

ADULT CANCERS NEAR HIGH VOLTAGE OVERHEAD POWER LINES

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Background. Extremely low frequency electromagnetic fields are designated as possibly carcinogenic in humans based on an epidemiologic association with childhood leukemia. Evidence for associations with various adult cancers is inconsistent and currently considered inadequate to make causal judgements.

Aims. To investigate risks of adult cancers in relation to distance and extremely low frequency electromagnetic fields from high voltage overhead power lines.

Methods. Case-control study. Adult cancers identified through national cancer registry data in England and Wales, 1974-2003. 6069 leukemia, 5409 brain/central nervous system, 6218 malignant melanoma, 22,395 female breast cancer cases and 36,187 age-sex matched cancer controls (three controls/case except breast cancer, one control/case) ages 15-74 years living within 1000 m of an overhead power line. Distance measures based on a Geographical Information System of the national power line network. Calculated magnetic fields based on EM2D program, which takes into account distance from the power line, tower design, clearance above ground, phase arrangement and historical load data – mainly estimated for the winter peak and scaled to give an annual average.

Main outcome measures. Risks of leukemia, brain/central nervous system cancers, malignant melanoma and female breast cancer in relation to distance and calculated magnetic fields within 1000 m of high voltage overhead power lines, adjusted for age, sex (except female breast cancer), deprivation, and rurality.

Results. Full results including adjusted odds ratio for various adult cancers by distance from powerlines and for calculated magnetic fields, ≥ 1000 nT compared with < 100 nT, will be presented at the conference (paper findings currently under peer review).

Conclusions. Our findings add substantive new evidence to the current inadequate and inconsistent body of research on low frequency magnetic fields and specific adult cancers.