

Research guide on health effects of electromagnetic fields June 5 2019

By Mark Graham

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Introduction

There have been thousands of studies from countries around the world that have found significant health effects (problems, results) as a result of long term exposure to non-ionizing electromagnetic radiation (EMR) far below the guidelines or limits set by most countries. The U.S. exposure guidelines were created by the Federal Communications Commission (FCC) in 1996 based on data from the 1980s and several false assumptions. They really are meant to protect industry profits, not people. That is a somewhat complicated subject for another place. This research guide is intended to present a significant amount of this research and help guide your investigation of the subject.

The wireless companies' response is usually that their equipment complies with the FCC guidelines. That may be true; however it does not mean their equipment is safe. They often say there is not a "consensus" in the scientific literature. That may be the direct result of industry sponsored research intended to reach a predetermined conclusion. Big Tobacco and nearly every polluting industry (toxic chemicals, pharmaceuticals, insecticides, etc.) have used the same arguments and strategy.

In my opinion public agencies (cities, counties, states, districts and even the federal government) should be guided by the Precautionary Principle when it comes to allowing 24/7 involuntary exposure to EMR from things such as cell towers, antennas, and phones, smart utility meters, wifi transmitters, wireless access points, baby monitors, etc. That Principle says we should err on the side of caution when there is uncertainty as to the long term health effects of a given product. Better safe than sorry. The industry claims to be "for more research", but they want to continue the unregulated marketing of their products while that research goes on – or in the case of 5G doesn't go on. Also, whenever there has been research showing health effects from their products they have disregarded it, reverting to the 2 defenses / excuses described earlier here.

These studies, appeals, resolution, and statements by scientists form, in my opinion, a very strong factual basis for minimizing one's exposure to EMR. A public agency generally has an obligation to protect its residents, but it is also often pressured by corporations to further the corporate interests. The Telecommunications Act of 1996, section 704, pre-empts certain regulation by state or local governments "on the basis of the environmental effects" of EMR as long as the equipment complies with the FCC guidelines. This does NOT mean that state and local governments have no power although the industry likes to present it that way. It is a very specific pre-emption within a section of the Act titled "Preservation of local zoning authority."

With that, here are some sources for your research in no particular order.

Both AT&T and Verizon exclude injuries from EMR from their insurance coverage and define EMR as a “pollutant”.

<http://www.keepcellantennasawayfromourelkgrovehomes.org/insurance-exemptions-for-harm-from-emf/>

The EMF Call

In order to protect the public and the environment from the known harmful effects from electromagnetic fields (EMF) we ask the United Nations, the World Health Organization and all governments not to accept the ICNIRP guidelines. They are not protective, rather they pose a serious risk to human health and the environment since they allow harmful exposure to the world population, including the most vulnerable, under the unscientific pretext that they are “protective”.

<https://www.emfcall.org/the-emf-call/>

The International EMF Scientist Appeal

Scientific basis for our common concerns

Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life.

<https://www.emfscientist.org>

BioInitiative 2012

Do we know enough to take action?

There is more evidence than we need.

The last five years worth of new scientific studies tell us the situation is much worse than in 2007 and yet people around the world have so much more daily exposure than even five years ago. Exposures are linked to a variety of adverse health outcomes that may have significant public health consequences. When added across billions of people worldwide, no argument for the status quo can be persuasive now.

In twenty-one technical chapters of this 2012 update, the contributing authors discuss the content and implications of about 1800 new studies. Overall, there is reinforced scientific evidence of risk where there is chronic exposure to low-intensity electromagnetic fields and to wireless technologies (radiofrequency radiation including microwave radiation).

There is more evidence in 2012 that such exposures damage DNA, interfere with DNA repair, evidence of toxicity to the human genome (genes), more worrisome effects on the nervous system (neurology) and more and better studies on the effects of mobile phone base stations (wireless antenna facilities or cell towers) that report lower RFR levels over time can result in adverse health impacts. There has been a big increase in the number of studies looking at the effects of cell phones (on the belt, or in the pocket of men radiating only on standby mode) and from wireless laptops on impacts to sperm quality and motility; and sperm death (fertility and reproduction).

In other new studies of the fetus, infant and young child, and child-in-school – there are a dozen or more new studies of importance.

<https://bioinitiative.org>

The American Academy of Pediatrics wrote a letter in 2013 to FCC

As radiation standards are reassessed, the AAP urges the FCC to adopt radiation standards that:

- Protect children's health and well-being. Children are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children. It is essential that any new standard for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded throughout their lifetimes.
- Reflect current use patterns. The FCC has not assessed the standard for cell phone radiation since 1996. Approximately 44 million people had mobile phones when the standard was set; today, there are more than 300 million mobile phones in use in the United States. While the prevalence of wireless phones and other devices has skyrocketed, the behaviors around cell phone uses have changed as well. The number of mobile phone calls per day, the length of each call, and the amount of time people use mobile phones has increased, while cell phone and wireless technology has undergone substantial changes. Many children, adolescents and young adults, now use cell phones as their only phone line and they begin using wireless phones at much younger ages. Pregnant women may carry their phones for many hours per day in a pocket that keeps the phone close to their uterus. Children born today will experience a longer period of exposure to radio-frequency fields from cellular phone use than will adults, because they

start using cellular phones at earlier ages and will have longer lifetime exposures. FCC regulations should reflect how people are using their phones today.

<https://ecfsapi.fcc.gov/file/7520941318.pdf>

The California Medical Association passed a resolution in December, 2014

Whereas scientists are increasingly identifying EMF from wireless devices as a new form of environmental pollution with a growing body of peer reviewed scientific evidence finding significant adverse health and biologic effects on living organisms with exposure to low levels of non-ionizing microwaves currently approved and used in wireless communication, and

Whereas peer reviewed research has demonstrated adverse biological effects of wireless EMF including single and double stranded DNA breaks, creation of reactive oxygen species, immune dysfunction, cognitive processing effects, stress protein synthesis in the brain, altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and brain tumors; and (2-55)

<https://ehtrust.org/the-california-medical-association-wireless-resolution/>

There was a study recently that found an association between miscarriage and magnetic field exposure.

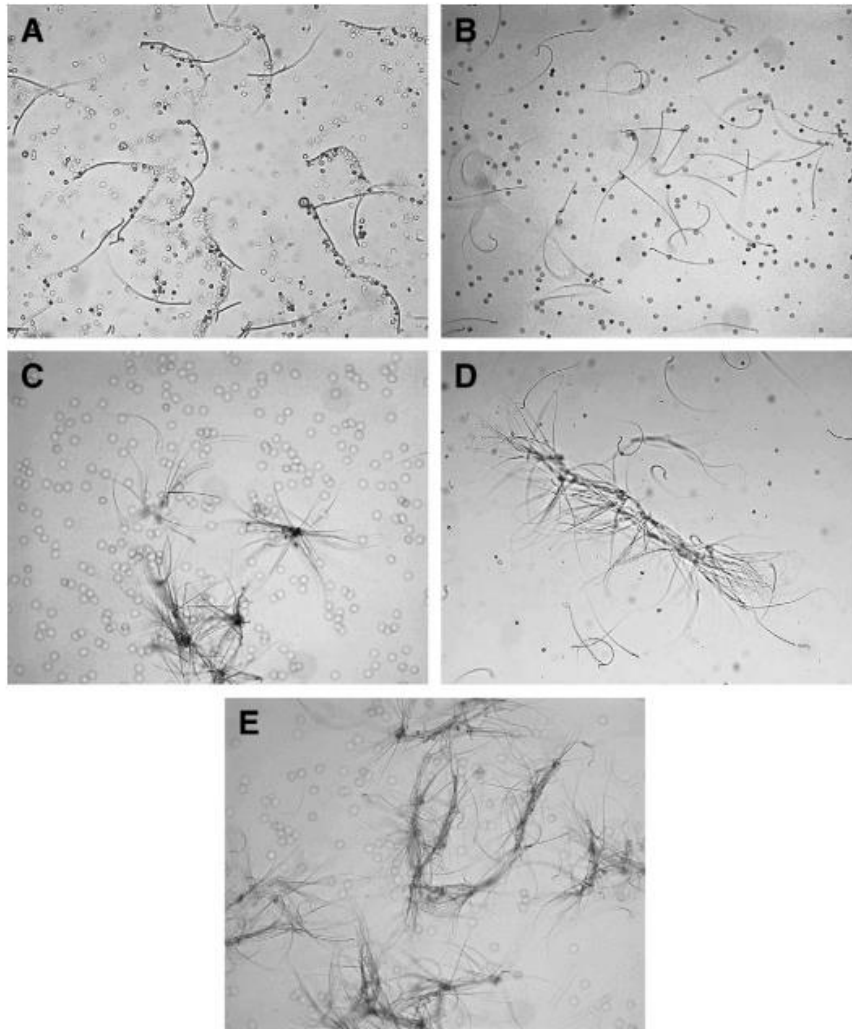
Magnetic field (MF) non-ionizing radiation is widespread and everyone is exposed to some degree. This prospective cohort study of 913 pregnant women examined the association between high MF exposure and miscarriage risk. Cox (proportional hazards) regression was used to examine the association. After controlling for multiple other factors, women who were exposed to higher MF levels had 2.72 times the risk of miscarriage (hazard ratio = 2.72, 95% CI: 1.42–5.19) than those with lower MF exposure.

<https://www.nature.com/articles/s41598-017-16623-8>

EMF effects on sperm cells

FIGURE 2

Sperm samples at $\times 20$ magnification. **(A)** Sperm cells from the experimental group, which appear dead. These cells are rigid with edema in the tails, giving them a wider appearance. Many blood cells are also sticking to the dead sperm cells. **(B)** Sperm sample from the control group. These individual sperm cells are evenly distributed across the slide without changes in gross morphology. These cells were actively moving. **(C)** Sperm sample from the experimental group, with sperm cells stuck together in type I clumps: Sperm heads are closely stuck together to form an umbrella shape. **(D)** Sperm sample from the experimental group, with sperm cells stuck together in type II clumps: Sperm cells are stuck together to form a small clump, and these small clumps are stuck together to form a big grass-bundle shape. **(E)** Sperm sample from the experimental group, with sperm cells stuck together in type III clumps: Sperm tails are stuck to the heads to form a ring shape. Some sperm cells in all types of clumps appeared to be alive, because there was some flagellar action, but they were unable to move individually.



Yan. *Cellular Phones Affect Sperm Motility. Fertil Steril* 2007.

<http://www.sacsmartmeters.org/scientific-studies/emf-effects-on-sperm-cells/>

Martin Blank, Ph.D. on the scientific research on health hazards of non-ionizing radiation.

“It has been assumed that non-ionizing radiation and the devices that generate it are biologically safe at levels insufficient to heat human tissue. But this is not the case. As I will explain in the coming chapters, there is a significant body of peer reviewed, high quality science that directly and clearly demonstrates that all forms of electromagnetic radiation - including non-ionizing radiation - have observable effects on biological systems. Biological reactions can be affected by exposure to all parts of the spectrum - even in the very low frequency ELF range. *All EMF is bioactive.*”

(emphasis in original)

Overpowered: What Science Tells us About the Dangers of Cell Phones and Other Wifi-Age Devices, Martin Blank, Ph.D., Seven Stories Press, 2014, p. 30

<http://www.randomhouse.com/book/226324/overpowered-by-martin-blank-phd>

You can read about Dr. Blank’s qualifications and publications here:

<http://www.physiology.columbia.edu/MartinBlank.html>

5G: Great risk for EU, U.S. and International Health! Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them

Written and Compiled by Martin L. Pall, PhD
Professor Emeritus of Biochemistry and Basic Medical Sciences

Summary:

We know that there is a massive literature, providing a high level of scientific certainty, for each of eight pathophysiological effects caused by non-thermal microwave frequency EMF exposures. This is shown in from 12 to 35 reviews on each specific effect, with each review listed in Chapter 1, providing a substantial body of evidence on the existence of each effect. Such EMFs:

1. Attack our nervous systems including our brains leading to widespread neurological/neuropsychiatric effects and possibly many other effects. This nervous system attack is of great concern.
2. Attack our endocrine (that is hormonal) systems. In this context, the main things that make us functionally different from single celled creatures are our nervous system and our endocrine systems – even a simple planaria worm needs both of these. Thus the consequences of the disruption of these two regulatory systems is immense, such that it is a travesty to ignore these findings.

3. Produce oxidative stress and free radical damage, which have central roles in essentially all chronic diseases.
4. Attack the DNA of our cells, producing single strand and double strand breaks in cellular DNA and oxidized bases in our cellular DNA. These in turn produce cancer and also mutations in germ line cells which produce mutations in future generations.
5. Produce elevated levels of apoptosis (programmed cell death), events especially important in causing both neurodegenerative diseases and infertility.
6. Lower male and female fertility, lower sex hormones, lower libido and increased levels of spontaneous abortion and, as already stated, attack the DNA in sperm cells.
7. Produce excessive intracellular calcium [Ca²⁺]_i and excessive calcium signaling.
8. Attack the cells of our bodies to cause cancer. Such attacks are thought to act via 15 different mechanisms during cancer causation.

<https://peaceinspace.blogs.com/files/5g-emf-hazards--dr-martin-l.-pall--eu-emf2018-6-11us3.pdf>

Scientists and Doctors Warn of Potential Serious Health Impacts of Fifth Generation 5G Wireless Technology

The Precautionary Principle (UNESCO) was adopted by EU 2005: "When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm."

Resolution 1815 (Council of Europe, 2011): "Take all reasonable measures to reduce exposure to electromagnetic fields, especially to radio frequencies from mobile phones, and particularly the exposure to children and young people who seem to be most at risk from head tumours... Assembly strongly recommends that the ALARA (as low as reasonably achievable) principle is applied, covering both the so-called thermal effects and the athermic [non-thermal] or biological effects of electromagnetic emissions or radiation" and to "improve risk-assessment standards and quality".

We urge EU:

- 1) To take all reasonable measures to halt the 5G RF-EMF expansion until independent scientists can assure that 5G and the total radiation levels caused by RF-EMF (5G together with 2G, 3G, 4G, and WiFi) will not be harmful for EU-citizens, especially infants, children and pregnant women, as well as the environment
- 2) To recommend that all EU countries, especially their radiation safety agencies, follow Resolution 1815 and inform citizens, including, teachers and physicians, about health risks from RF-EMF radiation, how and why to avoid wireless communication, particularly in/near e.g., daycare centers, schools, homes, workplaces, hospitals and elderly care.

<https://www.globalresearch.ca/scientists-and-doctors-warn-of-potential-serious-health-impacts-of-fifth-generation-5g-wireless-technology/5609503>

WhatIs5G.info

OVERVIEW

Before us looms perhaps the biggest health and environmental crisis of our times, that of the proliferation of wireless technology. The current soup of wireless radiation is effectively playing with the genetic makeup of all life.

And yet we now stand at the threshold of unleashing 5th generation cellular technology, 5G, which according to former FCC Chair Wheeler “will make available more licensed spectrum for mobile than in the cumulative history of mobile spectrum allocation.” It will take nothing short of a massive public awareness campaign to put the breaks on the aggressive and fast-moving wireless industry and our complicit government. But there is no choice. Many scientists are calling for caution now, and more recently, 180 scientists issued an appeal for a moratorium on 5g. We must heed the call.

We have a problem

It is well known, and even the FCC agrees, that wireless radiation that heats us, can be hazardous. If it burns us, it can harm us. But a debate has been on-going for over 60 years as to whether radiation that has negligible thermal effects – that is, it heats us only minimally – can impact health. Independent science overwhelmingly finds that non-thermal radiation can cause a multitude of health problems, while industry-funded science, more often than not, contends non-thermal radiation is safe.

<http://www.emfwise.com/myth.php>

<https://whatis5g.info/health/>

FCC admitted in 1999 that “non-thermal” effects might exist; said more research was needed

In 1999 FCC wrote that more research was needed on “non thermal effects”:

“In general, while the possibility of ‘non-thermal’ biological effects may exist, whether or not such effects might indicate a human health hazard is not presently known. Further research is needed to determine the generality of such effects and their possible relevance, if any, to human health.”

(Federal Communications Commission, Office of Engineering & Technology, “Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields”, OET BULLETIN 56, Fourth Edition, August 1999, page 8)

<https://www.fcc.gov/general/oet-bulletins-line>

and more specifically here:

https://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e4.pdf

EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses.

It should be noted that, during the last 20 years, more than 20 position papers and resolutions regarding EMF and health have been adopted by EMF researchers and physicians. These include the

Vienna EMF Resolution, Austria, 1998;

Stewart Report, UK, 2000;

Salzburg Resolution, Austria, 2000;

Freiburg Appeal, Germany, 2002;

Catania Resolution, Italy, 2002;

Irish Doctors' Environmental Association Statement, Ireland, 2005;

Helsinki Appeal, Finland, 2005;

Benevento Resolution, Italy, 2006;

Venice Resolution, Italy, 2008;

Porto Alegre Resolution, Brazil, 2009;

Russian National Committee on Non-Ionizing Radiation Protection Resolution, Russia, 2001;

International Doctors' Appeal, Europe, 2012; and

the Report of the Standing Committee on Health, Canada, 2015 (31–34).

<https://www.ncbi.nlm.nih.gov/pubmed/27454111>