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National Report (Republic of Korea)

1. Risk perception and communication activities

Risk communication (RC) activities for EMF in Korea are carried out by KIEES (Korea Institute of Electromagnetic Engineering and Science), ETRI (Electronics and Telecommunications Research Institute), KCA (Korea Communication Agency), and RRA (National Radio Research Agency). These organizations have been operating EMF-related websites such as www.emf.or.kr (KIEES), http://emf.kca.kr (KCA), and www.rra.go.kr/emf (RRA), respectively. These websites provide information on electromagnetic fields, such as exposure levels of home appliances, Q&A, educational programs, videos for risk communications, etc.

The recent construction of new data centers in Korea has led to increasing public concern regarding electromagnetic fields. In particular, residents in areas where data centers are being built are increasingly opposed to their installation. To mitigate these conflicts, a system similar to the simplified real-time monitoring system known as the 'EMF signal light'—currently in operation at locations such as childcare centers—has been installed and is being operated in areas where data centers are under construction. This system is designed to monitor ELF (extremely low frequency) electromagnetic fields.

In 2024, to enhance public understanding of electromagnetic fields, KIEES and ETRI jointly produced and distributed a video (https://youtu.be/4RDmnw2EZQs?si=nTR18kIMvQgPC_DV) in collaboration with a popular Korean YouTuber (Science Cookie). This video was produced in a fact-checking format to address fake news that had been circulating on the internet. Comparing the number of views on the websites produced by the aforementioned related institutions, it was found that this video achieved significantly greater outreach.

As reported last year, RRA has continually provided measurement services to inform the public about EMF exposure levels of various electric and electronic devices around us. Measurements are carried out based on public requests, and RRA discloses the measurement results on its website. The response of the general public to this service is very positive.

The GLORE (Global Coordination of Research and Health Policy on RF Electromagnetic fields) 2024 Annual Meeting was held in Seoul in October 2024. This meeting covered various topics, including updates on EMF policies and regulations, EMF issues related to emerging technologies, and recent research trends on the biological effects of electromagnetic fields. Over 60 experts from countries such as the United States, Japan, Canada, Australia, and the EU, including experts from international organizations, attended. The next meeting is scheduled to be held in Tokyo, Japan.

2. Risk management

In 2024, MSIT (Ministry of Science and ICT) established the 4th comprehensive plan for promoting radio waves ('24~'28), in accordance with the Radio Wave Act. The fourth strategic objective of this plan is "to create a safe and publicly trusted radio environment," which includes policy details for protecting humans from electromagnetic fields (EMF). Key elements of this strategy are as follows:

1. Continuing the application of existing EMF protection guidelines for devices such as mobile phones and household appliances.

2. Expanding the measurement services to resolve public concerns about EMF in living environments.
3. Establishing a neutral organization responsible for resolving conflicts caused by EMF.
4. Promoting the development of technologies for enhancing the efficiency of radio resource utilization, assessing human health risk from EMFs, and monitoring of radio environment based on AI technology.

3. Research on the biological effects of EMF

In 2024, a new five-year (2024-2028) RF research project, "A systematic study on health risks of EMF exposure in advanced wireless service environments (RS-2024-00466966)," was launched. The main research topics of the project are as follows:

- Interdisciplinary research on the biological effects of EMF (*in vivo* and *in vitro* study)
- Systematic epidemiological study of behavioral and cognitive effects of RF on adolescents
- Large-scale animal study to determine carcinogenicity of simultaneous exposure to 4G and 5G
- Development of a complex EMF exposure assessment technique and an exposure system for biological study

The project is funded by MSIT, and aims to protect humans from potential health risks related to EMF exposure and to identify the effects of electromagnetic fields on human health. ETRI is supervising it, collaborating with several universities and KIEES. ETRI and Dankook University, as associated partners in the Horizon EU GOLiAT project, are conducting joint research on the epidemiological study and exposure assessment. ETRI is also participating as an associated partner in the SEAWave project and shares the results of the domestic evaluation of environmental EMF exposure.

Additionally, the Korea-Japan joint project, titled "NTP Validation Animal Study on Carcinogenicity of Mobile Phone Radiofrequency Radiation," has been completed. The pathological review process was carried out, in which a blinded third-party review using a cloud-based analysis was included. Based on these results, Korea and Japan are currently preparing their respective manuscripts, which are expected to be published within this year.

Meanwhile, RRA and KAIST (Korea Advanced Institute of Science and Technology) are also conducting studies on the assessment of environmental EMF exposure using AI technology, "Development of artificial intelligence-based prediction algorithm for human exposure from base station electromagnetic wave (2022-0-00986)".

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