

Electric and Magnetic Fields

What is the current status of health research on EMF?

Electric and magnetic fields (or EMF) from electricity oscillate at a frequency of 60 Hertz. EMF are produced everywhere electricity is generated, transmitted or used. Typical sources of EMF that we encounter in our daily lives include the electrical wiring, appliances and equipment in our homes, offices and other buildings. Essentially, everything we plug into wall power outlets is a source of EMF. Power lines and related infrastructure in our communities also are sources of EMF. One important property of all EMF is that they are highest near the source but decrease very quickly with distance. Therefore, inside our homes, the most prominent sources of EMF are typically the household electrical appliances and building wiring.

Research on EMF exposure and human health has been ongoing since the late 1970s. In the nearly half-century since then, there have been thousands of studies published on this topic. This large body of scientific literature has been reviewed by numerous health and scientific agencies around the world, including the World Health Organization, the International Agency for Research on Cancer, and the U.S. National Institute of Environmental Health Sciences.

None of these agencies that have reviewed the research in-depth have concluded that EMF causes or contributes to adverse health effects in adults or children at the levels we encounter in our everyday environments, including from power lines.

Is EMF from overhead power lines different than from underground lines?

Both overhead and underground power lines are sources of EMF. However, when constructed underground, there is no appreciable electric field from the power line above ground because of the shielding effect of cable construction and the earth. There will be an electric field from overhead power lines but these electric fields are easily blocked by grounded conductive objects such as fences, trees, brush and buildings.

Magnetic field levels decrease rapidly with distance from a power line regardless of whether it is constructed overhead or underground. The levels of magnetic fields measured directly above an underground power line can be higher than those directly below an overhead power line of similar voltage and capacity simply because the line is located closer to you – buried a few feet underground, whereas, an overhead line could be 20 to 40 feet or more (depending on the voltage of the line) above ground. However, the magnetic field levels from underground lines decrease more quickly with distance than from overhead lines due to the smaller spacing between adjacent power line conductors.

What online resources are available regarding EMF?

World Health Organization "Electromagnetic fields Q&A," <https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields>

U.S. National Cancer Institute: Electromagnetic Fields and Cancer, <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet>

National Institute of Environmental Health Sciences: Electric and Magnetic Fields, https://www.niehs.nih.gov/sites/default/files/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

Health Canada: Power lines and electrical products: Extremely low frequency electric and magnetic fields, <https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/everyday-things-emit-radiation/power-lines-electrical-appliances.html>