

Health effects from dirty electricity



Science has linked dirty electricity with a number of health effects. We summarize the available scientific studies.

Keywords: dirty electricity, transients, EMI, electricity, health effect, science, diabetes, cancer, ADHD, multiple sclerosis, children, neurotransmitters

What is dirty electricity and what causes it?

Dirty electricity is high-frequency waves that travel on electrical wiring in homes and offices. They are created by many kinds of electronic equipment, such as:

- Computers
- Household electronics
- Energy-efficient lightbulbs (CFL, LED)
- Battery chargers
- Light dimmers
- Digital electrical meters
- Solar system inverters

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There are many other possible sources. Some may be outside the home, with the dirty electricity entering the home on the incoming wires.

Further information is available through the link at the end of this article (before the reference list).

Health effects

Scientific studies have linked dirty electricity to the following possible health effects:

- Attention deficiency hyperactivity disorder (ADHD)
- Diabetes
- Cancer (multiple kinds)

There is also some evidence that dirty electricity can exacerbate multiple sclerosis and affect neurotransmitters.

These links are not yet proven, and it may be that some of them turn out not to be true after all. Or there may be other health effects not yet identified. In the following we'll go through the studies that produced the above list. It is notable that the listed diseases were virtually unheard of until electricity became widely available.

People who are electrically sensitive sometimes report various symptoms when exposed to dirty electricity. Many stories are heard in the patient community, but this has not been investigated by scientists.

How does dirty electricity affect people?

It is not known how dirty electricity affects people. It is known that when dirty electricity travels on wires, it turns them into antennas that radiate the frequencies. This can be measured objectively (Vignati, 1997; Stott, 2004; Loftness, 2007). Sometimes it can even be picked up as static with a simple AM radio.

A human standing or sitting near such an electrical wire will receive the radiated field, which induces a small current in the body. The current increases with the frequency (Vignati, 1997; Armstrong, 1994).

The human body is more conductive for higher frequencies, which means an induced current, at, say, 10 Kilohertz, will penetrate more easily than one at the regular power frequency (50 or 60 hertz) (Relly, 1992).

These small currents may have a health effect, perhaps depending on the specific frequency. It is known that the human body relies on small currents to direct cells to repair wounds, broken limbs, etc. This was discovered already in the early 1980s (Becker, 1985).

Another exposure can be when people touch metal appliances, such as dish washers, washing machines and metal lamps. These are usually grounded through the electrical ground wire, but in practice they do carry a small voltage. Thus there will be a small current running through a person touching the appliance (Kavet, 2000).

Currently the research focus is on health effects from wireless technologies, which has resulted in newer theories, but we haven't found any articles considering whether any of them also apply to dirty electricity.

The McGill University study of electrical workers

The first mention of possible health effects from dirty electricity in the scientific literature was in a 1988 study of Swedish workers at 400 kilovolt substations. The authors wondered if the sparking and arcing the workers were exposed to might affect their health (Nordenson, 1988).

The first actual study of dirty electricity was published in 1994. It was done as part of a large study of electrical utility workers in Canada and France, where they investigated 2679 cases of cancer. They found the Canadian workers at Hydro-Quebec were more exposed to dirty electricity than the French workers and that the highest exposed workers had more than six times the average rate of lung cancer, which was statistically significant (Armstrong, 1994; Microwave News, 1994b).

This was a pioneering study where the scientists had to design a special instrument the workers wore to record their exposure to dirty electricity during a workday.

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The utility industry was quick to downplay the study and blame the lung cancers on people smoking, even though the study has taken that into account (Microwave News, 1994b).

The Canadian utility then prevented the McGill University scientists from doing further research. The utility legally owned all the data and they refused any further use of it, despite multiple pleas from the scientists (Microwave News 1994c, 1996).

The Havas Studies

Another Canadian, Magda Havas of Trent University, looked into dirty electricity around 2004.

One case study tracked the blood sugar (glucose) levels of two people with diabetes. The levels rose when the dirty electricity increased. (The study found the same effect in a third diabetic when exposed to radiation from a mobile phone base station.) (Havas, 2004a.)

A rural family reported increased well being when the dirty electricity was reduced in their home. It was finally eliminated by disconnecting the house from the grid. Then their two diabetic children both had lower blood sugar levels and required less insulin (Havas, 2004a).

The same study also found significant improvement in three individuals with moderate multiple sclerosis once the dirty electricity in their homes was reduced (Havas, 2004a).

The effect of reducing the dirty electricity by using the Stetzer plug-in capacitors was tried in two schools.

A simple pilot experiment was done in a school in Wisconsin. The school nurse watched for effects, which included “dramatically reduced” teacher absences due to sickness, and that the students used their asthma inhalers a lot less. Since this was not a full study, there is no report, but the story is briefly told in two conference proceedings (Havas, 2004a, 2004b) and in statements from the school nurse (Sbraggia, 2004, 2005).

A full study was then done in a school in Toronto, Canada. This school was chosen since it had one electrically sensitive student (Havas, 2004b).

They again used the Stetzer capacitors, which were plugged into outlets throughout the school.

The teachers were asked to fill in questionnaires twice daily for a six week period. They were asked about their own health status and how well each class behaved in terms of disruptions, focus and participation. The teachers were not told the nature of the study (i.e. about the dirty electricity) or that their environment would be changed for three weeks out of the six weeks, i.e. this was a single-blind study. (Some teachers may have noticed the little plug-in capacitors, so the blinding was not perfect.) No other measures were taken, such as identifying and unplugging individual sources of the dirty electricity.



The study found that when the dirty electricity was reduced, the students were more attentive, participated more in class and were less disruptive. This was pronounced in the elementary grades and less so with the older students. 56% of the participating teachers reported feeling better during the weeks the capacitors were installed.

Then Havas published several additional case studies of people who felt better after reducing the dirty electricity levels in their homes (Havas, 2004c). One of the cases was a diabetic whose blood sugar became nearly normal and her use of insulin dropped. Another case was a woman with multiple sclerosis who reported a number of symptom improvements (Havas, 2004c).

A second series of case studies involved four people with diabetes, including a 12-year old boy, who all objectively improved when the level of dirty electricity was lowered (Havas, 2008).

A nursing home in Ontario, Canada, monitored five of their diabetic residents before and after mitigation of their dirty electricity. Three of them improved. A

similar response was observed with three diabetic patients at a clinic in Japan (Havas, 2008).

In these case studies the people all knew about the changes in their environments, so their reports of improved symptoms could be the placebo effect, though the clear changes in the diabetic people's glucose levels and decreased need for insulin are remarkable.

The Stetzer capacitors are easy to install and are relatively low cost. However, their ability to reduce dirty electricity is limited and since they consume electricity they do increase the magnetic field around the wall wiring. There are better filters available, but they cost more and must be professionally installed.

The Milham Studies

Samuel Milham, MD, MPH, is a retired epidemiologist with a long career of investigating health risks of various kinds, especially associated with electricity.

He investigated a cancer cluster among the teachers at a middle school in California. He found the teachers teaching in the rooms with high levels of dirty electricity were more likely to get cancer (Milham, 2008; Milham, 2012).

Of the 137 teachers who had worked in the school, sixteen of them got cancer, some of them more than one type. He found that the ratio of malignant melanoma was 9.8 times the norm, thyroid cancer 13.3 times and uterine cancer 9.2 times.

The dirty electricity level in the school was very high compared to a then-recent survey of 125 northern California homes, and survey of another school and an office building. Milham calculated the cumulative exposure to dirty electricity for each teacher and found it correlated with her cancer risk.

While investigating another cancer cluster in a different school, (next to a mobile phone tower), Dr. Milham noticed a classroom had very high levels of dirty electricity. The fourth grade teacher complained that her students were unusually hyperactive and unteachable. Dr. Milham installed five Stetzer capacitors in the room and the following week the teacher reported the children were a lot more attentive. This was not a proper study, since the teacher knew about the capacitors. Dr. Milham didn't write an article, but just related the story in a letter (Milham, 2012?)

Scientists in Germany tested the neurotransmitters in people living near a new cell tower in the town of Rimbach. They found that the levels of four of the

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neurotransmitters permanently changed when the new tower was activated (Buchner, 2011).

This study inspired Dr. Milham to see if dirty electricity has a similar effect. Together with David Stetzer he tested the levels of the neurotransmitters dopamine and phenylethylamine in the staff of a library with extremely high levels of dirty electricity (and low levels of microwaves). Then they mitigated the problems in the library and also in the homes of the seven staff members.

They monitored the neurotransmitters in the 18 weeks following the mitigation. The levels of dopamine and phenylethylamine dropped sharply after the mitigation of the dirty electricity and then gradually rose again, which suggests that neurotransmitters are indeed affected by dirty electricity (Milham, 2013).

Animal Studies

In a 1994 Swedish-American study, scientists exposed mice to both a carcinogenic chemical and a 50 hertz magnetic field. There were three groups of mice:

The first group was exposed to the chemical only. The second group was exposed to both the chemical and a continuous 50 hertz magnetic field. The third group was also exposed to the chemical and the magnetic field, but here the magnetic field was rapidly turned on and off.

The third group developed many more tumors, and more rapidly than the other two groups. The reason appears to be the spikes (i.e. dirty electricity) created the many times the magnetic field was turned on (Rannug, 1994; Microwave News, 1994a).

Modulation

Modulation is when a carrier wave is modified by one or more additional frequencies. This is done intentionally for wireless communication, such as mobile phone and radio broadcasts. Several studies have found biological effects caused by modulation of radio-frequency signals, though it is unknown whether they are harmful or not (Blackman, 2007).

Dirty electricity is similar to modulation, since it modifies the 50 hertz/60 hertz household current's carrier wave. It may be that some of the findings for modulation of radio-frequency signals also apply to dirty electricity, but we have not found any articles considering that possibility.

Indirect Evidence

When electrical service was rolled out in the United States, it took two generations to cover the entire country. Electricity was initially only available in the cities, later on it gradually reached more and more rural areas. When an area became connected to the electrical grid, the rates of cancer, diabetes and heart disease went up dramatically. Using public health records, the rise of these diseases can be followed state by state and often county by county as well, as the electrical grid expanded (Milham, 2010).

In those days electricity was mostly used for incandescent light bulbs and electric motors. There was almost no electronics, but generators and electrical motors used brushes to transfer electricity to the rotor. Brushes generate a lot of dirty electricity by arcing and sparking.



In the Midwestern United States and Canada lives a religious sect called the Old Order Amish. They live without electricity or other modern conveniences, such as telephones, radios, and cars. (Cars expose people to powerful dirty electricity.) They have no ADHD and little obesity, cancer or diabetes (Milham, 2014).

Dr. Michael Ruff is a pediatrician who serves 800 Amish households. He states “We haven’t diagnosed a single child in this group with ADHD... On the other

hand we care for several Amish families who have left the church and adopted a modern lifestyle, and we do see ADHD...in their kids. Obviously, the genes in these two groups are the same. What's different is their environment" (Sherman, 2017).

The countries in the world that have the highest rates of obesity and diabetes tends to be low-income island nations in the Pacific. Those with the lowest levels tend to be low-income mainland nations in Asia and Africa.

What distinguishes these are not their income level, but that the high-obesity/high-diabetes nations are islands. Islands tend to get their electricity from diesel generators instead of large power plants. And diesel generators produce dirtier electricity than giant central power plants (Milham, 2014).

This difference may account for why island nations have so much obesity and diabetes, though other factors may explain it, such as genetic makeup and traditional diet.

More research

The study of health effects from dirty electricity has just started, and is not yet recognized by funding agencies as a "legitimate" field of study. Other than the 1994 study of Canadian utility workers, all the studies have been done on a shoestring.

Well-funded research is needed to provide robust evidence. There is a need for larger studies of various types.

The studies done by Havas and Milham, where the dirty electricity is mitigated, must be repeated and strengthened. The mitigation must be done using professional methods, including in-line filters, instead of the simple plug-in capacitors which are of limited value and can make things worse. These studies must also be done without any visual clues (i.e. using dummy plug-ins, or totally hidden measures).

School studies can be done over longer periods of time and compare grades and disciplinary actions with the level of dirty electricity each class is exposed to.

Some professions are exposed to elevated levels of dirty electricity, such as arc welders and some computer users. These occupations may be worth studying.

There is also a need to look into whether the “dirty” electric field or the magnetic field are causing the effect. The studies that provided measurements looked only at the electric field fluctuations, and mostly indirectly.

The Hydro-Quebec study is the only one that used a sort of dosimeter (measuring the electric field in the 5 to 20 MHz range). The other studies measured the fluctuation of the voltage on the cables in the walls, and only in the lower Kilohertz range.

More information

Other articles about dirty electricity are available at www.eiwellspring.org/demenu.html.

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