



## Karolinska Institutet

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Stockholm, October 5, 2012

To: Karen Walters-Edgar, Senior Management Assistant at [kedgar@sd61.bc.ca](mailto:kedgar@sd61.bc.ca)  
and

SD 61 Trustee

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Board of Education,  
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*[please, allow this letter to be officially entered as 'Correspondence' on the Board of Education Meeting agenda]:*

Dear Board of Education Trustees:

I understand your Board will very soon make a public announcement regarding the safety of Wi-Fi and its use in SD 61 schools. As a neuroscientist who has been studying the biophysical and epidemiological effects of electromagnetic fields for over 30 years, I believe children are placed at great risk with this type of exposure.

Wireless communication is now being implemented in our daily life in a very fast way. At the same time, it is becoming more and more obvious that the exposure to electromagnetic fields not only may induce acute thermal effects to living organisms, but also non-thermal effects, the latter often after longer exposures. This has been demonstrated in a very large number of studies and includes cellular DNA-damage, disruptions and alterations of cellular functions like increases in intracellular stimulatory pathways and calcium handling, disruption of tissue structures like the blood-brain barrier, impact on vessel and immune functions, and loss of fertility. Whereas scientists can observe and reproduce these effects in controlled laboratory experiments, epidemiological and ecological data derived from long-term exposures in well-designed case-control studies reflect this link all the way from molecular and cellular effects to the living organism up to the induction and proliferation of diseases observed in humans. It should be noted that we are not the only species at jeopardy; practically all animals and plants may be at stake. Although epidemiological and ecological

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investigations as such never demonstrate causative effects, due to the vast number of confounders, they confirm the relevance of the controlled observations in the laboratories.

#### PRECAUTIONARY PRINCIPLE

Because the effects are reproducibly observed and links to pathology cannot be excluded, the precautionary principle should be in force in the implementation of this new technology within the society. This will inevitably be the only method to support the sustainability of these innovative wireless communication technologies.

The February 2, 2000 European Commission Communication on the Precautionary Principle notes: "The precautionary principle applies where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen by the EU". Therefore, policy makers immediately should strictly control exposure by defining biologically-based maximal exposure guidelines also taking into account long-term, non-thermal effects, and including especially vulnerable groups, such as the elderly, the ill, the genetically and/or immunologically challenged, children and fetuses, and persons with the functional impairment, electrohypersensitivity.

#### SELETUN SCIENTIFIC STATEMENT, 2010

In November, 2009, I was involved in a Scientific Panel comprised of international experts on the biological effects of electromagnetic fields, which met in Seletun, Norway, for three days of intensive discussion on existing scientific evidence and public health implications of the unprecedented global exposures to artificial electromagnetic fields (EMF) from telecommunications and electric power technologies. This meeting was a direct consequence of on-going discussions already from the mid-nineties, when cellular communications infrastructure began to rapidly proliferate, and stretching through, among many, the Benevento (2006), Venice (2008) and London (2009) Resolutions from this decade. It further involved important conclusions drawn from the 600-page Bioinitiative Report published August 31, 2007, which was a review of over 2,000 studies showing biological effects from electromagnetic radiation at non-thermal levels of exposure, which partly was published subsequently in the journal Pathophysiology (Volume 16, 2009).

**The Seletun Scientific Statement (2010) recommends that lower limits be established for electromagnetic fields and wireless exposures, based on scientific studies reporting health impacts at much lower exposure levels. Many researchers now believe the existing safety limits are inadequate to protect public health because they do not consider prolonged exposure to lower emission levels that are now widespread.**

The body of evidence on electromagnetic fields requires a new approach to protection of public health; the growth and development of the fetus, and of children; and argues for strong preventative actions. These conclusions are built upon prior scientific and public health reports documenting the following:

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- 1) Low-intensity (non-thermal) bioeffects and adverse health effects are demonstrated at levels significantly below existing exposure standards.
- 2) ICNIRP/WHO and IEEE/FCC public safety limits are inadequate and obsolete with respect to prolonged, low-intensity exposures.
- 3) New, biologically-based public exposure standards are urgently needed to protect public health world-wide.
- 4) It is not in the public interest to wait.

Accordingly, EMR exposures should be reduced now rather than waiting for proof of harm before acting. This is in keeping with traditional public health principles, and is justified now given abundant evidence that biological effects and adverse health effects are occurring at exposure levels hundreds to thousands of times below existing public safety standards around the world.

• **The Seletun Panel (2011) recommends wired internet access in schools, and strongly recommends that schools do not install wireless internet connections that create pervasive and prolonged EMF exposures for children.**

• The Seletun Panel (2010) recommends preservation of existing land-line connections and public telephone networks.

• The Seletun Panel recommends against the use of cordless phones (DECT phones) and other wireless devices, toys and baby monitors, wireless internet, wireless security systems, and wireless power transmitters in SmartGrid-type connections that may produce unnecessary and potentially harmful EMF exposures.

• The Seletun Panel recognizes that wired internet access (cable modem, wired Ethernet connections, etc) is available as a substitute.

#### "NO PROOF OF HEALTH EFFECTS"

One often hears about "safe levels" of exposure and that there is "no proof of health effects", but my personal response to these seemingly reassuring statements is that it is very important to realize, from a consumer's point of view, that "no accepted proof for health effects" is not the same as "no risk". Too many times, 'experts' have claimed to be experts in fields where actually the only expert comment should have been: "I/we just do not know". Such fields were e.g. the DDT, X-ray, radioactivity, smoking, asbestos, BSE, heavy metal exposure, depleted uranium, etc., etc., etc., where the "no risk"-flag was raised before true knowledge came around. Later on, the same flag had to be quickly lowered, many times after enormous economic costs and suffering of many human beings.

In the case of "protection from exposure to electromagnetic fields", it is thus of paramount importance to act from a prudence avoidance/precautionary principle point of view. Anything else would be highly hazardous. Total transparency of information is the key sentence here, as I believe the public does not appreciate having the complete truth revealed years after a certain catastrophe already has taken place. For instance, it shall be noted, that today's





recommended values for wireless systems, such as the SAR-values, are just recommendations, and not safety levels. Since scientists observe biological effects at as low as 20 microWatts/kg, can it truly be stated that it is safe to allow irradiation of humans at SAR 2 W/kg, or at 100,000 times stronger levels of radiation?

#### IMBALANCED REPORTING

Another misunderstanding is the use of scientific publications (as the tobacco industry did for many years) as 'weights' to balance each other. But one can NEVER balance a report showing a negative health effect with one showing no effect. This is a misunderstanding which, unfortunately, is very often used both by the industrial representatives as well as official authorities to the detriment of the general public. True balance would be reports showing negative health effects against exact replications showing positive effects. However, this is not what the public has been led to believe.

#### NEED FOR INDEPENDENT RESEARCH

In many commentaries, debate articles and public lectures - for the last 20-30 years – I have urged that completely independent research projects must be inaugurated immediately to ensure our public health. These projects must be entirely independent of all types of commercial interests; public health cannot have a price-tag! It is also of paramount importance that scientists involved in such projects must be free of any carrier considerations and that the funding needed is covered to 100%, not 99% or less. This is the clear responsibility of the democratically elected body of every country.

#### WHO/INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), 2011

Very recently (in Lyon, France, May 31, 2011) the WHO/International Agency for Research on Cancer (IARC) has classified radiofrequency electromagnetic fields as possibly carcinogenic to humans (Group 2B), based on an increased risk for glioma, a malignant type of brain cancer. This should be added to the previous (2001) 2B classification of power-frequent (ELF) electromagnetic fields – emitted at high levels from handheld gadgets, such as eReaders and mobile phones – as a risk factor for childhood leukemia. Given the 2001 very close votes (9 to 11) for moving it to 2A and all the new knowledge that has accumulated since 2001, today the association between childhood leukemia and power-frequent (ELF) electromagnetic fields would definitely be signed into the much more serious 2A ("probably carcinogenic") category. So, the 'red flag' is – unfortunately – flying very high.

#### INVOLUNTARY EXPOSURE

According to Article 24 of the UNICEF's Child Convention "children have the right to ... a clean and safe environment, and information to help them stay healthy". We must all ensure that this article never is violated. This is about our social responsibility, and is very much a public health issue.

Many WiFi systems are close to beds, kitchens, playrooms, schoolrooms, and similar locations. These wireless systems are never off, and the exposure is not voluntary. They are being forced on citizens and their children everywhere. Based on this, the inauguration of



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wireless systems with grudging and involuntary exposure of millions to billions of human beings to pulsed microwave radiation should immediately be prohibited until 'the red flag' can be hauled down once and for all.

There has been insufficient public debate about whether children actually need these wireless applications in their school work or if there are pedagogic rationales supported by professional teachers behind these 'modernizations'. There should be debate rather than decision-making over parents' heads. It is the children (and their staff!) who will suffer the potential health consequences of living every minute in all these exposures from Wi-Fi, and similar wireless installations, and they have no choice in the matter. Approved man-made microwave exposures are one million billion times – or more – larger than natural evolutionary background levels, the latter being as low as  $0.00000000001 \mu\text{W}/\text{m}^2$ .

#### CONCLUSION

**In conclusion, wireless systems, such as Wi-Fi routers, cannot be regarded as safe in schools, but must be deemed highly hazardous and unsafe for the children as well as for the staff.**

I encourage governments and local health and educational bodies to adopt a framework of guidelines for public and occupational EMF exposure that reflect the Precautionary Principle. As noted, the Precautionary Principle states when there are indications of possible adverse effects, though they remain uncertain, the risks from doing nothing may be far greater than the risks of taking action to control these exposures. The Precautionary Principle shifts the burden of proof from those suspecting a risk to those who discount it — as some nations have already done. Precautionary strategies should be based on design and performance standards and may not necessarily define numerical thresholds because such thresholds may erroneously be interpreted as levels below which no adverse effect can occur.

Some 100 years back, we learned the hard lessons of ionizing radiation and the need for strict health protections – now we must openly face the possibility that we must take a seat in life's school and learn again. This time it is about non-ionizing radiation.

**Based on all of the above, I strongly urge you to consider your public stance on the safety of Wi-Fi in schools.**

Yours sincerely,

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