

DRAFT - WORK IN PROGRESS – Version 1 29/6/06: Adverse health effects associated with exposure to ELF electric and magnetic fields – assembly of scientific evidence and discussion of possible public health impact - Summary

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Summary

The following table gives the total impact, in thousands of pounds per year per 1,000 exposed population, from EMF exposure for five ‘*what-if*’ scenarios, as calculated in a moderate and transparent way in section 2.3. The impact of other diseases is of the order of 100 times greater than that of childhood leukaemia alone.

	CL alone	NIEHS 2	Calif 5	Calif 11	12 diseases
With credibility factors	4	70	146	679	716
With definite causation	5	122	246	1899	2629

We do not think it is rational to base an assessment on childhood leukaemia alone, when most of the hypothesised mechanisms and their supporting evidence relates to biological systems involved in many diseases, rather than exclusively to childhood leukaemia. The decreasing Degree of Certainty with greater numbers of diseases is however reflected in the credibility factors. Therefore, while there remains considerable uncertainty and imprecision in such assessments, it seems sensible to give consideration to the above scenarios and multiple outcomes, without adopting any one as definitive.

The next table shows the numbers of ELF-EMF epidemiological studies covered in major reviews to 2002, as explained in section 2.2. This shows that, on the basis of numbers of studies and their statistical strength, there is more and stronger evidence for some other diseases than for childhood leukaemia.

Disease	Studies	Positives	Significant positives	Significant negatives
childhood leukaemia	19	16	3	0
adult leukaemia	43	32	11	0
9 other diseases	150	110	36	1

Since 2002 there have been many new studies increasing knowledge of potential mechanisms. Important earlier studies have been overlooked in the major reviews, for example the results of Schuz *et al.* (2001) showing stronger associations of childhood leukaemia with nocturnal exposure, with its implications for the melatonin hypothesis.

In addition, we note two substantial areas of established and relevant research which have also been largely overlooked: solar and geo-magnetic activity (S-GMA), which includes ELF exposure, and bio-detection of magnetic fields by migrating birds and other animals. Both give firm implications for biological effects of very low fields. The first reinforces implications of ELF EMFs for various diseases. The second reinforces implications for biological mechanisms by which this may be possible.