

# Study links health risks to electromagnetic field exposure

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A study of real-world exposure to non-ionizing radiation from magnetic fields in pregnant women found a significantly higher rate of miscarriage, providing new evidence regarding their potential health

risks. The Kaiser Permanente study was published today in the journal *Scientific Reports*.

Non-ionizing [radiation](#) from magnetic fields is produced when electric devices are in use and electricity is flowing. It can be generated by a number of environmental sources, including electric appliances, power lines and transformers, wireless devices and wireless networks. Humans are exposed to magnetic fields via close proximity to these sources while they are in use.

While the health hazards from ionizing radiation are well-established and include radiation sickness, cancer and genetic damage, the evidence of health risks to humans from non-ionizing radiation remains limited, said De-Kun Li, MD, PhD, principal investigator of the study and a reproductive and perinatal epidemiologist at the Kaiser Permanente Division of Research in Oakland, California.

"Few studies have been able to accurately measure exposure to [magnetic field](#) non-ionizing radiation," Dr. Li said. "In addition, due to the current lack of research on this subject, we don't know the biological threshold beyond which problems may develop, and we also don't yet understand the possible mechanisms for increased risks."

In a new study funded by the National Institute of Environmental Health Sciences, researchers asked women over age 18 with confirmed pregnancies to wear a small (a bit larger than a deck of cards) magnetic-[field](#) monitoring device for 24 hours. Participants also kept a diary of their activities on that day, and were interviewed in person to better control for possible confounding factors, as well as how typical their activities were on the monitoring day. Researchers controlled for multiple variables known to influence the risk of [miscarriage](#), including nausea/vomiting, past history of miscarriage, alcohol use, caffeine intake, and maternal fever and infections.

Objective magnetic field measurements and pregnancy outcomes were obtained for 913 pregnant women, all members of Kaiser Permanente Northern California. Miscarriage occurred in 10.4 percent of the women with the lowest measured exposure level (1st quartile) of magnetic field non-ionizing radiation on a typical day, and in 24.2 percent of the [women](#) with the higher measured exposure level (2nd, 3rd and 4th quartiles), a nearly three times higher relative risk. The rate of miscarriage reported in the general population is between 10 and 15 percent, Dr. Li said.

"This study provides evidence from a human population that magnetic field non-ionizing radiation could have adverse biological impacts on human health," he said.

Strengths of this study, Dr. Li noted, included that researchers used an objective measuring device and studied a short-term outcome (miscarriage) rather than one that will occur years or decades later, such as cancer or autoimmune diseases. The study's main limitation is that it was not feasible for researchers to ask participants to carry the measuring device throughout pregnancy.

Dr. Li noted that the potential health risk of magnetic-field non-ionizing radiation needs more research. "We hope that the finding from this study will stimulate much-needed additional studies into the potential environmental hazards to human health, including the [health](#) of [pregnant women](#)."

**More information:** De-Kun Li et al. Exposure to Magnetic Field Non-Ionizing Radiation and the Risk of Miscarriage: A Prospective Cohort Study, *Scientific Reports* (2017). [DOI: 10.1038/s41598-017-16623-8](https://doi.org/10.1038/s41598-017-16623-8)

Provided by Kaiser Permanente

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