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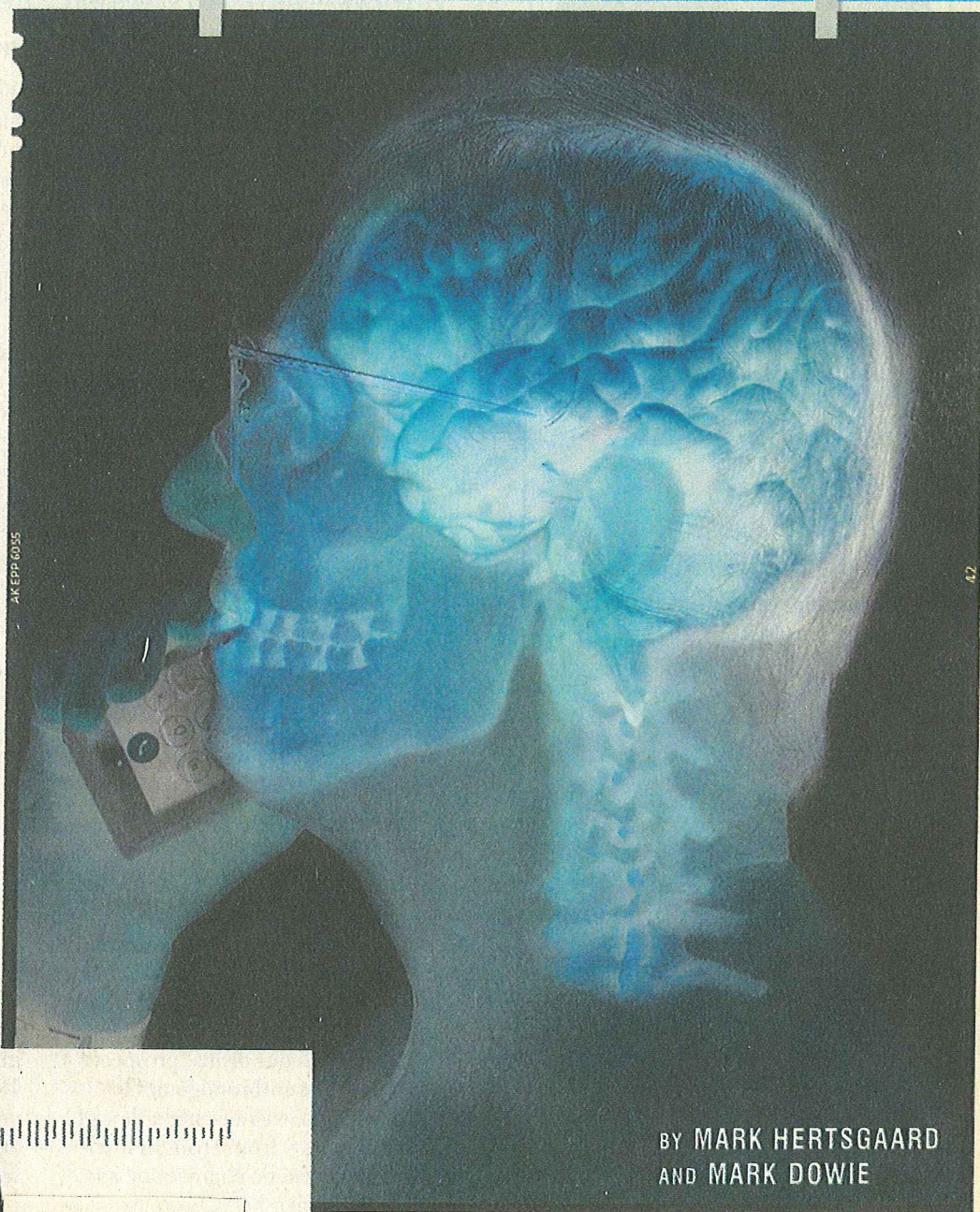
JOAN WALSH

# THE **Nation.**

**SPECIAL INVESTIGATION**

**HOW BIG WIRELESS MADE US THINK THAT CELL PHONES ARE SAFE**

**DISINFORMATION CAMPAIGN REVEALED; 5G ROLLOUT TO EXPOSE EVERYONE TO "MASSIVELY INCREASING" RADIATION**



BY MARK HERTSGAARD AND MARK DOWIE



**Link to this Nation article:** [www.thenation.com/article/how-big-wireless-made-us-think-that-cell-phones-are-safe-a-special-investigation](http://www.thenation.com/article/how-big-wireless-made-us-think-that-cell-phones-are-safe-a-special-investigation)

Things didn't end well between George Carlo and Tom Wheeler; the last time the two met face-to-face, Wheeler had security guards escort Carlo off the premises. As president of the Cellular Telecommunications and Internet Association (CTIA), Wheeler was the wireless industry's point man in Washington. Carlo was the scientist handpicked by Wheeler to defuse a public-relations crisis that threatened to strangle his infant industry in its crib. This was back in 1993, when there were only six cell-phone subscriptions for every 100 adults in the United States. But industry executives were looking forward to a booming future.

## **Cellphones had been allowed onto the US consumer market a decade earlier without any government safety testing.**

Remarkably, cell phones had been allowed onto the US consumer market a decade earlier without any government safety testing. Now, some customers and industry workers were being diagnosed with cancer. In January 1993, David Reynard sued the NEC America Company, claiming that his wife's NEC phone caused her lethal brain tumor. After Reynard appeared on national TV, the story went viral. A congressional subcommittee announced an investigation; investors began dumping their cell-phone stocks; and Wheeler and the CTIA swung into action.

A week later, Wheeler announced that his industry would pay for a comprehensive research program. Cell phones were already safe, Wheeler told reporters; the new research would simply "re-validate the findings of the existing studies."

### **Carlo's Past**

George Carlo seemed like a good bet to fulfill Wheeler's mission. He was an epidemiologist who also had a law degree, and he'd conducted studies for other controversial industries. After a study funded by Dow Corning, Carlo had declared that breast implants posed only minimal health risks. With chemical-industry funding, he had concluded that low levels of dioxin, the chemical behind the Agent Orange scandal, were not dangerous. In 1995, Carlo began directing the industry-financed Wireless Technology Research project (WTR), whose eventual budget of \$28.5 million made it the best-funded investigation of cell-phone safety to date. Outside critics soon came to suspect that Carlo would be the front man for an industry whitewash. They cited his dispute with Henry Lai, a professor of biochemistry at the University of Washington, over a study that Lai had conducted examining whether cell-phone radiation could damage DNA. In 1999, Carlo and the WTR's general counsel sent a letter to the university's president urging that Lai be fired for his alleged violation of research protocols. Lai accused the WTR of tampering with his experiment's results. Both Carlo and Lai deny the other's accusations.



Critics also attacked what they regarded as the slow pace of WTR research. The WTR was merely "a confidence game" designed to placate the public but stall real research, according to Louis Slesin, editor of the trade publication *Microwave News*. "By dangling a huge amount of money in front of the cash-starved [scientific] community," Slesin argued, "Carlo guaranteed silent obedience. Anyone who dared complain risked being cut off from his millions." Carlo denies the allegation.

### **Carlo finds "serious questions" about cellphone safety.**

Whatever Carlo's motives might have been, the documented fact is that he and Wheeler would eventually clash bitterly over the WTR's findings, which Carlo presented to wireless-industry leaders on February 9, 1999. By that date, the WTR had commissioned more than 50 original studies and reviewed many more. Those studies raised "serious questions" about cell-phone safety, Carlo told a closed-door meeting of the CTIA's board of directors, whose members included the CEOs or top officials of the industry's 32 leading companies, including Apple, AT&T, and Motorola.

Carlo sent letters to each of the industry's chieftains on October 7, 1999, reiterating that the WTR's research had found the following:

"The risk of rare neuro-epithelial tumors on the outside of the brain was more than doubled...in cell phone users"; there was an apparent "correlation between brain tumors occurring on the right side of the head and the use of the phone on the right side of the head"; and "the ability of radiation from a phone's antenna to cause functional genetic damage [was] definitely positive...."

Carlo urged the CEOs to do the right thing: give consumers "the information they need to make an informed judgment about how much of this unknown risk they wish to assume," especially since some in the industry had "repeatedly and falsely claimed that wireless phones are safe for all consumers including children."

The World Health Organization classifies cell-phone radiation as a "possible" carcinogen.

The very next day, a livid Tom Wheeler began publicly trashing Carlo to the media. In a letter he shared with the CEOs, Wheeler told Carlo that the CTIA was "certain that you have never provided CTIA with the studies you mention"—an apparent effort to shield the industry from liability in the lawsuits that had led to Carlo's hiring in the first place. Wheeler charged further that the studies had not been published in peer-reviewed journals, casting doubt on their validity.



Wheeler's tactics succeeded in dousing the controversy. Although Carlo had in fact repeatedly briefed Wheeler and other senior industry officials on the studies, which had indeed undergone peer review and would soon be published, reporters on the technology beat accepted Wheeler's discrediting of Carlo and the WTR's findings. (Wheeler would go on to chair the Federal Communications Commission, which regulates the wireless industry. He agreed to an interview for this article but then put all of his remarks off the record, with one exception: his statement that he has always taken scientific guidance from the US Food and Drug Administration, which, he said, "has concluded, 'the weight of scientific evidence had not linked cell phones with any health problems.'")

Why, after such acrimony, Carlo was allowed to make one last appearance before the CTIA board is a mystery. Whatever the reason, Carlo flew to New Orleans in February 2000 for the wireless industry's annual conference, where he submitted the WTR's final report to the CTIA board. According to Carlo, Wheeler made sure that none of the hundreds of journalists covering the event could get anywhere near him. When Carlo arrived, he was met by two seriously muscled men in plain clothes; the larger of the two let drop that he had recently left the Secret Service. The security men steered Carlo into a holding room, where they insisted he remain until his presentation. When summoned, Carlo found roughly 70 of the industry's top executives waiting for him in silence. Carlo had spoken a mere 10 minutes when Wheeler abruptly stood, extended a hand, and said, "Thank you, George." The two muscle men then ushered the scientist to a curbside taxi and waited until it pulled away.

In the years to come, the WTR's cautionary findings would be replicated by numerous other scientists in the United States and around the world, leading the World Health Organization in 2011 to classify cell-phone radiation as a "possible" human carcinogen and the governments of Great Britain, France, and Israel to issue strong warnings on cell-phone use by children. But as the taxi carried Carlo to Louis Armstrong International Airport, the scientist wondered whether his relationship with the industry might have turned out differently if cell phones had been safety-tested before being allowed onto the consumer market, before profit took precedence over science. But it was too late: Wheeler and his fellow executives had made it clear, Carlo told *The Nation*, that "they would do what they had to do to protect their industry, but they were not of a mind to protect consumers or public health."

This article does not argue that cell phones and other wireless technologies are necessarily dangerous; that is a matter for scientists to decide. Rather, the focus here is on the global industry behind cell phones—and the industry's long campaign to make people believe that cell phones are safe.



As happened earlier with Big Tobacco and Big Oil, the wireless industry's own scientists privately warned about the risks.

That campaign has plainly been a success: 95 out of every 100 adult Americans now own a cell phone; globally, three out of four adults have cell-phone access, with sales increasing every year. The wireless industry is now one of the fastest-growing on Earth and one of the biggest, boasting annual sales of \$440 billion in 2016.

Carlo's story underscores the need for caution, however, particularly since it evokes eerie parallels with two of the most notorious cases of corporate deception on record: the campaigns by the tobacco and fossil-fuel industries to obscure the dangers of smoking and climate change, respectively. Just as tobacco executives were privately told by their own scientists (in the 1960s) that smoking was deadly, and fossil-fuel executives were privately told by their own scientists (in the 1980s) that burning oil, gas, and coal would cause a "catastrophic" temperature rise, so Carlo's testimony reveals that wireless executives were privately told by their own scientists (in the 1990s) that cell phones could cause cancer and genetic damage.

Carlo's October 7, 1999, letters to wireless-industry CEOs are the smoking-gun equivalent of [the November 12, 1982, memo](#) that M.B. Glaser, Exxon's manager of environmental-affairs programs, sent to company executives explaining that burning oil, gas, and coal could raise global temperatures by a destabilizing 3 degrees Celsius by 2100. For the tobacco industry, Carlo's letters are akin to [the 1969 proposal](#) that a Brown & Williamson executive wrote for countering anti-tobacco advocates. "Doubt is our product," the memo declared. "It is also the means of establishing a controversy...at the public level."

Like their tobacco and fossil-fuel brethren, wireless executives have chosen not to publicize what their own scientists have said about the risks of their products.

On the contrary, the industry—in America, Europe, and Asia—has spent untold millions of dollars in the past 25 years proclaiming that science is on its side, that the critics are quacks, and that consumers have nothing to fear. This, even as the industry has worked behind the scenes—again like its Big Tobacco counterpart—to deliberately addict its customers. Just as cigarette companies added nicotine to hook smokers, so have wireless companies designed cell phones to deliver a jolt of dopamine with each swipe of the screen.

This *Nation* investigation reveals that the wireless industry not only made the same moral choices that the tobacco and fossil-fuel industries did; it also borrowed from the same public-relations playbook those industries pioneered. The playbook's key insight



is that an industry doesn't have to win the scientific argument about safety; it only has to keep the argument going. That amounts to a win for the industry, because the apparent lack of certainty helps to reassure customers, even as it fends off government regulations and lawsuits that might pinch profits.

Central to keeping the scientific argument going is making it appear that not all scientists agree. Again like the tobacco and fossil-fuel industries, the wireless industry has "war gamed" science, as a Motorola internal memo in 1994 phrased it. War-gaming science involves playing offense as well as defense: funding studies friendly to the industry while attacking studies that raise questions; placing industry-friendly experts on advisory bodies like the World Health Organization; and seeking to discredit scientists whose views depart from the industry's.

Funding friendly research has perhaps been the most important component of this strategy, because it conveys the impression that the scientific community truly is divided. Thus, when studies have linked wireless radiation to cancer or genetic damage—as Carlo's WTR did in 1999; as the WHO's Interphone study did in 2010; and as the US National Toxicology Program did in 2016—industry spokespeople can point out, accurately, that other studies disagree. "[T]he overall balance of the evidence" gives no cause for alarm, asserted Jack Rowley, research and sustainability director for the Groupe Special Mobile Association (GSMA), Europe's wireless trade association, speaking to reporters about the WHO's findings.

A closer look reveals the industry's sleight of hand. When Henry Lai, the professor whom Carlo tried to get fired, analyzed 326 safety-related studies completed between 1990 and 2005, he learned that 56 percent found a biological effect from cell-phone radiation and 44 percent did not; the scientific community apparently was split. But when Lai recategorized the studies according to their funding sources, a different picture emerged: 67 percent of the independently funded studies found a biological effect, while a mere 28 percent of the industry-funded studies did. Lai's findings were replicated by a 2007 analysis in *Environmental Health Perspectives* that concluded industry-funded studies were two and a half times less likely than independent studies to find a health effect.

One key player has not been swayed by all this wireless-friendly research: the insurance industry. *The Nation* has not been able to find a single insurance company willing to sell a product-liability policy that covered cell-phone radiation. "Why would we want to do that?" one executive chuckled before pointing to more than two dozen lawsuits outstanding against wireless companies, demanding a total of \$1.9 billion in damages.



Some judges have affirmed such lawsuits, including a judge in Italy who refused to allow industry-funded research as evidence.

Even so, the industry's neutralizing of the safety issue has opened the door to the biggest, most hazardous prize of all: the proposed revolutionary transformation of society dubbed the "Internet of Things." Lauded as a gigantic engine of economic growth, the Internet of Things will not only connect people through their smartphones and computers but will connect those devices to a customer's vehicles and home appliances, even their baby's diapers—all at speeds faster than can currently be achieved.

Billions of cell-phone users have been subjected to a public-health experiment without informed consent.

## 5G

There is a catch, though: The Internet of Things will require augmenting today's 4G technology with 5G, thus "massively increasing" the general population's exposure to radiation, according to a petition signed by 236 scientists worldwide who have published more than 2,000 peer-reviewed studies and represent "a significant portion of the credentialed scientists in the radiation research field," according to Joel Moskowitz, the director of the Center for Family and Community Health at the University of California, Berkeley, who helped circulate the petition. Nevertheless, like cell phones, 5G technology is on the verge of being introduced without pre-market safety testing.

Lack of definitive proof that a technology is harmful does not mean the technology is safe, yet the wireless industry has succeeded in selling this logical fallacy to the world. In truth, the safety of wireless technology has been an unsettled question since the industry's earliest days. The upshot is that, over the past 30 years, billions of people around the world have been subjected to a massive public-health experiment: Use a cell phone today, find out later if it causes cancer or genetic damage. Meanwhile, the wireless industry has obstructed a full and fair understanding of the current science, aided by government agencies that have prioritized commercial interests over human health and news organizations that have failed to inform the public about what the scientific community really thinks. In other words, this public-health experiment has been conducted without the informed consent of its subjects, even as the industry keeps its thumb on the scale.

"The absence of absolute proof does not mean the absence of risk," Annie Sasco, the former director of epidemiology for cancer prevention at France's National Institute of Health and Medical Research, told the attendees of the 2012 Childhood Cancer conference. "The younger one starts using cell phones, the higher the risk," Sasco continued, urging a public-education effort to inform parents, politicians, and the press about children's exceptional susceptibility.



For adults and children alike, the process by which wireless radiation may cause cancer remains uncertain, but it is thought to be indirect. Wireless radiation has been shown to damage the blood-brain barrier, a vital defense mechanism that shields the brain from carcinogenic chemicals elsewhere in the body (resulting, for example, from secondhand cigarette smoke). Wireless radiation has also been shown to interfere with DNA replication, a proven progenitor of cancer. In each of these cases, the risks are higher for children: Their skulls, being smaller, absorb more radiation than adults' skulls do, while children's longer life span increases their cumulative exposure.

The wireless industry has sought to downplay concerns about cell phones' safety, and the Federal Communications Commission has followed its example. In 1996, the FCC established cell-phone safety levels based on "specific absorption rate," or SAR. Phones were required to have a SAR of 1.6 watts or less per kilogram of body weight. In 2013, the American Academy of Pediatrics advised the FCC that its guidelines "do not account for the unique vulnerability and use patterns specific to pregnant women and children." Nevertheless, the FCC has declined to update its standards.

The FCC has granted the industry's wishes so often that it qualifies as a "captured agency," argued journalist Norm Alster in a report that Harvard University's Edmond J. Safra Center for Ethics published in 2015. The FCC allows cell-phone manufacturers to self-report SAR levels, and does not independently test industry claims or require manufacturers to display the SAR level on a phone's packaging. "Industry controls the FCC through a soup-to-nuts stranglehold that extends from its well-placed campaign spending in Congress through its control of the FCC's congressional oversight committees to its persistent agency lobbying," Alster wrote. He also quoted the CTIA website praising the FCC for "its light regulatory touch."

The revolving-door syndrome that characterizes so many industries and federal agencies reinforces the close relationship between the wireless industry and the FCC. Just as Tom Wheeler went from running the CTIA (1992–2004) to chairing the FCC (2013–2017), Meredith Atwell Baker went from FCC commissioner (2009–2011) to the presidency of the CTIA (2014 through today). To ensure its access on Capitol Hill, the wireless industry made \$26 million in campaign contributions in 2016, according to the Center for Responsive Politics, and spent \$87 million on lobbying in 2017.

Neutralizing the safety issue has been an ongoing imperative because the research keeps coming, much of it from outside the United States. But the industry's European and Asian branches have, like their US counterpart, zealously war-gamed the science,



spun the news coverage, and thereby warped the public perception of their products' safety.

The WHO began to study the health effects of electric- and magnetic-field radiation (EMF) in 1996 under the direction of Michael Repacholi, an Australian biophysicist. Although Repacholi claimed on disclosure forms that he was "independent" of corporate influence, in fact Motorola had funded his research: While Repacholi was director of the WHO's EMF program, Motorola paid \$50,000 a year to his former employer, the Royal Adelaide Hospital, which then transferred the money to the WHO program. When journalists exposed the payments, Repacholi denied that there was anything untoward about them because Motorola had not paid him personally. Eventually, Motorola's payments were bundled with other industry contributions and funneled through the Mobile and Wireless Forum, a trade association that gave the WHO's program \$150,000 annually. In 1999, Repacholi helped engineer a WHO statement that "EMF exposures below the limits recommended in international guidelines do not appear to have any known consequence on health."

Two wireless trade associations contributed \$4.7 million to the Interphone study launched by the WHO's International Agency for Cancer Research in 2000. That \$4.7 million represented 20 percent of the \$24 million budget for the Interphone study, which convened 21 scientists from 13 countries to explore possible links between cell phones and two common types of brain tumor: glioma and meningioma. The money was channeled through a "firewall" mechanism intended to prevent corporate influence on the IACR's findings, but whether such firewalls work is debatable. "Industry sponsors know [which scientists] receive funding; sponsored scientists know who provides funding," Dariusz Leszczynski, an adjunct professor of biochemistry at the University of Helsinki, has explained.

The FCC grants the wireless industry's wishes so often that it qualifies as a "captured agency."

To be sure, the industry could not have been pleased with some of the Interphone study's conclusions. The study found that the heaviest cell-phone users were 80 percent more likely to develop glioma. (The initial finding of 40 percent was increased to 80 to correct for selection bias.) The Interphone study also concluded that individuals who had owned a cell phone for 10 years or longer saw their risk of glioma increase by nearly 120 percent. However, the study did not find any increased risk for individuals who used their cell phones less frequently; nor was there evidence of any connection with meningioma.



When the Interphone conclusions were released in 2010, industry spokespeople blunted their impact by deploying what experts on lying call “creative truth-telling.”

“Interphone’s conclusion of no overall increased risk of brain cancer is consistent with conclusions reached in an already large body of scientific research on this subject,” John Walls, the vice president for public affairs at the CTIA, told reporters. The wiggly word here is “overall”: Since some of the Interphone studies did not find increased brain-cancer rates, stipulating “overall” allowed Walls to ignore those that did. The misleading spin confused enough news organizations that their coverage of the Interphone study was essentially reassuring to the industry’s customers. *The Wall Street Journal* announced “Cell Phone Study Sends Fuzzy Signal on Cancer Risk,” while the BBC’s headline declared: “No Proof of Mobile Cancer Risk.”

The industry’s \$4.7 million contribution to the WHO appears to have had its most telling effect in May 2011, when the WHO convened scientists in Lyon, France, to discuss how to classify the cancer risk posed by cell phones. The industry not only secured “observer” status at Lyon for three of its trade associations; it placed two industry-funded experts on the working group that would debate the classification, as well as additional experts among the “invited specialists” who advised the group. Niels Kuster, a Swiss engineer, initially filed a conflict-of-interest statement affirming only that his research group had taken money from “various governments, scientific institutions and corporations.” But after Kuster co-authored a summary of the WHO’s findings in *The Lancet Oncology*, the medical journal issued a correction expanding on Kuster’s conflict-of-interest statement, noting payments from the Mobile Manufacturers Forum, Motorola, Ericsson, Nokia, Samsung, Sony, GSMA, and Deutsche Telekom. Nevertheless, Kuster participated in the entire 10 days of deliberations.

The industry also mounted a campaign to discredit Lennart Hardell, a Swedish professor of oncology serving on the working group. Hardell’s studies, which found an increase in gliomas and acoustic neuromas in long-term cell-phone users, were some of the strongest evidence that the group was considering.

Hardell had already attracted the industry’s displeasure back in 2002, when he began arguing that children shouldn’t use cell phones. Two scientists with industry ties quickly published a report with the Swedish Radiation Authority dismissing Hardell’s research. His detractors were John D. Boice and Joseph K. McLaughlin of the International Epidemiology Institute, a company that provided “Litigation Support” and “Corporate Counseling” to various industries, according to its website. Indeed, at the very time Boice and McLaughlin were denigrating Hardell’s work, the institute was providing expert-witness services to Motorola in a brain-tumor lawsuit against the company.



The wireless industry didn't get the outcome that it wanted at Lyon, but it did limit the damage. A number of the working group's scientists had favored increasing the classification of cell phones to Category 2A, a "probable" carcinogen; but in the end, the group could only agree on an increase to 2B, a "possible" carcinogen.

That result enabled the industry to continue proclaiming that there was no scientifically established proof that cell phones are dangerous. Jack Rowley of the GSMA trade association said that "interpretation should be based on the overall balance of the evidence." Once again, the slippery word "overall" downplayed the significance of scientific research that the industry didn't like.

Industry-funded scientists had been pressuring their colleagues for a decade by then, according to Leszczynski, another member of the Lyon working group. Leszczynski was an assistant professor at Harvard Medical School when he first experienced such pressure, in 1999. He had wanted to investigate the effects of radiation levels higher than the SAR levels permitted by government, hypothesizing that this might better conform to real-world practices. But when he proposed the idea at scientific meetings, Leszczynski said, it was shouted down by Mays Swicord, Joe Elder, and C.K. Chou—scientists who worked for Motorola. As Leszczynski recalled, "It was a normal occurrence at scientific meetings—and I attended really a lot of them—that whenever [a] scientist reported biological effects at SAR over [government-approved levels], the above-mentioned industry scientists, singularly or as a group, jumped up to the microphone to condemn and to discredit the results."

Years later, a study that Leszczynski described as a "game changer" discovered that even phones meeting government standards, which in Europe were a SAR of 2.0 watts per kilogram, could deliver exponentially higher peak radiation levels to certain skin and blood cells. (SAR levels reached a staggering 40 watts per kilogram—20 times higher than officially permitted.) In other words, the official safety levels masked dramatically higher exposures in hot spots, but industry-funded scientists obstructed research on the health impacts.

"Everyone knows that if your research results show that radiation has effects, the funding flow dries up." —Dariusz Leszczynski, adjunct professor of biochemistry at the University of Helsinki said in an interview in 2011.

Sure enough, the Radiation and Nuclear Safety Authority of Finland, where Leszczynski had a long career, discontinued research on the biological effects of cell phones and discharged him a year later.



According to scientists involved in the process, the WHO may decide later this year to reconsider its categorization of the cancer risk posed by cell phones; the WHO itself told *The Nation* that before making any such decision, it will review the final report of the National Toxicology Program, a US government initiative. The results reported by the NTP in 2016 seem to strengthen the case for increasing the assessment of cell-phone radiation to a “probable” or even a “known” carcinogen. Whereas the WHO’s Interphone study compared the cell-phone usage of people who had contracted cancer with that of people who hadn’t, the NTP study exposed rats and mice to cell-phone radiation and observed whether the animals got sick.

“There is a carcinogenic effect,” announced Ron Melnick, the designer of the study. Male rats exposed to cell-phone radiation developed cancer at a substantially higher rate, though the same effect was not seen in female rats. Rats exposed to radiation also had lower birth rates, higher infant mortality, and more heart problems than those in the control group. The cancer effect occurred in only a small percentage of the rats, but that small percentage could translate into a massive amount of human cancers. “Given the extremely large number of people who use wireless communications devices, even a very small increase in the incidence of disease...could have broad implications for public health,” the NTP’s draft report explained.

But this was not the message that media coverage of the NTP study conveyed, as the industry blanketed reporters with its usual “more research is needed” spin. “Seriously, stop with the irresponsible reporting on cell phones and cancer,” demanded a *Vox* headline. “Don’t Believe the Hype,” urged *The Washington Post*. *Newsweek*, for its part, stated the NTP’s findings in a single paragraph, then devoted the rest of the article to an argument for why they should be ignored.

The NTP study was to be peer-reviewed at a meeting on March 26–28, amid signs that the program’s leadership is pivoting to downplay its findings. The NTP had issued a public-health warning when the study’s early results were released in 2016. But when the NTP released essentially the same data in February 2018, John Bucher, the senior scientist who directed the study, announced in a telephone press conference that “I don’t think this is a high-risk situation at all,” partly because the study had exposed the rats and mice to higher levels of radiation than a typical cell-phone user experienced. *Microwave News’s* Slesin speculated on potential explanations for the NTP’s apparent backtracking: new leadership within the program, where a former drug-company executive, Brian Berridge, now runs the day-to-day operations; pressure from business-friendly Republicans on Capitol Hill and from the US military, whose weapons systems rely on wireless radiation; and the anti-science ideology of the Trump White House. The



question now: Will the scientists doing the peer review endorse the NTP's newly ambivalent perspective, or challenge it?

**"The research keeps coming."**

The scientific evidence that cell phones and wireless technologies in general can cause cancer and genetic damage is not definitive, but it is abundant and has been increasing over time. Contrary to the impression that most news coverage has given the public, 90 percent of the 200 existing studies included in the National Institutes of Health's PubMed database on the oxidative effects of wireless radiation—its tendency to cause cells to shed electrons, which can lead to cancer and other diseases—have found a significant impact, according to a survey of the scientific literature conducted by Henry Lai. Seventy-two percent of neurological studies and 64 percent of DNA studies have also found effects.

The wireless industry's determination to bring about the Internet of Things, despite the massive increase in radiation exposure this would unleash, raises the stakes exponentially. Because 5G radiation can only travel short distances, antennas roughly the size of a pizza box will have to be installed approximately every 250 feet to ensure connectivity. "Industry is going to need hundreds of thousands, maybe millions, of new antenna sites in the United States alone," said Moskowitz, the UC Berkeley researcher. "So people will be bathed in a smog of radiation 24/7."

## Precautionary Principle

There is an alternative approach, rooted in what some scientists and ethicists call the "precautionary principle," which holds that society doesn't need absolute proof of hazard to place limits on a given technology. If the evidence is sufficiently solid and the risks sufficiently great, the precautionary principle calls for delaying the deployment of that technology until further research clarifies its impacts. The scientists' petition discussed earlier urges government regulators to apply the precautionary principle to 5G technology. Current safety guidelines "protect industry—not health," contends the petition, which "recommend[s] a moratorium on the roll-out of [5G]...until potential hazards for human health and the environment have been fully investigated by scientists independent from industry."

No scientist can say with certainty how many wireless-technology users are likely to contract cancer, but that is precisely the point: We simply don't know. Nevertheless, we are proceeding as if we do know the risk, and that the risk is vanishingly small.

Meanwhile, more and more people around the world, including countless children and adolescents, are getting addicted to cell phones every day, and the shift to radiation-heavy 5G technology is regarded as a fait accompli. Which is just how Big Wireless likes it.



**\*see 14 min. video of Dr. Martin Pall at the San Francisco Commonwealth Club describing specific mechanisms of microwave radiation biologic harms:  
[https: vimeo.com/132870272](https://vimeo.com/132870272)**







# Internet Links for Important Testimonies

(Most are 15 minutes or less)

1. Senator Blumethal asks wireless industry about safety of 5G: *Winning the Race to 5G and the Next Era of Technology Innovation in the United States*; United States Senate executive hearing. (**Advance the video to 2:04 hours:minutes.**)  
<https://www.commerce.senate.gov/public/index.cfm/hearings?ID=06336057-CC60-45DF-A361-32D7401EE6CB>

2. Wireless Tech Forum: Introduction (Patrick Colbeck)  
<https://www.youtube.com/watch?v=H5f-qDbVvCQ&feature=youtu.be>

3. Dr. Ron Melnick: NTP study  
[https://www.youtube.com/watch?v=LjLPTNf\\_NGI&feature=youtu.be](https://www.youtube.com/watch?v=LjLPTNf_NGI&feature=youtu.be)

4. Body of Evidence behind Cancer Assertions (Dr. Anthony Miller)  
<https://www.youtube.com/watch?v=M4CxDucJKHo&feature=youtu.be>

5. Biological Mechanisms of Cell Functions (Dr. Paul Heroux)  
<https://www.youtube.com/watch?v=nJyQk3Y6NGE&feature=youtu.be>

6. Clinical Observations of Microwave Sickness (Dr. James Ziobron)  
<https://www.youtube.com/watch?v=Y4B130m2EWE&feature=youtu.be>

7. Microwave Sickness (Dafna Tachover)  
<https://www.youtube.com/watch?v=QjmqEoian80&feature=youtu.be>

8. Dr. Sharon Goldberg Testifies at Michigan's 5G Small Cell Tower Legislation Hearing October 4, 2018  
[https://www.youtube.com/watch?v=CK0AliMeKA&list=PL4pSLcFFUtushANn1i\\_QnAPKxKxuDhFtN](https://www.youtube.com/watch?v=CK0AliMeKA&list=PL4pSLcFFUtushANn1i_QnAPKxKxuDhFtN)

9. Practical Safeguards (Theodora Scarato)  
<https://www.youtube.com/watch?v=fLLfWQIMxtA&feature=youtu.be>

10. Kevin Mottus, CA Brain Tumor Association  
[https://www.youtube.com/watch?time\\_continue=973&v=ljLynbr5iPc](https://www.youtube.com/watch?time_continue=973&v=ljLynbr5iPc)



**France** - <https://wearetheevidence.org/french-court-recognized-electromagnetic-sensitivity-as-an-occupational-disease/>

**Belgium** - <http://www.brusselstimes.com/brussels/14753/radiation-concerns-halt-brussels-5g-for-now>

**Massachusetts** - <http://www.bcattv.org/bnews/top-stories/verizon-drops-small-cell-wireless-booster-application-in-faceoffees/>

<http://www.bcattv.org/programming/government-channel/board-fselectmen/board-of-selectmen-october-22-2018/>

**Burlington, Massachusetts** -

<http://www.burlington.org/town-government/small-cell-information.php>

**Portland, Oregon** - <https://prepforthat.com/portland-blocking-5g-networks-over-health-risks/>

**Marin County, CA** - <https://www.marinij.com/2019/02/06/marin-supervisors-urged-to-reject-5g/>



## Other References on the Internet

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Cambridge, MA 02138 USA  
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<sup>14</sup>Hertsgaard, Mark and Dowie, Mark, "How Big Wireless Made Us Think That Cell Phones Are Safe: A Special Investigation," *The Nation*, April 28, 2018 Issue. <https://www.thenation.com/article/how-big-wireless-made-us-think-that-cell-phones-are-safe-a-special-investigation>

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## Important References for Understanding EMF Issues (It's informative to read just the reference titles.)

Electromagnetic fields (EMFs) are found in a spectrum of frequencies from a few Hertz (Hz) (cycles per second), corresponding to the earth's natural frequency, to more than  $10^{20}$  Hertz, corresponding to gamma radiation. In between these limits are frequencies that include radio waves, the visible light spectrum, X-rays, and much more. An Internet search on "EMF Spectrum" will locate graphic representations and more details about this type of energy.

<sup>1</sup>Sources of EMF Exposure and How to Avoid Them, EMF Environmental Health Initiative by Cindy Sage and Nancy Evans.

<https://www.healthandenvironment.org/docs/xaruploads/EMFSourcesAndChoices.pdf>

<sup>2</sup>"What are EMFs? Your Guide to the Types & Sources," Nontoxic Living, July 10, 2017.

<https://www.nontoxicliving.tips/blog/what-are-emfs-your-guide-to-the-types-sources>

<sup>3</sup>Melnick, Ronald L., PhD, "Peer Review of the Draft NTP Technical Reports on Cell Phone Radiofrequency Radiation," National Toxicology Program, U. S. Department of Health and Human Services, March 28, 2018. (Click on Final Documents)

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<sup>6</sup>The EMF-Portal of the RWTH Aachen University, an Internet information platform that summarizes scientific research data on the effects of electromagnetic fields (EMFs). It is a searchable literature data base, in German and English, which contains **27,962** publications and **6,315** summaries of individual scientific studies on this subject.

<https://www.emf-portal.org/en>

# Wireless Electromagnetic Radiation

## Executive Summary

- All of today's wireless devices send and receive data through two-way microwave radiation that exposes our citizens to biologically active electromagnetic fields (EMFs).
- Current FCC guidelines governing public exposure to wireless radiation were set in 1996 and have not been updated to reflect use of today's wireless technology.
- The public exposure limits are based on a half hour of exposure from one device. They do not account for the 24/7 exposures emitted by cell towers, street antennas, wireless devices and routers today, or the cumulative effects from constant exposure over time.
- The 1996 guidelines were set by electronic and electrical engineers (IEEE) and do not take into account the knowledge possessed by scientists, doctors and public health experts who specialize in human biology.
- These outdated guidelines were based solely on a thermal theory; i.e. how much heat it takes to raise the temperature of one's skin.
- Today's science proves there are many adverse biological effects at the non-thermal level, and our outdated guidelines still allow radiation thousands of times higher than where biological effects are occurring.
- Today's devices are tested at a distance away from the body; the fine print indicates using them on the body (i.e., holding a cell phone, putting it to one's head, using a laptop or tablet in the lap and touching it with one's hand) may cause exposure to radiation higher than even the FCC's allowable limits.
- The IEEE now recognizes the need to update public radiation exposure guidelines for non-thermal effects. See this article from 2016 and the 2018 article on the NTP study, "Clear Evidence of Cell Phone RF Radiation Cancer Risk".
- Since public policy has not caught up to the science, industry continues to aggressively promote products and infrastructure that expose the public to toxic levels of microwave radiation including the utility "smart" grid being piloted in Worcester, and the small cell antennas/distributed antenna systems (DAS) being rolled out state-wide to support 5G and the Internet of Things.
- Wireless technology has never been safety tested for children, fetuses, the elderly or those with known health compromises. Today's science proves these sub-populations are especially vulnerable to wireless radiation. Many in Massachusetts are already becoming ill.





See summaries below for the current science as well as international, U.S. federal, state and Commonwealth EMF activities. Financial impact, information on common points of confusion and solutions are also provided at the end.

## Current Science

- The U.S. National Toxicology Program in 2018 published final results from a multi-year, \$30M study on electromagnetic radiation and health. They reported peer-reviewed findings of **DNA damage, brain and heart tumors** at the non-thermal level.
- The FDA appears to be downplaying the results, and the now-retired scientist Dr. Ronald Melnick who designed the study indicates, “The NTP studies clearly show that non-ionizing radiation can cause cancers and other adverse health effects.”
- The Ramazzini Institute in Italy published another large study in 2018 that confirms the NTP findings.
- These support findings of epidemiological studies on wireless radiation that show increased cancer risks, especially for children.
- Thousands of studies world-wide are reporting further evidence of long-term biological harm at the non-thermal level including **autism, Alzheimer’s, infertility, neurotoxicity, genotoxicity, DNA damage and more.**
- In the short-term, evidence is linking this form of non-thermal radiation to a new debilitating disease called electrosensitivity (ES) that commonly presents with one or more of the following: **headaches, insomnia, nausea, dizziness, tinnitus, skin heating/flushing/tingling, fatigue, tachycardia, learning disabilities, impaired cognitive function, nose and ear bleeds, behavior issues and more.**

## International Initiatives

- See the EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses which indicates, “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.”

- Many other countries allow far less wireless radiation exposure to their citizens than the U.S., and many have governance in place to minimize public health risks. See the Environmental Health Trust for a summary of international policy actions on wireless.
- In 2011 the WHO classified wireless radiation as a 2B Possible Human Carcinogen and today's science merits moving the classification to a known human carcinogen.
- Leading world scientists have submitted an appeal to the **United Nations and World Health Organization** to protect the public from wireless radiation. They outline a plan to do so until the industry brings biologically safe technology to market. Columbia University's Dr. Martin Blank provides a three-minute introduction to the appeal here.
- Longtime World Health Organization advisor Anthony B. Miller, M.D., indicates radiofrequency (RF) radiation from any source now fully meets the criteria to be classified as a “Group 1 carcinogenic to humans” agent.

### U.S. Federal Activity

- After the first oncologist stated his patient died from tumors on the side of her brain that lined up with the antennas in her cell phone, the **Cellular Telephone Industry Association (CTIA)** commissioned a \$28M multi-year study that showed wireless technology is carcinogenic. The CTIA suppressed evidence of harm in the 1990s and did not inform the public.
- In 1996, the **FCC established thermal guidelines for radiation exposure based on engineering standards, not the scientific biological evidence** that shows harm at the non-thermal level.
- In 1997, the industry influenced the passage of the **Telecommunications Act** and lead local municipalities to believe there could be no recourse if citizens became ill or expressed concerns over radiation emissions from cell towers. They also buried disclaimers in the legal fine print of cell phone manuals indicating users should keep the devices at a distance from their bodies, else exceed the FCCs public radiation exposure guidelines.





- Harvard University's Law School Center for Ethics published a 2015 report detailing these events and more. See *Captured Agency: How the Federal Communications Commission is Dominated by the Industries it Presumably Regulates.*
- In 2018 *The Nation* conducted a similar special investigation, *How Big Wireless Made Us Think That Cell Phones Are Safe: A Special Investigation.* The disinformation campaign—and massive radiation increase—behind the 5G rollout.
- EMFs were addressed in a **2008 congressional hearing** where scientists presented findings of increased penetration of cell phone radiation in the brains of children: [https://www.youtube.com/watch?v=h\\_YhKblPtOo](https://www.youtube.com/watch?v=h_YhKblPtOo)
- In 2012 the **BioInitiative Report** was published, summarizing evidence of harm from thousands of studies all over the world.
- In 2013 the **U.S. Government Accountability Office** instructed the FCC to "formally reassess the current RF energy exposure limit, including its effects on human health." More than 900 public comments from doctors, scientists, the **American Academy of Pediatrics**, the **American Academy of Environmental Medicine** and more have been submitted under Docket 13-84. The FCC has not responded.
- The Environmental Health Trust summarizes additional Policy activities including **statements from the EPA, Department of the Interior, Radio Frequency Interagency Workgroup, U.S. Science Advisory Board** and more.
- The **United States Access Board's** IEQ Indoor Environmental Quality Project indicates electromagnetic sensitivities may be considered **disabilities** under the ADA:  
  
<https://www.access-board.gov/research/completed-research/indoor-environmental-quality/introduction>
- The Access Board recommends the following **accommodations**:  
  
<https://www.access-board.gov/research/completed-research/indoor-environmental-quality/recommendations-for-accommodations>
- Job Accommodation Network (JAN) is one of several services provided by the U.S. Department of Labor's Office of Disability Employment Policy (ODEP). JAN offers the following **Accommodation Ideas for Electromagnetic Sensitivity**:





<http://askjan.org/soar/other/electrical.html>

- Israeli and New York lawyer Dafna Tachover has developed electrosensitivity from wireless technology and in September 2016 **testified before the FCC's Disability Advisory Committee**. See her five-minute testimony here: <https://www.youtube.com/watch?v=qg0H63GLkU&feature=youtu.be>  
Ms. Tachover is also building We Are The Evidence (WATE) to document that this issue is affecting constituents from all professions and stations in life.
- On June 20, 2016, just weeks after the National Toxicology Program announced EMFs cause DNA damage, brain and heart tumors, former **FCC Chairman Tom Wheeler** indicated in a speech at the National Press Club the **priority with 5G is to be first to market, regardless of public health or safety**. He states, "Turning innovators loose is far preferable to expecting committees and regulators to define the future. We won't wait for the standards to be first developed in the sometimes arduous standards-setting process or in a government-led activity."
- Fifth-generation technology, or **5G**, will not go through buildings, walls, ceilings, floors, etc., like 3G and 4G do. To get the faster speeds that 5G promises for the **Internet of Things**, the industry will need to put small cell antennas at close range to make those connections. 5G will still use 3G and 4G to operate, so existing antennas and cell towers will remain; 5G will add to the existing radiofrequency radiation infrastructure with toxic millimeter waves (MMW). We will have more antennas emitting hazardous radiation 24/7/365 at eye-levels where we live, work, go to school and play.
- The **industry is fast-tracking 50+ federal bills** to remove control from local municipalities to install small cell antennas/distributed antenna systems (DAS) throughout our neighborhoods every four to 12 houses. If not stopped, these bills will set the infrastructure for the Internet of Things, and allow hazardous radiation to be emitted on our citizens at street level 24/7. See S.19 MOBILE Now Act, S.88 DIGIT Act, S.1682 AIRWAVES Act, HR. 3895 Smart Cities and Communities Act, and HR. 3901 Moving FIRST Act.
- Not one to put all their eggs in one basket, **the industry is also trying to push state-level 5G infrastructure legislation to take away home rule rights from municipalities**. The Environmental Health Trust is tracking the bills.
- In September 2017, more than 180 scientists and doctors from 35 countries, recommended a moratorium to the European Union on the roll-out of the fifth generation, 5G, for telecommunication until potential hazards for human health and the environment have been fully investigated by scientists independent from industry.





- The **2018 National Institutes of Health (NIH) Health in Buildings Roundtable Conference** featured a technology panel with wireless radiation experts warning of the harm from today's wireless exposures and offering safer solutions.

## Massachusetts Leads the Nation

- In the 2015/16 legislative session, the **Joint Committee on Public Health reported out favorably S. 1222**. An Act creating a special commission to study the health impacts of electromagnetic fields. Scientists, doctors, technologists and concerned citizens sent in testimony supporting the need to educate and protect citizens from wireless technology hazards. The bill did not progress further.
- In the 2017/18 session, **Senator Karen Spilka reintroduced the bill as S.1268** *Resolve creating a special commission to examine the health impacts of electromagnetic fields* to look at non-industry-funded science and recommend public protections.
- A **panel of world experts held a briefing at the State House in 2015** to encourage legislation giving citizens the right to know wireless radiation is hazardous. See leading scientist and Nobel Peace Prize Co-Laureate Dr. Devra Davis and retired long-time Microsoft Canada President Frank Clegg address the legislature here.
- Following the above legislative briefing, the panel of world experts held a **standing-room only public forum in Framingham**:
  - Dr. Devra Davis, Ph.D. in Framingham, MA talks about wireless radiation
  - Frank Clegg speaks more casually to the Framingham forum audience with details on what industry and other countries are doing, including France's recent ban on wi-fi in preschools
  - Child Psychologist, School Consultant, Researcher and Author Dr. Catherine Steiner-Adair speaks of the developmental, social and emotional impact technology is having on our children
  - Dr. R.S. Sharma from India speaks on health and environmental impacts of mobile phones and other wireless devices, and how India has lowered their public radiation exposure limits by 90%
  - Janet Newton, President of EMR Policy Institute speaks on wi-fi dangers for rooftop workers





- Framingham Board of Health Director Mike Hugo speaks on a desire to implement right-to-know labeling in retail stores, and wired technology in schools
  - Dr. Devra Davis, Q&A with OB/GYN on dangers of Wi-fi on children and pregnant women
  - Dr. Devra Davis, Q&A with Ashland school board member on dangers of Wi-Fi & children
- **National Grid is piloting the utility “smart” grid in Worcester**, installing microwave radiation emitting meters on homes without informed consent. The project is being examined by the MA Attorney General’s Office for cost overruns and public health implications.
  - **Senator Michael Moore** introduced S.1864: An Act relative to utilities, smart meters, and ratepayers’ rights to give citizens the choice of using a utility “smart” meter or a traditional non-radiation-emitting mechanical analog meter.
  - Harvard’s Professor Lawrence Lessig is representing Berkeley, CA pro bono in their attempts to inform the public on the right to know what the fine print disclaimers say in mobile device manuals. The city ordinance passed and the industry lost three court attempts to block it. **Senator Julian Cyr has introduced two bills to give Massachusetts citizens the right to know too: S.107** An Act relative to disclosure of radiofrequency notifications (requires **warning labels** on radiation-emitting products) and **S.108** An Act relative to the safe use of hand-held devices by children (requires posting of **safety notices at point of sale**). The Joint Committee on Consumer Protection and Professional Licensure has received an extension to examine this issue.
  - **Representative Carolyn Dykema** introduced H.2030 An Act relative to best **management practices for wireless in schools** and public institutions of higher education, which was discharged by the Joint Committee on Education then reported out favorably by the Joint Committee on Public Health before being sent to study.
  - **School districts** throughout the Commonwealth are beginning to seek guidance on EMF protections in school. Parents and administrators in Ashland, Worcester, Framingham, Brookline, Dover-Sherborn, Medway, Pepperell, Lexington, Concord, Sudbury, Wilbraham, Dedham, Shrewsbury, Southborough, Belmont, Newburyport and elsewhere are examining the issue.





- **Maryland's Department of Health and Mental Hygiene** has issued the first-in-the-nation Wi-Fi Radiation in Schools Report **advising hard-wiring with wi-fi turned off**. **Dr. Robert Knorr, MA Department of Public Health**, Bureau of Environmental Health Director is also drafting public health fact sheets on EMFs. California issued a cell phone radiation fact sheet December 2017. (Note: Maryland has a bill this session too, House Bill 866: AN ACT concerning Primary and Secondary Education – Health and Safety Guidelines and Procedures – Digital Devices.)
- Local boards of health in <sup>Massachusetts</sup> Ashland, Framingham, Southborough and Pepperell have begun discussing measures to protect their citizens from EMFs.
- Residents in Hamilton, Weston, Wayland, Sherborn and Framingham have sought **protections from cell tower and small cell antenna installations**.
- Towns like Randolph have already begun putting **by-laws in place to retain local decision-making control** for wireless communication systems as industry pushes to take that right away from our municipalities through federal bills S.19 MOBILE Now Act and S.88 DIGIT Act. Other towns are examining proactive measures too.
- Building commissioners and inspectors discussed this issue at the 2017 annual conference of the **Massachusetts Association of Building Commissioners**.
- The **Massachusetts Association of School Committees** and **Massachusetts Association of School Superintendents** shared information on wireless radiation at their 2016 and 2017 convention.
- The MBTA has rejected a commuter rail wi-fi upgrade project that would put hundreds of 74' monopoles in historic and residential areas; they too are examining the biological hazards of wireless radiation.
- A child at the prestigious **Fay School in Southborough** has been diagnosed with electromagnetic sensitivity caused by the school's industrial strength wi-fi system. The school declined to grant reasonable accommodations so there is a **federal ADA lawsuit** underway in Worcester. Other children are also suffering symptoms at the Fay School and elsewhere. In a ground-breaking ruling, the judge has accepted expert testimony confirming there is harm at the non-thermal level.
- In 2004, the Brookline Fire Fighters were instrumental in developing the **International Fire Fighters Association position paper opposing cell towers at fire stations after fire fighters became ill.**





- <sup>MASS.</sup> Ashland Public Schools has become the first in the nation to adopt Best Practices for Mobile Devices to protect students and staff. The non-industry funded scientists tell us hard-wired internet connections with the wi-fi antennas turned off is the only safe solution, but this was a courageous first step in the absence of higher authorities to advise them. Parents and teachers' unions throughout the country are discussing Ashland's Best Practices and encouraging their schools to do the same.
- <sup>MASS.</sup> Ashland Public Library is the first in the nation to host a **six-part film and discussion series** on Electromagnetic Radiation and Health.
- <sup>MASS.</sup> Ashland Public Library is also the first in the nation to **put on loan an Acoustimeter** so residents and employees can measure the amount of radiation emitted in their homes, offices, schools and places of leisure. WACA-TV helped to produce a 23-minute public service video to show how to use the meter and offer suggestions for remediation.
- Pepperell Community Media released a five-part cable series on The Dangers of Wi-Fi aired in communities all over the United States.

## Financial Impact

- The science is showing that one of the biological effects of wireless radiation's constant pulse is that it causes a leakage in the cell membrane at the voltage-gated calcium channels (VGCCs) which control many of our bodies' systems. This leakage creates a chemical reaction outside the cell wall that produces a very destructive free radical called **peroxynitrite**.
- Peroxynitrite is linked to not only cancer and heart disease, but to 40 other escalating chronic illnesses that have more than doubled since 1990. Data culled from U.S. government databases on disease stemming from peroxynitrite show **economic impact for medical costs, lost income and medical research is estimated to be over \$2.5 trillion annually**.
- Insurers including Lloyd's of London are no longer covering EMF exposure risks, and the financial liability may fall to the state as it imposes wireless infrastructure and systems onto their citizens and schools. California's Department of Finance opposed their 5G infrastructure bill, SB-649 based on financial analysis.

## Common Points of Confusion





- When first joining the conversation on the health effects of EMFs it is easy to **get confused and overwhelmed by conflicting information**. Please see EMF Points of Confusion vs. Fact to help make sense of what you will find in your research, or what you might hear from industry representatives.

## The Urgency

The industry knows the NTP study results are due out at the end of 2018 so they are furiously pushing legislation at state and federal levels to take away home rule rights so they can be first to market with toxic 5G and the Internet of Things (IoT).

- In 2018, **Martin Pall, PhD**, Professor Emeritus of Biochemistry and Basic Medical Sciences explains why 5G will be extremely harmful:

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

- Arthur Firstenberg explains “**phased array**”, the most dangerous aspect of 5G cellular antennas:

<http://www.cellphonetaskforce.org/5g-from-blankets-to-bullets/>

- In September 2017 over **180 scientists and doctors from 35 countries** sent a declaration to officials of the European Commission demanding a **moratorium** on the increase of cell antennas for planned 5G expansion. Experts have also signed on from the U.S. and other non-European countries:

<https://drive.google.com/file/d/0B14R6QNkmaXueIFrNWRQcThNV0U/view>

## Solutions

- With your help, **this problem is solvable**. The International EMF Scientists ([www.emfscientist.org](http://www.emfscientist.org)) have already laid out a plan in their Appeal to the World Health Organization and the United Nations. We each just have to own our part of the solution and **develop the political will to get started**.
- **Wireless networks are not as fast, secure, reliable or energy-efficient as wired systems**. The policy paper, “Re-Inventing Wires: The Future of Landlines and Networks,” indicates the U.S. should instead invest in hard-wired telecommunications infrastructure to support economic growth, bridge the digital divide and diminish risks to security, privacy, public health and the environment.





- You can listen to a 2018 **Commonwealth Club** audio presentation on Re-Inventing Wires:

<https://www.commonwealthclub.org/events/archive/podcast/reinventing-wires-future-landlines-and-networks>

- **The film Generation Zapped** is being released for world-wide private and community screenings to educate the public on wi-fi hazards and solutions for safer technology use. It won Best Documentary at the 2018 D.C. Independent Film Festival and was shown at the Massachusetts State House, Google headquarters, and elsewhere around the U.S. and the world. **Generation Zapped** is a great tool to educate the public and is now widely available online.
- The non-profit **Wireless Education** is poised with on-line training courses to quickly educate Schools & Families and the Corporate workplace.

Please, let's work with the industry to bring biologically safe technology to market, and inform the public *immediately* of ways to reduce current exposures to microwave radiation from today's wireless technology.

Thank you for reviewing this information. Please **contact** technology safety educator Cece Doucette for additional information at [c2douce@gmail.com](mailto:c2douce@gmail.com) or 508-395-4212.







## EMF Points of Confusion vs. Fact

Many are surprised to learn the electromagnetic fields (EMFs) emitted by wireless technology are biologically hazardous, and they often get push-back from others when they open the conversation. This fact sheet provides information to help sort fact from misinformation and identifies solutions for safer technology use.

Point of Confusion	FACT
The FCC says wi-fi is fine.	FCC guidelines are outdated for the non-ionizing electromagnetic fields (EMFs) generated by electric and wireless devices. The <u>U.S. Government Accountability Office</u> in 2012 instructed the FCC to bring their public radiation exposure limits in line with <u>current science</u> . <u>Hundreds of formal comments</u> have been submitted to the FCC by EMF scientists, doctors and the <u>American Academy of Pediatrics</u> . The FCC has failed to respond and continues to promote wireless technology. To understand how the FCC came to protect corporate profit over public health, see <u>Harvard's Captured Agency: How the Federal Communications Commission is Dominated by the Industries it Presumably Regulates</u> .
The manufacturers make it look like all wi-fi all the time is the way to go.	Most consumers, and even many who work in the industry, are unaware of the manufacturers' <u>fine print</u> that comes with each device indicating one should never keep an active device on one's body or radiation exposure may exceed even the FCC's outdated non-protective guidelines. Additionally, science indicates we should have invoked the <u>Precautionary Principle</u> decades ago when evidence of harm was first found, and not exposed the public until proven safe. We have not done this in the U.S. but <u>other countries</u> have. This <u>table</u> illustrates the disparity in exposure levels.
There are studies showing no evidence of harm.	No evidence of harm is not the same as safe. This technology was brought to market without safety testing and has never been proven safe. Using the tobacco industry playbook, the telecommunications industry produces its own scientific studies under conditions designed to show no evidence of harm. This creates doubt among consumers so they will continue to purchase wireless products. Dr. Henry Lai provides insights <u>here</u> . The non-industry funded <u>international EMF scientists</u> have done the research proving wireless radiation is hazardous and are appealing to the WHO and UN to take action to protect the public.
There are not many studies done on wi-fi.	Cellular technology came first so that is why the majority of studies, which can take years to complete, use cell phones. However, all mobile devices and wireless technologies operate in a biologically hazardous segment of the <u>electromagnetic radiation spectrum</u> . So, what cell phone studies reveal holds true for 2G, 3G, 4G, 5G, wi-Fi and the Internet of Things too. We have <u>thousands of studies</u> showing man-made EMFs are hazardous to all <u>biological species</u> — humans, plants, animals, and insects -- including the <u>pollinators</u> needed to grow our food.





Point of Confusion	FACT
<p>Surely we would know if this were an issue.</p>	<p>Advertising dollars influence media content, and telecommunications, energy and technology companies are among <u>the top advertisers</u>. Media executives will not allow true investigative journalism into this issue or their revenues will drop so we rarely hear of wi-fi harm in mainstream media. The non-industry funded <u>O'Dwyer Report</u> may be the only journalistic outlet covering this issue extensively in the U.S. The rest will say more research is needed, to appease industry advertisers which keeps consumers taking their chances with the latest wireless products.</p>
<p>Our education agencies do not see this as an issue.</p>	<p>Few state or federal agencies have investigated this issue because the industry has been so effective at suppressing evidence of harm while offering financial incentives to adopt EMF products and infrastructure. In our top-down education system, local schools often do not feel empowered to act. However, legal precedents are being set that leave schools, public agencies and companies at risk. The insurance industry has identified EMFs as one of the top emerging hazards. Loyds of London and other insurers do not cover EMF damages so schools and businesses can be held directly responsible for harm. Workers compensation cases have also been awarded for EMF damages in the workplace, and teachers unions are beginning to request hard-wired work environments. <u>Click here</u> for additional information. <u>Ashland Public Schools, MA</u> has become the first in the nation to adopt Best Practices for Mobile Devices and others are beginning to investigate.</p>
<p>We need wireless for the 21<sup>st</sup> century classroom.</p>	<p>The industry identified children as an untapped market and began their 21<sup>st</sup> Century Classroom campaign to put a wireless device in the hands of every child. In addition to <u>biological harm from wi-fi</u>, studies are showing <u>excessive screen time is harming neurological brain development</u>. This is causing impaired social and emotional skills, digital addiction and poorer educational outcomes. <u>Finland</u> students do not use computers.</p>
<p>Some say electrosensitivity doesn't exist.</p>	<p>The United States Access Board's IEQ Indoor Environmental Quality Project indicates electromagnetic sensitivities may be considered <u>disabilities under the ADA</u> and recommends accommodations. Just as Lyme Disease was dismissed by medical practitioners before it was widely understood, today's doctors, nurses, psychologists and social workers in many countries have yet to be trained to diagnose and treat electrosensitivity (ES). School nursing records often indicate an increase in one or more common symptoms among students and staff following the installation of wireless systems: headaches, tachycardia, bloody noses, ear bleeds, skin rashes, nausea, tinnitus (loud ringing in the ears), vertigo, inability to concentrate, depression, anxiety, insomnia. See also the <u>EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses</u> and the <u>Guideline of the Austrian Medical Association for the diagnosis and treatment of EMF related health problems and illnesses (EMF syndrome)</u>.</p>

EMF Points of Confusion vs. Fact

Contact Cece Doucette, c2douce@gmail.com

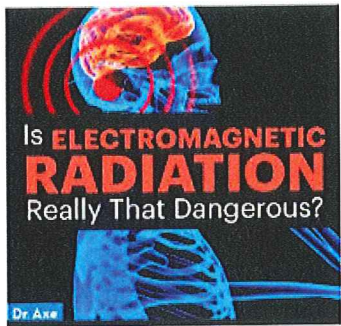




Point of Confusion	FACT
<p>The radiation drops off with distance.</p>	<p>This is true, in physics the inverse-square law states the intensity is inversely proportional to the square of the distance from the source of that physical quantity. While it is good practice to keep one's distance from a radiation-emitting device, the hazardous effects still occur at a distance. It is the pulsed, spiked, erratic wave that causes biological damage. Many routers and cell antennas send and receive data at long distances, and those erratic pulses, though spread out with distance, go through our bodies just as they go through buildings, walls, ceilings, etc. They still cause biological effects as a distant bullet would, and are cumulative over time.</p>
<p>Respected engineers, physicists, medical professionals and technologists in our community want our children to have wi-fi in schools.</p>	<p>Most professionals have been taught in school and in their work that there must be enough heat from a wireless device to raise the temperature of skin tissue in order to cause harm. Non-industry funded science has now proven this thermal effect premise is false. <u>Thousands of studies show biological effects at the non-thermal, non-ionizing level; most recently the U.S. National Toxicology Program study found DNA damage as well as brain and heart cancer. Professionals in all sectors will benefit from education on EMFs.</u></p>
<p>There is nothing we can do, wi-fi is everywhere.</p>	<p>Leading non-industry funded EMF scientists from around the world have already sent a <u>formal appeal to the World Health Organization and United Nations to address this "emerging public health crisis"</u>. They succinctly outline specific measures to solve this problem, the first of which is to protect children and pregnant women. Until policy catches up with science and biologically safe technology is brought to market:</p> <ul style="list-style-type: none"> <li>• Use hard-wired connections with antennas turned off (cell, data, Bluetooth, wi-fi, locator) to access the internet safely and avoid legal exposure. Hard-wired is not only safer, it is faster, more reliable and more secure than wireless. Use Ethernet cables and adapters to hard-wire routers, laptops, tablets, etc. Clear sleeping areas of EMFs, and never give to or use an active device near a child.</li> <li>• Choose corded baby monitors, gaming devices, entertainment systems; turn off any wi-fi antennas.</li> <li>• Use corded landline phones, they are safer and more reliable, especially during power outages. Avoid DECT cordless phones, they have high EMF emissions. Cell phones can be forwarded to landlines.</li> <li>• Keep analog utility meters, they do not emit the electromagnetic radiation that "smart" meters do.</li> <li>• Work with public servants to keep wireless infrastructure away from where we live, work, learn, play.</li> </ul> <p>The U.S. Collaborative for High Performance Schools provides <u>Low-EMF Best Practices</u> to establish a hard-wired school environment and prohibit use of personal wi-fi devices in school, except during emergencies. See <u>Wirelesseducation.org</u>, a non-profit charity that distills the science and medical recommendations into easy-to-learn concepts in affordable 40-minute e-learning courses for families, schools, and workplaces.</p>

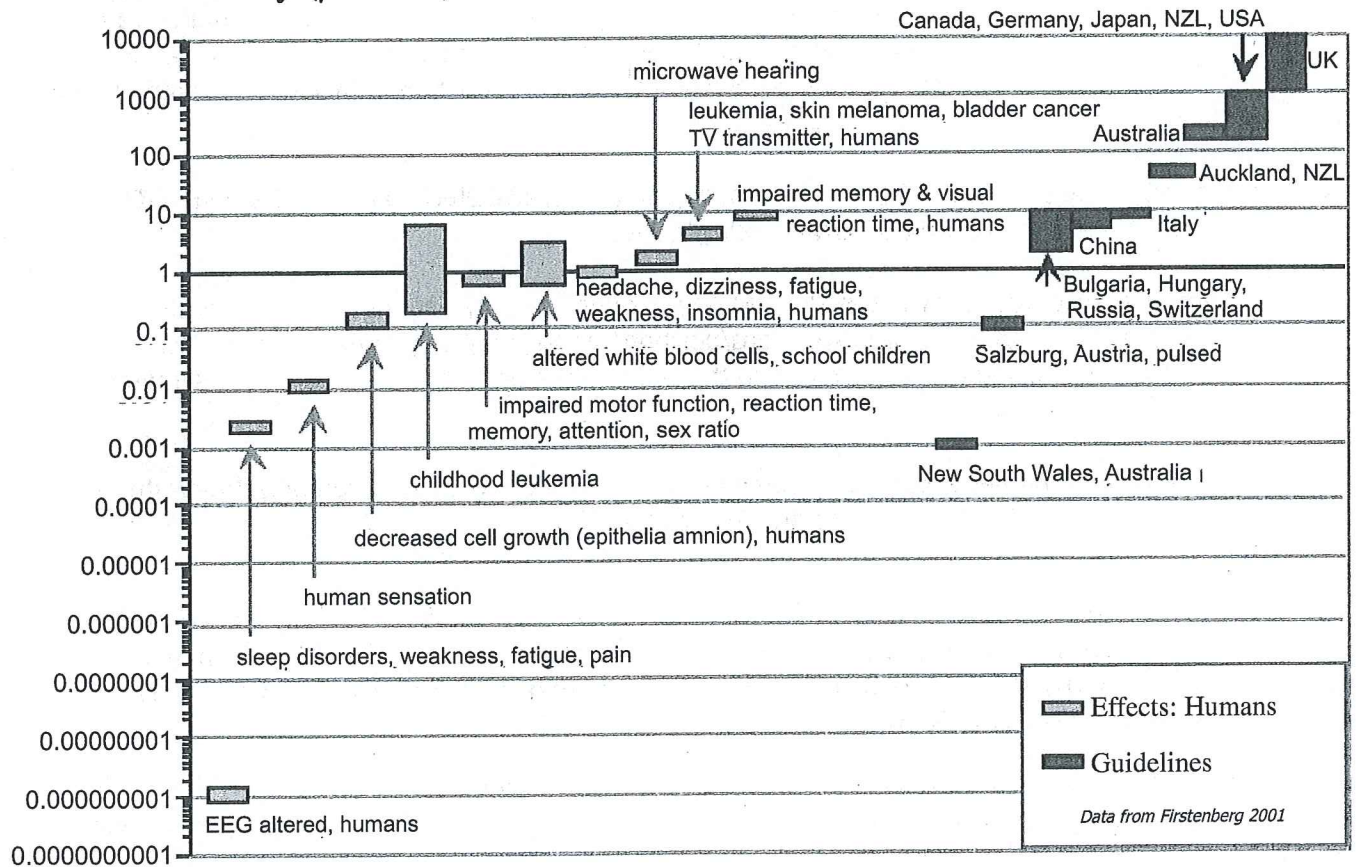






## Humans: Radiofrequency Guidelines & Effects

Power Density ( $\mu\text{W}/\text{cm}^2$ )









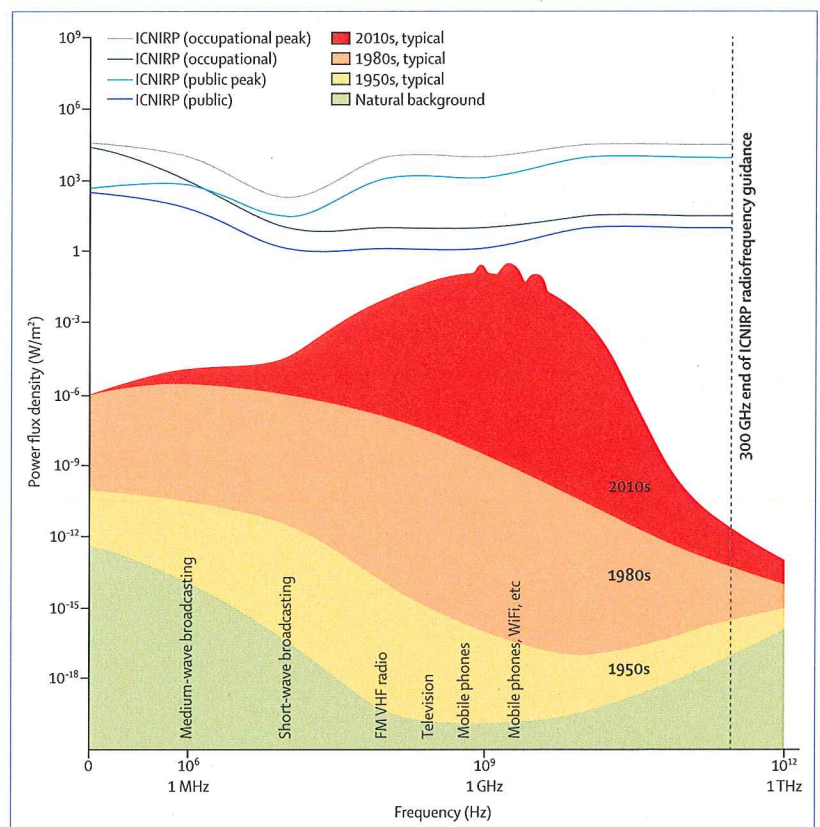
# Planetary electromagnetic pollution: it is time to assess its impact

As the Planetary Health Alliance moves forward after a productive second annual meeting, a discussion on the rapid global proliferation of artificial electromagnetic fields would now be apt. The most notable is the blanket of radiofrequency electromagnetic radiation, largely microwave radiation generated for wireless communication and surveillance technologies, as mounting scientific evidence suggests that prolonged exposure to radiofrequency electromagnetic radiation has serious biological and health effects. However, public exposure regulations in most countries continue to be based on the guidelines of the International Commission on Non-Ionizing Radiation Protection<sup>1</sup> and Institute of Electrical and Electronics Engineers,<sup>2</sup> which were established in the 1990s on the belief that only acute thermal effects are hazardous. Prevention of tissue heating by radiofrequency electromagnetic radiation is now proven to be ineffective in preventing biochemical and physiological interference. For example, acute non-thermal exposure has been shown to alter human brain metabolism by NIH scientists,<sup>3</sup> electrical activity in the brain,<sup>4</sup> and systemic immune responses.<sup>5</sup> Chronic exposure has been associated with increased oxidative stress and DNA damage<sup>6,7</sup> and cancer risk.<sup>8</sup> Laboratory studies, including large rodent studies by the US National Toxicology Program<sup>9</sup> and Ramazzini Institute of Italy,<sup>10</sup> confirm these biological and health effects in vivo. As we address the threats to human health from the changing environmental conditions due to human activity,<sup>11</sup> the increasing exposure to artificial electromagnetic radiation needs to be included in this discussion.

Due to the exponential increase in the use of wireless personal communication devices (eg, mobile or cordless phones and WiFi or Bluetooth-enabled devices) and the infrastructure facilitating them, levels of exposure to radiofrequency electromagnetic radiation around the 1 GHz frequency band, which is mostly used for modern wireless communications, have increased from extremely low natural levels by about  $10^{18}$  times (figure). Radiofrequency electromagnetic radiation is also used for radar, security scanners, smart meters, and medical equipment (MRI, diathermy, and radiofrequency ablation). It is plausibly the most rapidly increasing

anthropogenic environmental exposure since the mid-20th century, and levels will surge considerably again, as technologies like the Internet of Things and 5G add millions more radiofrequency transmitters around us.

Unprecedented human exposure to radiofrequency electromagnetic radiation from conception until death has been occurring in the past two decades. Evidence of its effects on the CNS, including altered neurodevelopment<sup>14</sup> and increased risk of some neurodegenerative diseases,<sup>15</sup> is a major concern considering the steady increase in their incidence. Evidence exists for an association between neurodevelopmental or



**Figure:** Typical maximum daily exposure to radiofrequency electromagnetic radiation from man-made and natural power flux densities in comparison with International Commission on Non-Ionizing Radiation Protection safety guidelines<sup>1</sup> Anthropogenic radiofrequency electromagnetic radiation levels are illustrated for different periods in the evolution of wireless communication technologies. These exposure levels are frequently experienced daily by people using various wireless devices. The levels are instantaneous and not time-averaged over 6 minutes as specified by International Commission on Non-Ionizing Radiation Protection for thermal reasons. Figure modified from Phillips and Lamburn<sup>12</sup> with permission. Natural levels of radiofrequency electromagnetic radiation were based on the NASA review report CR-166661.<sup>13</sup>



behavioural disorders in children and exposure to wireless devices,<sup>14</sup> and experimental evidence, such as the Yale finding, shows that prenatal exposure could cause structural and functional changes in the brain associated with ADHD-like behaviour.<sup>16</sup> These findings deserve urgent attention.

At the Oceania Radiofrequency Scientific Advisory Association, an independent scientific organisation, volunteering scientists have constructed the world's largest categorised online database of peer-reviewed studies on radiofrequency electromagnetic radiation and other man-made electromagnetic fields of lower frequencies. A recent evaluation of 2266 studies (including in-vitro and in-vivo studies in human, animal, and plant experimental systems and population studies) found that most studies (n=1546, 68.2%) have demonstrated significant biological or health effects associated with exposure to anthropogenic electromagnetic fields. We have published our preliminary data on radiofrequency electromagnetic radiation, which shows that 89% (216 of 242) of experimental studies that investigated oxidative stress endpoints showed significant effects.<sup>7</sup> This weight of scientific evidence refutes the prominent claim that the deployment of wireless technologies poses no health risks at the currently permitted non-thermal radiofrequency exposure levels. Instead, the evidence supports the International EMF Scientist Appeal by 244 scientists from 41 countries who have published on the subject in peer-reviewed literature and collectively petitioned the WHO and the UN for immediate measures to reduce public exposure to artificial electromagnetic fields and radiation.

Evidence also exists of the effects of radiofrequency electromagnetic radiation on flora and fauna. For example, the reported global reduction in bees and other insects is plausibly linked to the increased radiofrequency electromagnetic radiation in the environment.<sup>17</sup> Honeybees are among the species that use magnetoreception, which is sensitive to anthropogenic electromagnetic fields, for navigation.

Man-made electromagnetic fields range from extremely low frequency (associated with electricity supplies and electrical appliances) to low, medium, high, and extremely high frequency (mostly associated with wireless communication). The potential effects of these anthropogenic electromagnetic fields on

natural electromagnetic fields, such as the Schumann Resonance that controls the weather and climate, have not been properly studied. Similarly, we do not adequately understand the effects of anthropogenic radiofrequency electromagnetic radiation on other natural and man-made atmospheric components or the ionosphere. It has been widely claimed that radiofrequency electromagnetic radiation, being non-ionising radiation, does not possess enough photon energy to cause DNA damage. This has now been proven wrong experimentally.<sup>18,19</sup> Radiofrequency electromagnetic radiation causes DNA damage apparently through oxidative stress,<sup>7</sup> similar to near-UV radiation, which was also long thought to be harmless.

At a time when environmental health scientists tackle serious global issues such as climate change and chemical toxicants in public health, there is an urgent need to address so-called electrosmog. A genuine evidence-based approach to the risk assessment and regulation of anthropogenic electromagnetic fields will help the health of us all, as well as that of our planetary home. Some government health authorities have recently taken steps to reduce public exposure to radiofrequency electromagnetic radiation by regulating use of wireless devices by children and recommending preferential use of wired communication devices in general, but this ought to be a coordinated international effort.

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We declare no competing interests. We thank Alasdair Philips for assistance with the figure and Victor Leach and Steve Weller for assistance with the ORSAA Database, which has enabled our overview of the scientific evidence in this area of research.

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For the Oceania Radiofrequency Scientific Advisory Association see [www.orsaa.org](http://www.orsaa.org)

For the International EMF Scientist Appeal see [www.emfscientist.org](http://www.emfscientist.org)





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Robert D. Kane was actively employed with Motorola in the telecommunications industry for more than 30 years. He was directly involved with programs and projects for the design and development of portable cell phones, radio frequency radios, microwave telecommunications systems, video display systems, and biological effects research.

This is what Kane writes in the final section of his 2001 book *Cellular Telephone Russian Roulette*.

#### **"Damage Control" II - A Continuing Public Deception**

Many of the problems of the industry could have been avoided had the influences of the scientific researchers superseded those of the product marketers. But the industry chose to ignore researchers who were providing unfavorable answers. The industry instead organized a broad and comprehensive public relations campaign to persuade users of portable cellular telephones that the operation was safe. The cellular telephone industry engaged in the business of preaching a "belief system."

Never mind that the most current research findings report DNA damage to brain tissue as a result of exposure to radio frequency radiation.

Never mind that recent conferences sponsored by the cellular telephone industry manufacturers and service providers, were dominated by reports of research findings that show that most of the energy radiating from

the portable cell phones is absorbed in a small region of the user's brain.

The CTIA (Cellular Telecommunications Industry Association) representatives tell industry insiders that scientists are very dangerous and if the scientific process is used the scientists would come back with more questions than answers, which is very risky. This information comes as part of a series of CTIA seminars held to teach cellular industry people how to wage the public relations battle for the minds of the public. This is termed *research by press release or research by public relations* instead of good old-fashioned scientific research. Of course, research by press release is more predictable than the laboratory research, which could provide embarrassing evidence of biological hazards.

However, owners of portable cellular telephones are now warned that if they are concerned about the radiation then they should limit their use to the shortest time possible and completely avoid use except for emergency situations. Is it possible that by now even the manufacturers of these "high-tech" wonder devices and their association spokesmen are prepared to admit that they may have unleashed the next unseen plague on humanity? Probably not - there are still too many executives and managers looking for their next promotion and continuing their long careers.

The cellular telephone industry is the observer or spectator, at a game.... It is nothing less than cellular Russian roulette. The only difference is that with regular



Russian roulette the results are immediate. You know immediately if you're a loser or not. With cellular Russian roulette you may not know for years if you are the loser. You may not know of a brain tumor until five or ten years after the day you "lost" at the game.

You pick up the phone once, twice, ten times a day - or only a few times a month. But each and every time you're gambling that "this time" won't be the occasion when the radiation causes irreparable damage to your brain. It only takes a seemingly small trauma at a very small location to result in tissue damage, DNA damage, or chromosome mutations.

This nonscientific industry experiment using the general population is unique in the history of humanity. Never before has such a large "guinea pig" experiment been performed. Even the government experiments with nuclear radiation only exposed a few thousand uninformed people. This bold experiment may expose virtually the entire segment of the population that can afford to operate the high-tech portables.

It is cellular telephone Russian roulette. Go ahead and make the call. Do you feel lucky today?

\*Note: Since this book was published one would think that the cellular industry might have reduced radiation from cell phones and devices, but that is not the case. Ninety percent of the phones tested in France within the last 4 years have exceeded safety guidelines - sometimes by 3 or 4 times. Germany and S. Korea are advising the public about which phones give out the least radiation.

Centinel, a start up cellular company has a new phone in the works which promises an independent data privacy sliding switch on its phones as well as a detector that will alert users about strength of ambient signals in their environment.





## GOVERNMENTS AND ORGANIZATIONS THAT BAN OR WARN AGAINST WIRELESS TECHNOLOGY

**1993: Environmental Protection Agency (EPA):** The FCC's exposure standards are "seriously flawed."

Official comments to the FCC on guidelines for evaluation of electromagnetic effects of radio frequency radiation, FCC Docket ET 93-62, November 9, 1993.

**1993: Food and Drug Administration (FDA):** "FCC rules do not address the issue of long-term, chronic exposure to RF fields." Comments of the FDA to the FCC, November 10, 1993.

**1993: National Institute for Occupational Safety and Health (NIOSH):** The FCC's standard is inadequate because it "is based on only one dominant mechanism—adverse health effects caused by body heating."

Comments of NIOSH to the FCC, January 11, 1994.

**1994: Amateur Radio Relay League Bio-Effects Committee:** "The FCC's standard does not protect against non-thermal effects." Comments of the ARRL Bio-Effects Committee to the FCC, January 7, 1994.

**2000: UK Department of Education:** Children under 16 should not use cell phones except in an emergency.

[http://www.cellular.co.za/news\\_2000/news-08052000\\_uk\\_schools\\_warned\\_over\\_radiation.htm](http://www.cellular.co.za/news_2000/news-08052000_uk_schools_warned_over_radiation.htm)

**2002: Interdisciplinary Society for Environmental Medicine** (3000 physicians in Germany) recommends banning cell phone use by children and banning cell phones and cordless phones in preschools, schools, hospitals, nursing homes, events halls, public buildings and vehicles. <http://www.cellphonetaskforce.org/wp-content/uploads/2018/11/Freiburger-Appeal-original-English.pdf>

**2003: American Bird Conservancy and Forest Conservation Council:** Brought a lawsuit against the FCC because millions of migratory birds were being disoriented by microwave radiation and crashing into cell towers. [http://www.ewire.com/display.cfm/Wire\\_ID/1498](http://www.ewire.com/display.cfm/Wire_ID/1498)

**2004: International Association of Fire Fighters** opposes communication antennas on fire stations.

<http://www.iaff.org/HS/Facts/CellTowerFinal.asp>

**2005: Salzburg, Austria's Public Health Department** bans WLAN and DECT phones in public schools. <http://www.safeinschool.org/2011/01/wi-fi-is-removed-from-schools-and.html>

**August 2005: Austrian Medical Association:** Warns against Wi-Fi, cordless phones, and cell phone use by children.

[http://www.thepeoplesinitiative.org/Wifi\\_and\\_Schools.html](http://www.thepeoplesinitiative.org/Wifi_and_Schools.html)

**August 2005: Vienna Medical Association** warns against Wi-Fi, and cell phone use by children up to age 16. <http://freiburger-appell-2012.info/media/EMF%20Guideline%20OAK-AG%20%202012%2003%2003.pdf>

**2006: Frankfurt, Germany's government** states it will not install WiFi in its schools until it has been shown to be harmless.

[http://www.icems.eu/docs/deutscher\\_bundestag.pdf](http://www.icems.eu/docs/deutscher_bundestag.pdf)

**2006: UK schools** remove their wireless networks: Prebandal Preparatory School, Chichester, West Sussex; Ysgol Pantycelyn School in Carmarthenshire, Wales; and Stowe School, in Buckinghamshire, England. London Times, November 20, 2006.

[http://www.timesonline.co.uk/tol/life\\_and\\_style/education/article642575.ece](http://www.timesonline.co.uk/tol/life_and_style/education/article642575.ece)

**2007: Ballinderry Primary School, Ireland:** Removed Wi-Fi to protect young children. <http://www.safeinschool.org/2011/01/wi-fi-is-removed-from-schools-and.html>

**2007 Bavaria, Germany's Parliament** recommends against Wi-Fi in schools. [http://www.icems.eu/docs/deutscher\\_bundestag.pdf](http://www.icems.eu/docs/deutscher_bundestag.pdf)

**2007 Australian Democrats:** The "explosion in wireless communications technology" is causing widespread illness.

[http://www.democrats.org.au/docs/2007/Joining\\_the\\_Dots\\_ExecSummary.pdf](http://www.democrats.org.au/docs/2007/Joining_the_Dots_ExecSummary.pdf)

**2007: European Environmental Agency,** Europe's top environmental watchdog, calls for immediate action to reduce exposure to radiation from Wi-Fi, mobile phones and their masts. [http://www.nzherald.co.nz/world/news/article.cfm?c\\_id=2&objectid=10463870](http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10463870)

**2008: International Commission on Electromagnetic Safety** (comprised of scientists from 16 nations): Recommends limiting cell phone use by children, teenagers, pregnant women and the elderly. <http://www.icems.eu/resolution.htm>

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- 2008: Lakehead University, Ontario** bans Wi-Fi on campus. <http://www.cbc.ca/news/canada/toronto/story/2010/08/15/ontario-wifi.html>
- 2008: Madhya Pradesh, India:** Bans cell phones in schools by both students and teachers. [http://www.indiaedunews.net/Madhya\\_Pradesh/Teachers\\_students\\_unhappy\\_with\\_mobile\\_phone\\_ban\\_in\\_schools\\_5241/](http://www.indiaedunews.net/Madhya_Pradesh/Teachers_students_unhappy_with_mobile_phone_ban_in_schools_5241/)
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- 2008: Progressive Librarians Guild** recommends against wireless technology in libraries. <http://libr.org/plg/wifiresolution.php>
- 2008: Russian National Committee for Non-Ionizing Radiation Protection** warns that cell phones are unsafe even for short conversations. Children under 16, pregnant women, epileptics, and people with memory loss, sleep disorders and neurological diseases should never use cell phones. [http://www.radiationresearch.org/pdfs/rncnirp\\_children.pdf](http://www.radiationresearch.org/pdfs/rncnirp_children.pdf)
- 2008 Sebastopol, California:** Reneges on its contract to install citywide Wi-Fi. <http://www.boingboing.net/2008/03/24/town-of-sebastopol-c.html>
- 2008: University of Pittsburgh Cancer Institute:** Children should never use a cell phone except in an emergency. <http://www.post-gazette.com/pg/08205/898803-114.stm>
- 2008: Voice (UK Teachers Union)** calls for a ban on Wi-Fi in schools. [http://www.voicetheunion.org.uk/index.cfm/page/\\_sections.content.cfm/cid/1326/navid/434/parentid/330](http://www.voicetheunion.org.uk/index.cfm/page/_sections.content.cfm/cid/1326/navid/434/parentid/330)
- 2009: Hérouville Saint-Clair, France:** Bans Wi-Fi in public schools. <http://www.wifiinschools.org.uk/4.html>
- 2009: Irish Doctors Environmental Association:** Warns that current safety guidelines are "not appropriate." <http://www.ideaireland.org/>
- 2009: Karnataka State, India:** Bans cell phones in all schools and pre-university colleges. <http://www.hindu.com/2009/09/14/stories/2009091454460500.htm>
- May 2009: U.S. Fish and Wildlife Service** urges Congress to focus on the potential connection between electromagnetic fields and "Bee Colony Collapse". <http://electromagnetichealth.org/electromagnetic-health-blog/emf-and-warnke-report-on-bees-birds-and-mankind/>
- December, 2010: French Parliament** passes a law prohibiting advertising cell phones to children under 14; prohibits children up to age 14 from using cell phones in pre-schools and public schools; requires cell phones to be labeled with SAR values and a recommendation to use headsets. <http://www.enviroblog.org/2010/12/french-cell-phone-radiation-disclosure-at-point-of-sale.html>
- May 27, 2011: Council of Europe** passes a resolution recommending wired Internet connections in schools, and the creation of radiation-free zones to protect electrosensitive people. <http://assembly.coe.int/Documents/AdoptedText/ta11/eRES1815.htm>.
- August 30, 2011: The Israeli Ministry of Education** publishes guidelines strictly limiting the use of mobile phones on all school grounds, citing children's and youths' increased risk of malignant tumors and the "passive exposure" experienced by children who do not use phones. <http://norad4u.blogspot.com/2011/09/israeli-ministry-of-education-is-going.html>
- September 8, 2011: Pretty River Academy in Collingwood, Ontario** removes WiFi from campus as a precaution, joining Roots and Wings Montessori school in Surrey, British Columbia. [http://www.safeschool.ca/uploads/CTV\\_School\\_cuts\\_WiFi.pdf](http://www.safeschool.ca/uploads/CTV_School_cuts_WiFi.pdf); [http://www.safeschool.ca/School\\_Bans\\_WiFi.html](http://www.safeschool.ca/School_Bans_WiFi.html)
- Feb 13, 2012: Citing safety concerns, the Ontario English Catholic Teacher's Association** representing 45,000 teachers, is calling for a ban on new Wi-Fi installations in the province's 1,400-plus Catholic schools and advocating that computers in all new schools should be hardwired as well. <http://www.cbc.ca/news/canada/toronto/story/2012/02/13/toronto-oecta-wifi.html>
- March, 2012: the Austrian Medical Association (ÖAK)** releases guidelines for the diagnosis and treatment of health problems caused by exposure to electromagnetic fields. <http://www.aerzteammer.at/documents/10618/976981/EMF-Guideline.pdf>
- June 19, 2012: The Russian National Committee on Non-Ionizing Radiation Protection** has officially recommended that WiFi not be used in





schools. <http://youtu.be/5CemiJ-yIA4>.

**25 Aug 2012: Israeli Minister of Health Rabi Yaakov Litzman** states that he supports calls to action for a ban on Wi-Fi in schools. <http://www.mast-victims.org/index.php?content=news&action=view&type=newsitem&id=5723>

**5 July 2013: Supreme Court of India** upholds a decision of the High Court of the State of Rajasthan to remove all cell towers from the vicinity of schools, colleges, hospitals and playgrounds because of radiation "hazardous to life." The over 200-page November 27, 2012 Rajasthan decision reviews worldwide evidence that cell towers are harming human beings and wildlife. <http://www.google.com/url?sa=t&rct=j&q=israni%20%22union%20of%20india%22%20%22high%20court%22%20rajasthan&source=web&cd=5&ved=0CD4QFJAE&url=http%3A%2F%2Fwww.rtiindia.org%2Fforum%2Fattachments%2Fchit-chat%2F8595d1358495483-no-mobile-towers-near-schools-hospitals-directs-rajasthan-hc-no-mobile-towers-near-schools-hospitals-directs-rajasthan-high-court.pdf&ei=80MeUqZONMnkyQGJmYGwDA&usg=AFQjCNFCfNEMAnTRaTYhfxag1UQdZohJkg>

**15 Aug 2013: Elementary Teachers Federation of Ontario**, representing 76,000 teachers, recommends that cell phones be turned off in classrooms, and that all WiFi transmitters be labeled as part of a hazard control program. <http://annualmeeting.ca/wp-content/uploads/2013/07/Session-71.pdf>

**16 Sept 2013: City of Mumbai, India** adopts a policy prohibiting cell towers on schools, colleges, hospitals, orphanages, and juvenile correction homes; prohibiting nearby antennas from being directed toward such buildings; and requiring that antennas on such buildings be removed. The policy also requires the approval of 70% of the residents of an apartment or condominium building, and the approval of 100% of the residents of the top floor, before antennas are installed on the roof. <http://www.mcgm.gov.in/irj/go/km/docs/documents/MCGM%20Department%20List/Public%20Relation%20Officer/Press%20Release/Public%20Notice%20for%20Chief%20Engineer%20Development%20Plan%20Department%20eng.pdf>

**4 Jan 2014: High Court of West Bengal, India** ordered a cell tower removed because "The radiation of the said tower is dangerous to the life of human beings and also flora and fauna causing severe imbalance to the wholesome environment which is emancipated as one of the basic fundamental rights included with right to life as enshrined in Article 21 of the Constitution of India."

**20 April 2016: City of Haifa, Israel bans WiFi in schools.** WiFi is ordered immediately removed from all kindergartens and schools in the city to protect the children from radiation. A wired internet system is being installed in all schools.

**September 2018: Cell phones to be banned in primary and middle schools in France.** As of the beginning of the 2018 school year, cell phones will be banned not only in classrooms but at breaks, lunch times and between lessons "as a matter of public health."

### ***DOCTORS AND SCIENTISTS CALLING FOR STRICTER REGULATION AND/OR A MORATORIUM ON WIRELESS TECHNOLOGY***

<http://international-emf-alliance.org/index.php/appeals>, <http://www.raif-woelfle.de/elektrosmog/redir.htm?http://www.raif-woelfle.de/elektrosmog/allgemein/appelle.htm>, <http://www.avaate.org/IMG/doc/Alcalaci.doc>

Vienna Resolution 1998  
Salzburg Resolution 2000  
Declaration of Alcalá 2002  
Catania Resolution 2002  
[Freiburger Appeal 2002](#)  
Bamberger Appeal 2004  
Maintaler Appeal 2004  
Coburger Appeal 2005  
Oberammergauer Appeal 2005  
Haibacher Appeal 2005  
Pfarrkirchener Appeal 2005  
Freienbacher Appeal 2005  
Lichtenfelser Appeal 2005  
Hofer Appeal 2005  
Helsinki Appeal 2005  
Parish Kirchner Appeal 2005  
Saarlander Appeal 2005  
Stockächer Appeal 2005  
Benevento Resolution 2006  
Allgäuer Appeal 2006  
WiMax Appeal 2006





**Schlüchterner appeal**

**Brussels Appeal 2007**

**Venice Resolution 2008**

**Berlin Appeal 2008**

**Paris Appeal 2009**

**London Resolution 2009**

**Porto Alegre Resolution 2009**

**European Parliament**

**EMF Resolution 2009**

**Dutch Appeal 2009**

**Int'l Appeal of Würzburg 2010**

**Copenhagen Resolution 2010**

**Seletun Consensus Statement 2010**

**Potenza Picena Resolution 2013**

[Doctors' Appeal to Health Canada 2014](#)

[Scientists' Declaration to Health Canada 2014](#)

[International Scientists Appeal 2015](#)

[Brussels Declaration 2015](#)

[Paris Appeal 2016](#)

[Reykjavik Appeal 2017](#)

[International Scientists Appeal for a 5G Moratorium 2017](#)

[Nicosia Declaration 2017](#)

[Madrid Declaration 2017](#)

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