

Wi-Fi in schools

- the peer-reviewed science showing harm to health
- mitigating the risks

Schools around the world are banning Wi-Fi and wiring their internet due to overwhelming scientific evidence of harm to health and increased risk of cancer from microwave radiation, with young people especially vulnerable. In France and Israel, primary schools are not permitted to use Wi-Fi and secondary schools must switch it off when not in use. In Oregon State USA, a bill was passed in August 2019 declaring the use of Wi-Fi in schools a health emergency. In 2011, the Parliamentary Assembly of the Council of Europe warned against the use of Wi-Fi in schools and compared wireless radiation with asbestos and tobacco.

Wi-Fi is a proven carcinogen

Radio frequency electromagnetic radiation (RF-EMR) from mobile devices, masts and Wi-Fi is currently classified by the WHO as a Class 2B (possible) human carcinogen. This is considered wholly inadequate by international independent experts in RF-EMR, who have been challenging the WHO to re-classify RF-EMR as a Class 2A (probable) or Class 1 (definite) carcinogen.

Two large-scale authoritative studies from the National Toxicology Program in the US (2018) and the Ramazzini Cancer Research Institute in Italy (2018) showed 'clear evidence' of cancer from RF-EMR. Many thousands of other peer-reviewed studies have shown a wide range of harmful bio-effects from RF-EMR, including DNA damage and neurological damage. Research shows that 68% of non-industry-funded studies show that RF-EMR causes harm. *References: see attached list of studies.*

PHE, the WHO and ICNIRP guidelines are unsafe

The core EMR group within the WHO and Public Health England consists of members of ICNIRP, the International Commission on Non-Ionising Radiation Protection. This is a small, private group of self-selected, non-accountable scientists who do not specialise in EMR. ICNIRP members have been repeatedly exposed for having financial conflicts of interest and ties with industry. Their guidelines are opinion only* and are based on short-term heating effects of mobile devices on a plastic dummy in tests performed in 1998. They do not take into account the thousands of peer-reviewed studies showing harmful bio-effects. In 2008 the EU Parliament voted the ICNIRP limits obsolete by 522 votes to 16. Emission levels from masts and routers have increased greatly since then. Campaigners and scientists point to the parallels with lead, asbestos, glyphosate and tobacco in terms of industry interests versus protecting public health.

Members of the public, politicians, school heads and cancer charities understandably defer to PHE when considering safety. Members of the public also often take the advice of physicists and engineers who are not cognisant with the research from EMR scientists. It is the independent EMR experts and emeritus professors in biochemistry and human radiation effects who are issuing urgent warnings. Campaigning doctors from groups such as PHIRE Medical (<http://phiremedical.org>) and SSITA (Safe Schools Information Technology Alliance, <https://ssita.org.uk>) have stated that this is a public health emergency. PHE is currently the object of written complaints from campaigning doctors and is under investigation from the PHSO ombudsman. Legal cases against PHE are being prepared and the UK government and the PHE EMR advisors are now on legal notice over their 'advice.'

*At a presentation to the Radiation Research Trust Conference in September 2008, Paolo Vecchia, the Chairman of ICNIRP, made the following statement: *“The ICNIRP guidelines are neither a mandatory prescription for safety, the “last word” on the issue nor are they defensive walls for Industry or others.”*

Some studies

23 controlled scientific studies show serious health effects of Wi-Fi

Pall, M (2018). Wi-Fi is an important threat to human health. *Environmental Research* 164;405-416. <https://www.sciencedirect.com/science/article/pii/S0013935118300355>

This overview of 23 studies by Professor Emeritus of Biochemistry at Washington State University and international EMR expert Dr Martin Pall concludes that Wi-Fi causes seven ‘very serious’ health effects including damage highly likely to produce mutations that impact future generations.

Pall states: Repeated Wi-Fi studies show that Wi-Fi causes oxidative stress, sperm/testicular damage, neuropsychiatric effects including EEG changes, apoptosis, cellular DNA damage, endocrine changes, and calcium overload...EMF effects are often cumulative; and EMFs may impact young people more than adults.

The decreased DNA repair and increased DNA damage following EMF exposure, in conjunction with the increased cell division in young children, strongly suggest that young children may be increasingly susceptible to cancer following such exposures.

Established bio-effects include: neurological effects such as concentration and learning problems, disturbance to signalling pathways in the brain, insomnia, irritability, depression, brain fog, dizziness, anxiety, memory problems, headaches, brain tumours. Other demonstrated effects include heart tumours, DNA damage, endocrine damage, sperm damage, skin irritation, nervous system damage.

Link: [Professor Martin Pall on WiFi/5G cellular effects](#)

Brain gliomas have doubled/quadrupled since 1998

Three recent studies have shown that incidence of aggressive brain gliomas have doubled in the UK and Denmark and quadrupled in France in the last two decades. Gliomas are the same type of tumour found in the US and Italian studies on irradiated rats, above [rat disease patterns are 97% similar to those of humans]. Brain cancer is now the biggest cancer killer of young people and head and neck cancers are on the increase. With smartphones and tablets attached to Wi-Fi, 4G and Bluetooth being only recent products to come to market, there is likely to be more epidemiological evidence to come.

Brain cancer increasing in the young:

Physicians for Safe Technology: wireless radiation and brain tumours <https://mdsafetech.org/science/cancer/>

WiFi alters brain activity in young adults

<http://wifiinschools.org.uk/resources/wifi+brain+July+2011.pdf>

<https://ssita.org.uk/articles-and-studies/>

Two new recent and important studies have found that electromagnetic fields from Wi-Fi transmitters can alter electrical brain activity and decrease a measure of attention in young adults when performing a memory task. These are the first reports to look at the effects of Wi-Fi on brain function. The attractiveness of Wi-Fi as a learning tool in schools is significantly decreased if it could be damaging the cognitive abilities and brain development of pupils. The studies used a Wi-Fi access point (1.5m away), giving a field strength of 0.49V/m. This is well within the exposures experienced by someone using a Wi-Fi enabled laptop.

WiFi causes DNA damage to rat testes

Adage et al (2016). Does prolonged radiofrequency radiation emitted from Wi-Fi devices induce DNA damage in various tissues of rats? *J Chem Neuroanat.* 75(Pt B):116-22.

This study showed DNA damage from Wi-Fi to testes and identified them as a particularly sensitive organ to RF radiation. Some scientists are warning about mutagenic effects on future generations.

Sperm damage from ‘even a small amount of WiFi exposure.’

“Effects of Wi-Fi (2.45 GHz) Exposure on Apoptosis, Sperm Parameters and Testicular Histomorphometry in Rats: A Time Course Study.” Zanzan University of Medical Sciences, in Zanzan, Iran, June to August 2014.

Our Wi-Fi is currently the exact same frequency microwaves cook our food with, there is absolutely no difference between the two except for the concentrated power in a microwave oven to focus the frequencies.

Sperm damage

<https://www.aspire-reproduction.org/mounting-evidence-of-harmful-effects-of-wifi-router-electromagnetic-waves-on-sperm/>

Wi-Fi causes oxidative stress to brain and liver

Çelik Ö, Kahya MC, Nazıroğlu M (2016). Oxidative stress of brain and liver is increased by Wi-Fi (2.45GHz) exposure of rats during pregnancy and the development of newborns. *J Chem Neuroanat.* 75(Pt B):134-9.

In conclusion, Wi-Fi-induced oxidative stress in the brain and liver of developing rats was the result of reduced GSH-Px, GSH and antioxidant vitamin concentrations. Moreover, the brain seemed to be more sensitive to oxidative injury compared to the liver in the development of newborns.

Memory adversely affected in adolescents

Anna Schoeni, Katharina Roser, Martin Rösli (2015). Memory performance, wireless communication and exposure to radiofrequency electromagnetic fields: A prospective cohort study

in adolescents. *Environment International* 85; pp 343-351. <https://www.sciencedirect.com/science/article/pii/S0160412015300659?via%3Dihub>

A change in memory performance over one year was negatively associated with cumulative duration of wireless phone use and more strongly with RF-EMF dose.

Adverse neuropsychiatric effects

Journal of Chemical Neuroanatomy study by Emeritus Professor Martin Pall: <https://www.ncbi.nlm.nih.gov/pubmed/26300312>

Wi-Fi radiation has a mutagenic effect on the brain

<https://www.ncbi.nlm.nih.gov/pubmed/20353343>

Kesari KK, Behari J, Kumar S (2010). Mutagenic response of 2.45 GHz radiation exposure on rat brain. *Int J Radiat Biol.* 86(4):334-43.

The study concludes that the chronic exposure to these radiations may cause significant damage to brain, which may be an indication of possible tumour promotion.

Increased cancer risk for children

Includes useful detailed information for schools on reducing risks

<https://www.frontiersin.org/articles/10.3389/fpubh.2017.00279/full>

Hardell et al (2017). Measurements of Radiofrequency Radiation with a Body-Borne Exposimeter in Swedish Schools with Wi-Fi. *Frontiers in Public Health.*

'The risk for cancer may be accentuated for children'

'Measures to minimize children's exposure to RF radiation in school would include preferring wired connections, allowing laptops, tablets and mobile phones only in flight mode and deactivating Wi-Fi access points, when not used for learning purposes.'

Brain cancer risk from phones and Wi-Fi

<https://www.independent.co.uk/news/science/mobile-phone-use-raises-childrens-risk-of-brain-cancer-fivefold-937005.html>

Blood samples before and after Wi-Fi exposure

https://www.youtube.com/watch?v=D1pzeTFmCn8&fbclid=IwAR1EAJdeGvgIE6uUkO4rJr40mk5JMSq5b3ovLCdyrHSx_6muER1EFXgBjxl

[v=D1pzeTFmCn8&fbclid=IwAR1EAJdeGvgIE6uUkO4rJr40mk5JMSq5b3ovLCdyrHSx_6muER1EFXgBjxl](https://www.youtube.com/watch?v=D1pzeTFmCn8&fbclid=IwAR1EAJdeGvgIE6uUkO4rJr40mk5JMSq5b3ovLCdyrHSx_6muER1EFXgBjxl)

Modulated radiation used for wireless technologies more biologically stressful than toxic chemicals

In response to Wi-Fi, living cells produce heat-shock proteins which cascade into free radical formation, followed by drastic DNA damage, which precedes the development of cancer.
http://server2.charityadvantageservers.com/client/ResearchAssociatesSR_A6BNQ8B2/antenna_sickness.aspx

Melatonin disruption

[Multiple chemical sensitivity and melatonin disruption](#)

Wi-Fi, especially when left on at night, disrupts the production of melatonin which significantly reduces sleep quality and increases cancer risk, as melatonin is an important anti-cancer hormone.

Published science on WiFi - lists of studies

<https://ehtrust.org/science/peer-reviewed-research-studies-on-wi-fi/>

Children absorb more radiation than adults

https://www.sciencedirect.com/science/article/pii/S2213879X14000583?fbclid=IwAR3_Pv412Yj1pSI270x_fFa1p1a6TSVh7ugQRxKuA60o2a0CdDg8MkETcsQ

Children are especially vulnerable to RF-EMR damage due to stem cells and the developing brain: Emeritus Professor at Washington State University Martin Pall's talk <https://www.youtube.com/watch?v=lulKq3FMGGs>

<http://www.parentsfor safetechnology.org>
Children are especially vulnerable due to:
Smaller heads
More active stem cells
Higher body water acting as a conductor
Thinner skulls

Opinion: a huge body of research provides clear evidence of the significant threats to children's health from Wi-Fi routers and cellular masts

by Professor Tom Butler, Professor of Information Systems, specialising in Semantic & Regulatory Technologies, and Principal Investigator at GR3C at UCC. An overview of the research.

<https://www.rte.ie/brainstorm/2019/0417/1043133-why-everyday-wireless-technology-poses-a-health-risk-to-children/?fbclid=IwAR26XzBenmujdHAIQ2x5807KLNbQ2-U4v-Kkv040ftMvdxs1NoPd5t8hwWQ>

Studies showing harm to children from smartphones and Wi-Fi

<https://www.radiationresearch.org/wp-content/uploads/2019/10/On-the-Clear-Evidence-of-the-Risks-to-Children-from-Smartphone-and-WiFi-Radio-Frequency-Radiation-Final-2019.pdf>

Damage from just minutes of exposure

Includes calls to wire Wi-Fi in schools

https://stopsmartmeters.org.uk/uk-medical-doctors-call-for-immediate-action-against-wireless-technologies/?fbclid=IwAR1pUP2pvS1CcKc0-e_F5kBEbA52svyfgO6Sm7RyQ_yxZOhrRH6dU7nnKgyY

Mechanisms of damage: problems and solutions

Link: [The Biological effects of weak magnetic fields:](#)

This paper by EMF specialist Andrew Goldsworthy explains mechanisms by which Wi-Fi can have serious effects on human health.

80% of children may be affected without knowing it

The independent doctors' group IGNIR estimates that:

- 80% of children are subconsciously affected (eg disturbed sleep, impaired cognition and memory etc)
- 1.2 % are severely and consciously affected, but most will not link their ill health with the cause

IGNIR guidelines: <https://ignir.org>

Mobile phones and children/adolescents

bioinitiative.org: Effects of mobile phones on children's and adolescents' health:

Bioinitiative are a group of MDs and PhDs from 10 countries.

https://bioinitiative.org/effects-mobile-phones-children-health/?fbclid=IwAR0azmU5eZacmuilwEVTAExbOybcEOAiLU88wQqFzeCFfI2eFIyLN45TB_E - commentary on effects of mobile phones on children's health

The French public health advisors, ANSES, have recently issued warnings for people, especially children, to keep mobile phones away from the body.

https://www.anses.fr/en/content/exposure-mobile-telephones-carried-close-body?fbclid=IwAR3Wtv6LbIV6pkh6GEzclCsMrav9nQBgzTA9cfb1-So1rK6Z2_z5aCsDbdw

Swiss research shows that smartphones damage memory performance in teenagers: <https://www.dailymail.co.uk/sciencetech/article-5973969/Radiation-smartphones-trigger-memory-loss-teenagers-new-study-reveals.html?fbclid=IwAR2nmrp1-a24sTm6adskDQYrqpEDhaVcKXidSQYMql5dzKQ8eBrZirmPiqo>

Acute effects of radiofrequency electromagnetic field emitted by mobile phone on brain function: <https://www.ncbi.nlm.nih.gov/pubmed/28426166>

Mobile phone use has been linked beyond any reasonable doubt with brain cancer in studies.

UK Chief Medical Officer Sir William Stewart warned children under 16 to use mobile phones only in an emergency.

Electro-sensitivity

It is thought that 435,000 people in the UK are unable to attend work or school due to symptoms of ES. ES is denied by industry and by UK public health bodies who claim that it is psychosomatic. However, it has been found by independent researchers that it can be measured using objective biomarkers. ES is medically and legally recognised in Sweden and France is now following suit.

Testimonials from sufferers

<https://wearetheevidence.org/wireless-harms/>

Useful information and anecdotal reports of symptoms from ES-UK:

“Every day in my classroom (it’s the only classroom that physically has the little Wi-Fi white box on the ceiling) I get the same headache: everyday, same spot, same feeling.”

<http://www.es-uk.info/wp-content/uploads/2018/11/11.3-III-Health-from-Wi-Fi-2012.pdf>

ES-UK

<http://www.es-uk.info/information/>

[EHS as a unique pathological disorder](#)

Insurances companies do not insure for Wi-Fi damage to schoolchildren

Insurance companies hire independent scientists and do not insure for RF-EMR damage. In February 2015 Lloyd’s of London informed schools that it was excluding liability coverage for injuries resulting from or contributed to by microwave radiation and electromagnetic fields. School boards therefore become liable: <http://parentsforasafeschool.blogspot.com/2015/02/school-boards-left-on-hook-for-wi-fi.html>

Warnings from doctors and experts

The Parliamentary Assembly of the Council of Europe warns against Wi-Fi in schools (2011)

http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994&fbclid=IwAR29U4iWjZmgnBY4AbKYNAIUxWG_sRbm9cgOh6yovVxt-hXdsU7hw37FgH4

In April 2011 the Parliamentary Assembly of the Council of Europe (a 47-nation organisation upholding human rights) passed the draft Resolution 1815 in which they recommended wired internet in schools in place of Wi-Fi and the strict regulation of mobile phone use.

'Given the context of growing exposure of the population, in particular that of vulnerable groups such as young people and children, there could be extremely high human and economic costs if early warnings are neglected... Waiting for high levels of scientific and clinical proof before taking action to prevent well-known risks can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco.'

Recommendations:

*'...take all reasonable measures to reduce exposure to electromagnetic fields, especially to radio frequencies from mobile phones, and particularly the exposure to children and young people who seem to be most at risk from head tumours.
...for children in general, and particularly in schools and classrooms, give preference to wired Internet connections, and strictly regulate the use of mobile phones by schoolchildren on school premises.'*

The recommendations in detail: <https://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994>

NHS report on the Council of Europe Resolution: <https://www.nhs.uk/news/pregnancy-and-child/call-to-ban-mobiles-and-wifi-from-schools/>

Bioinitiative doctors warn against Wi-Fi

Bioinitiative is a group of physicians and PhDs from 10 countries. The 1480pp **Bioinitiative Report** is double peer-reviewed by 29 authors from 10 countries and contains 3800 technical papers.

The 2014 Bioinitiative Report states *"wireless laptops and other wireless devices should be strongly discouraged in schools for children of all ages."*

A room containing several devices using Wi-Fi will bring the RF-EMR levels in a room up to extremely high levels so that the overall damage is far higher than just a Wi-Fi router alone.

EUROPAEM (European Academy for Environmental Medicine) recommendations

(<https://www.degruyter.com/downloadpdf/j/reveh.2016.31.issue-3/reveh-2016-0011/reveh-2016-0011.pdf>)

Functional, morphological, and biochemical changes at the cellular, tissue, and organism level, as well as behavioral changes have been studied under experimental conditions, and epidemiology has assessed the association between occupational and residential exposure to EMFs and neurodegenerative diseases as well as neurological symptoms. Research has shown that EMFs (RF and ELF) have deleterious effects on brain neurons and brain functioning (81).

Wi-Fi scores as a high risk factor - risk assessment for schools

wifiinschools.org.uk

<http://www.wifiinschools.org.uk/20.html>

Risk assessment:

<https://www.wirelessriskassessment.org/risk-assessment1>
https://cdn.website-editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/RF_Risk_Assessment_June_2018b.pdf

risk: could happen
severity of effects - moderate to severe e.g. brain tumour

Possible damage to areas of the body closest to the devices, including increased cancer risk, oxidative stress, cell death, damage to DNA, damage to male fertility, or female fertility. *Exposures from Wi-Fi-enabled devices close to the body can be as high as from mobile phones (similar maximum Specific Absorption Rates, SARs139), so effects may be similar to those reported for mobile phones close to the body.*

NB Phones have already been found to have levels far higher than manufacturers are permitted (<https://www.phonegatealert.org/en/apples-iphone-widespread-deception-over-the-real-sar-levels>).

<http://wifiinschools.org.uk/4.html>

Warning from Education Professionals Union

Philip Parkin, the General Secretary of the Education Professionals Union, Voice, formerly the Professional Association of Teachers, UK, has called for a full investigation into the networks. *'We continue to be concerned about the possible effects of Wi-Fi. Particularly on children whose brains and bodies are still developing'* he said (2007). Voice is calling for a moratorium on new Wi-Fi networks in schools and the suspension of existing Wi-Fi if possible. *'The proliferation of wireless networks could be having serious implications for the health of some staff and pupils without the cause being recognised'. 'There are huge commercial pressures which may be why there has not yet been any significant action'*.

Wi-Fi is one of the riskiest EMR technologies, say EUROPAEM

Mikko Ahonen PhD

<https://www.wirelesseducation.org/1073-2/>

Wi-Fi routers do not have to be on all the time - this practice adds up to a very heavy cumulative dose of radiation.

The mobile industry has a patent [9] to change Wi-Fi routers and the continuous 10 times per second (10 Hz) beacon signal for health reasons. The patent application mentions DNA damage, which has been found in multiple-studies [10]. Until this new technology is brought to market however, we would be wise to turn off the Wi-Fi when not absolutely needed.

The 10 Hz pulse itself is problematic, since in human brainwaves this 10 Hz 'hits' the alpha band and can interfere with cognitive abilities and sleep.

Often Wi-Fi risk is down-played by saying “the exposure is only a fragment of the public exposure guidelines.” Current radiation guidelines are 20 years old and do not take into consideration biological effects or the pulsed-nature of the signal, where there is a great difference between average and peak values [11]. When Wi-Fi devices produce pulsed microwave radiation, its peak values will exceed several precautionary recommendation levels of what is considered safe for exposure.

Additionally, current guidelines only account for radiation from one device. **With dozens of devices emitting radiation at once in a typical classroom, children and staff are exposed to very high amounts of microwave radiation not accounted for in outdated guidelines. It is no wonder the EUROPAEM environmental health group listed Wi-Fi as one of the riskiest RF-technologies** [12 <https://www.degruyter.com/downloadpdf/j/reveh.2016.31.issue-3/reveh-2016-0011/reveh-2016-0011.pdf>]. They point to the exceptionally fast rise time and fall time of Wi-Fi signals, which may have an effect on calcium channels in human cells and the unnatural opening of these channels [13] which can lead to disease.

It is recommended not to exceed a 100 $\mu\text{W}/\text{m}^2$ precautionary level in classrooms. When a Wi-Fi router is installed in a classroom these levels can reach 30.000 $\mu\text{W}/\text{m}^2$ (peak value). In many schools, Wi-Fi routers are attached to the ceiling of the classroom. This may be particularly risky, because the router uses microwave radiation to transmit its device ID continuously, even when there is not a single wireless device connected to it. Often the router is rather close to children’s and teachers’ heads and these signals enter one’s body as they travel through walls, ceilings and floors.

The American Academy of Pediatrics

AAP has repeatedly advised the US government to reassess regulations regarding human exposure to wireless radiation. The AAP states that children and pregnant women need more protections, and AAP points to research that indicates that children’s brains and bodies absorb proportionately more of this radiation due to their unique physiology. Children are at higher risk as their brain and immune system are still developing.

<https://ehtrust.org/wp-content/uploads/AAP-Recommendations-Fact-Sheet-3.pdf>

AAP advice to government: <https://ehtrust.org/wp-content/uploads/American-Academy-of-Pediatrics-Letters-to-FCC-and-Congress-.pdf>

Doctors’ letters warning about EMR including WiFi in schools

<https://ehtrust.org/wp-content/uploads/Doctor-Letters-on-Wi-Fi-In-School-Full-Compilation.pdf>

As a physician leader in Canada I am very concerned about the increasing evidence internationally that EMR is creating increasing health problems in our population as its use increases exponentially. This is particularly true among children and young Canadians, and teachers and nurses who are continuously exposed to WiFi routers in schools... This issue is under active consideration by the Health and Public Policy Committee of the Royal College of Physicians and Surgeons of Canada, the Health Policy and Public Health Committees of the Canadian Medical Association and the Council of Family Physicians of Canada, the Canadian Pediatric Society and the Canadian Cardiovascular Society.

Letter for schools: <https://ehtrust.org/letter-on-health-risks-of-wi-fi-in-school-for-principal-and-school-administrators/>

Submission to Westminster and risk assessment by neuroscientist Dr Sarah Starkey

This [submission by Dr Sarah Starkey](#) to the Westminster Parliamentary Science and Technology Committee in 2018, arguing for a review of PHE advice.

Wireless radiofrequency signals...may result in serious negative health, wellbeing or developmental outcomes...If children are to be protected from harm, or possible harm, restrictions and regulations need to be introduced. "Harming children is wrong, even when it is economically advantageous or taking action is difficult."

This draft [Risk Assessment](#) from Dr Starkey can be of use to schools and those in a safeguarding role.

On the Clear Evidence of the Risks to Children from Non-Ionizing Radio Frequency Radiation: The Case of Digital Technologies in the Home, Classroom and Society by Professor Tom Butler: <https://www.radiationresearch.org/wp-content/uploads/2019/10/On-the-Clear-Evidence-of-the-Risks-to-Children-from-Smartphone-and-WiFi-Radio-Frequency-Radiation-Final-2019.pdf>

Technology and Education: How Safe Are Our Children? Presentation by Dr Sarah Starkey, including details of studies not included in reports by AGNIR, the body which advised PHE.
The UK Government is not independent. It recently made more than £1.3 billion from auctioning partial licences for the next generation of communications, 5G, and it made £22.5 billion from 3G licences. They are promoting wireless 'smart' meters, 'smart cities' and the internet of things. Do not expect them to admit easily that there are any risks at all. Safety has and is being ignored both in product design and by politicians and decision makers. We are teaching science in schools, but appear to stop valuing scientific information when it becomes inconvenient. https://cdn.website-editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/NEU_WiFi_in_Schools.pdf

Safe Schools California

"Heart problems have occurred in children in schools after WiFi was installed.67 One school in Simcoe, Ontario had several children experience serious heart problems that seemed to be directly related to WiFi. When the children were removed from the school and were free from RF exposure, their problems ended. Now there are defibrillators in schools. I don't recall ever hearing of children having heart attacks un ti very recently. How can regulators not see the association?"

—Sharon Noble, Director Coalition to Stop Smart Meters

Wi-Fi bans in schools

France

Wi-Fi was banned in 2015 in French primary schools and schools in Russia and Israel (where much microwave research has been performed for many decades). Secondary schools are asked to switch off Wi-Fi when not in use. A number of universities and libraries have now also removed Wi-Fi networks. In Spain, the Parliament of Navarra has voted to ban Wi-Fi in schools.

Information on phone and wireless bans in French schools by public health bodies: <https://ehtrust.org/france-policy-recommendations-cell-phones-wireless-radiation-health/>

Action elsewhere to protect children: <http://www.parentsforsafetechnology.org/worldwide-countries-taking-action.html>

State of Maryland

The State advises against Wi-Fi in schools:

https://phpa.health.maryland.gov/OEHFP/EH/Shared%20Documents/CEHPAC/MD_CEHPAC_SchoolWiFi_022017_final.pdf?fbclid=IwAR2tZok8_UQnKDPBJYnQY3S32phKyo1m0-rTk6-U8zUfAkrKmZJ0qvgZ7jA

Maryland Dept of Education guidelines for safer Wi-Fi in schools:

The Maryland State Department of Education should recommend that local school systems:

- *Consider using wired devices.*
 - *Where classrooms have internet access with a wireless connection, WiFi can be turned off and wired local area network (LAN) can provide a reliable and secure form of networking for as many wireless devices as necessary without any microwave electromagnetic field exposure.*
 - *If a new classroom is to be built, or electrical work is to be carried out in an existing classroom, network cables can be added at the same time, providing wired network access with minimal extra cost and time.*
 - *Have children place devices on desks to serve as barrier between the device and children's bodies.*
 - *Locate laptops in the classroom in a way that keeps pupil heads as far away from the laptop screens (where the antennas are) as practicable.*
 - *Consider using screens designed to reduce eyestrain.*
 - *Consider using a switch to shut down the router when it is not in use.*
- 9 Wifi in Schools Australia: Reducing EMR. http://www.WiFi-in-schools-australia.org/p/blog-page_13.html.*

WiFi Radiation in Schools December 13, 2016 Page 9

- *Teach children to turn off WiFi when not in use.*
- *Consider placing routers as far away from students as possible.*
- *Share this document with teachers and parents.*
- *The General Assembly should consider funding education and research on electromagnetic radiation and health as schools add WiFi to classrooms.*
- *The Maryland Department of Health and Mental Hygiene should provide suggestions to the public on ways to reduce exposure:*
 - *Sit away from WiFi routers, especially when people are using it to access the internet.*
 - *Turn off the wireless on your laptop when you are not using it.*

- Turn off WiFi on smartphones and tablets when not surfing the web.
- Switch tablets to airplane mode to play games or watch videos stored on the device.

Oregon

Oregon State bill 283 declares an emergency regarding Wi-Fi in schools:

<https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/SB283>

SB 283 Enrolled

<https://olis.leg.state.or.us/liz/2019R1/Measures/Overview/SB283>

<https://ehtrust.org/first-in-the-nation-oregon-passes-state-bill-on-wireless-radiation-and-health-in-school/>

Video: 'around the world many countries have stopped using Wi-Fi - we must do our due diligence'

[https://www.youtube.com/watch?](https://www.youtube.com/watch?v=Qg0kEcDAmPI&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=14)

[v=Qg0kEcDAmPI&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=14](https://www.youtube.com/watch?v=Qg0kEcDAmPI&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=14)

14 year old testifies her story on health impact of Oregon school Wi-Fi:

[https://www.youtube.com/watch?](https://www.youtube.com/watch?v=VmkrkBbgKCK&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=4)

[v=VmkrkBbgKCK&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=4](https://www.youtube.com/watch?v=VmkrkBbgKCK&list=UUGOSWGSfR2X9TU3wN5aUgzw&index=4)

Schools taking action including Maryland State action and Oregon State bill on Wi-Fi in schools as a health emergency:

<https://ehtrust.org/take-action/schools-programs/>

Cyprus has [removed Wi-Fi](#) from elementary classrooms and has a strong public awareness [campaign](#) educating [parents](#), [teenagers](#) and [pregnant women](#).

Belgium has [banned](#) cell phones manufactured for young children and also banned Wi-Fi in some regions.

Ontario [Ontario School removes Wi-Fi over safety concerns](#)

Schools in US and Canada: [Schools in US and Canada removing Wi-Fi](#)

Israel and Germany: Haifa, Israel has [installed](#) corded connections in all schools, and the countries Israel and Germany officially [recommend](#) wired connections in schools and reducing children's exposure to RFR.

Australia: In 2015 the Queensland Department of Education issued "[Guide to Safe Technology](#)"

Geneva: *The Child and Youth Service of the Department of Public Instruction of Geneva, Switzerland issued a [letter](#) to be transmitted to all teachers about the health risks of digital technology, detailing how screens can affect sleep, eyesight, diabetes, cardiovascular disease and obesity, and recommends "Only switch your WLAN on when you need it. With laptops, in particular, it is a good idea to switch the WLAN off as otherwise the device will repeatedly try to connect to a network, leading to unnecessary radiation" and "Don't hold your laptop close to your body while it is connected to a WLAN."*

San Francisco: The [United Educators of San Francisco](#) (UESF), at a joint health committee with the San Francisco Unified School District, has approved going forward with a resolution for safer

technology. The resolution became official as of May 23rd, 2018 and the [“Resolution on Enhancing Technology Safety in San Francisco Unified School District”](#) and [press release](#) be found on UESF website.

Ashland, Massachusetts became the first US School District to institute [“Best Practices”](#) posted in every classroom to “turn the Wi-Fi off when not in use and keep devices away from the body” ([Magazine article on Ashland’s Decision Here](#), [Newspaper Coverage](#).)

New York State: the Onteora School District in New York State adopted [“Best Practices with Wi-Fi”](#)

[“Guidelines for Safer Use of Wireless Technology in Classrooms”](#) were developed for the New York State Teachers’ Union who later hosted a webinar [on the risks of wireless technologies](#).

Worcester, Massachusetts: the School Committee voted to approve [“Radiofrequency Radiation Exposure”](#) to be posted on the Worcester District Website.

New Jersey: the Education Association recently published an article entitled, [“Minimize Health Risks from Wireless Devices”](#) and detailed several [recommendations](#) on reducing the health risks of technology: “Keep devices away from the body” and “hard wire all devices, including printers, projectors and boards.” [Please download a PDF with the recommendations at this link.](#)

UK: Several schools in the UK have removed their Wi-Fi systems because parents were concerned about adverse health effects (TimesOnline, Nov 20th, 2006; Ulster Star, 28th Aug 2008; BBC News, 25th Sept 2009). Parents in some schools are refusing to let their children use the wireless computers, and are campaigning to have alternative wired-up computing facilities available (Liverpool Daily Post 21st Oct 2009; BBC Radio Merseyside 1.15pm 21st Oct 2009; Gazettelive 15th Oct 2009).

Moves being made in schools around the world to wire the wireless <https://www.stopumts.nl/pdf/Compilation-RF-radiation-2017.pdf>

Resources - mitigating the risks

Actions for schools to reduce risks

Safe Schools Information Technology Alliance

<https://ssita.org.uk>

<https://ssita.org.uk/children/>

PHIRE doctors

phiremedical.org

<http://phiremedical.org/vulnerability-in-children/>

Dr Erica Mallory-Blythe's talk on EMR and children: <https://www.youtube.com/watch?v=sNFdZVeXw7M>

Excellent resource for schools:

<https://ehtrust.org/take-action/schools-programs/>

Information from the Environmental Health Trust (EH Trust) (Dr Devra Davis & colleagues)

<https://ehtrust.org/wp-content/uploads/WiFi-in-Schools-Toolkit-EHT.pdf>

An ever growing amount of scientific research documents show adverse effects from exposure to this radiation—such as memory and sleep problems, headaches, cancer, and damage to reproduction, brain development, and DNA. These effects are found at very low levels of wireless radiation. The radiation penetrates deeper into children's brains due to their thinner skulls. Children's brains and immune systems are still developing, therefore they are more vulnerable to the effects.

Physician groups such as the American Academy of Pediatrics, the Vienna Medical Association, and Athens Medical Association are among the many international medical organizations that have issued recommendations to the public to reduce exposure to cell phone radiation. Countries such as France, Cyprus, and Israel have banned wireless in young children's classrooms. In several letters sent to school districts, physicians strongly recommended wired connections for technology in classrooms to eliminate unnecessary wireless radiation exposures.

The Collaborative for High Performance School Low EMF Criteria includes:

- *Install a wired local area network (LAN) for Internet access throughout the school.*
- *Provide wired network connections for desktop computers, laptops, notebooks, and tablets.*
- *All wireless transmitters shall be disabled on all Wi-Fi-enabled devices.*
- *Install easily accessible hard-wired phones for teacher and student use.*
- *Prohibit use of standard DECT cordless phones operating at 2.4 GHz and 5.8 GHz*
- *Prohibit the use of cell phones and other personal electronic devices in instructional areas / classrooms.*

The American Academy of Pediatrics: Have written letters to the US government and made [ten recommendations](#) on how to reduce RFR radiation exposure

SafeG wired connections

Wi-Fi routers are often vastly overpowered [https://safeg.net/home/?](https://safeg.net/home/?fbclid=IwAR3xGA5vIKTOMx7uVwVpeOPN2zaDbfQ4oPrau3_Th3Djo_1qhmqsEIIDjYc)

[fbclid=IwAR3xGA5vIKTOMx7uVwVpeOPN2zaDbfQ4oPrau3_Th3Djo_1qhmqsEIIDjYc](https://safeg.net/home/?fbclid=IwAR3xGA5vIKTOMx7uVwVpeOPN2zaDbfQ4oPrau3_Th3Djo_1qhmqsEIIDjYc)

Schools and families course: <https://www.wirelesseducation.org/store/l2/>

Wired child: <http://wiredchild.org/home.html>

Safer internet solutions <https://ehtrust.org/key-issues/cell-phoneswireless/wifi-in-schools/>

- Physical measures initially include assessing how many systems can run on ethernet, i.e be hardwired
- Switch off when not in use or use opt-in/opt-out systems for individual classrooms
- Assess current power densities for RF fields
- Hold an assembly on the topic of EMF 'rules of thumb', educate about choice and attitude
- [Share printable resources on safety tips](#)
- Carry out the Risk Assessment and accountability assessments available
- Investigate options for Harmonisers where WiFi cannot be replaced

Working for Safe Technologies for Nurseries, Schools and Colleges

<http://www.wifiinschools.org.uk>

WiFiinschools.org.uk has been set up by a small group of scientists concerned about the rapid spread of wireless technologies in schools. We are concerned by the lack of information that schools and parents have been given about the potential risks from this technology.

Wi-Fi router guards can be used to block signal if router cannot be turned on and off <https://www.radiationhealthrisks.com/wifi-radiation-protection-items/>

Checklist on reducing EMR in classrooms

<https://ehtrust.org/wp-content/uploads/Reducing-EMF-in-School-Classrooms-EHT-.pdf>

The Collaborative for High Performance Schools

The US-based Collaborative for High Performance Schools has developed [Best Practices](#) for LOW EMF classrooms which includes using corded, not cordless phones, using ethernet connected, not wireless computers in the classroom.

https://ehtrust.org/wp-content/uploads/US-CHPS__Criteria_2014_Low-EMF-Low-ELF-Criteria102314_VA-1-copy-2.pdf

Cece Doucette, comms professional <https://sites.google.com/site/understandingemfs/contact>

Policy and template for reducing risk from Australian private school

[Upper Sturt Primary School WiFi and Cell Phone Policy](#)

Meters for measuring radiation:

www.es-uk.info/docs/20110111_products_services.pdf

Further information and links

Talk by doctor, EMR expert and campaigner Dr Erica Mallory-Blythe <https://www.youtube.com/watch?v=7hQKFPQL6gl&feature=youtu.be>

Wi-Fi in schools proven dangerous - documentary http://www.electrosmogprevention.org/public-health-alert/wifi-dangers/wifi-in-schools-proven-dangerous/?fbclid=IwAR1DwUr5HUWnl95hmlzR0IA5Rg3_rz2llfEf5mcnGkp5stR9oYNex23r6_8

Powerful Wi-Fi in schools causes symptoms & linked with cancer/lower limits in some countries (video from Australia)

<https://www.youtube.com/watch?v=YF5XeQAhtQE&list=PLT6DbkXhTGoDuG9AjOwvPaWLSk8mYyeyK>

Is WiFi making your child ill? Article with info from Dr Erica Mallory-Blythe: <https://www.telegraph.co.uk/health-fitness/body/wifi-internet-family-dangerous-health/>

Panorama programme on WiFi (2007): Wi-Fi computers emit high levels of radiation

<https://www.bbc.co.uk/programmes/b007ngfl>

An example measurement showed that the electrical field strength 0.5m from a Wi-Fi-enabled computer in a school (1.7V/m) was greater than that from the beam of greatest intensity from a mobile phone mast near the school (mast reading measured at adult torso height above ground, approximately 100m from the mast - the distance at which the field strength is greatest, 0.7V/m). Several international studies show cancer clusters around phone masts and many anecdotal reports show clear cancer clusters.

Generation Zapped – multi award winning documentary 2017

<https://vimeo.com/ondemand/generationzapped>

The Santa Clara Medical Association warns about children and WiFi in schools: https://issuu.com/18621/docs/bulletin_0415_web/17?e=8664035/12346964

Boy's Wi-Fi symptoms: <https://www.somersetlive.co.uk/news/somerset-news/health-boss-responds-somerset-father-2609943> Simon Mann hits back at father who takes son out of school - symptoms disappear when wifi isn't there - good list of sx here

Debra Fry: daughter ill and suicide https://www.mirror.co.uk/news/uk-news/school-wifi-networks-could-put-12602188?fbclid=IwAR1_vRdvcqhKDqxyYVEi4OlnRMsTNY-q3j6Vn97ITJ7lapl20KetXsQE0n0

Brain fog article: mum removed kids from school and brain fog lifted: https://www.mirror.co.uk/news/uk-news/wifi-makes-kids-sick-mum-12587349?utm_source=facebook.com&utm_medium=social&utm_campaign=sharebar&fbclid=IwAR00NPXPk5g8k2Jbwc9wtY-PqdZCimQYwdkP6YZOPsnTp8N7Kqzgm4U9i4

For educating children:

Cress dies when beside a Wi-Fi router: <https://vimeo.com/359157026?fbclid=IwAR1QH-CiV46WZfprWa8gfo7ZSrNzZkVhB3feo6vyAadjHQuuOOISRBySOM>

School cress experiment by 'science pioneers': https://www.youtube.com/watch?v=eMu53s-IL8I&feature=share&fbclid=IwAR0xcoHHXSa8XxC4nWhVQP-cepxk_Zp-eLx5IZM5yDSx6yXEG-badQTxWLk

Websites including material on the health dangers of Wi-Fi:

- www.wifiinschools.org.uk/
- www.wifiexposure.com
- www.emfields.org/faq.asp#AcoustimeterWiFi
- <http://electromagneticman.co.uk/>
- www.es-uk.info/
- www.powerwatch.org.uk/rf/wifi.asp
- <http://wiredchild.org/sciencealias/43-what-the-science-tells-us/67-what-the-science-tells-us-wireless-products.html>
- www.cavisoc.org.uk/Wi-fi.html
- www.mastsanity.org/info-guides-/wi-fi-guide.html

How can I measure Wi-Fi radiation?

Barrie Trower is a weapons expert and research physicist with a specialisation in microwaves and he is scientific advisor to the Radiation Research Trust. He trained at the Government (Ministry of Defense) microwave warfare establishment(s) early in the 1960s. He is the author of both Tetra Reports for the Police Federation of England and Wales and the Public and Commercial Service Union. Some interviews with him can be seen on YouTube.

WHO influenced by industry

<https://olgasheean.com/wp-content/uploads/2017/02/WHO-setting-the-standard-for-a-wireless-world-of-harm.pdf>

Heart problems have occurred in children in schools after WiFi was installed.⁶⁷ One school in Simcoe, Ontario had several children experience serious heart problems that seemed to be directly related to WiFi. When the children were removed from the school and were free from RF exposure, their problems ended.

SSITA (Safe Schools Information Technology Information) doctors' written complaint to

Public Health England: *'Failure to promote precaution in the case of other wireless technologies such as Wi-Fi and smart meters cannot be justified on the grounds that exposures are less than from mobile phones. This does not take into account the fact that exposure from Wi-Fi in schools and smart meters is constant whereas mobile phone exposure only occurs during phone calls. Furthermore, mobile phone exposure is voluntary whereas in the case of Wi-Fi in schools and smart meters in homes it is involuntary, i.e. people are being forced to be exposed to the pulsed microwaves and cannot choose to exercise precaution. This is arguably a violation of the Right to Health Protection as outlined in Section 4 of the article 'Precautionary Environmental Protection and Human Rights' (2007).'*²⁵

Leaflet: 'If Wi-Fi damages DNA and changes what is going on in my brain, then why do I have to use it at school?' <http://www.wifiinschools.org.uk/30.html>

