FILE # SPC-04-000-2A

10/16/04

VOTE AGAINST APPROVING DAY CARE AT 308 W WILLIAM CANNON

10-28-04 #55

PRESENTED by DIANA HURRY FOR JOE & JOYCE FENWICK

OCT 21 AM 11:46

To the city of Austin —

I STRONGLY RECOMMEND THAT THE CITY of AUSTIN DOES NOT ALLOW A CHILD CARE-DAY CARE TO BE ESTABLISHED AT 308 W. WILLIAM CANNON DR, which is right beneath VERY high VOLTAGE POWER LINES.

I AM A CANCER NURSE, AT MD ANDERSON CANCER CENTER (The #1 CANCER hospital in the world) AND A member of the ONCOLOGY NURSING SOCIETY (ONS). I have SEEN FIRST hand the suffering that LEUKEMIA CAUSES. I deal with it and fight this disease every day. I would not wish this disease on my worst enemy. The PAIN and SUFFERING is heartbreaking. SMALL children are growing RAPIDLY, and LINKAGE has been ESTABLISHED, with high POWER LINES (see ATTACHED SCIENTIFIC STUDIES). PLEASE, ESTABLISH YOUR DAY CARE SOMEWHERE ELSE. Do not PUT the children of AUSTIN in HARMS WAY.

SINCERELY,

Jocelyn N. Fenwick

JOCELYN N FENWICK, M.D., MSN, RN, OCN

Joseph E Fenwick

DC

DIANA HURRY will present our LETTER. DC 10/16/04

ARMIN No. 5505 Engineer's Computation Pad

MICRO WAVE NEWS

Vol. XVII No. 4 A Report on Non-Ionizing Radiation July/August 1997

INSIDE...

HIGHLIGHTS pp.2-5

Talk of Bologna: Wireless Comes Home

Wireless Notes:
Losing a Job over Tower Protest • Do Harvard Profs Read What They Sign?

Finns Say Cell Phones Safe—Data To Come

Phone-Pacemaker EMI Seen as Manageable

IEEE Reaffirms RF/MW Exposure Standard

Insurer Battles Cell Antennas in Australia

Australian Mouse Study: Industry View

EMF NEWS pp.6-14

Power Line Talk:
SDG&E, Neutra at Odds over Future of California EMF Program • NY Property Lawsuit Dismissed • Southwest Research Institute Ends EMF Work

NAS–NRC Panel Reviews, Criticizes Navy Studies on Project ELF
Tree Growth Findings Questioned

Swiss Firm Warns EMF Claims Could Threaten Entire Insurance Industry

Glazer, Jordan Lawsuits Withdrawn

Germans Link Childhood Leukemia and Measured Magnetic Fields

Statistics and Dose-Response in NCI Study

Exposure Both at Home and Work Raises Leukemia Risk, Swedes Say

Wertheimer-Leeper and Kaune on Use of Wire Codes in NCI Study

What They Are Saying About NCI Study

FROM THE FIELD p.15

Telstra Denies Cover-Up on Repacholi Study

Clippings from All Over

Flashback: 5, 10, 15 Years Ago

UPDATES pp.16-18

Environmental Impact Report on Digital TV • EMF–Testicular Cancer Link • Baby Broadcasts in Baltimore • Medical Devices: EBI Loses $150M Suit, OrthoLogic Gets FDA Approval • Conference on Beneficial EMF Effects • People in the News

NCI Dismisses Leukemia Risk for Children Living Near Power Lines

Measured Magnetic Fields Stir Debate

A major study by the National Cancer Institute (NCI) has found "little evidence" that living near high-current power lines is associated with childhood leukemia.

"The results of our study differ from three earlier studies," said the lead investigator, Dr. Martha Linet of the NCI's radiation epidemiology branch. Linet explained that her team found no evidence of a significantly increased risk of acute lymphoblastic leukemia (ALL) among children who lived in homes near high-current electrical wiring.

More Coverage of the NCI Study on pp.10-14
Germans and Swedes Find Links • Dose-Response Flap • Wertheimer-Leeper vs. Kaune on Wire Codes

For measured magnetic fields, the NCI team found "a slightly elevated, but not statistically significant, risk" for ALL among those children exposed to 2 mG or more, as compared to those in homes with magnetic fields below 0.65 mG. Linet also said that there was "no evidence" of a dose-response relationship — that is, an increase in the risk of leukemia with increasing exposures to electromagnetic fields (EMFs).

Newspapers across the country and television networks featured prominent coverage of the NCI study, which appeared in the July 3 *New England Journal of Medicine (337,* pp.1-7). In an accompanying editorial, the *Journal* called for an end to power line health research.

The NCI's characterization of the results for measured fields has provoked

(continued)

Views on the News: The NCI Study

NCI Comes to a Cautious Conclusion —Or Is It Reckless?

CANCER STUDY FINDS NO LINK TO POWER LINES read the headline in the *Los Angeles Times.* The NCI study has "debunked" the link between EMFs and childhood cancer, according to a news story in the *Montreal Gazette,* while the *Hartford Courant* reported that the study has "discounted" the connection. *Science* magazine suggested, "It could be the obituary" for the EMF issue.

Yet the NCI's own data show an increased leukemia risk at EMF levels found in about 5% of U.S. homes. On the job, workers are often exposed to levels many times higher. Is the NCI willing to tell these people that they are safe?

(continued on next page)

In a word, no. Dr. Robert Tarone of the NCI conceded that, "We cannot say that there is nothing going on at higher exposure levels." Yet the NCI is not discouraging anyone from sounding the "all clear."

The NCI's results actually show that children exposed to more than 3 mG face a 72% increase in leukemia risk. Many other epidemiologists believe that this study provides evidence for an EMF effect. But you'd never know this from the NCI's press release.

How did the NCI arrive at a conclusion that seems at odds with its own data? First, there is the question of statistical significance. The researchers found a higher risk above 2 mG and indications of a dose-response relationship. But these results were not statistically significant, meaning that they could have happened by chance more than 5% of the time.

This is an important point—but no one should forget that the definition of "statistical significance" is a rule of thumb, not a law of nature. A finding with a significance level of 4% could still turn out to be due to chance. And one with a significance level of 10% could still reflect a real association.

Epidemiologists are arguing about whether the NCI team used the right kind of test to look for a dose-response relationship (see p.11). Regardless of who is right, the numbers tell us basically the same thing: There is some evidence of a dose-response relationship, but it is not conclusive.

The data that show a higher risk above 3 mG *are* statistically significant—but the NCI researchers discount this finding for another reason. The *a priori* hypothesis they had decided to test was that a child's leukemia risk would increase with exposures above 2 mG.

The use of *a priori* hypotheses has been adopted by epidemiologists for important reasons. It is a way for researchers to keep themselves honest since, if enough different comparisons are done, some false-positive findings will emerge due to chance. But it was never meant to be dogma.

The Chasm Between 2-3 mG and 1,000 mG

The selection of 2 mG rather than 3 as the cutoff point was somewhat arbitrary. Current international standards allow exposures up to 1,000 mG for children and 5,000 mG for workers. In this context, the difference between 2 and 3 mG almost seems a nonissue.

Had 3 mG been chosen instead, the headlines would have told a completely different story. As a *post hoc* finding, it is only limited evidence of a higher risk—but why is the NCI holding it up as evidence that there is no danger at all?

Epidemiologists have recently come under fire for acting as accomplices of an alarmist media in needlessly stirring public fears. But if epidemiologists need to take some responsibility for the headlines prompted by their studies, this has to cut both ways. When a study that suggests some risk leads to news reports that there is no danger, science is not well served. In this case, being too conservative in the interpretation of data is not an act of caution—rather, it leads to a reckless indifference to public health.

Millions of people live in the 5% of U.S. homes with EMFs above 3 mG. Add in the power company employees, telephone workers, sewing machine operators and others who routinely experience even higher exposures, and it is clear that a huge number of people are potentially at risk.

The NCI's Dr. Martha Linet has acknowledged that her conclusions are at odds with those of three previous studies. It is worth noting that none of the investigators in those studies feels that the NCI study is the last word. In fact, all three—Drs. Stephanie London, David Savitz and Nancy Wertheimer—feel that the NCI's results are either ambiguous or show a cancer link. And, in fact, the risks uncovered by the NCI are consistent with the range found in earlier investigations, and the weight of the evidence still favors an association between EMFs and leukemia in children.

But the *New England Journal of Medicine* is in a hurry to toss all these studies aside. Dr. Edward Campion's editorial asserts that "the better epidemiologic studies, including that by Linet," support the conclusion of no risk. These "better studies" are not identified, and what makes them better is not defined—unless it is the fact that Campion agrees with their conclusion.

The *Journal* does not stop there. It goes on to declare that "it is time to stop wasting our research resources" on EMF health research. In an interview, Campion said he saw no distinction between studies of residential EMFs and on-the-job exposures.

Never mind the higher risk ratios found in occupational cancer studies. Never mind the links to Alzheimer's disease, Lou Gehrig's disease, brain tumors and breast cancer. The *Journal* views any interest in the health effects of non-ionizing radiation as essentially without scientific foundation, blaming "activists and the media" for concerns about "microwave appliances, radar, VDTs, and even cellular telephones."

It is this kind of overreaching that betrays an ideological agenda. But sweeping statements will not make the EMF issue go away. Too many facts already litter the scientific landscape, and their number continues to grow. In this issue alone, we report on three new epidemiological studies pointing to health risks posed by EMFs, including a German study that contradicts the NCI's conclusions.

The issue of EMFs and human health is an unsolved puzzle. All the pieces do not fit together neatly, and that, of course, is frustrating. But the correct response to a frustrating puzzle is not to dump all the pieces on the floor, as Campion does.

The media have little tolerance for uncertainty. But good science requires dealing with uncertainty every day—having your curiosity spurred on by what you do not know, while avoiding a rush to judgment. It is unfortunate when national scientific and medical institutions, like the *New England Journal* and the NCI, show as little tolerance for uncertainty as the television news.

MICROWAVE NEWS is published bimonthly. • ISSN 0275-6595 • PO Box 1799, Grand Central Station, New York, NY 10163 • (212) 517-2800; Fax: (212) 734-0316; E-mail: <mnwn@pobox.com>; Web site: www.microwavenews.com • Editor and Publisher: Louis Slesin, PhD; Senior Editor: Peter Hogness; Associate Editor: Christopher Doherty; Assistant Editor: Douglas Barnes; Copy Editors: Jim Feldman, Roy Thomas Jr.; Intern: Charles Sisk; Production Coordinator: Joe Mungioli; Circulation Assistant: Diana Cooper • Subscriptions: $325.00 per year ($350.00 Canada & Foreign, U.S. funds only); Single copies: $60.00 •

Meeting: 2003 ASCO Annual Meeting
Category: Tumor Biology/Immunobiology/Human Genetics
SubCategory: Epidemiology/Molecular Epidemiology

Bookmark

Residential exposure to electric power transmission lines in childhood increases the risk of myeloproliferative and lymphoproliferative disorders in later life.

Abstract No: 3602

Citation: Proc Am Soc Clin Oncol 22: page 896, 2003 (abstr 3602)

Author(s): R. M. Lowenthal, D. M. Tuck, I. Bray, University of Tasmania, Hobart, Australia; University of Plymouth, Plymouth, UK

Abstract: There is continuing controversy about possible carcinogenicity of power frequency electromagnetic fields (EMFs) and particular public concern about possible risks associated with residential exposure to electricity transmission lines. We used a database, collected in Tasmania in the 1970s, of 854 patients with myeloproliferative disorders (MPDs) and lymphoproliferative disorders (LPDs) (including leukemias, lymphomas, multiple myeloma and related diagnoses) and their age- and sex-matched controls, to examine the risks, if any, of residence less than 300 m from transmission lines of 88, 110 or 220 kV at any time in their lives. Subjects lived at a total of 9,245 addresses. 94 patients and 64 controls had at least one address within 300 m of a transmission line (Chi-square test for association p=0.01), giving an unadjusted odds ratio (OR) of 1.5. Adjusting for socio-economic status and occupational exposure, risks were found to be greater amongst patients who had resided closest to transmission lines (less than 50 m) and amongst those who had resided close to transmission lines for the longest periods. The greatest risks were found in adult patients who had resided close to transmission lines during their early years of life (age 0-5 years) (OR 4.82; p=0.03; 95% CI 0.99-23.41). In analyses by diagnostic category, we found the risk of LPDs (but not MPDs) amongst adults who had resided close to transmission lines between ages 0-15 was particularly high (OR 6.179; p=0.005; 95% CI 1.37-27.90). These findings suggest that prolonged residential exposure to electric power transmission lines, especially early in life, may increase risks of the later development of MPDs and LPDs. Whether this is indeed an effect of EMFs rather than an effect of unidentified confounders, or a problem of control matching, remains to be determined.

Associated Presentation(s):

A presentation was not made on this abstract

Other Abstracts in this Sub-Category:

1. **A comparison of 5 immunohistochemical biomarkers and HER-2/neu gene amplification by fluorescence in situ hybridization in White and Korean patients with early-onset breast carcinoma**
   Meeting: 2003 ASCO Annual Meeting Abstract No: 3454 First Author: D. H. Choi

2. **A Sephardi Jewish founder mutation causing hereditary nonpolyposis colorectal cancer.**
   Meeting: 2003 ASCO Annual Meeting Abstract No: 3442 First Author: L. P. Tomsho

3. **Average tumor size and overall survival of patients with primary diagnosis of breast cancer influenced by a more frequent use of mammography**
   Meeting: 2003 ASCO Annual Meeting Abstract No: 3487 First Author: H. L. Sommer

4. **Breast cancer in the Bahamas: Preliminary evidence for a high incidence of genetic risk.**

Electronic full text is not currently available.

Title Magnetic fields and cancer in children residing near Swedish high-voltage power lines

Creator/Author Feychting, M. ; Ahlbom, A. (Karolinska Institute, Stockholm (Sweden))

Publication Date 1993 Oct 01

Other Numbers ISSN0002-9262; CODEN: AJEPAS

Resource/ Doc Type Journal Article

Resource Relation American Journal of Epidemiology ; Vol/Issue: 138:7

Subject 560400 -- Other Environmental Pollutant Effects; CHILDREN-- LEUKEMIA;CHILDREN-- NEOPLASMS;ELECTROMAGNETIC FIELDS-- BIOLOGICAL EFFECTS;ELECTROMAGNETIC FIELDS-- ENVIRONMENTAL EXPOSURE; CENTRAL NERVOUS SYSTEM;ELECTRICITY;EPIDEMIOLOGY;POWER TRANSMISSION LINES;SWEDEN

Related Subject AGE GROUPS;DEVELOPED COUNTRIES;DISEASES;EUROPE;IMMUNE SYSTEM DISEASES;NEOPLASMS;NERVOUS SYSTEM;SCANDINAVIA;WESTERN EUROPE

Description/ Abstract A case-control study was conducted to test the hypothesis that exposure to magnetic fields of the type generated by high-voltage power lines increases cancer incidence in children.^The study base consisted of everyone under age 16 years who had lived on a property located within 300 meters of any of the 220 and 400 kV power lines in Sweden during the period 1960-1985.^Subjects were followed from their entry into the study base through 1985.^A total of 142 cancer cases were identified through a record linkage to the Swedish Cancer Registry.^There were 39 leukemia and 33 central nervous system tumor cases.^A total of 558 controls were selected at random from the study base.^Exposure was assessed by spot measurements and by calculations of the magnetic fields generated by the power lines, taking distance, line configuration, and load into account.^Information about historical loads on the power lines was used to calculate the magnetic fields for the year closest in time to diagnosis.^When historical calculations were used as exposure assessment for childhood leukemia with cutoff points at 0.1 and 0.2 microtesla (microT), the estimated relative risk increased over the two exposure levels and was estimated at 2.7 (95% confidence interval (CI) 1.0-6.3) for 0.2 microT and over; p for trend = 0.02.^When the upper cutoff point was shifted to 0.3 microT, the relative risk was 3.8 (95% CI 1.4-9.3); p for trend = 0.005.^These results persisted when adjustment for potential confounding factors was made.^For central nervous system tumor, lymphoma, and all childhood cancers combined, there was no support for an association.

Country of Publication United States

Language English

Format Pages: 467-481

OSTI Identifier OSTI ID: 5634365

System Entry Date 2001 May 13

« back to previous page | « back to news headlines | sign up to our newsletter

Health Professionals
Respiratory
Breast Cancer
GI
Cardiovascular
Psychiatry
Prostate Cancer

Patient Resources
Migraine
Heartburn
Blood Pressure
Asthma

Site Info
Latest Medical News
About Us
Medical Newsletter
RSS/XML News Feed
JavaScript News Feed
Medical Toolbar
Your Opinions
Contact Us

Childhood leukaemia risk doubles within 100 metres of high voltage power lines

15 Sep 2004

email this to a friend
printer friendly page
view all opinions on this
write an opinion on this

The biggest ever publicly funded UK study (1) into power lines and child cancer has found that children under the age of 15 living within 100 metres of high-voltage power lines have close to twice the risk of developing leukaemia. Children aged 0-5 are the most vulnerable so their risk is likely to be even higher.

This result from the OXFORD CHILDHOOD CANCER RESEARCH GROUP study, headed by Gerald Draper analysed and compared 33 years of data (from1962 to1995) on 35,000 children diagnosed with cancer, with their distance to the nearest electricity transmission line. These latest findings from the Draper study of a direct effect on childhood leukaemia from U.K. power lines follow from the acknowledged International studies that the risk of childhood leukaemia is doubled for magnetic field exposures above 0.4 microtesla, well below that seen under high voltage powerlines.

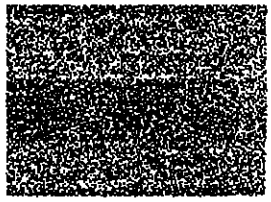
We have learned that " preliminary results" of the latest Draper study, funded to run from 1997-2001 were known as long as 3 years ago and were formally shown confidentially to the U.K. Department of Health in May 2003, but to date has not as yet been entrusted to the public.

We of the Trentham Environmental Action Campaign, an independent research and activist group, concerned about adverse health effects from power-lines, believe it to be absolutely scandalous that 3 years after telling the Department of Health of these latest U.K. findings, it is only as a consequence of our intervention that we are now able to make these findings public.

There appears to have been a determination to withhold the Draper Report for as long as possible.

Trentham has a high voltage powerline crossing many of the houses and there are a significant number of households with young children within 100 metres of the line. Our concerns are also shared by REVOLT, Powerwatch and Electromagnetic Hazard and Therapy, organisations which have also voiced concerns about the health risks of electromagnetic fields for many years.

Our campaign group has been in constant contact with the Government, Mr George Hooker at the Department of Health and the National Radiological Protection Board [NRPB]. We have also been deeply disappointed in the organisations' continuing denial of the problem despite their knowing about these new study results. The NRPB already acknowledges that there is international consensus on the fact that the incidence of childhood leukaemia is doubled at a magnetic field of 0.4 microtesla, which is exceeded under most powerlines. In March 2004, the NRPB reduced the national magnetic field exposure guidelines from 1,600 microtesla to 100 microtesla [3].



They said "In the light of these findings (the association between exposure to magnetic fields and childhood leukaemia) and the requirement for additional research, the need for further precautionary measures should be considered by government". However, 100 microtesla is still 250 times higher than the level (0.4 microtesla) at which the risk of developing childhood leukaemia is doubled.

Electromagnetic fields from powerlines are also linked to adult cancers, depression and suicide. Our Trentham group carried out a local survey which produced extremely worrying results. Depression, miscarriages, headaches, insomnia (with its attendant chronic health problems due to immune system damage) were much more common in the people who lived near the powerline, compared with those who lived further away. Some of these health problems were also found in the important California Health Department report [4] of 2002.

The leukaemia link has now been repeatedly demonstrated. The government should take our nation's health seriously enough to stop allowing houses to be built near high-voltage lines and to remove overhead powerlines from residential areas.

The Minister for Housing and Planning, Keith Hill, in a letter dated July 2004, said "We are aware that there is continuing debate about the effect of living under power lines and whether this can have adverse long-term health effects.

We are of the opinion that power lines are unlikely to have significant effects on the environment". Is this a government statement about people's health or about the environment? Is this confusion, or spin?

It is time the government and planners took the health issue seriously, and reversed their policy of favouring developers, clearly ignoring the risk to children's health. New housing near powerlines should be restricted, and existing lines through residential areas phased out.

Only 50 years ago developing childhood leukaemia was an almost certain death sentence. Due to dramatic improvements in treatment, about 80% of children who suffer from the most common form of childhood leukaemia (ALL, acute lymphoblastic leukaemia) now live for more than 5 years after treatment, but childhood leukaemia remains the largest child killer disease. Survivors often suffer ongoing adverse health complications. The number of children developing leukaemia has been steadily growing over the last 50 years. In 2001, Dr Sam Milham reported [5] a link between the growth in electricity supply and the growth in leukaemia incidence in the USA.

We ignore this at our peril.

[1] Draper G, Vincent T, Kroll M & Swanson J - Childhood cancer and electromagnetic field exposures from powerlines - Department of Health funded 1997-2001, RRX 46 (as yet still unpublished)

[2] International Scientific Conference on the incidence, causal mechanisms and prevention of childhood leukaemia and other cancers. Westminster, 6-10th September 2004. See: http://www.leukaemiaconference.org

[3] See: http://www.nrpb.org for details of their announcements and downloadable publications

[4] Neutra R R, DelPizzo V & Lee G M - An Evaluation of the possible risks from electric and magnetic fields (EMFs) from power lines, internal wiring, electrical occupations & appliances, 2002, California Department of Health & Human Services, The Program, Oakland, California.
http://www.dhs.ca.gov/ehib/emf/RiskEvaluation/riskeval.html
See commentary
on: http://www.electric-fields.bris.ac.uk

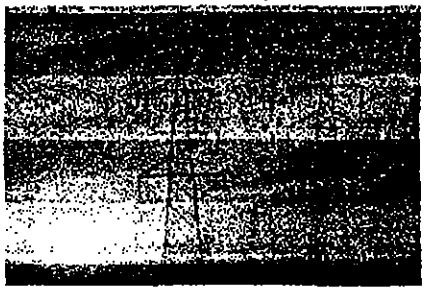
[5] Milham S & Ossiander E M - Historical evidence that residential electrification caused the emergence of the childhood leukaemia peak Medical Hypotheses, 2001, 56(3) 290-295

Further information about powerlines and health problems (including the Trentham survey) can be found on the following websites

TEAC http://www.revolt.co.uk/trentham Media (only) Tel: 01782 658648 Mobile 07963915428 (Maureen A)

Midwest Today, April/May 1996

NEWSFRONT



DO HIGH-VOLTAGE POWER LINES CAUSE CANCER

Studies link Electromagnetic Fields (EMFs) To Illness

By NEAL LAWRENCE

It was sort of a funny story when we first heard about it a few years ago: A dairy farmer living in Wisconsin near high voltage utility company transmission lines couldn't turn out the lights in his barn. Even with the switches in the off position, night after night after he had finished his chores, he'd go back out to the barn to find the light bulbs still glowing from the electrical charge hovering in the air. The cows were none too happy about it either, because the constant light prevented them from sleeping, and they gave less milk.

But the story doesn't seem so funny any more -- not after the spate of recent reports of children developing deadly illnesses or adults dying prematurely of rare diseases -- all apparently because they had the misfortune of living near high amounts of electrical current.

A growing body of scientific evidence suggests that invisible electromagnetic fields (EMFs) -- created by everything from high-voltage utility company lines to personal computers, microwave ovens, TVs and even electric blankets -- are linked to a frightening array of cancers and other serious health problems in children and adults.

Though it received scant attention from the mainstream press, a report leaked last October from the U.S. National Council on Radiation Protection said there is a powerful body of impressive evidence showing that even very low exposure to electromagnetic radiation has long-term effects on health.

The report cited studies that show EMFs can disturb the production of the hormone melatonin, which is linked with sleep patterns. It said there was strong evidence that children exposed to EMFs had a higher risk of leukemia.

This follows on the heels of three epidemiological reports released in 1994. One indicated a tie between occupational exposure to EMFs and Alzheimer' s disease. Another suggested a link with Sudden Infant Death Syndrome (SIDS). The third study indicated a tie with Amyotrophic lateralsclerosis.

Now a surprising new report released in February by physicists at Britain's University of Bristol shows that power lines attract particles of radon -- a colorless, odorless gas irrefutably linked with cancer.

What's this all about? And why have the media failed to report with the appropriate emphasis the implications of these significant health risks?

Shortly after her son Kevin was diagnosed with leukemia, Julie Larm of Omaha, NE. began to notice other children at the local pool who had lost their hair or had surgical scars. As her suspicion rose, she began talking to other parents.

One person she contacted was Dee Hendricks, whose son was also undergoing cancer treatment. Together they collected the names of eleven children in the area who had cancer.

When they plotted them on a map they were surprised to see that all lived within one mile of each other and an electric power substation.

"If there was nothing to worry about, why does our utility have an EMF committee...which was in effect long before we came and started making noise ?" asks Larm, a member of the Omaha Parents for the Prevention of Cancer. "Why do they need such things if theres nothing to it?"

The group's efforts have been buttressed by Paul Brodeur, a campaigning environmental journalist who had in his day taken on asbestos and chlorofluorocarbons and is the author of two books on the subject of EMFs. Brodeur is convinced that EMFs are one of the greatest environmental threats facing the nation.

"Never before has there been this much epidemiological evidence of the carcinogenicity of any agent," says Brodeur, "and that agent declared to be benign."

Robert Becker, M.D., author of *Cross Currents* (Tarcher, 1990), who has studied this subject since the 1960s warns, "EMFs could turn out to be a far worse environmental disaster, affecting far more people, than toxic waste, radiation or asbestos."

To some, especially the families of people with unexplained cancers, the sheer volume of research that has been carried out on this issue suggests there must be a cancer connection and perhaps a cover-up. Their suspicion is heightened by the fact that many of the studies are funded by the utility industry, which would be directly affected by the studies' outcomes.

At the heart of the matter is a relatively simple and well-understood physical phenomenon: When an electric current passes through a wire, it generates an electromagnetic field that exerts forces on surrounding objects. Electric fields arise from the strength of an electric charge; magnetic fields, from the charge's motion.

Unlike ionizing radiations such as x-rays -- which pack sufficient wallop to knock electrons out of the molecules that make up the human body -- EMFs do not produce charged particles, so experts always believed they posed no danger. Therefore, the Federal government has never regulated EMFs, and the electric industry was allowed to set its own standards.

But other recent experimental studies have shown that even weak magnetic fields can change the chemistry of the brain, impair the immune system, and inhibit the synthesis of melatonin, a hormone known to suppress several types of tumors and to be present in reduced amounts in men as well as women who develop breast cancer.

Some lab tests have confirmed that EMFs affect living cells in a variety of ways, most of them harmful. (Scientists are intrigued, however, by their ability to speed slow-healing fractures, enhancing bone formation).

What's confusing is that the studies have produced widely divergent and often contradictory results. On the one hand many scientists are convinced the study of electromagnetic fields is a massive waste of time and money -- costing an estimated one billion dollars a year. After years of extensive study, Dr. Garry Boorman says, "We're not sure what part of the field, if any, is toxic or important, or could be hazardous to your health."

As a PBS "Frontline" documentary reported, scientists have been unable to locate a mechanism by which electromagnetic fields would trigger a biological reaction. The energy in the fields to which most of us are exposed is tiny tens of millions of times too small to break the molecules in cells. All living organisms evolved in the presence of the earths magnetic field, which is two hundred times larger.

Dozens of animal experiments have been carried out in which rats and mice are exposed to very large magnetic fields

for long periods -- some for their entire lives -- but no animal has ever been proven to contract cancer due to this exposure. Generations of rodents raised in the presence of high magnetic fields do not show any increased evidence of birth defects or depressed immune systems.

With no animal data to support the claim and no physical mechanism to explain how it might affect the body, the main support for a connection has come from epidemiology.

As for clusters like the ones which motivated Julie Larm and her group in Omaha, many scientists are skeptical about their significance, if any, to the debate about EMFs. Because conditions like cancer are surprisingly common about one-third of the population gets cancer in their lifetimes random clusters of the disease are not unusual and are found close to and far from power lines.

Still, because of our reliance on electricity and the potential financial consequences for utilities and other companies, the regulation of EMFs is a politically sensitive issue. There is evidence to establish that the Bush administration tried to suppress findings of a study by the Environmental Protection Agency linking electromagnetic fields to certain health problems. The Clinton White House, meanwhile, has been largely silent on the issue.

Cover-Up?

Lending credence to claims that there is, indeed, a public health risk from EMFs and that the government knows about it is that an EPA report a few years ago raised suspicions of a causal link between electromagnetic fields and leukemia, brain tumors, breast and prostrate cancer, even birth defects.

Less-publicized but still significant are some of the foreign studies. Last July, Canadian researchers told the Lancet medical journal they had found a high rate of leukemia among children whose mothers had worked at sewing machines while pregnant.

Checks showed the operators were exposed to more electromagnetic radiation than people who work on power lines or in power stations.
In another study, Swedish researchers assessed the long-term exposure of people living near high-voltage transmission lines by taking spot measurements of the field strength in each home, and using them to confirm the accuracy of a computer model that calculated the strength of the fields emitted by each of the lines, according to distance from the lines, the wiring configurations, and the current level the lines were known to be carrying.

Then they programmed a computer with records of past current loads that had been maintained over the previous 20 years for each of the transmission lines. They were thus able to pinpoint with great accuracy EMF exposure for each cancer victim. What they found was a clear dose-response relationship between exposure to even weak power-frequency electromagnetic fields and the development of cancer, especially acute and chronic myeloid leukemia.

A second Swedish study, which also employed cases and controls, was conducted by epidemiologists. It confirmed that average magnetic field exposure over time was the critical factor in the development of disease. Interestingly, these studies were funded in part by the Swedish utility industry.

Maria Feychting of Swedens Karolinska Institute looked at 127,000 children who lived near big power lines for over 25 years and found twice the risk of leukemia.

"In our study we found about a two-fold increase in the risk if the children were living close, within 50 meters (yards) of a big power line," she told Britain's Channel Four television.

The new study by the University of Bristol showing that power lines can attract cancer-causing gases like radon has heightened concerns.

Even scientists who have failed to find a reason for the apparent link refuse to say it is safe to live near a high-voltage

power line.

Warning to Parents

Of critical importance to all parents is that some studies have suggested that children exposed to magnetic fields of between two and three milligauss or above experienced a significantly increased risk of developing cancer. Since ambient levels of two to three milligauss can routinely be measured in buildings within 50 to 150 feet of wires carrying strong electric current, these findings are especially troublesome.

The report leaked last October by the mellitus National Council on Radiation Protection recommended a safety limit of 0.2 microteslas, a very weak field compared to those generated by household appliances. A person standing one foot away from a vacuum cleaner or electric drill can be exposed to anywhere between two and 20 microteslas.

There is no way to block EMFs (they even penetrate lead shielding), and the only protection is distance from the source.

In our electronic age, its almost impossible to eliminate exposure to the myriad of electrical sources with which we come in contact on a daily basis.

Thousands of electric company substations are scattered throughout our cities large and small and they abut homes, apartments and office buildings -- even schools. Since few of the high-voltage lines that lead into and out of these substations have been buried to prevent harmful emissions, magnetic fields of potent strength can be found virtually everywhere.

Concerns have also been raised about magnetic fields given off by faulty household wiring, by high-current conductors concealed in the walls, ceilings and floors of commercial office buildings and other large structures; and by high-voltage transformers that can be found in almost any large building.

The EPA Raises Questions

Concerns about so-called non-ionizing radiation began to mount in 1979, when a study of cancer rates among Colorado school children determined that those who lived near power lines had two or three times as much chance to develop cancer. The link seemed so improbable that power companies eagerly paid to have the study replicated. To their surprise, the subsequent scientific inquiry supported the original findings, which have since been buttressed by a variety of additional studies and reports of increased cancer rates among workers employed in the electric industry.

One such study, conducted by the Fred Hutchinson Cancer Research Center in Seattle, WA. confirmed that telephone linemen, electricians and electric-power workmen are developing breast cancer at six times the expected rate.

But it was the Environmental Protection Agency's scientific review that has had an explosive impact, lending the most credence to those who have been warning of EMF health hazards.

The report -- a 367-page document entitled "Evaluation of the Potential Carcinogenicity of Electromagnetic Fields" -- came to light in 1990, when someone in the agency leaked a draft version of it to Louis Slesin, editor of an influential newsletter called *Microwave News*.

Chief among the conclusions was one specifying that power line electromagnetic fields should be classified as a "probable human carcinogen." William Farland, then-director of the EPA's Office of Health and Environmental Assessment ordered this conclusion deleted from the report.

Then the Associated Press reported that the Bush administration tried to delay release of the EPA's findings. Robert E. McGaughy, the project manager and chief author of the report, was quoted as saying that the White House "was concerned not about the accuracy of the report...[but] about how people would react to the news and how it would

affect the electric power industry."

Ultimately, after two major TV networks and newspapers throughout the country exposed the Bush administration's efforts at censorship, the report was released. It contained a disclaimer that asserted "the controversial and uncertain nature of the scientific findings of this report" and declared that it should not be construed as "representing Agency policy or position."

The Medical Connection

Just how EMFs affect humans is still not entirely known.

In the case of cancer, most specialists theorize that a malignant tumor forms in at least two stages. In the first, referred to as "initiation," an outside agent damages the cell's genetic material. Because EMFs are not strong enough to break molecular and chemical bonds, scientists are concentrating on the second stage of cancer, a series of steps called "promotion." Researchers are tying to pinpoint ways in which EMFs might cause cells to grow and multiply abnormally.

Some studies suggest that EMFs may promote cancer by interfering with the transmission of calcium across the cell membrane, a flow that governs such processes as muscle contraction, egg fertilization, cell division, and growth. EMFs may also disturb a cell's ability to process hormone, enzyme, and other biological signals that regulate normal growth.

EMFs are known to affect nerve impulses. Melatonin, a regulatory hormone secreted by the pineal gland near the brain, ordinarily stimulates immune responses and may suppress tumor growth. Reduced melatonin production has been linked to breast and prostate cancer. Melatonin secretion in turn is controlled by norepinephrine, a neurotransmitter in the brain. Receptors for its relative, the hormone epinephrine, are disturbed by EMFs.

Some doctors stated that their observations led them to believe that it was possible that magnetic fields stimulate the rate of cancer cell growth, or act as a cancer promoter.

A San Antonio researcher discovered human cancer cells exposed to 60 Hz fields (the frequency of a high-voltage line) grew as much as 24 times as fast as unexposed cells and showed greatly increased resistance to destruction by the cells of the body's defense system.

Female breast cancer has reached epidemic proportions, with one in ten American women developing it and one in four dying. Alarmingly, of women who develop the disease, 55% have no known risk factors. Breast cancer mortality rates are five times lower in Asia and Africa than in industrialized North America and northern Europe regions where EMFs are omnipresent.

Electric Companies On the Spot

A contention of the electric utility industry in the United States had been that the pathologies referred to in most of the studies might actually have been induced by exposure to pesticides, chemicals or other toxic agents in the environment.

For a time they contended that if power-line magnetic fields really did cause cancer, the fivefold increase in electrical usage during the past 30 years would have been expected to have produced an epidemic of childhood leukemia. The utility industry stopped making this statement in June of 1991, after the National Cancer Institute disclosed that a study it had made showed that in recent years there had been unexplained increases of nearly 11% in childhood leukemia, and of more than 30% in childhood brain cancer.

A study in the *American Journal of Industrial Medicine* reported a steep increase in brain-cancer rates over the past dozen years among the general population.

People working with computer monitors are developing primary brain tumors at nearly five times the expected rate.

Still, as Dr. Becker observes, "Companies wont admit that EMFs are risky, because they will become liable. And the government wont, because it is the largest user of the electromagnetic spectrum, especially for military communications. Our whole economy depends on them now."

Not surprisingly, as people begin to focus on the problem of EMFs, property values near power lines and electric substations have been plummeting, and numerous lawsuits have been filed.

Click Here To Recommend This Story To A Friend

Back to the top

MIDWEST TODAY
P.O. BOX 685, PANORA, IA. 50216