

Melnykovych, Andrew (PSC)

From: Melnykovych, Andrew (PSC)
Sent: Monday, January 06, 2014 12:17 PM
To: 'song bird'
Subject: RE: Case 2012-00428 Docs

Ms. Holloway-

The documents attached to the e-mail below, as well as the earlier document "Cherry - 31 studies" will be placed into the case record for the Commission's consideration in the above-referenced matter. As I noted in an earlier e-mail, for procedural reasons the documents they are being entered as attachments to public comments, rather than as evidence.

Thank you for your continued interest.

Andrew Melnykovych
Director of Communications
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601
502-782-2564 cell:502-330-5981

RECEIVED

By Kentucky Public Service Commission at 12:22 pm, Jan 06, 2014

-----Original Message-----

From: song bird [REDACTED]
Sent: Saturday, January 04, 2014 1:48 PM
To: Melnykovych, Andrew (PSC)
Subject: Case 2012-00428 Docs

Dear Mr. Melnykovych,

Attached please find 3 document from the American Academy of Environmental Medicine and 1 document from the California Council on Science and Technology on "Health Impacts of Radio Frequency from Smart Meters".

Please enter them into evidence for Case 2012-00428

Per my daughter's conversation with you, we understand you are of the belief that smart meters are not dangerous. I want to make sure that for the sake of you, your family, the courts, and the entire nation, that you have as many epidemiological studies, research, and documentation available to prove and confirm that these meters are deadly and should not be allowed to even be made, let alone installed on any business or home!

I am of the opinion that these utility companies and big businesses are either totally ignorant of the dangers because they didn't do the research and only cared about the money, or they are fully aware and just don't care about anything except the money!

Personally I believe there is more than enough evidence and public outcry to prove these meters are deadly and shouldn't be made, let alone installed!

Thank-you for your time,

Ruby Holloway



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November 14, 2013

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Wireless Radiofrequency Radiation in Schools

Founded in 1965 as a non-profit medical association, the American Academy of Environmental Medicine (AAEM) is an international organization of physicians and scientists interested in the complex relationships between the environment and health. For forty years the Academy has trained Physicians to treat the most difficult, complex patients who are often left behind by our medical system, because their illness, rather than stemming from traditionally understood factors, is related to underlying environmental causes, including (bio)chemical or radiation exposures. AAEM physicians, and physicians world-wide, are treating patients who report adverse, debilitating health effects associated with exposure to radiofrequency energy (RF).

The AAEM strongly supports the use of wired Internet connections, and encourages avoidance of radiofrequency such as from WiFi, cellular and mobile phones and towers, and “smart meters.”

The peer reviewed, scientific literature demonstrates the correlation between RF exposure and neurological, cardiac, and pulmonary disease as well as reproductive and developmental disorders, immune dysfunction, cancer and other health conditions. The evidence is irrefutable. Despite this research, claims have been made that studies correlating emissions from WiFi, phones, smart meters, etc. with adverse health effects do not exist.

In May 2011 the World Health Organization elevated exposure to wireless radiation, including WiFi, into the Class 2b list of Carcinogens; recent research strengthens the level of evidence regarding carcinogenicity.

There is consistent, emerging science that shows people, especially children who are more vulnerable due to developing brains and thinner skulls, are being affected by the increasing exposure to wireless radiation. In September 2010, the Journal of the American Society for Reproductive Medicine-Fertility and Sterility, reported that only four hours of exposure to a standard laptop using WiFi caused DNA damage to human sperm.

In December 2012 the American Academy of Pediatrics, representing 60,000 pediatricians, wrote to Congress requesting that it update the safety levels of microwave radiation exposure especially for children and pregnant women.

With WiFi in public facilities as well as schools, children would be exposed to WiFi for unprecedented periods of time, for their entire childhood. Some of these signals will be much more powerful than would be received at home, due to the need for the signals to go through thick walls and to serve many computers

simultaneously. Signals in institutions are dozens of times more powerful than café and restaurant systems.

To install WiFi in schools plus public spaces risks a widespread public health hazard that the medical system is not yet prepared to address. Statistics show that you can expect to see an immediate reaction in 3% and delayed effects in 30% of citizens of all ages.

It is better to exercise caution and substitute with a safe alternate such as a wired connection. While more research is being conducted, children must be protected. Wired technology is not only safer, it also stronger and more secure.

While the debate ensues about the dangers of RF, it is the doctors who must deal with the after effects. Until we can determine why some get sick and others do not, and some are debilitated for indeterminate amounts of time, we implore you to not take the risk, particularly with the health of so many children with whose safety you have been entrusted. Avoidance will always be the best policy. It should be reflected by minimizing RF exposures in public spaces.

Respectfully,

The Board of Directors of the American Academy of Environmental Medicine

Comments on the Draft Report
by the California Council on Science and Technology
“Health Impacts of Radio Frequency from Smart Meters”

by Daniel Hirsch¹
31 January 2011

Abstract

The draft report by the California Council on Science and Technology (CCST) does not appear to answer the questions asked of it by the requesting elected officials. Furthermore, rather than being an independent, science-based study, the CCST largely cuts and pastes estimates from a brochure by the Electric Power Research Institute, an industry group, issued some weeks earlier. The EPRI estimates appear incorrect in a number of regards. When two of the most central errors are corrected – the failure to take into account duty cycles of cell phones and microwave ovens and the failure to utilize the same units (they should compare everything in terms of average whole body exposure) **the cumulative whole body exposure from a Smart Meter at 3 feet appears to be approximately two orders of magnitude higher than that of a cell phone, rather than two orders of magnitude lower.**

It is strongly recommended that CCST revise its Draft Report and conduct actual measurements of cell phone, microwave oven, and SmartMeter RF cumulative whole body power densities. If measurements aren't made, then rigorous calculations correcting for cell phone and microwave oven duty cycles and whole body exposures should be made.

A summary figure below shows how rough estimates of the effect of those corrections suggest SmartMeters may produce cumulative whole body exposures far higher than that of cell phones or microwave ovens.

¹ The assistance of two UCSC student research assistants, Bailey Hall and Catherine Wahlgren, in the preparation of this review is gratefully acknowledged.

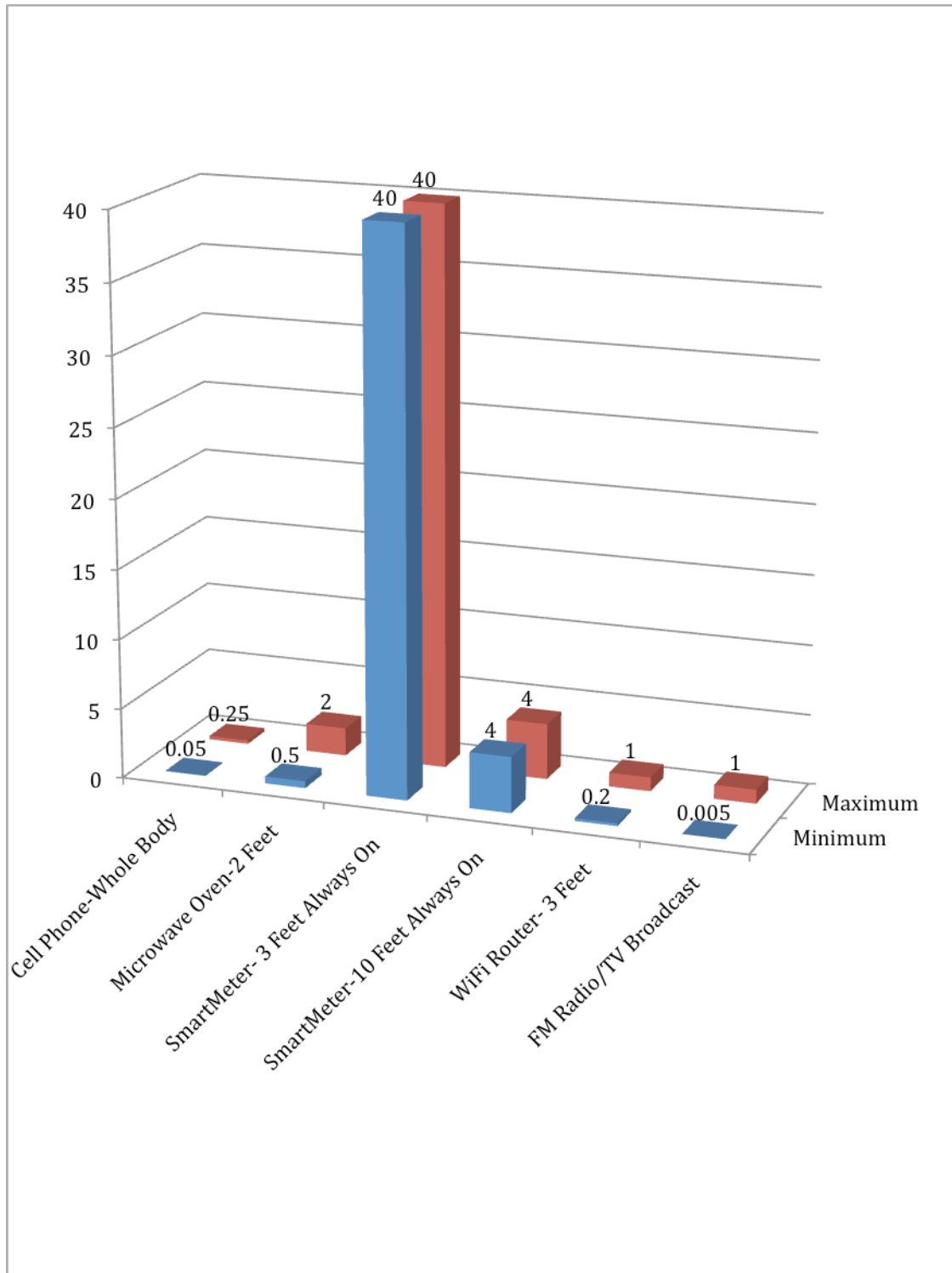


Figure A. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from assumed cell phone dose at ear].

On 30 July 2010 Assemblymember Jared Huffman requested that CCST undertake an “independent, science-based study” of two questions: “whether FCC standards for SmartMeters are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields, and further to assess whether additional technology specific standards are needed for SmartMeters and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects.”

Unfortunately, the Council draft report answers neither question.

In September, Assemblymember William Monning and Mill Valley Mayor Stephanie Moulton-Peters joined in the request, asking in particular that CCST review the central issue associated with the current FCC standards, which are decades old and based solely on protecting against prompt thermal effects (heating of tissue)—that they fail to take into consideration long-term and cumulative exposures to these devices and potential non-thermal health impacts (e.g., latent cancers).

Again, the Council’s draft report provides little if any useful information or analysis of this matter. There is no mention or analysis of the specific studies that have suggested, for example, a cancer effect from RF exposure such as the large, international study funded by the cell phone industry, the Interphone study, that found a significant increase in brain cancers in people who used cell phones half an hour a day for ten years. Given the long latency period generally for solid cancers, such a finding gives pause as to what might be seen over the long term. Some other studies have suggested an increased risk of brain cancer on the side of the head where the cellphone is normally used. Other studies, however, have not found an effect. Given the nature of the request from the elected officials for a review of this critical scientific issue—whether there is the potential for non-thermal health effects from cumulative, long-term exposure to RF radiation—one would have hoped that there would have been a more detailed analysis of this question in the report.

The report is candid, however, that at present the issue is unresolved. But it goes on to then say there is no basis for changing the FCC standards which are based only on prompt, thermal effects. One could equally well say there is no basis for maintaining the FCC standards, given the uncertainties about latent, non-thermal effects.

What the CCST draft report does focus on, however, is the relative exposure from SmartMeters compared to other RF-emitting devices in common use. Here, again, the draft report disappoints. The elected officials cited claims made by the electric utility industry regarding safety of SmartMeters and purportedly relative low exposures compared to other common devices and requested “an independent, science-based study.”

However, the CCST draft report does not appear to include much if any independent work on the subject but rather merely pastes in a table taken from an 8-page pamphlet released a few weeks earlier by the Electric Power Research Institute (EPRI), an advocacy group for the

electric power industry.² This EPRI table and the graph made from it constitute the core of the CCST report, and is reproduced here as Figure 1.

The EPRI pamphlet is not a peer-reviewed scientific study. It is a brief item for an advocacy group that is supported by industry. If the elected officials wanted the industry's views, it would have asked for them. Instead, it wished an independent, science-based study by an entity without the kinds of conflicts of interest EPRI has on this matter. But the CCST draft report is basically simply a cut-and-paste job from the EPRI brochure.

Note also that the estimate for exposure from a single SmartMeter contained in the EPRI item and repeated in the CCST draft is not a measured value but estimated—how is not made clear. EPRI's measurements were for a bank of ten SmartMeters; it didn't measure one alone but somehow estimated for it, despite the difference in how exposure falls off from one versus ten. The latter is inverse of the distance, the former inverse square of the distance. One presumes the electeds wanted actual measured values from an independent source, not a calculated value from the electric industry, without even an explanation of how it is was calculated and without independent verification.

CCST does correct one error made in the EPRI brochure whereby it reduced the presumed power density estimates for the SmartMeter by duty cycles of 1 and 5%. CCST rightly indicated that future duty cycles could be much higher as “new applications and functionality are added to the meter's communication module in the future.” For this reason, it assumed a 100% duty cycle in its calculations.

HOWEVER, CCST did not correct numerous other apparent errors from the EPRI brochure when it adopted EPRI's values. For example, for cell phone exposures, CCST did not correct for the presumed duty cycle of the cell phone (which CCST indicates on average is 1%). Nor did it convert the EPRI cell phone power density estimate into comparable units. EPRI (and thus CCST) compared a *whole body average* exposure to SmartMeter radiation to *peak exposure to the ear* for the cell phone. One needs to compare apples and apples, or whole body exposures to whole body exposures. Comparing the peak dose to the ear from a cell phone, when the rest of the body gets vastly less radiation, with a whole body exposure where all organs get roughly the same dose from a SmartMeter, doesn't seem appropriate. If there is a cancer effect, it is likely associated with the total RF energy the body receives.

Similar apparent errors were made in the comparison to microwave ovens. Again, the duty cycle of the microwave oven is ignored. It is used perhaps fifteen minutes a day, and it is unlikely people are 2 feet away from the device for the full time it is on. Its “down time” must be included if one is looking, as requested by the elected officials, at potential cumulative, long-term exposures.

² The EPRI brochure was apparently released on November 17, providing little if any time for serious review of it by CCST prior to the release a few weeks later (with the holidays intervening) of the CCST report on which it was based.

[Additionally, the values given for microwave oven exposures by EPRI and adopted without changed in the CCST draft report seem questionable. Three references are given in the EPRI report, although for which claim each applies is not made clear. The first reference, the ICNIRP report, does not in fact give measured values for microwave ovens, but instead reports what the legal limit for leakage is, generally reported to be orders of magnitude above what typical exposures from microwave ovens really are. The second reference is to a 1978 paper by PG&E's consultant, RA Tell. That paper CCST has not made available for review, but it is over three decades old, and thus of little relevance to today's microwave ovens. The third reference is merely to a personal communication with Tell, without any information as to the content of that communication. When one checks the values reported by EPRI and uncritically adopted by CCST, it appears that the first value, 5 mW/cm² at 2 inches from the device, is in fact not a measured value of typical exposures but the vastly higher legal limit for leakage. The literature in fact indicates that 50% of microwave ovens produce less than 0.062 mW/cm² at 5 cm, or two orders of magnitude below the value reported by EPRI and reproduced by CCST without question. See, e.g., R, Mathes, "Radiation Emission from Microwave Ovens," *Journal of Radiation Protection*, Vol. 12, No. 3, September 1992. One presumes the leakage rate has been reduced even further since then.]

One recognizes that if one is comparing to FCC existing standards based solely on acute, thermal effects that duty cycle might be treated differently. But if there is a cancer effect, which is what the electeds asked CCST to study, a likely key aspect of the dose-response relationship is the cumulative whole body dose. For ionizing radiation, about which I have spent much of my career, the determining factor is largely how much radiation energy the body has absorbed. [There are of course other factors, such as the relative biological effectiveness (RBE) of different types of ionizing radiation and varying sensitivity of different organs.] So, if the question were how does SmartMeter and cell phone RF radiation compare to FCC limits, duty cycle may be treated in a different fashion. But since the question is what if FCC limits, based solely on thermal effects, may be inadequate to protect against cancer and other non-thermal effects, then the duty cycle—which determines the cumulative total exposure received—and whole body exposure must be factored in. My fundamental recommendation is that the draft report should be revised to correct for these two factors.

I have taken the liberty, with the help of two student assistants, to demonstrate the potential impact of some of these corrections.

Figure 1 is simply the CCST Figure 1, which in turn was largely taken from the estimates in the EPRI pamphlet. Units were simply converted by CCST from mW/cm² to μW/cm² and it corrected the duty cycle for the SmartMeter, otherwise the data are unchanged from EPRI's estimates. One will note that the estimated exposure from the cell phone is just to the ear, in direct contact with the cell phone, whereas the other comparisons, including the SmartMeter, are for whole body exposures, and that the duty cycle of the cell phone and microwave oven were not corrected. In other words, the chart compares a SmartMeter that is always on with a cell phone or microwave oven when they are being used, even though 99% of the time they are not in use. This overestimates the cumulative exposure by a factor of 100 for the cell phone and microwave oven, and dramatically skews the comparison.

Figure 2 fixes the error regarding duty cycle for the cell phone and microwave oven, markedly altering the comparison. The minimum cumulative exposure over time from the SmartMeter at 3 feet is 80 times the minimum cumulative exposure from the microwave oven and four times the minimum cumulative exposure from the cell phone, for example. This does not involve any correction of the while-on exposure values for either the cell phone or microwave oven, only the duty cycle factor.

Figure 3 provides a very rough approximation of the correction of the cell phone at the ear estimate to a whole body estimate so it is comparable to the whole body estimate for the SmartMeter. *It should be stressed that neither this estimate nor that in Figure 4 using a different approach is intended to be a definitive figure, but is intended to be exemplary of the kind of change to the comparison a detailed analysis may produce. It is my recommendation that CCST carefully measure, or at minimum thoroughly calculate, the average power density over the whole body from a cell phone held at the ear. We here have made two very rough estimates just to make the point what a far more detailed analysis may show.*

The value used for the peak cell phone power density for a cell phone held to the ear in the CCST draft report is taken directly from the EPRI pamphlet, without apparent independent review or correction. According to p. 6 of the EPRI pamphlet, the value it gives apparently is not a measured value but an estimate. How the estimate was arrived at is not detailed in the brochure. All that is said is in footnote 1, “Based on a 3-inch 250mW antenna emitting in a cylindrical wavefront.” A quick calculation to try to reproduce what EPRI must have done indicates that if it merely assumed that all of the energy from a 250mW cell phone was transmitted by holding directly against the ear into a circular area with a 3 inch diameter, the power density in that small circular area around the ear would be 5 mW/cm². That is precisely the upper value given by EPRI in its table. We don’t know if that is what EPRI did, since it doesn’t tell us what it did and CCST does not appear to have tried to confirm the asserted value. But in any case, 5 mW/cm² from a 250mW cell phone would indeed appear to require that that power be deposited solely in that very small circular area.

Averaging over the full potentially exposed surface area of the body (presuming only half the body surface could be exposed to the cell phone from any one angle), the whole body exposure would be approximately on average 0.25 mW/cm² given the maximum value to the ear of 5 mW/cm² put forward by EPRI and the CCST draft report and correcting as well for the duty cycle. **The SmartMeter thus would produce 160 times more cumulative whole body exposure than the cell phone assuming this estimate for whole body exposure.** This is shown in Figure 3.³

³ In these graphs we have used the values for a microwave oven at 2 feet put forward by EPRI and repeated by CCST even though, as discussed above, they appear questionably high. Note that measured values indicate typical measured microwave oven RF fields 5 cm from the oven are in the range of 0.062 mW/cm², whereas the EPRI estimates used by CCST are for comparable values 2 feet away, which, if the exposure were drop by inverse square of the distance, should be very much lower. It is unclear whether EPRI is actually referring to measured values or to the legal limits, the latter being irrelevant in this context.

Since the EPRI estimate for cell phone peak power density at the ear is unexplained as to its derivation, we have also made a very rough estimate of whole body exposure from a cell phone from an independent line of calculation. Taking the values EPRI (and thereby CCST) put forward for exposure at three feet from a 250 mW SmartMeter, and noting that EPRI assumed the cell phone would also be 250mW, one can make a rough estimate of power density for the whole body from a cell phone held at the head. The exposure at one's waist would be approximately three feet from the source, just as in the assumed case of the SmartMeter. Presuming that the dose falls off as the inverse square of the distance, a very rough estimate of power density averaged over half the surface of the whole body, and taking into account duty cycle, yields a cumulative cell phone whole body power density of roughly $0.75 \mu\text{W}/\text{cm}^2$. **Using this way of estimating suggests the SmartMeter would produce 50 times the cumulative whole body exposure as a cell phone.** The results of this comparison are found in Figure 4.

We are here using the duty cycles proposed by CCST itself in its draft report. We recognize other duty cycles can be considered. Perhaps one should presume maximum duty cycle in the future for SmartMeters, when all additional features are incorporated, might be only 50%, for example. But other factors also need to be considered, including exposures from banks of SmartMeters attached to an apartment building, and the exposure from all the devices within a home that are planned to be constantly communicating by RF with the SmartMeter.⁴

It is strongly recommended that CCST revise the report and perform actual measurements. At minimum, revised calculations that correct for duty cycle and cumulative whole body exposure should be conducted.

⁴ It is noted that EPRI claims a diminished dose in back of a bank of SmartMeters, but it is unclear that that claim can be relied upon. The particulars of the specific test done by EPRI, in connection with the manufacturer of the devices (who has an obvious interest in findings suggesting safety), are not spelled out. Furthermore, it is unclear how the SmartMeter can communicate with devices inside the home—the key purpose—if the back of the device blocks most of the signal from getting through.

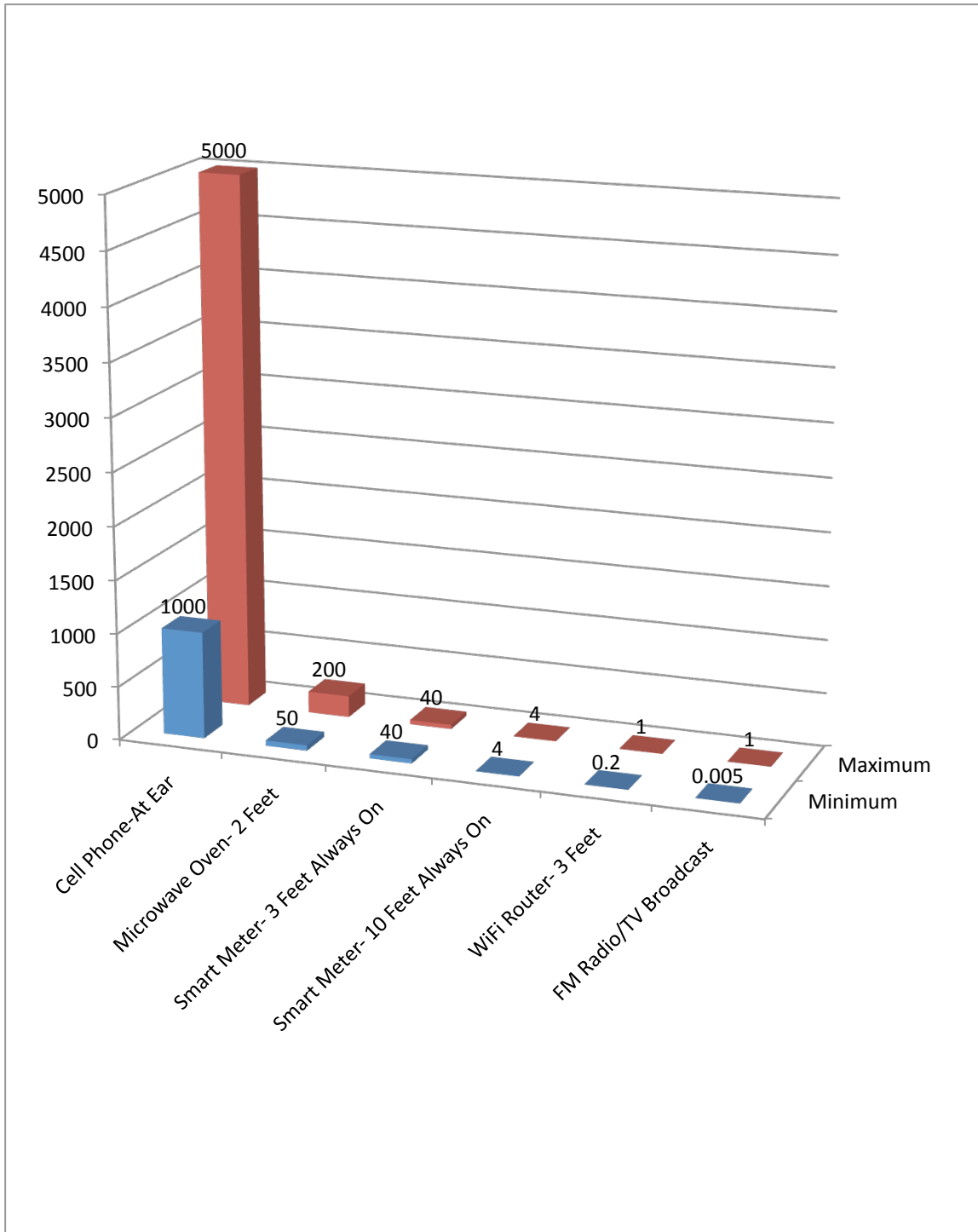


Figure 1: Graph from CCST Report in $\mu\text{W}/\text{cm}^2$ —uncorrected for whole body exposure or duty cycle

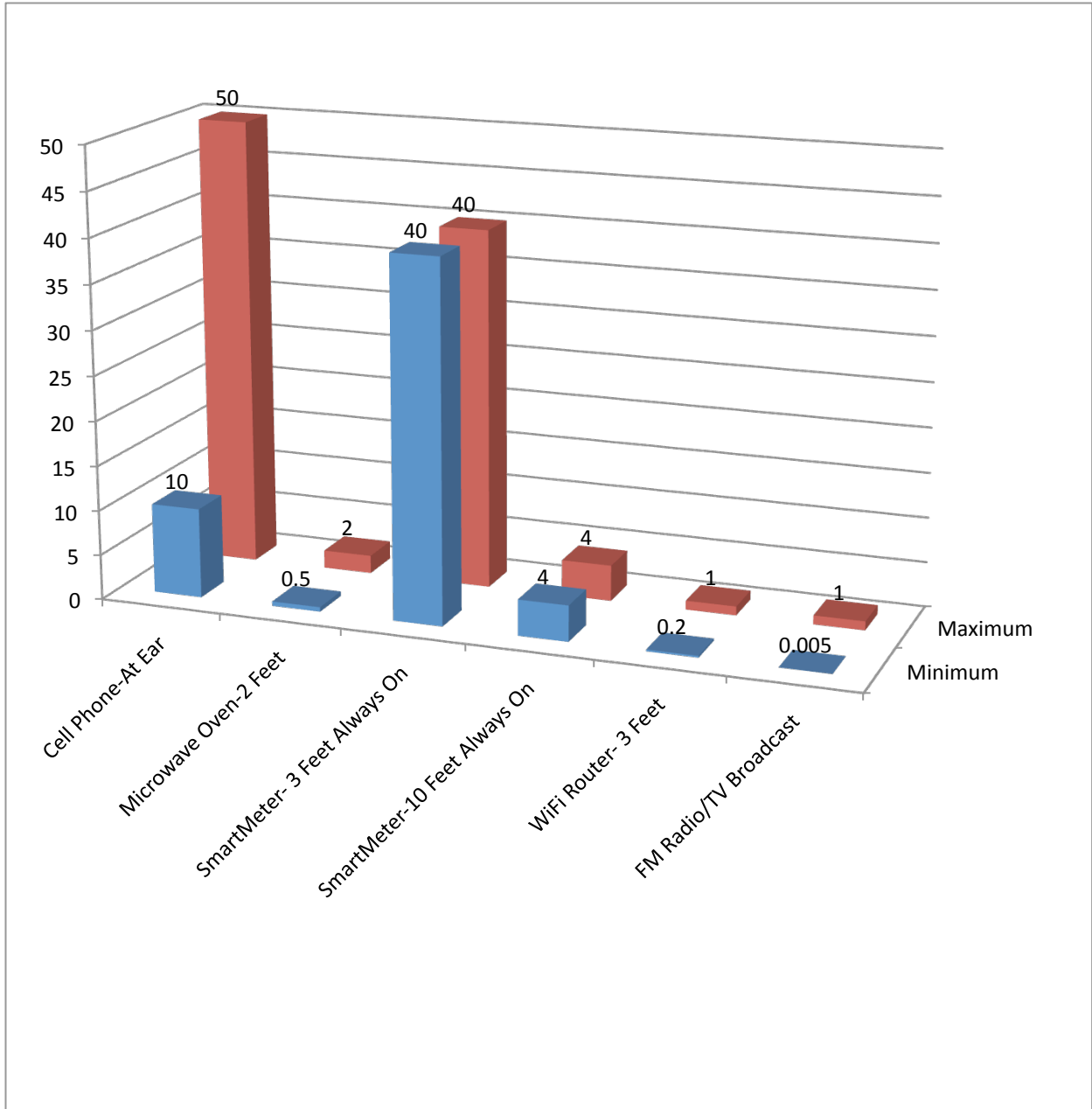


Figure 2. Comparison of Radio-Frequency Levels from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected only for assumed duty cycle].

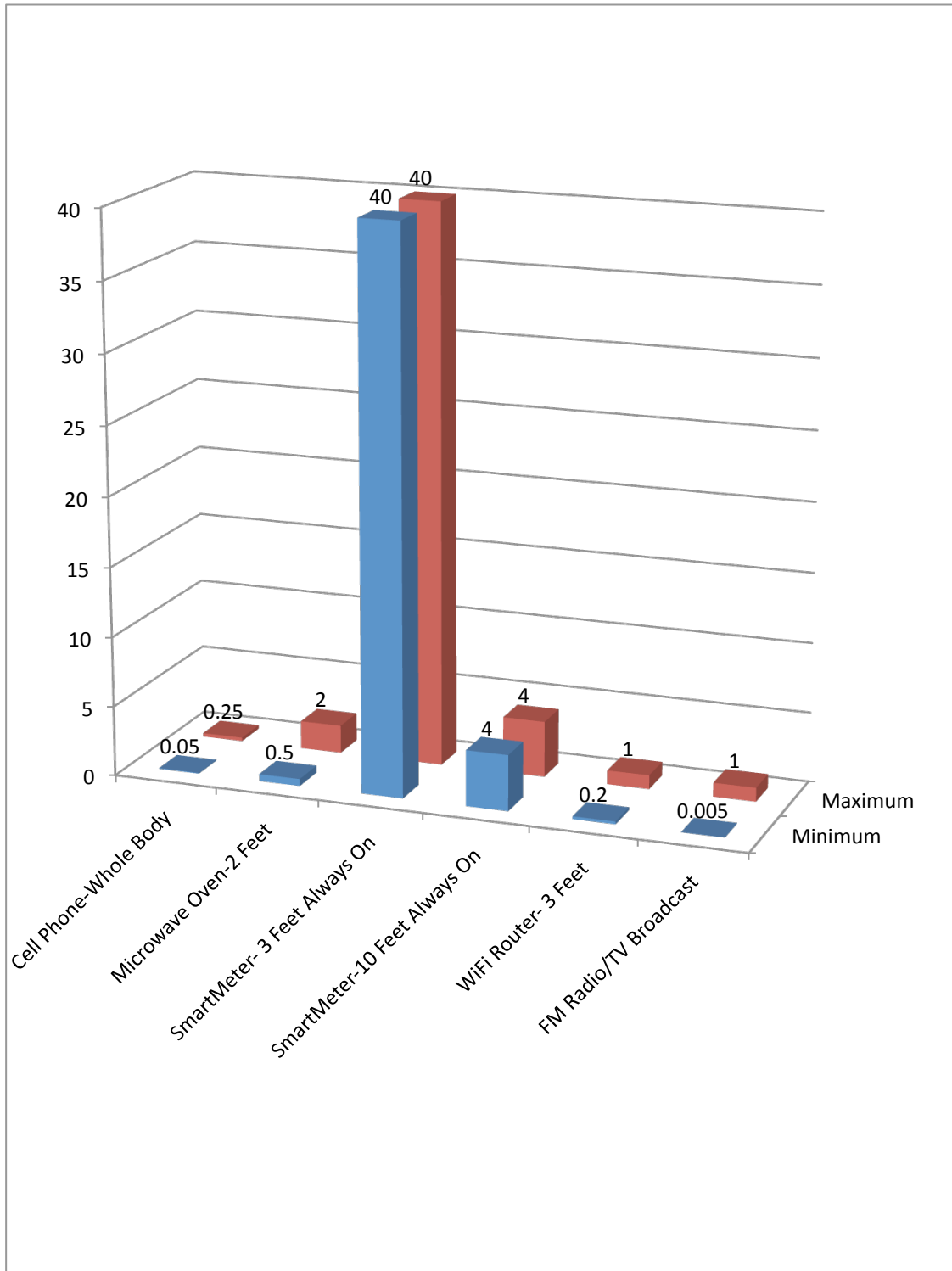


Figure 3. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from assumed cell phone dose at ear].

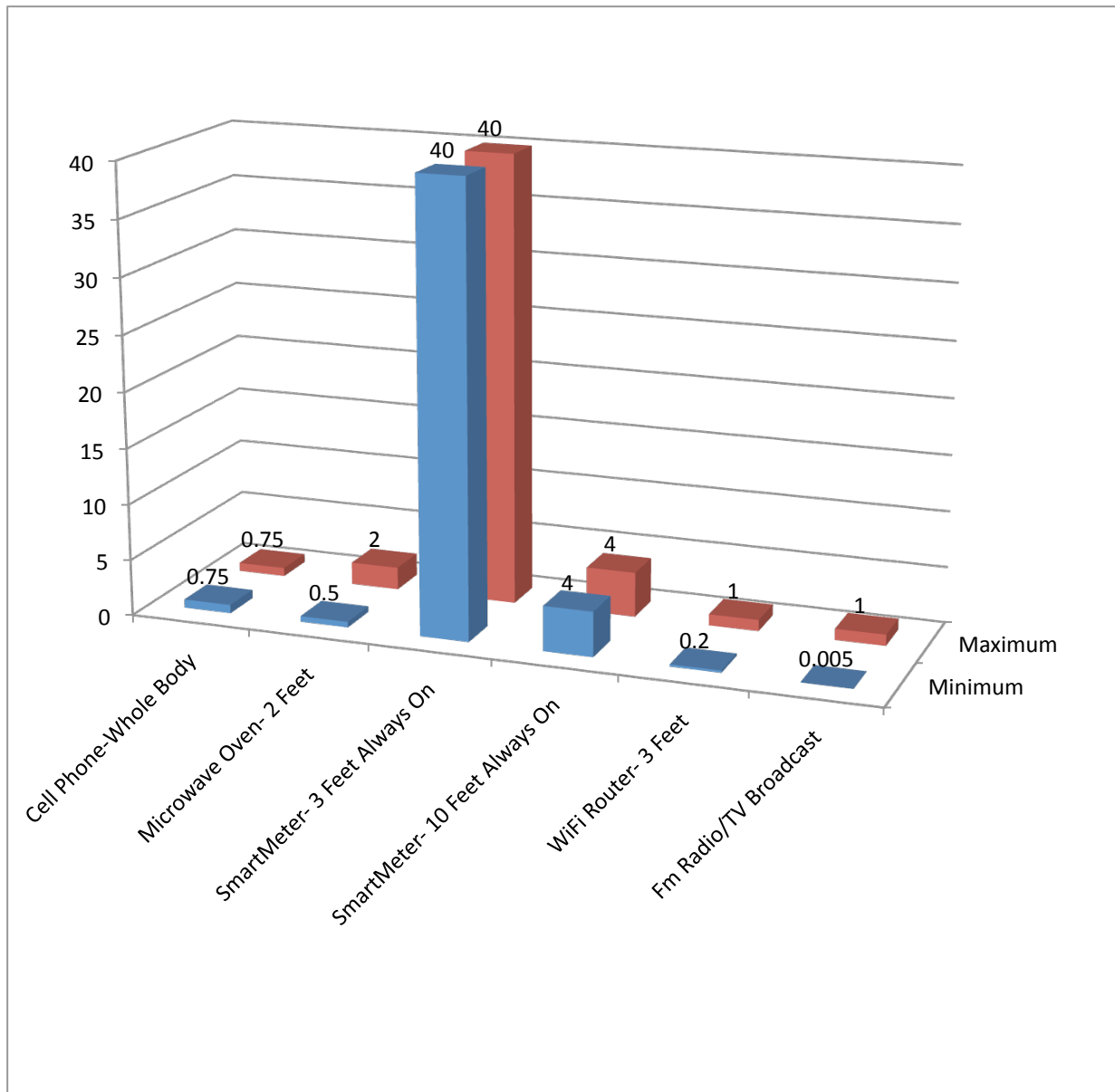


Figure 4. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from EPRI/CCST SmartMeter estimated levels at 3 feet].



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Smart Meter Case Series

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Founded in 1965 as a non-profit medical association, the American Academy of Environmental Medicine (AAEM) is an international organization of physician and scientists interested in the complex relationship between the environment and health.

AAEM physicians and physicians world-wide are treating patients who report adverse, debilitating health effects following the installation of smart meters, which emit electromagnetic frequencies (EMF) and radiofrequencies (RF).

The peer reviewed, scientific literature demonstrates the correlation between EMF/RF exposure and neurological, cardiac, and pulmonary disease as well as reproductive disorders, immune dysfunction, cancer and other health conditions. The evidence is irrefutable. Despite this research, claims have been made that studies correlating smart meter emissions with adverse health effects do not exist.

The AAEM has received a case series submitted by Dr. Federica Lamech, MBBS, *Self-Reporting of Symptom Development from Exposure to Wireless Smart Meters' Radiofrequency Fields in Victoria*. AAEM supports this research. It is a well documented 92 case series that is scientifically valid. It clearly demonstrates adverse health effects in the human population from smart meter emissions.

The symptoms reported in this case series closely correlate not only with the clinical findings of environmental physicians, but also with the scientific literature. Many of the symptoms reported including fatigue, headaches, heart palpitations, dizziness and other symptoms have been shown to be triggered by electromagnetic field exposure under double blind, placebo controlled conditions. Symptoms in this case series also correlate with the Austrian Medical Association's Guidelines for the Diagnosis and Treatment of EMF Related Health Problems.

It is critically important to note that the data in this case series indicates that the "vast majority of cases" were not electromagnetically hypersensitive until *after* installation of smart meters. Dr. Lamech concludes that smart meters "may have unique characteristics that lower people's threshold for symptom development".

This research is the first of its kind, clearly demonstrating the correlation between smart meters and adverse health effects.

Based on the findings of this case series, AAEM calls for:

- Further research regarding smart meter health effects
- Accommodation for health considerations regarding smart meters.
- Avoidance of smart meter EMF/RF emissions based on health considerations, including the option to maintain analog meters.
- A moratorium on smart meters and implementation of safer technology
- Physicians and health care providers to consider the role of EMF and RF in the disease process, diagnosis and treatment of patients.

Passed by the Board of Directors of the American Academy of Environmental Medicine October 23, 2013

Please note: Smart Meter case series research to be released upon publication



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January 19, 2012

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Decision Proposed Decision of Commissioner Peevy (Mailed 11/22/2011)
BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
On the proposed decision 11-03-014

Dear Commissioners:

The Board of the American Academy of Environmental Medicine opposes the installation of wireless “smart meters” in homes and schools based on a scientific assessment of the current medical literature (references available on request). Chronic exposure to wireless radiofrequency radiation is a preventable environmental hazard that is sufficiently well documented to warrant immediate preventative public health action.

As representatives of physician specialists in the field of environmental medicine, we have an obligation to urge precaution when sufficient scientific and medical evidence suggests health risks which can potentially affect large populations. The literature raises serious concern regarding the levels of radio frequency (RF - 3KHz – 300 GHz) or extremely low frequency (ELF – 0Hz – 300Hz) exposures produced by “smart meters” to warrant an immediate and complete moratorium on their use and deployment until further study can be performed. The board of the American Board of Environmental Medicine wishes to point out that existing FCC guidelines for RF safety that have been used to justify installation of “smart meters” only look at thermal tissue damage and are obsolete, since many modern studies show metabolic and genomic damage from RF and ELF exposures below the level of intensity which heats tissues. The FCC guidelines are therefore inadequate for use in establishing public health standards. More modern literature shows medically and biologically significant effects of RF and ELF at lower energy densities. These effects accumulate over time, which is an important consideration given the chronic nature of exposure from “smart meters”. The current medical literature raises credible questions about genetic and cellular effects, hormonal effects, male fertility, blood/brain barrier damage and increased risk of certain types of cancers from RF or ELF levels similar to those emitted from “smart meters”. Children are placed at particular risk for altered brain development, and impaired learning and behavior. Further, EMF/RF adds synergistic effects to the damage observed from a range of toxic chemicals. Given the widespread, chronic, and essentially inescapable ELF/RF exposure of everyone living near a “smart meter”, the Board of the American Academy of Environmental Medicine finds it unacceptable from a public health standpoint to implement this technology until these serious medical concerns are resolved. We consider a moratorium on installation of wireless “smart meters” to be an issue of the highest importance.

The Board of the American Academy of Environmental Medicine also wishes to note that the US NIEHS National Toxicology Program in 1999 cited radiofrequency radiation as a potential carcinogen. Existing safety limits for pulsed RF were termed “not protective of public health” by the Radiofrequency Interagency Working Group (a federal interagency working group including the FDA, FCC, OSHA, the EPA and others). Emissions given off by “smart meters” have been *classified by the World Health Organization International Agency for Research on Cancer (IARC) as a Possible Human Carcinogen.*

Hence, we call for:

- An immediate moratorium on “smart meter” installation until these serious public health issues are resolved. Continuing with their installation would be extremely irresponsible.
- Modify the revised proposed decision to include hearings on health impact in the second proceedings, along with cost evaluation and community wide opt-out.
- Provide immediate relief to those requesting it and restore the analog meters.

Members of the Board
American Academy of Environmental Medicine

<http://www.neilcherry.com/documents.php>

(31 Studies)

Epidemiological principles for ELF/EMR Studies.

Abstract:

Epidemiology is fundamental science and the strongest evidence for the assessment of human health effects of disease agents. Moving from a possible association to a causal effect the assessment principles are followed by the Sir Austin Bradford-Hill approach. When dealing with the health effects of electromagnetic fields and radiation some specific and important epidemiological principles must be used. Exposure assessments are vital. Electromagnetic fields and radiation are invisible, odourless, silent and tasteless, and are ubiquitous. Therefore the basic physics and engineering principles that explain the nature and strength of these fields are fundamental. The basic methods of environmental epidemiology involve identifying the disease rates in an exposed group to [compare](#) the disease rates in a non-exposed group, with no confounders to confuse the results. A major problem with EMF and EMR is that in most communities there is no non-exposed reference group because we live in homes with electromagnetic fields from electric power wires and [appliances](#) and we can receive radio, TV and cellphone signals all the time in our homes. Everyone in the world is exposed to radio short-waves and satellite [microwaves](#). This has led to the Ubiquitous Exposure (No Non-exposed Group) Principle, an extension of the Healthy Worker Effect. For studies around Radio, TV and cell site transmission towers, the horizontal antenna patterns are used to focus most of the RF energy to where most of the receiving population lives. The vertical antenna patterns are a function of the frequency of the carrier signal. They have main beams and many side-lobes which produce complex radial undulating signal intensity, varying with distance from the tower. For studies of people living in the vicinity of radio, TV and cellphone towers it is vital that the radiation patterns and population patterns are understood. Studies that appropriately match exposure with cancer and other health effects, show strong, consistent and significant dose-response relationships indicating causal linkage between electromagnetic fields and radiation and human health effects.

Epidemiology is fundamental science and the strongest evidence for the assessment of human health effects of disease agents. Moving from a possible association to a causal effect the assessment principles are followed by the Sir Austin Bradford-Hill approach. When dealing with the health effects of electromagnetic fields and radiation some specific and important epidemiological principles must be used. Exposure assessments are vital. Electromagnetic fields and radiation are invisible, odourless, silent and tasteless, and are ubiquitous. Therefore the basic physics and engineering principles that explain the nature and strength of these fields are fundamental. The basic methods of environmental epidemiology involve identifying the disease rates in an exposed group to compare the disease rates in a non-exposed group, with no confounders to confuse the results. A major problem with EMF and EMR is that in most communities there is no non-exposed reference group because we live in homes with electromagnetic fields from electric power wires and appliances and we can receive radio, TV and cellphone signals

all the time in our homes. Everyone in the world is exposed to radio short-waves and satellite microwaves. This has led to the Ubiquitous Exposure (No Non-exposed Group) Principle, an extension of the Healthy Worker Effect. For studies around Radio, TV and cell site transmission towers, the horizontal antenna patterns are used to focus most of the RF energy to where most of the receiving population lives. The vertical antenna patterns are a function of the frequency of the carrier signal. They have main beams and many side-lobes which produce complex radial undulating signal intensity, varying with distance from the tower. For studies of people living in the vicinity of radio, TV and cellphone towers it is vital that the radiation patterns and population patterns are understood. Studies that appropriately match exposure with cancer and other health effects, show strong, consistent and significant dose-response relationships indicating causal linkage between electromagnetic fields and radiation and human health effects. **Size:** 57 pages, 1150 KB.

[EMR Epidemiological Principles for EMF and EMR Studies](#)

IARC's 1982 Benzene Human Carcinogen Assessment applied to Microwaves.

Abstract:

The International Agency for Research on Cancer (IARC) is a World Health Organization Department, with the responsibility to assess carcinogenic effects of environmental and occupational toxins. Epidemiology is the fundamental science and the strongest evidence for the assessment of human health effects of disease agents. In 1974 an IARC review concluded that animal carcinogenicity had not been demonstrated and human studies showed that benzene mixtures resulted in damage to the haematopoietic system with suggestion of leukaemia from several case studies and one Japanese case-control study. In 1982 the IARC re-evaluation reported that workers and the general public were exposed to Benzene from numerous sources including chemicals and the production and use of gasoline. IARC's 1982 re-evaluation concluded that benzene was a human carcinogen. Therefore it is appropriate to investigate what the level of evidence was for Benzene in 1982. If we apply the same principles and level of evidence to radar and microwave exposures up to 1982, would the evidence have reached or exceeded the IARC evaluation standard? This review shows that the evidence that microwaves enhanced the rates of cancer in people was stronger in 1982 than the evidence for Benzene. The International Agency for Research on Cancer (IARC) is a World Health Organization Department, with the responsibility to assess carcinogenic effects of environmental and occupational toxins. Epidemiology is the fundamental science and the strongest evidence for the assessment of human health effects of disease agents. In 1974 an IARC review concluded that animal carcinogenicity had not been demonstrated and human studies showed that benzene mixtures resulted in damage to the haematopoietic system with suggestion of leukaemia from several case studies and one Japanese case-control study. In 1982 the IARC re-evaluation reported that workers and the general public were exposed to Benzene from numerous sources including chemicals and the production and use of gasoline. IARC's 1982 re-evaluation concluded that benzene was a human carcinogen. Therefore it is appropriate to investigate what the level of evidence was for Benzene in 1982. If we apply the same principles and level of evidence to radar and microwave exposures up to 1982, would the evidence have reached or exceeded the

IARC evaluation standard? This review shows that the evidence that microwaves enhanced the rates of cancer in people was stronger in 1982 than the evidence for Benzene.

Size: 15 pages, 161 KB.

[EMR IARC benzene-microwave assessment.pdf](#)

EMR spectrum principle.

Abstract:

The electromagnetic spectrum has a very wide range of frequencies. Understanding how these various frequencies interact with human bodies is very important for appreciating how these signals and fields can cause biological effects when tissues or whole bodies are exposed. Biophysics is a very important scientific discipline for understanding how the natural body electromagnetic and biological systems work and how external signals from extremely low-frequency fields and radiofrequency and microwave radiation enter into and interactive with the body systems and cells. The basic physics principles involved are resonance interaction and absorbance and energy converting and conservation. The failure to understand these principles leads to errors in the setting of standards and the inappropriate interpretation of epidemiological results.

Size: 12 pages, 215 KB.

[EMR Spectrum Principle paper.pdf](#)

A New Paradigm, the physical, biological and health effects of Radiofrequency Microwave Radiation.

Abstract:

"Our frame of reference determines what we look at and how we look. And as a consequence, this determines what we find."

Burke J, The Day the Universe Changed, 1985.

Our preconceived views strongly influence our opinions and decisions. People almost universally view the human (mammal) body as a biological organ with biochemical processes controlling biological cells. This fails to recognize the vital role of biophysics with its electromagnetic signals carrying out vital functions in the brain, central nervous system, heart, motor neuron system and in all cells. Oscillating electromagnetic signals, produced by and interacting with ions, such as calcium ions, are active in all cells for cell-to-cell communication, gap junctions and voltage-gated ion channels. Phase locked loop detection systems are widespread in cells and especially neurons. The heart and brain are monitored using the ECG and EEG electromagnetic detection systems. Classical physics processes involve resonant absorption and interference with the natural EMR/EMF signals. This has been causally demonstrated with external ELF signals altering the ELF calcium ion oscillations in brain and heart tissue. Understanding and appreciating this biophysical science, opening your mind to the genotoxic evidence and considering the epidemiological evidence, leads to a major paradigm shift. External EMR/EMF signals penetrate human bodies, resonantly interacting with cellular processes, altering cellular calcium ions, reducing melatonin and damaging DNA. Everyone has their whole body exposed to these genotoxic signals showing that EMR/EMF is a Ubiquitous Universal Genotoxic Carcinogen, that causes elevation of the rates of a wide range of cancer, cardiac, reproductive and neurological diseases and death

in human populations. This paradigm is confirmed by multiple independent papers showing DNA damage and a body of epidemiological studies showing elevated sickness and death rates for all of these health effects in electrical workers and many also at residential exposure levels, many involving dose-response relationships pointing to a safe threshold of zero exposure, consistent with EMR/EMF being a genotoxic carcinogen.

Size: 67 pages, 943 KB.

[EMR new paradym-microwave paper.pdf](#)

Category: Natural Electromagnetic Radiation Health Effects

Schumann Resonances, a plausible biophysical mechanism for the human health effects of Geomagnetic Activity.

Abstract:

A large number of studies have found significant correlations between Solar and Geomagnetic Activity (S-GMA) indexes and human health and biological effects for mainly high but also for low activity levels. These studies therefore support the proposal that S-GMA may be a natural hazard. The studies also suggest that this might relate to loss of homeostatic equilibrium in vulnerable people. Effects identified include reduced melatonin, increased blood pressure, and increases in cancer, neurological and cardiac disease and death. A plausible mechanism between S-GMA and mammals would advance this proposal. The loss of synchronization in many of these health effects suggests the involvement of a timing mechanism such as the inability to detect and respond to an ELF Zeitgeber which provides synchronization of neurological, cardiac and cellular functions. Biophysical communication systems use oscillating calcium ions that are shown to be altered by external ELF signals. The Schumann Resonance signal, as a natural globally available ELF signal, is proposed as this biophysical mechanism. Its intensity varies diurnally, seasonally, with GMA events and with sunspot activity. The SR signal is extremely highly correlated with solar and GMA indices. Physically this occurs because S-GMA systematically changes the D-Region electron densities so that this systematically alters the upper boundary of the SR resonant cavity. The D-Region is the upper boundary of the resonant cavity in which the Schumann Resonance signal is generated. There is strong evidence that human brains can detect and respond to the Schumann Resonance signal. Hence there is considerable support for the hypothesis that the Schumann Resonance signal is a plausible biophysical mechanism for the observed health effects of S-GMA. Hence there is also strong support for the proposal that S-GMA is a natural hazard. A strong link between the SR signal and tropical temperature implies that increasing climatic extremes will generate increased extremes of SR signals especially around periods of sunspot maximum.

This is the larger paper of Schumann Resonance study which was peer-reviewed and slightly summarised to be published in the journal, Natural Hazard 26: 279- 331.

Size: 56 pages, 387 KB.

[EMR Schumann Resonance paper 1.pdf](#)

Schumann Resonance and sunspot relations to human health effects in Thailand.

Abstract:

There is sensible scientific evidence to establish a trail of connection from the sun activity to human biological and health effects. This explains why sunspot numbers and indices of Geomagnetic Activity are correlated with serious human health effects in a large body of published studies. The key element is the role of the Schumann Resonance signal that is detected by human brains and is used to synchronize diurnal and ELF brain rhythms. The Schumann Resonance signal intensity is modulated and highly correlated with solar activity and the electron concentrations in the lowest layers of the ionosphere. The enhanced or weakened solar activity moves the level of the SR signal outside the normal homeostatic range and, through the Melatonin mechanism, causes health problems and enhanced death rates in large human populations. A five-year monthly data-base is used to confirm the correlation between the climatic factors of sunspot number, Geomagnetic Indices, Southern Oscillation Index and Global mean temperature anomalies with the SR signal strength. The Sunspot Number emerges as the strongest factor. A 19 year data-set of annual mortality rates in SE Asia is used to seek evidence of correlations between human mortality rates and the sunspot number in order to support and confirm the SR hypothesis. A wide range of mortalities that are associated with Melatonin reduction, are found to be significantly correlated with sunspot number, including cancer, cardiac and neurological mortality.

Size: 12 pages, 144 KB.

[EMR Schumann Resonance paper2.pdf](#)

Medical hypothesis, Schumann Resonance and intelligence.

Abstract:

The brain is a typical biological organ which is soft, adaptive and flexible, and therefore in order to be stable and coherent and in order to develop thinking and intelligence it needs to be independently synchronised but not controlled. The Schumann Resonance signal provides an appropriate and plausible synchronising signal. No other globally available appropriate signal is known.

Size: 4 pages, 68 KB.

[MedicalHypothesisPaper.pdf](#)

Suicide and Solar Activity linked through the Schumann Resonance Signal.

Abstract:

Monthly suicide rates in a New Zealand city, Christchurch, are found to have a highly significant adaptive homeostatic relationship to the monthly sunspot number. A reasonable scientific question is 'how can sunspots on the sun cause suicide on the earth?' The answer to the question is 'through the Schumann Resonance signal which is modulated by the solar activity and is detected by the human brain and modulates the Melatonin output, which is related to serious depression and suicide.' The Schumann Resonance signal provides a homeostatic control of brain activity. Therefore increased and decreased Schumann Resonance intensity, produced by increased and decreased solar activity, is shown to produce homeostatic relationships with cancer, cardiac, reproductive and neurological disease and mortality rates, including anxiety, depression and suicide. This study has found significant homeostatic relationships between the monthly mean sunspot number and the suicide rates in Christchurch, New Zealand. An adaptive

response appears from high, middle, low and very low solar activity over the 11-year sunspot cycle from 1988 to 1998.

Associate Professor Neil Cherry
Lincoln University, New Zealand

Size: 78 KB.

[Schumann Resonance and suicide.pdf](#)

Sudden Infant Death Syndrome (SIDS) related to Solar Activity through the Schumann Resonance mechanism.

Abstract:

Significant homeostatic relationship from Geomagnetic Activity (GMA) and Sudden Infant Death Syndrome (SIDS) was found in Ontario, Canada. A similar relationship is plausible elsewhere, but only if the size of the population produces sufficient daily SIDS cases to allow investigation of the daily rates. In Christchurch, New Zealand the population is too small so the monthly SIDS and sunspot relationship was studied to determine if the links between solar activity and SIDS rates, through the Schumann Resonance mechanism, were identifiable. Solar activity through the Schumann Resonance mechanism reduces melatonin in human populations. Reduced melatonin is associated with increased risk of SIDS. Significant correlations were found for adaptive homeostatic ?U? and inverse ?U? patterns between solar activity and SIDS over prolonged periods of months during 8 years, which included sunspot maximum, sunspot minimum and the transition period.

Neil Cherry
Lincoln University
10th January 2003

Size: 116 KB.

[EMR Schumann Resonance SIDS paper.pdf](#)

Category: ELF Health Effects

Evidence that Electromagnetic fields from high voltage powerlines and domestic power wires and appliances, are hazardous to human health.

Abstract:

Dr Cherry was asked by a school in Florida, United States, to review the biological and epidemiological health effects of electromagnetic fields, especially for children. It was proposed that a substation be constructed next to the school with high-voltage powerlines coming in. This review shows that there are many studies showing that extremely low-frequency electromagnetic fields reduce melatonin, enhance chromosome aberrations, damage DNA strands and increase rates of cancer in electrical and electronic workers, and children and adults in residential situations, both from powerlines and from the fields in their own homes. Because we almost all live in homes with electric energy this means that the electromagnetic fields are enhancing the background cancer rate. Thus there is no non-exposed group to be used as a reference group for epidemiological studies. Therefore the published studies significantly underestimate the relative risks levels. Very few people realize how many health effects are related to the background fields we live in. Integrating all of this information leads to the conclusion that the applied

guideline/standard should be 1mG. Because many people live in fields above the 1mG guideline and the safe level is zero, this report recommends that we use the New Zealand Ministry for the Environment approach to reduce exposures below a guideline. When actual exposures are less than the guideline they should be maintained and reduced to be ?good?, below 33% (0.33mG) or ?Excellent?, below 10% (0.1mG). This approach would significantly improve the public health effects, not only of cancer, but also for cardiac, neurological and reproductive health effects, all of which have been associated with exposure to these fields with dose-response relationships pointing down to zero exposure.

Size: 50 pages, 816 KB.

[EMR-ELF health effects 09-02.pdf](#)

Category: RF/MW Health Effects

Independent academic review of biological and epidemiological effects of cellphone radiation.

Abstract:

The widespread and massively growing rate of usage of mobile phones around the world is leading to having over a billion people using their phones most days. Initially we had bag phones and car phones, over 10 years ago we moved to portable handsets which originally were analogue phones and now most of the phones are digital. With the phone held against the ear the exposure of the head to modulated or digitally pulsed microwaves from the antenna, is very high. The head is a very sensitive bioelectromagnetic organ. Therefore resonance absorption and electrical interference are classical biophysics mechanisms. Cherry (2002) shows that natural electromagnetic radiation, the Schumann Resonance signal, when it is modulated by Solar Activity, is associated with modulation of human health effects, including cancer, cardiac, reproductive and neurological diseases and mortality. The study also shows that similar elevated health effects are found in electrical workers and physiotherapists exposed to short wave and microwaves. Since the cellphone radiation exposes the user's body to about a million times higher and the head to about a billion times higher exposure than the mean Schumann resonance signal, it is scientifically plausible that the same effects will be found from exposure to cellphone radiation. This review confirms that scientific studies show all these effects from exposure to cellphone radiation. It is therefore scientifically plausible that these health effects will be found in populations living within the vicinity of cellphone sites and from using cellphones.

Size: 33 pages, 297 KB.

[EMR Cell phone review paper.pdf](#)

Childhood Cancer in the vicinity of the Sutro Tower, San Francisco.

Abstract:

The Sutro Tower is a prominent structure on an elevated site in San Francisco. Since 1973 it has provided radio and TV signals for the San Francisco Bay region. There have been long-standing concerns about the health effects of this high-powered transmitter located in the centre of a large urban population. The a priori hypothesis is that RF/MW radiation is a Ubiquitous Universal Genotoxic Carcinogen. This is based on a number of occupational studies and previous studies that have shown elevated cancer rates in

residential populations living in the vicinity of radar and RF/MW broadcast towers. It is supported by many laboratory studies showing that ELF and RF/MW signals damage DNA. Thus it is predicted that at residential levels of RF/MW exposure cancer rates will increase in the vicinity of the Sutro Tower. This is tested by using the childhood cancer data-set from 1973-1988 with residential locations analysed to see if there is elevation of cancer and possible dose-response relationships. All of the analyses support and together confirm the hypothesis, and the radial patterns eliminate potential confounding factors.

Size: 23 pages, 265 KB.

[EMR Living Near Broadcast Towers Health.pdf](#)

Living near a broadcast tower can be hazardous to your health Health Effects in the vicinity of Radio/TV towers and mobile phone base stations.

Abstract:

There is robust scientific evidence that electromagnetic radiation is a Ubiquitous Universal Genotoxic Carcinogen. If this understanding was applied to the data available in 1982, when IARC declared benzene a Human Carcinogen, then the level of data for RF/MW radiation being a human carcinogen was considerably stronger than that for benzene. A large body of laboratory experiments and epidemiological studies now confirm the hypothesis. The evidence is further strengthened through the biophysics understanding of the EMR Spectrum Principle. This shows that as the carrier frequency increases the dielectric constant declines and the induced tissue electric field and induced current increases significantly. This implies and confirms that all of the health effects found in "electrical workers" will be found at much lower mean exposure levels in the vicinity of broadcast towers. Where studies have been carried out, the adverse health effects have been found. When compared with actual radiation patterns they show a causal effect. This confirms that hypothesis and the toxicology of the signals with a safe level of zero exposure. Hence living in the vicinity of broadcast and mobile phone towers produces Cancer, Cardiac, Reproductive and Neurological (CCRN) health effects. It is highly probable that these adverse health effects will be found in the vicinity of cell sites. Because of the small population numbers around single sites, these effects will only be detectable by studying populations around hundreds of cell sites.

Sleep disturbance in the vicinity of the Schwarzenburg Short-wave radio tower in Switzerland was causally related to the RF exposure through dose-response relationships, experimental confirmation and a measured reduction in melatonin in cows and people. A study in France has already shown an exposure-related dose-response in sleep disturbance (and other neurological symptoms) around cell towers, confirming that the effects are the same from cellphone radiation at residential exposure levels. Cellphone radiation also damages DNA. Therefore it is a serious health hazard, even at residential exposure levels, for all CCRN effects.

Salzburg, Austria, in 2000 and was updated for Tokyo in 2002.

Size: 41 pages, 420 KB.

[EMR Sutro Paper 09-02.pdf](#)

Category: Biological Mechanisms

EMF-EMR Reduces Melatonin in Animals and People.

Abstract:

Melatonin is a vital natural neurohormone that regulates the daily circadian rhythm in mammals. Melatonin is the most potent known antioxidant. At night the pineal gland's output of Melatonin rises and the Melatonin is carried by the circulation system throughout the body, passing through the cell membrane and scavenging free radicals in the cell to protect the DNA. It also has many other vital functions involving assistance of the immune system to maintain its immunocompetence, and it regulates sleep activity including aspects of REM sleep and sleep efficiency. Hence substances or activities that reduce melatonin output cause many serious biological effects in humans and other mammals, including sleep disturbance, chronic fatigue, DNA damage leading to cancer, cardiac, reproductive and neurological diseases and mortality. Reduced melatonin is also associated with arthritis, depression and suicide, seasonally affective disorder (SAD), miscarriage, sudden infant death syndrome (SIDS), Schizophrenia, Alzheimer's disease and Parkinson's disease. Multiple independent studies have found that electromagnetic fields reduce Melatonin in animals, fish and human beings. The evidence includes correlations with Geomagnetic Activity reducing human melatonin, through the Schumann Resonance signal effect. The level of evidence exceeds the usual requirement for causal link. This strongly suggests that Melatonin production caused by electromagnetic fields and radiation exposure contributes significantly to the elevation of many adverse health effect rates in the community.

Size: 15 pages, 274 KB.

[EMR Reduces Melatonin in Animals and People.pdf](#)

Evidence to support the a priori hypothesis that Electromagnetic Radiation across the spectrum is a Ubiquitous Universal Genotoxic Carcinogen.

Abstract:

By October 2001 Dr Cherry had concluded that there was very strong evidence that electromagnetic radiation from across the spectrum is a Ubiquitous Universal Genotoxic Carcinogen. The evidence is strong from multiple independent studies showing that from extremely low-frequency to microwave radiation signals and fields damage DNA. Epidemiological studies confirm this by showing that there are increased rates of cancer in many body organs because the whole body is exposed, from residential studies from power ELF frequencies and radio frequencies causing increased cancer rates and from a large body of studies showing cardiac, reproductive and neurological health effects.

Size: 53 pages, 717 KB.

[EMR is a Universal Genotoxic Carcinogen 11-01.pdf](#)

Motorola Funded Counter Research on Microwave DNA Damage.

Abstract:

Dr Henry Lai and Dr Narendra Singh used a DNA Comet Assay developed by Dr Singh to determine the microwaves damaged DNA-strands. They found that non-thermal microwave exposures significantly caused single and double DNA stranded breakage in living mice brains. The cellphone company Motorola wanted to prove that these studies were wrong and that microwaves and cell phone radiation do not cause DNA strand breakage. They funded Dr Roti Roti at Washington University, St Louis to replicate the Lai and Singh studies to try to show that they do not produce these effects. Dr Roti Roti used a different, much less sensitive assessment method and used a cell-line not living mice. Hence it is not a replicate study. They claimed not to show any DNA strand breakage from radiation exposures. The analysis of their own published data shows that they actually did show that microwaves and cellphone non-thermal radiation significantly damages DNA-strands and enhances significant repair rates in human cells.

Size: 7 pages, 190 KB.

[EMR Motorola Funded Counter Research on DNA breakage.pdf](#)

Category: Specific Health Effect Reviews

Brain cancer table.

Abstract:

This review document shows a summary of over 95 epidemiological studies involving power frequency fields, radio frequencies and microwave exposures, including cell phone usage showing elevated brain cancer rates in children and adults in over 420 exposed groups.

Size: 36 pages, 238 KB.

[EMR Brain cancer paper09-02.pdf](#)

Epidemiological studies of enhanced Brain CNS Cancer incidence and mortality from EMR/EMF exposures.

Abstract:

A very large number of epidemiological studies relate EMF and EMR exposures to Brain/CNS Cancers and a large laboratory set of studies show that the EMF fields and EMR damage DNA. Taken together, they give robust support for the hypothesis that oscillating Electromagnetic Fields and Radiation are a Ubiquitous Universal Genotoxic Carcinogen. Brain Cancer is shown to be elevated in over 400 exposed groups with over 50 dose-response relationships. Both residential studies and occupational studies show elevated, significantly raised and dose-response increased Brain/CNS Cancer rates from EMF/EMR chronic exposures. The evidence is substantially higher than the classical causal linkage. The EMF/EMR fields have been introduced into homes, schools, buildings, factories and along streets, covering more and more of the areas in the developed world over the past century. Over the 20th century these fields have contributed a major proportion of the increase in cancer, by a factor of 50 to 80% of the 6- to 7-fold total increase,

because of the unique ubiquitous nature of exposures to the EM fields and the RF/MW radiation. There is robust evidence of the oscillating electromagnetic spectrum from ELF to RF/MW being Genotoxic and Carcinogenic. Therefore this generates the Ubiquitous Genotoxic Carcinogen Effect (UGCE) which results from the absence of a non-exposed control group. The UGCE has been almost universally ignored in published epidemiological studies even though together they support and confirm the hypothesis. The UGCE, along with the Healthy Worker Effect, mean that the epidemiological cancer Odd Ratios (OR) and Relative Risks (RR) are grossly under-estimated because of the lack of a non-exposed control group. The genotoxic nature of these fields is so strong that exposed parents pass cancer, including Brain Cancer, on to their children. This review shows that there is strong and robust evidence that chronic exposures to ELF/RF/MW fields across the spectrum, through strength, consistency, biological plausibility and many dose-response relationships, cause increased rates of Brain/CNS Cancer from residential and occupational exposures. There is no safe threshold because of the genotoxic nature of the biological mechanism.

Size: 34 pages, 193 KB.

[EMR Brain cancer paper09-02.pdf](#)

World Conference on Breast Cancer - Ottawa, Canada, 26-31 July 1999.

Abstract:

Breast cancer is a serious problem for women and also a risk for men. In assessing the risk of breast cancer associated with exposure to electromagnetic fields and radiation (EMF & EMR) this review approaches the problem primarily from both the whole-body point of view. Our minds control many body functions through the central nervous system and through mediating a wide range of hormones. This includes melatonin, which is a highly potent free radical scavenger. Hence melatonin protects cells from cancer and it strengthens the immune system. EMR is shown to influence the brain, reduce the output of key hormones (e.g. Melatonin and Thyrotropin), and to impair the immune system. Thus EMR is carcinogenic. Alteration of cellular calcium ions is a well-established biological effect of EMR exposure. Calcium ion influx is associated with the survival of damaged cells, and thus increases cancer risk. Calcium ion efflux is associated with enhanced cell death (apoptosis) of damaged cells, and hence enhances neurodegenerative diseases. Calcium ion efflux is also related to impairment of the immune system, and to alteration of reaction times and brain EEG rhythms.

German research has proven that human brains detect and use the Schumann Resonances (SR) for timing synchronization. Altering the intensity and frequency of the SR changes human reaction times and circadian rhythms. A large body of research shows that there is an optimal intensity of SR, with increases and decreases in natural EMR being associated with a wide range of adverse neurological and cardiac health effects, and breast cancer. This research proves that sensitive and vulnerable human beings are made ill and can die when the natural EMR changes. The mean ELF intensity level of the SR is about 0.1 pW/cm². This is 2 billion times lower than internationally recommended public health guidelines for ELF exposure. Cell line and animal exposure experiments, and epidemiological studies of

populations who are occupationally and residentially exposed to EMR reveal significant hormonal, neurological, cardiac and cancer effects. A series of laboratory experiments involving breast cancer prone rats exposed to 50/60Hz exposure down to 0.1mT EMF, produced dose response relationships with the size and number of mammary tumors, with melatonin reduction and with reduced T lymphocytes. They also show a significant increase in proto oncogene activity. Occupational and residential studies of human populations show significant increases in breast cancer across the EMR spectrum, especially for pre-menopausal women and for positive estrogen receptor breast cancer. Since cell phones pose a very high risk it is recommended that all EMR exposures, especially cell phone exposure, be minimized.

Size: 40 pages, 331 KB.

[EMR-EMF and BREAST Cancer.pdf](#)

Cardiac Effects of Natural and Artificial EMR:

Abstract:

The heart is a muscular organ whose regular coordinated contraction, called a heart beat, is regulated by an electrical pulse that initiates a cascade of calcium ions that carry the message into all the heart cells to initiate the contraction of the heart beat. Therefore it is biologically plausible that natural and artificial electromagnetic fields will interfere with the heart activity. It has been shown that external ELF fields cause altered calcium-concentrations in neurons and heart cells. Altered blood pressure is associated with the Schumann Resonance signal, along with its modulation of human heart disease and mortality rates in a homeostatic manner. Electrical and electronic workers, radio/TV workers are shown to have increased risks of heart disease and mortality. We all live in electromagnetic fields which act to contribute to increase the rate of cardiac disease and death. A new high risk factor is the usage of a cellphone. Cellphones have been shown to interfere with electronic pacemakers. Therefore it is very reasonable that they will interfere with biological pacemakers, that is, our hearts. The use of a cellphone is associated with significant increase of blood pressure. This is a symptom of hypertension and shows that there is a cardiac risk factor. This risk factor is strongly confirmed in the context of the Schumann Resonance signal effects, electrical workers effects and altered cardiac functions in radio, TV and radar exposed workers.

Size: 19 pages, 118 KB.

[EMR Cardiac Effects Review.pdf](#)

Evidence that EMF/EMR causes Leukaemia/Lymphoma in Adults and Children.

Abstract:

Both local ELF fields and far-fields of RF/MW radiation expose the whole human body and induce electric currents that flow through the body seeking ?earth?. The electric current induces the formation of magnetic fields, creating the combined electromagnetic field. The induced electric currents primarily flow through the strong conduction high water organs, circulation system and bone marrow. They also flow through the electrical conduction fibres of the Central Nervous System. The oscillating electromagnetic signals damage the DNA in the exposed cells the

current is flowing through, generating cell death and mutations that primarily lead to Leukaemia and Lymphoma. This explains why Leukaemia rates in Children and Adults has progressively risen over the 20th Century as more and more homes have been provided with electric power. This produced living environments involving chronic low-level ELF field exposures in homes, along streets and in all building environments with electric power supplies. The unique ubiquitous exposure situation produced by this development provides a sole and confirmed source of the vast majority of the elevated cancer rates, including most of the Leukaemia/Lymphoma rates. Since both residences and work places involve chronic EM field exposures, the epidemiological studies of both are appropriately considered and the issue of no non-exposed control group needs to be dealt with. Appropriate exposure assessment is vital for determining dose-response relationships. The results of over 40 residential studies and 100 occupational studies give strong, extensive and robust evidence that ELF and RF/MW (EMR) radiation is proven to cause Leukaemia and Lymphoma in children and adults, including over 40 dose-response relationships.

This paper summarises the evidence that electromagnetic fields and radiation enhance the rates of Leukaemia and All Cancer in groups, including residential and occupational exposures. To date there have been published at least 22 studies showing dose-response increases in childhood cancer and leukaemia. This is far more than the level of evidence for a classical assessment for a causal effect.

Size: 25 pages, 185 KB.

[EMR Leukaemia Review Paper.pdf](#)

Evidence of Neurological effects of Electromagnetic Radiation: Implications for degenerative disease and brain tumour from residential, occupational, cell site and cellphone exposures.

Abstract:

The brain is a very sensitive bioelectromagnetic organ. Therefore it is scientifically plausible that the brain will react to and be sensitive to external electromagnetic signals. It has been shown that there is very strong evidence that the brain detects and responds to the Schumann Resonance signal of 0.1pW/cm². Since the first evidence that RF radiation damages chromosomes in 1959, many independent studies have identified broken DNA strands, chromosome aberrations and altered gene expression in animal cells, human cells and in living animals and humans from EMR exposure. Microwaves, including cell phone radiation, open the Blood Brain Barrier (BBB). Exposure to RF/MW is consistently associated with headaches, fatigue, loss of concentration and memory loss. These symptoms have been called "The Radiofrequency Sickness Syndrome" or "Microwave Syndrome". Because these are subjective symptoms they have been largely dismissed in the West. These symptoms are now shown with cell phone use in a significant dose-response manner. All of these effects are linked to electromagnetic radiation's ability to alter cellular calcium ions and GABA through cellular signal transduction processes not involving heat, to reduce melatonin and damage DNA, and enhance Apoptosis. A large and growing body of epidemiological research is revealing EMR associated neurological effects, degenerative disease and brain tumour. Cell phone radiation is

involved in many of the biological effects and now shows significant increases in DNA damage and brain tumours. Residential exposures down to 0.4nW/cm², typically a thousand times stronger than the Schumann Resonance signal, and living within the vicinity of cell sites, are shown to have a causal relationship to the melatonin reduction related sleep disturbance. Therefore they will produce a host of other genotoxic and melatonin related health effects.

Key Words: Electromagnetic radiation, calcium ion efflux, GABA, genotoxicity, melatonin reduction, neurological disease, suicide, brain cancer

Size: 29 pages, 340 KB.

[EMR Neurological Report 10 Sept 2002.pdf](#)

Reproductive effects from EMF/EMR exposure.

Abstract:

Epidemiology is fundamental science and the strongest evidence for the assessment of human health effects of disease agents. Many epidemiological studies have shown elevated reproductive problems from exposure to electromagnetic fields and radiation. There are well-established plausible biological mechanisms including genotoxic effects, altered calcium-ions and reduced melatonin. Animal experiments show many reproductive health effects from acute and chronic RF/MW exposures, confirming that there is a non-thermal mechanism, consistent with a genotoxic substance. Reproductive effects identified by epidemiology include miscarriage, congestive malformation, stillbirths, sudden infant death syndrome, reduced sperm counts, infertility and passing on cancer to the children. The observed effects are all consistent with the identified biological mechanisms. Taken together there is very strong evidence that acute and chronic exposure to electromagnetic fields and radiation enhances the risk of reproductive health problems and therefore exposures should be significantly reduced to reduce the risk.

Size: 31 pages, 389 KB.

[EMR Reproductive Review effects.pdf](#)

Actual or potential effects of ELF and RF/MW radiation on enhancing violence and homicide, and accelerating aging of human, animal or plant cells.

Abstract:

The brain is a very sensitive Bioelectromagnetic organ that through classical resonance processes can be altered and damaged by external electromagnetic fields and radiation. This review will explore the possibility that this could result in violence enhanced rates of homicide. The evidence that electromagnetic fields and radiation electromagnetic are genotoxic means that exposure to any electromagnetic fields and radiation will enhance cell death (Apoptosis). The natural ageing process involves oxygenated free radicals from the breathing process causing enhanced rates DNA damage, cancer and cell death. Exposure to electromagnetic fields and radiation also reduces melatonin which limits a body's ability to scavenge the free radicals and therefore contributes to enhanced Apoptosis and cancer rates. Melatonin is also necessary for a healthy immune system. Reduced melatonin is also associated with depression and suicide, and therefore it is likely to be associated with enhanced rates of violence or homicide. Since electromagnetic radiation

damages the DNA and reduces melatonin it is scientifically logical that it also enhances many of the natural aging processes in people, animals and plants. These conclusions are strongly supported by robust evidence that natural weather related effects are caused by natural electromagnetic fields and radiation with extremely small intensities. Therefore it is logical and proven that humanly generated fields and radiation at intensities from a thousand to many billion times higher, also significantly enhance a wide range of adverse health effects, including cancer, heart disease, sleep disturbance, depression, suicide, anger, rage, violence, homicide, neurological disease and mortality.

Size: 96 pages, 1208 KB.

[EMR and Aging and violence.pdf](#)

Cataract as a side effect of unprotected exposure to microwave hyperthermia treatment of breast cancer.

Abstract:

Some doctors around the world use microwaves in cancer treatments. There is scientific and medical evidence to support this treatment. The heating by microwaves enhances the blood circulation and enhances the locally supply of treatment drugs that are applied to enhance the death rates cancer cells. Some doctors simply as microwaves or they can treatment. They believe and they observe that this reduces the cancer tumours. Almost all of them do not know what mechanism is that enhances the Cell death rate. There is very strong evidence from many multiple independent studies that microwaves are genotoxic, that is, they damage DNA. Cells with damage to DNA have three main outcomes. They are mutated, produce cancer or produce enhanced cell rates (Apoptosis or Necrosis). Enhanced cell death rates will help to reduce the cancer. However, some doctors do not use focused treatment and protection or all other tissues. They are unaware of the toxic effects and claim that there are no side-effects. Because microwaves are genotoxic end they are associated with serious neurological, cardiac, reproductive and cancer increased rates, the "no side-effects claim" is not correct. There is extremely strong and will establish evidence that there are serious side-effects and therefore using the treatment must be done responsibility by focusing the signal and protecting all other tissues.

Size: 33 pages, 530 KB.

[20021021.pdf](#)

Environmental Health Factors for Motor Neuron Disease.

Abstract:

Motor Neurone Disease (MND) is a progressive disease and once the symptoms are jointly evident enough to allow diagnosis, MND is a rapidly terminal disease. A plausible mechanism is the enhanced Apoptosis of the Motor Neurones leading to the loss of skeletal muscular control and strength. This has led to the development of a hypothesis that attempts to explain the overall evidence pattern, including the seasonal MND related birth peak in Spring, the familial and occupational MND associations. The hypothesis proposes that the development of MND is based on a variable initial volume of Motor Neurons and the development of the disease

through the enhanced cumulative Apoptosis rates over people's life-time, leading to premature loss of the Motor Neuron muscular control and premature death primarily through lung failure. The cumulative life-time damage causing factors include exposure to environmental neurotoxins, stressful activity that reduces sleep quality and melatonin, heavy work load periods, and lower antioxidant levels in diets. This is a complex set of factors that can enhance the Motor Neurone Apoptosis rate. This is connected to the lack of CNS neuron regeneration. The associated environmental neurotoxin effects include those from heavy metals, smoking, agricultural chemicals, water and air pollution, toxic chemicals and genotoxic electromagnetic fields. The ubiquitous nature of any associated substance, especially dioxin and electromagnetic fields, suggests that they are the largest general population risk factor. Electromagnetic fields and some toxic chemicals have been found to pass cancer on to children from mother and/or father's exposures. This supports a genotoxic mechanism that is supported by many studies showing chromosome damage and DNA strand breakage. These disease agents are likely to reduce the initial Motor Neuron Volume and/or advance the rate of development of Motor Neuron Disease through enhanced Apoptosis rates. Reducing the general population's exposure to environmental and residential genotoxic and neurotoxic substances is likely to be associated with a significant reduction in the incidence of MND in future generations.

Size: 15 pages, 128 KB.

[EMR MND Environmental Effects.pdf](#)

Category: Major Evidence Reviews

Evidence of Health Effects of Electromagnetic Radiation, To the Australian Senate Inquiry into Electromagnetic Radiation.

Abstract:

Genotoxic and epidemiological evidence was presented to the Australian Senate Inquiry. The Inquiry Chairperson, Senator Lyn Allison, described Dr Neil Cherry's evidence as the only independent professional evidence not related to industry. Since he spent most of June and July that year in Europe presenting evidence in Italy, Austria, Ireland, Switzerland and the European Parliament in Brussels, and collecting research results from the other presentations of world leading independent researchers, the evidence presented here was strongly updated. The conclusions from this evidence are strongly contrasted with the position of Dr Michael Repacholi from the WHO, ICNIRP (International Commission on Non-Ionizing Radiation Protection), the Australian Radiation Laboratory and many other "authorities" around the world.

Size: 85 pages, 1055 KB.

[EMR Australian Senate Evidence 8-9-2000.pdf](#)

Evidence that Electromagnetic Radiation is Genotoxic: The implications for the epidemiology of cancer and cardiac, neurological and reproductive effects.

Abstract:

Dr Cherry was invited in June 2000 by a group of European Parliament MPs to present evidence to a European Parliament Conference as to whether there was any

evidence that electromagnetic radiation was a genotoxic and any epidemiological evidence showing what exposure levels could be safe. Dr Cherry was surprised to find many studies showing that electromagnetic radiation is genotoxic, including several isothermal studies and several with dose-response relationships. He also found many epidemiological studies showing dose-response relationships for cancer, cardiac, reproductive and neurological effects, showing a safe level of zero exposure, consistent with EMF/EMR being genotoxic.

"Our frame of reference determines what we look at and how we look. And as a consequence, this determines what we find."

Burke J, The Day the Universe Changed, 1985.

Size: 1,070 KB.

[EMR Evidence That EMR-EMF is genotoxic.pdf](#)

Evidence of brain cancer from occupational exposure to pulsed microwaves from a police radar.

Abstract:

Since the first evidence that RF radiation damages chromosomes in 1959, many independent studies have identified broken DNA strands, chromosome aberrations and altered gene expression in animal cells, human cells and in living animals and humans from EMR exposure. This confirms that RF/MW radiation is genotoxic with a safe exposure level of zero. Scores of epidemiological studies show that EMR increases brain tumors, including 16 studies with dose-response relationships and at least six specifically identifying Astrocytomas. Exposure to RF/MW is consistently associated with headaches, fatigue, loss of concentration and memory loss. These symptoms have been called "The Radiofrequency Sickness Syndrome" or "Microwave Syndrome". These symptoms are now shown to arise from cellphone usage in a significant dose-response manner. Cellphone use has also been associated with increased rates of brain tumor in 6 studies and eye cancer in one study. Police traffic radar is also shown to be genotoxic through studies associating it with increased rates of testicular cancer. This is a consistent and coherent set of studies confirming that microwaves, radar and police radar are genotoxic. Exposing an officer's head over many months will produce a significantly increased risk of producing an Astrocytoma brain tumor. All of these effects occur for exposures well within existing standards. The standards are based on tissue heating and ignore the evidence of genotoxicity, cancer and neurological effects.

Size: 76 pages, 839 KB.

[EMR Police brain tumor report 02.pdf](#)

ICNIRP critique 2000
CRITICISM OF THE HEALTH ASSESSMENT IN THE
ICNIRP GUIDELINES FOR RADIOFREQUENCY AND MICROWAVE
RADIATION (100 kHz - 300 GHz)

Abstract:

Dr Cherry was invited by the Ministry of Health/ Ministry for the Environment of New Zealand to carry out a peer-review of the proposal to adopt the ICNIRP guidelines for cell sites in New Zealand, in November 1999. The ICNIRP guidelines were covered by a published assessment in 1998. This review shows that the

assessment had ignored all published studies showing chromosome damage. It was highly selective, biased and very dismissive of the genotoxic evidence and the epidemiological evidence of cancer effects and reproductive effects. The assessment gives the strong impression of being predetermined in the belief that the only effects were from high exposures that cause electric shocks and acute exposures that cause tissue heating. For, example, they cite two studies saying that they do not show any significant increased effects of Brain/CNS cancer from microwave exposures when the actual published papers, Grayson (1996) and Beall et al. (1996), both do show significant increases of Brain/CNS cancer.

Size: 158 pages, 1162 KB.

[EMR ICNIRP critique 09-02.pdf](#)