



International Agency for Research on Cancer
Centre International de Recherche sur le Cancer

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IARC FINDS LIMITED EVIDENCE THAT RESIDENTIAL MAGNETIC FIELDS INCREASE RISK OF CHILDHOOD LEUKAEMIA

An expert scientific working group of the Monographs Programme of the International Agency for Research on Cancer (IARC) has concluded its review of health effects of static and extremely low frequency (ELF) electric and magnetic fields. Such fields include the earth's magnetic field, and also originate from electrical power transmission lines, electrical wiring in buildings, and electric appliances. Magnetic fields are measured in units of microTesla; the earth's static magnetic field, to which everyone is exposed, varies from 25 microTesla at the equator to 65 microTesla at the poles. Most research on health effects has been done on ELF magnetic fields with frequencies of 50 or 60 Hz.

Reports were first published in 1979 that childhood cancer might be associated with exposures to residential ELF fields. Numerous studies in many countries have been undertaken since then of possible increased cancer risks in children and adults from ELF magnetic field exposures. Special attention has focussed on leukaemia and on brain tumours, which early reports had suggested might be increased. IARC has now concluded that ELF magnetic fields are possibly carcinogenic to humans, based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukaemia. Children who are exposed to residential ELF magnetic fields less than 0.4 microTesla have no increased risk for leukaemia. Because of insufficient data, static magnetic fields and static and extremely low frequency electric fields could not be classified as to carcinogenic risk to humans.

However, pooled analyses of data from a number of well-conducted studies show a fairly consistent statistical association between a doubling of risk of childhood leukaemia and power-frequency (50 or 60 Hz) residential ELF magnetic field strengths above 0.4 microTesla. In contrast, no consistent evidence was found that childhood exposures to ELF electric or magnetic fields are associated with brain tumours or any other kinds of solid tumours. No consistent evidence was found that residential or occupational exposures of adults to ELF magnetic fields increase risk for any kind of cancer.

Studies in experimental animals have not shown a consistent carcinogenic or co-carcinogenic effects of exposures to ELF magnetic fields, and no scientific explanation has been established for the observed association of increased childhood leukaemia risk with increasing residential ELF magnetic field exposure.

Health effects of radiofrequency electromagnetic fields, which are produced by such sources as radio and television transmission towers, portable telephones, and radar, were not evaluated by the IARC working group. These exposures will be reviewed by the IARC Monographs Programme when research that is currently in progress has been published, most likely in 2005.

For further details of the Monographs evaluation, consult <http://monographs.iarc.fr>, under "Agents most recently evaluated," or inquire by e-mail to cie@iarc.fr

For further details of current research at IARC on electric and magnetic fields, inquire by e-mail to cardis@iarc.fr

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