment: The research group investigated possible links between childhood cancer and magnetic fields from underground cables in an epidemiological study covering over 50,000 people born and diagnosed under the age of 15 years old in England and Wales from 1962 to 2008. The researchers calculated the distance of the mother's address to the closest 275 or 400 kV AC cable or high-voltage DC cable at the child's birth and the resulting magnetic fields. They found no association between the risk of leukemia and the distance to cables or the magnitude of magnetic fields.

Source:

Bunch KJ, Swanson J, Vincent TJ, Murphy MFG. Magnetic fields and childhood cancer: an epidemiological investigation of the effects of high-voltage underground cables. *Journal of Radiological Protection* 35 (2015) 695–705.

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No. 04

### ***Synoptic Analysis Clarifies Childhood Leukemia Risk from Extremely Low-Frequency Magnetic Field Exposure***

Editor-in-chief's comment: The author had scrutinized studies on extremely low-frequency magnetic fields and the risk of childhood leukemia using a synoptic approach, where all reported risk estimates were analyzed irrespective of their statistical significance, both pooled



together as well as separated into sub-pools of, for example, different exposure metric. According to him, the analysis clarified that risk estimates critically depend on statistical power. He, therefore, concluded that the analysis explains former contradictory results and provides convincing evidence that the risk of childhood leukemia is not increased by exposure to magnetic fields.

Source:

Leitgeb N. Synoptic Analysis Clarifies Childhood Leukemia Risk from ELF Magnetic Field Exposure. *Journal of Electromagnetic Analysis and Applications* 7 (2015) 245–258.

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No. 05

***Actual and Perceived Exposure to Electromagnetic Fields and Non-Specific Physical Symptoms: an Epidemiological Study Based on Self-Reported Data and Electronic Medical Records***

Editor-in-chief's comment: The research group investigated the possible associations of actual and perceived exposure to electromagnetic fields with non-specific physical symptoms and sleep quality, using both self-reported data and medical records registered by general practitioners. The study found no convincing evidence that everyday life exposure to magnetic fields would play a role. According to the researchers, better exposure characterization with respect to sources of extremely low-frequency magnetic fields is needed to draw more solid conclusions. They did suggest, however, that perceived exposure is an independent determinant of non-specific symptoms.

Source:

Baliatsas C, Bolte J, Yzermans J, Kelfkens G, Hooiveld M, Lebret E, van Kamp I. Actual and perceived exposure to electromagnetic fields and non-specific physical symptoms: An epidemiological study based on self-reported data and electronic medical records. *International Journal of Hygiene and Environmental Health* 218 (2015) 331–344.

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No. 06

***Extremely Low-Frequency Magnetic Field Exposure and Parkinson's Disease: a Systematic Review and Meta-Analysis of the Data***

Editor-in-chief's comment: The research group performed a meta-analysis of 11 previous studies evaluating the potential relationship between occupational exposure to magnetic fields and Parkinson's disease. They found great variation in the methods of exposure assessment, with some studies capturing the full occupational history and others based on occupations held at a certain point of time. The meta-analysis did not provide evidence that occupational exposure to extremely low-frequency magnetic fields would increase the risk of Parkinson's



disease.

Source:

Huss A, Koeman T, Kromhout H, Vermeulen R. Extremely Low Frequency Magnetic Field Exposure and Parkinson's Disease – A Systematic Review and Meta-Analysis of the Data. *International Journal of Environmental Research and Public Health* 12 (2015) 7348–7356.

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No. 07

***Occupational Exposure to Extremely Low-Frequency Magnetic Fields and Electrical Shocks and Acute Myeloid Leukemia in Four Nordic Countries***

Editor-in-chief's comment: The research group conducted, using the Nordic Occupational Cancer cohort, a case-control study on 5,409 adults diagnosed with acute myeloid leukemia (AML) between 1961 and 2005 in Finland, Iceland, Norway, and Sweden, and 27,045 controls. All subjects had started their employment career after 1945. The researchers did not observe any statistically significant association between AML and occupational exposure to magnetic fields or employment in electric/electronic occupations.

Source:

Talibov M, Guxens M, Pukkala E, Huss A, Kromhout H, Slottje P, Martinsen JI, Kjaerheim K, Sparén P, Weiderpass E, Tryggvadottir L, Uuksulainen S, Vermeulen R. Occupational exposure to extremely low-frequency magnetic fields and electrical shocks and acute myeloid leukemia in four Nordic countries. *Cancer Causes Control* 26 (2015) 1079–1085.

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No. 08

***Occupational Exposure to Electric Shocks and Magnetic Fields and ALS in Sweden***

Editor-in-chief's comment: The research group evaluated, in a case-control study conducted in Sweden, the association of ALS with electric occupations, as well as with occupational exposure to magnetic fields and electric shocks. Subanalyses were performed for subjects by, for example, gender and age (aged under/over 65). The results did not confirm previous observations of a higher risk of ALS in electrical occupations or in exposure to magnetic fields. The researchers concluded that additional studies need to be performed.

Source:

Fischer H, Kheifets L, Huss A, Peters TL, Vermeulen R, Ye W, Fang F, Wiebert P, Vergara XP, Feychting M. Occupational Exposure to Electric Shocks and Magnetic Fields and Amyotrophic Lateral Sclerosis in Sweden. *Epidemiology* 26 (2015) 824–830.

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No. 09

## ***Occupational Exposure to Electric Shocks and Magnetic Fields and the Risk of ALS: the Swiss National Cohort***

Editor-in-chief's comment: The authors had investigated the possible link between ALS and exposure to magnetic fields and electric shocks. They observed no increased risks in workers in electrical occupations.

### **Source:**

Huss A, Spoerri A, Egger M, Kromhout H, Vermeulen R. Occupational exposure to magnetic fields and electric shocks and risk of ALS: The Swiss National Cohort. *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration* 16 (2015) 80–85.

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