



December 28, 2011

## ***The Economist*—and the Truth About Microwave Radiation Emitted from Wireless Technologies**

In its unsigned commentary on September 3, 2011, [“Worrying about Wireless”](#), *The Economist* makes a number of technical errors and misleading statements about microwave radiation that we write to correct. The governments of more than a dozen nations have issued precautionary advice and policies about wireless devices, including restricting cellphone use by children in France, India and Israel (See Worldwide Advisories at [www.saferphonezone.com](http://www.saferphonezone.com)). *The Economist* would do well to consult with experts in these and other tech-savvy nations to learn the science behind these countries’ decisions so that it can provide accurate reporting on wireless safety and health matters.

*The Economist states:*

*“Let it be said, once and for all, that no matter how powerful a radio transmitter--whether an over-the-horizon radar station or a microwave tower--radio waves simply cannot produce ionising radiation. The only possible effect they can have on human tissue is to raise its temperature slightly.”*

This is a red herring. Of course microwave radiation is non-ionizing radiation. It has insufficient energy to *directly* break chemical bonds including mutating DNA. Independent studies show that microwave radiation from cellphones can damage genetic material and disrupt DNA repair without inducing heat. Microwave radiation from cellphones can also increase the production of damaging free radicals, which can also *indirectly* damage DNA. <sup>[1a,b,c]</sup>

In 2000 the cellphone companies T-Mobil and DeTeMobil Deutsche Telekom Mobilnet commissioned the ECOLOG report. This report acknowledged that microwave radiation damages genes, living cells, and the immune system. Since then, the evidence base suggesting that prolonged cellphone use can harm human health has grown substantially. In May 2011, after a rigorous review of the evidence, the World Health Organization’s (WHO) International Agency for Research on Cancer (IARC) classified radiation emitted by wireless devices including cellphones as “possibly carcinogenic.”

In addition, scientific studies carried out in Russia in the 1950s and 1960s and corroborated by European researchers more recently show that microwave radiation affects the heart, brain and liver, as well as the production of hormones and male human and animal fertility.

*The Economist states:*

*“In the real world...sources of ionising radiation...are the sole sources energetic enough to knock electrons out of atoms--breaking chemical bonds and producing dangerous free radicals in the process...that can damage a person’s DNA and cause mutation, radiation sickness and even death.”*

Growing evidence demonstrates that cancer and other types of illness do not only derive from *direct* damage to the ionic bonds that hold together our DNA. Researchers at the U.S. National Institute of Environmental Health Sciences (NIEHS) have shown that 2 out of every 5 known causes of cancer do not directly damage DNA.

In addition, several investigators have shown in animal experiments that microwaves can damage the blood-brain barrier (BBB), a vital biological mechanism for protecting the brain from toxins. In fact, radiation similar to that of cellphones forms the foundation for important new uses of microwave and other non-ionizing radiation to treat brain, breast and liver tumors. Given these therapeutic uses of microwave radiation, it would be folly to assume that other exposures have no biological consequences.

Furthermore, a 2011 NIH Study showed that simply placing a phone that is turned on next to the ear for just fifty minutes can significantly increase the metabolism of the brain’s main fuel—glucose. The long-term impact of this change is not known, but altered glucose metabolism is one hallmark of Alzheimer’s and other neurodegenerative diseases.<sup>[2]</sup> Other studies show that rabbits exposed prenatally to cellphone radiation produce offspring with damaged brains, liver and skin.<sup>[3]</sup> Experiments have confirmed that cellphone-exposed rodents that have been trained to run mazes lose the capacity to find food or a hidden platform or recognize objects with some speculation that these are form of dementia.<sup>[4a,b,c]</sup> Case-control studies report that those who use cellphones regularly for a decade have increased rates of malignant tumors of the brain, cheek (parotid gland), and hearing nerve (acoustic neuroma)—in areas of the head that receive the highest exposures to cellphone radiation.<sup>[5-6]</sup>

Recognizing the scientific foundation for this damage, Austrian workers’ compensation cases have provided remuneration for cellphone-related workplace damages. An Italian Court recognized that cellphones and cordless phones may cause adverse health effects and awarded full disability to a heavy user of both types of phones.

*The Economist states:*

*“...radio waves do not pack anywhere near enough energy to produce free radicals. The “quanta” of energy (i.e. photons) carried by radio waves in, say, the UHF band used by television, Wi-Fi, Bluetooth, cordless phones, mobile phones,...have energy levels of a few millionths of an electron-volt. That is less than a millionth of the energy needed to cause ionisation.”*

*The Economist* is practicing the cliché, “Beating a dead horse” by continuing to harp that this is not ionizing radiation. No one disagrees! While cellphone signals are weak, their fluctuating nature (highly complex modulation) may explain why they are so biologically active. Furthermore, long-term exposure to the fields from electrical power distribution frequencies,

specifically those associated with the 50 and 60 hertz power grids, have been linked to leukemia and neurological diseases, such as Lou Gehrig's disease and Alzheimer's, in scientific studies and in official reports from the states of New York and California. A decade previous to the recent IARC declaration, IARC declared Extremely Low Frequency (ELF) electromagnetic fields as a Class 2B Possible Carcinogen in 2001. In addition to microwave emissions, cellphones also expose users to these ELF fields from the phone's battery. Four milli-Gauss (mG) is linked to a doubling of incidence of childhood leukemia, and a 2005 study of phones on the market found fields of 47 to 146 mG at 5 mm from the surface of the phones. <sup>[7]</sup>

*The Economist states:*

*“A year earlier, after a landmark, decade-long study undertaken by teams in 13 countries, the IARC had reported that no adverse health effects associated with the use of mobile phones could be found.”*

In fact, within the 13-country Interphone study organized by IARC, those with the highest use for a decade had a doubled risk of brain tumors. The study reported no overall increased risk when looking at all those who had made one call a week for 6 months. But, when researchers reviewed evidence on those subjects who had used cellphones for ten years or more, they found a statistically significant doubling in the risk of glioma (190 cases, OR=2.18, 95 % CI=1.43-3.31) for long-term users in comparison to short-term users who used a phone for 1.0-1.9 years. <sup>[8]</sup> Interphone also reported significantly increased risk for acoustic neuromas and parotid gland tumors. <sup>[5,9]</sup>

*The Economist states:*

*“The Group 2B classification...rates the health hazard posed by mobile phones as similar to the chance of getting cancer from coffee, petrol fumes and false teeth.”*

*The Economist* fails to note that many nations have taken serious regulatory actions regarding other substances placed in this classification, including some pesticides that are banned around the world today such as DDT, engine exhausts, and toxic and persistent brominated or fluorinated flame retardants. There are numerous examples of substances first classified as Class 2B that were later moved into Class 2A (probably carcinogenic) or Class 1 (carcinogenic). Given the short time for which cellphones have been used relative to the induction periods of many cancers, the current evidence base can only hint at the extent of the evidence that will ultimately materialize. In this respect, cellphone radiation is quite unlike coffee (coffee does slightly increase the risk of bladder cancer, while reducing that of colon cancer) or false teeth.

*The Economist states:*

*“...by classifying mobile phones as a Group 2B risk, what the IARC was effectively saying...was that, even if such a health risk exists, there is no way of ever ruling out bias, chance or other confounding circumstance with any reasonable degree of confidence.”*

This misreads the intent of the IARC review. The purpose of an IARC evaluation is to anticipate harm and prevent or reduce danger. In looking at experimental evidence along with human data, IARC indicated that data on long-term incidence of brain cancer will ultimately clarify the nature

of the hazard. In fact, there were relatively few regular cellphone users in the Interphone study (which completed data collection in 2004) who had more than ten years use. Three other studies have carried out meta-analyses of all published data on people with over ten years of cellphone use. <sup>[10-12]</sup> All of these reported a significant risk in gliomas (cancer of the brain). One of these also found an approximate doubling of the risk of being diagnosed with a glioma on the same (“ipsilateral”) side of the head as that preferred for long-term (>10 years) cellphone use (118 cases, OR=1.9; 95% CI, 1.4-2.4). <sup>[11]</sup>

If a 2-fold risk occurs in the world’s 5.6 billion cellphone users, this could conservatively result in 250,000 avoidable brain tumors every year. In addition to the devastating health consequences (half of those diagnosed die within two years) a single case of brain cancer costs nearly \$500,000 to treat in one year. The economic impact of such an illness around the globe could be staggering. Phone use is expanding rapidly in developing countries that lack personnel, resources and the infrastructure to provide cancer surgery and treatment.

Brain and other cancers are not the sole health impact of concern from cellphones, which have been linked in a number of separate peer-reviewed published studies to serious health problems including reproductive and neurological damage. The potential social and economic impacts of these other chronic health threats has led many governments and health organizations, including the IARC experts, to advocate sensible cellphone use (e.g. texting holding phone away from lap, use of the speaker mode or a wired hands-free headset, and use of a land-line in the home or office, especially by children, etc.).

*The Economist states:*

*“...the number of text messages sent and received by [older] Americans...rose by 75%...Over the same period the number of phone calls made and received by adults of all ages fell by 25%.”*

Many people speak on the phone for durations exceeding those of past years, and while texting is removing the locus of radiation from the brain, data intensive texts create radiation bursts directed at other parts of the body. People who repeatedly text are getting frequent, intermittent high doses of this radiation.

Adults are not the only age groups using cellphones today. Children’s use of cellphones has grown dramatically in many nations. Several peer-reviewed published studies indicate that the risks for children are significantly higher than for adults. This is not surprising as children’s brains are less well protected (due to thinner skulls and less myelin covering the nerve fibers).

*The Economist states:*

*“The whole brouhaha over mobile phones causing brain cancer is a monumental irrelevance compared with scofflaws who insist on using their handsets to text or talk while driving.”*

There is no doubt that texting while driving is dangerous and should be banned. The personal and economic costs of treating the potential brain tumors and other serious illnesses that could occur from the long-term impact of frequent cellphone use could very well dwarf those of texting while driving.

History is replete with failures to control highly profitable carcinogenic substances, ranging from tobacco to asbestos, until proof of harm became irrefutable. We can ill afford to go through that same course with cellphones today, given the long latency involved with brain cancer and their ubiquity. *The Economist* owes its staff and readers better than to rehash outdated physics and hollow reassurances of safety.

Readers are left to wonder whether the significant advertising revenues generated from cellphones may account for *The Economist's* lopsided and misleading editorial. One analysis of U.S. newspaper advertising conducted by ElectromagneticHealth.org in 2010 showed that print ad space from telecommunications businesses was estimated to be between 1.77% and 11.40% of total print advertising space during the sample period.

How much advertising revenue does *The Economist* and its related entities receive from telecommunications advertising, and what steps has *The Economist* taken to ensure balanced reporting on this vitally important industry?

With this unsigned opinion piece (which appeared to be a news article) containing so many technical errors and misleading statements, *The Economist* has undermined its reputation for independent and probing analysis. *The Economist* owes its readers a better accounting of the science on this important public health issue. The fact that questions remain is undeniable, but to state that all is fine in the face of growing evidence that it is not, fails to provide critical information about this important public health challenge. We need to promote safer wireless device use and public health policies for our children and ourselves.

In light of the many errors and misstatements in its commentary, *The Economist* should publish a correction on the issues we have raised.

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