

Research on the Health Issues Related to Electric and Magnetic Fields Conducted from Various Perspectives



Situation Report Bulletin: 1/2020 – published 30 June 2020

Contents

01: Editorial

02: Gaps in knowledge relevant to the “guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz–100 kHz)”

03: The role of dwelling type when estimating the effect of magnetic fields on childhood leukemia in the California Power Line Study (CAPS)

04: Electric field and air ion exposures near high voltage overhead power lines and adult cancers: a case control study across England and Wales

05: Maternal cumulative exposure to extremely low frequency electromagnetic fields, prematurity and small for gestational age: a pooled analysis of two birth cohorts

06: “Symptoms associated with environmental factors” (SAEF) – Towards a paradigm shift regarding “idiopathic environmental intolerance” and related phenomena

07: Assessment of low-frequency magnetic fields emitted by DC fast charging columns

08: Exposure of live-line workers to magnetic fields: A dosimetric analysis

No. 01

Editorial

In the previous bulletin, I mentioned that this year would see a number of interesting events. Due to the Covid-19 pandemic, however, these events have been either postponed or canceled. The ICNIRP website has advised that they have rescheduled the 9th International NIR Workshop in South Korea to January 14–15, 2021. The BioEM2020 conference was canceled, so the next conference will be BioEM2021, to be held June 13–18, 2021, in Honolulu, Hawaii.

Despite the Covid-19 pandemic, quite a few studies related to electric and magnetic fields have been published. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has published an article on the gaps in knowledge relevant to the guidelines for limiting exposure to electric and magnetic fields (1 Hz–100 kHz). What makes the ICNIRP article particularly interesting is that their recommendations have been used for drafting the European Union



legislation related to electric and magnetic fields. Indeed, the ICNIRP's 9th International NIR Workshop, Session 3, will address the topic of protecting health in the low-frequency range.

Once again, I have found new scientific articles of interest for this bulletin. The first of them is a paper on childhood leukemia. The article discusses the relation between maternal cumulative exposure to electromagnetic fields and the baby being premature or small for gestational age (SGA). There is also an article on the assessment of low-frequency magnetic fields emitted by DC fast charging columns used for charging electric vehicles.

The last article of this bulletin deals with occupational exposure, this time focusing on live-line work and the magnetic field exposure related to that.

In addition to this bulletin, I'd like to mention another interesting publication (available in Finnish). In early 2020, Fingrid published a new brochure on the electric and magnetic fields of power lines. The publication includes interviews with Lauri Puranen of the Radiation and Nuclear Safety Authority (STUK), Mikko Paunio of the Ministry of Social Affairs and Health, and myself.

Hope you enjoy reading this summary in English!

Leena Korpinen, Professor
Editor-in-chief, Situation Report Bulletin

Leena Korpinen is a specializing physician for the Joint Municipal Authority for North Karelia Social and Health Services and an adjunct professor at Tampere University.



No. 02

Editor-in-chief's comment: In this article, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) identifies areas related to low-frequency electric and magnetic fields in which further research is needed. The areas requiring more research proposed by the ICNIRP include pain perception, neurodegenerative disorders, childhood leukemia, interaction mechanisms, radical pair mechanism, dosimetry, and modeling.

Gaps in Knowledge Relevant to the “Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz–100 kHz)”

Source:

International Commission on Non-Ionizing Radiation Protection (ICNIRP). Gaps in knowledge relevant to the “guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz–100 kHz)”. *Health Physics*. 118 (5): 533–542; 2020.

No. 03

Editor-in-chief's comment: The researchers explored the role of dwelling type when estimating the effect of magnetic fields on childhood leukemia. They used data from the California Power Line Study (CAPS), obtaining information on type of dwelling at birth on over 2,000 subjects. According to the researchers, dwelling type did not play a significant role in the magnetic field–leukemia relationship as a risk factor or confounder.

The Role of Dwelling Type When Estimating the Effect of Magnetic Fields on Childhood Leukemia in the California Power Line Study (CAPS)

Source:

Amoon A T, Crespi C M, Nguyen A, Zhao X, Vergara X, Arah O A, Kheifets L. The role of dwelling type when estimating the effect of magnetic fields on childhood leukemia in the California Power Line Study (CAPS). *Cancer Causes & Control*, 2020: 31(6).

No. 04

Editor-in-chief's comment: The research explores electric field and air ion exposures near high voltage overhead power lines and their association with cancer. The research was conducted as a case control study that investigated the risk of adult cancer in 1974–2008 in England and Wales. According to the researchers, the results do not support the hypothesis that air ion density or electric fields in the vicinity of power lines were associated with cancer risk in adults.

Electric Field and Air Ion Exposures near High Voltage Overhead Power Lines and Adult Cancers: a Case Control Study across England and Wales

Source:



Toledano M B, Shaddick G, de Hoogh K, Fecht D, Freni Sterrantino A, Matthews J, Wright M, Gulliver J, Elliott P. Electric field and air ion exposures near high voltage overhead power lines and adult cancers: a case control study across England and Wales. *International Journal of Epidemiology*, 2020, i57–i66.

No. 05

Editor-in-chief's comment: The researchers studied the relation between maternal cumulative exposure to magnetic fields and prematurity or small for gestational age (SGA). They pooled data from two birth cohorts (Elfe and Epipage2) that included both premature and full-term babies. The researchers conclude that the results provide no clear evidence with regard to the effect of maternal exposure to ELF-EMF on the risk of prematurity or SGA.

Maternal Cumulative Exposure to Extremely Low Frequency Electromagnetic Fields, Prematurity and Small for Gestational Age: A Pooled Analysis of Two Birth Cohorts

Source:

Migault L, Garlantézec R, Piel C, Marchand-Martin L, Orazio S, Cheminat M, Zaros C, Carles C, Cardis E, Ancel P-Y, Charles M-A, de Seze R, Baldi I, Bouvier G. Maternal cumulative exposure to extremely low frequency electromagnetic fields, prematurity and small for gestational age: a pooled analysis of two birth cohorts. *Occup Environ Med* 2020; 77: 22–31.

No. 06

Editor-in-chief's comment: The article discusses various symptoms associated with environmental factors. The authors are trying to find an appropriate term/concept for this phenomenon. According to the article, different health conditions and their symptoms have been associated with chemical, physical, or biological environmental factors. However, these symptoms are unrelated to objectifiable pathophysiological mechanisms. The authors therefore propose adopting a descriptive term “symptoms associated with environmental factors” (SAEF).

“Symptoms Associated with Environmental Factors” (SAEF) – Towards a Paradigm Shift Regarding “Idiopathic Environmental Intolerance” and Related Phenomena

Source:

Haanes J V, Nordin S, Hillert L, Witthöft M, van Kamp I, van Thriel C, Van den Bergh O. “Symptoms associated with environmental factors” (SAEF) – Towards a paradigm shift regarding “idiopathic environmental intolerance” and related phenomena. *Journal of Psychosomatic Research* 131 (2020) 109955.

No. 07

Editor-in-chief's comment: The authors have explored low-frequency magnetic fields emitted by direct current (DC) fast charging columns used for electric vehicles. They refer to the European



Commission's Joint Research Centre (JRC) and its Interoperability Centre that has conducted a measurement campaign assessing low-frequency magnetic fields emitted by fast-charging devices in standby condition and during quick recharge, comparing the values to the reference levels stated in the EU directive. The authors devised a reproducible method for measuring magnetic fields emitted during fast charging.

Assessment of Low-Frequency Magnetic Fields Emitted by DC Fast Charging Columns

Source:

Trentadue G, Pinto R, Salvetti M, Zanni M, Pliakostathis K, Scholz H, Martini G.
Assessment of low-frequency magnetic fields emitted by DC fast charging columns.
Bioelectromagnetics. 2020; 41: 308–317.

No. 08

Editor-in-chief's comment: Using dosimetric analysis, the research group has explored exposure to magnetic fields in live-line work when working near power lines and in substations. The group concludes that it is not necessary to take further precautions for workers.

Exposure of Live-Line Workers to Magnetic Fields: A Dosimetric Analysis

Source:

Bottauscio O, Arduino A, Bavastro D, Capra D, Guarneri A, Parizia A A, Zilberti L. Exposure of live-line workers to magnetic fields: A dosimetric analysis. International Journal of Environmental Research and Public Health Health 2020, 17, 2429.

Editorial staff:

Leena Korpinen, editor-in-chief

Sonator Oy, editorial assistant

Zento Oy, graphic and technical realization

The Finnish situation report bulletin is funded by Fingrid Oyj.

The Ministry of Economic Affairs and Employment of Finland is contributing to the work of the project's management group.

The next situation report bulletin will be published in winter 2020. The archive is available at www.leenakorpinen.com.

