



Theodora Scarato
Executive Director of Environmental Health Trust

January 10, 2020



Building science and radiofrequency Radiation: What makes smart and healthy buildings

Frank M. Clegg^a  , Margaret Sears^b , Margaret Friesen^c , Theodora Scarato^d , Rob Metzinger^e , Cindy Lee Russell^f , Alex Stadtner^g , Anthony B. Miller^h 

- Adverse Health Effects of RFR at Levels Lower than Limits
- Summary of Insurance Industry and RFR Liability
- Environmental Impacts of Cell Tower and Radiofrequency Radiation
- International Actions to Reduce Public Exposure to RFR
- Regional policies to limit RFR exposure in schools
- Recommendations for the Building Industry
- Strategies to eliminate or minimize RFR exposures from sources within buildings
- Strategies to minimize the RFR exposures from external sources

Wireless Companies Warn Their Shareholders of Risk but Not Their Customers nor Residents



CROWN
CASTLE

“If frequency emissions from wireless handsets or equipment on our communications infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues....”

“We currently do not maintain any significant insurance with respect to these matters.”

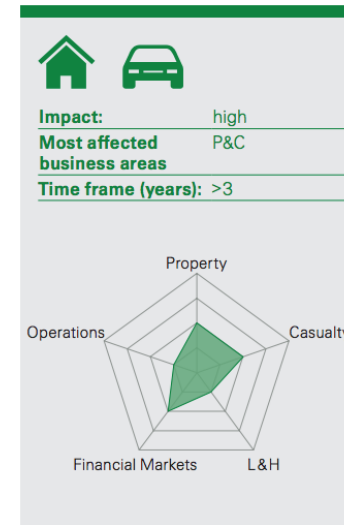
-Crown Castle

verizon
wireless

“We may incur significant expenses in defending these lawsuits. In addition, we may be required to pay significant awards or settlements.”

-Verizon Communications Inc.

5G is rated as a “high impact” emerging risk affecting property and casualty claims in more than 3 years. “Off the leash – 5G mobile networks” Impact = High



Off the leash – 5G mobile networks

5G – short for fifth generation – is the latest standard for cellular mobile communications. Providing ultrafast broadband connection with higher capacity and lower latency, 5G is not only heaven for your smartphone. It will enable wireless connectivity in real time for any device of the Internet of things (IoT), whether that be autonomous cars or sensor-steered factory. In doing so, it will allow decentralised seamless interconnectivity between devices.

To allow for a functional network coverage and increased capacity overall, more antennas will be needed, including acceptance of higher levels of electromagnetic radiation. In some jurisdictions, the rise of threshold values will require legal adaptation. Existing concerns regarding potential negative health effects from electromagnetic fields (EMF) are only likely to increase. An uptick in liability claims could be a potential long-term consequence.

Other concerns are focused on cyber exposures, which increase with the wider scope of 5G wireless attack surfaces. Traditionally IoT devices have poor security features. Moreover, hackers can also exploit 5G speed and volume, meaning that more data can be stolen much quicker. A large-scale breakthrough of autonomous cars and other IoT applications will mean that security features need to be enhanced at the same pace. Without, interruption and subversion of the 5G platform could trigger catastrophic, cumulative damage. With a change to more automation facilitated by new technology like 5G, we might see a further shift from motor to more general and product liability insurance.

There are also worries about privacy issues (leading to increased litigation risks), security breaches and espionage. The focus is not only on hacking by third parties, but also potential breaches from built-in hard- or software “backdoors.” In addition, the market for 5G infrastructure is currently focussed on a couple of firms, and that raises the spectre of concentration risk.



Potential impacts:

- Cyber exposures are significantly increased with 5G, as attacks become faster and higher in volume. This increases the challenge of defence.
- Growing concerns of the health implications of 5G may lead to political friction and delay of implementation, and to liability claims. The introductions of 3G and 4G faced similar challenges.
- Information security and national sovereignty concerns might delay implementation of 5G further, increasing uncertainty for planning authorities, investors, tech companies and insurers.
- Heated international dispute over 5G contractors and potential for espionage or sabotage could affect international cooperation, and impact financial markets negatively.
- As the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency.





5G is rated as a “high impact” emerging risk affecting property and casualty claims in more than 3 years.
“Off the leash – 5G mobile networks” Impact = High

	
Impact:	high
Most affected business areas	P&C
Time frame (years):	>3

Off the leash – 5G mobile networks

5G – short for fifth generation – is the latest standard for cellular mobile communications. Providing ultrafast broadband connection with higher capacity and lower latency, 5G is not only heaven for your smartphone. It will enable wireless connectivity in real time for any device of the Internet of things (IoT), whether that be autonomous cars or sensor-steered factory. In doing so, it will allow decentralised seamless interconnectivity between devices.

To allow for a functional network coverage and increased capacity overall, the industry is testing acceptance of higher levels of exposure. In some jurisdictions, the rise of threshold values for electromagnetic fields (EMF) are only likely to increase. This could have a potential long-term consequence.

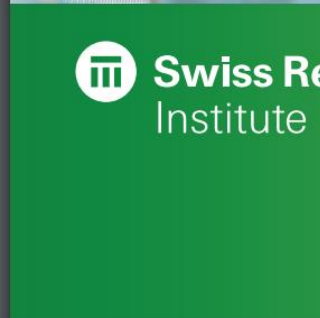
Exposures, which increase with the number of devices, have led to concerns. Traditionally IoT devices have been used for security, but hackers can also exploit 5G speed and capacity to be stolen much quicker. A large-scale deployment of IoT applications will mean a significant increase in the number of devices at the same pace. Without a secure platform could trigger catastrophic, leading to more automation facilitated by the further shift from motor to more autonomous.

Security issues (leading to increased litigation) are a major concern. The focus is not only on hacking but also on the physical security of 5G infrastructure. The current security of 5G infrastructure is currently under review, which raises the spectre of concentration of power.

Increased with 5G, as attacks become more sophisticated, increases the challenge of defence. The implications of 5G may lead to political tensions, and to liability claims. The introduction of 5G and IoT will pose similar challenges.

- Information security and national sovereignty concerns might delay implementation of 5G further, increasing uncertainty for planning authorities, investors, tech companies and insurers.
- Heated international dispute over 5G contractors and potential for espionage or sabotage could affect international cooperation, and impact financial markets negatively.
- As the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency.

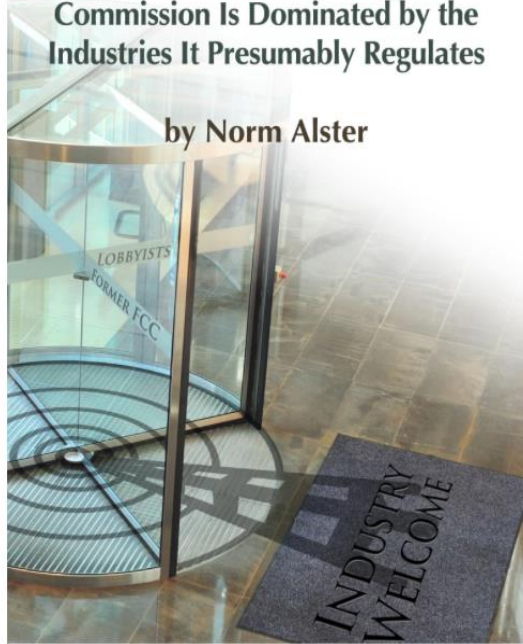
“As the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency.”



Captured Agency:

How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates

by Norm Alster



www.ethics.harvard.edu



HARVARD UNIVERSITY
Edmond J. Safra
Center for Ethics

2015: Harvard Center for Ethics Report

The FCC is a “captured agency” with a revolving door between industry and the FCC. US Congress receives /lobbied with millions from industry.

“...consumer safety, health, and privacy, along with consumer wallets, have all been overlooked, sacrificed, or raided due to unchecked industry influence.”

“It is these hardball tactics that recall 20th century Big Tobacco tactics.”
-Norm Alster 2015

In addition, published reports on EMF research has found:

- Industry money affects the quality of results ([Prasad 2017](#))
- Existence of sponsorship and publication biases ([Valentini 2011](#))
- Industry funded science is substantially less likely to report statistically significant effects ([Huss 2007](#))

The consulting firms of Big Tobacco are now now protecting cell phone companies. The same scientists/lawyers/PR firms.

2020: 5G described as a \$12.3 Trillion Market

The Harvard Press Book “Captured Agency: How the Federal Communications Commission is Dominated by the Industries it Presumably Regulates

[Learn more about investigative reports on industry influence in wireless.](#)

The FCC is a Captured Agency

Exemplifying the Revolving Door of Industry and Government

Ajit Pai
FCC Chair
Former Counsel for Verizon



Tom Wheeler former FCC Chair that launched 5G actions.

Former Head of CTIA –The Wireless Association
Former Head of NCTA National Cable and Telecommunications Association



Brendan Carr
FCC Commissioner
Former lawyer for Wiley Rein LLPP
Represented Wireless Industry in suing San Francisco for their Cell Phone Ordinance
His wife is the Oversight Staff Director of the Committee on Ways and Means at U.S. House of Representatives.



Bruce Romano

Ass Legal Chief in the FCC's Office of Engineering and Tech to the law firm of Wiley Rein -representing the CTIA .



Jonathan Adelstein
President/CEO of PCIA Wireless infrastructure Association
Former FCC commissioner



Michael Powell
Former FCC commissioner
President & CEO of NCTA



Meredith Attwell Baker
Head of the CTIA The Wireless Association
Former lead Lobbyist for Comcast
Former FCC Commissioner

2010: San Francisco passed the *first in the nation* Cell Phone Right to Know Law



Cell Phones Emit Radio-frequency Energy



Studies continue to assess potential health effects of mobile phone use.

If you wish to reduce your exposure, the City of San Francisco recommends that you:

- Keep distance between your phone and body
- Use a headset, speakerphone, or text instead
- Ask for a free factsheet with more tips



Learn More:

SF Department of Environment @ [SFEnvironment.org/cellphoneradiation](https://sfenvironment.org/cellphoneradiation)
Federal Communications Commission @ [FCC.gov/cgb/consumerfacts/mobilephone.html](https://fcc.gov/cgb/consumerfacts/mobilephone.html)
World Health Organization @ [WHO.int/mediacentre/factsheets/fs193/en/](https://who.int/mediacentre/factsheets/fs193/en/)



Learn More:

SF Department of the Environment
[SFEnvironment.org/cellphoneradiation](https://sfenvironment.org/cellphoneradiation) • (415) 355-3700

Federal Communications Commission
[FCC.gov/cgb/consumerfacts/mobilephone.html](https://fcc.gov/cgb/consumerfacts/mobilephone.html)

This material was prepared solely by the City and County of San Francisco and shall be provided to consumers under local law.

In 2011 Brendan Carr (now FCC Commissioner) was lawyer for the CTIA - The Wireless Industry -and filed legal challenges against SF arguing the law violated companies free speech rights.



Carr presenting at CTIA 2018 Summit as FCC Commissioner


4/2019 FCC Item: “FCC Maintains Current RF Exposure Safety Standards”

- No need to update FCC limits because there is no science that shows it is necessary- according to the FDA.
- *“We further decline to revisit our RF exposure policy as it pertains to children.”*
- *“We also decline to revisit our RF exposure evaluation procedures for consumer portable devices, especially phones. Current evaluation procedures require consumer portable devices to be tested at maximum power under normal use conditions. For phones testing is performed against the head, representing normal use during a phone call, and at a separation distance of up to 2.5 centimeters (about one inch) from the body to represent phone use in other ways”*
- *“Even though some parties claim that the RF exposure evaluation procedures for phones should require testing with a “zero” spacing – against the body – this is unnecessary.”*
- *“Given the federal safety determination, the information on the FCC’s websites and in device manuals are both adequate to inform consumers of these issues and do not risk contributing to an erroneous public perception or overwarning of RF emissions from FCC certified or authorized devices.”*

[4/2019 FCC Item:](#) *“We further decline to revisit our RF exposure policy as it pertains to children.”*

“Similarly the FDA maintains that “the scientific evidence does not show a danger to any users of cell phones from RF exposure, including children and teenagers.”

Footnote: <https://www.fda.gov/radiation-emitting-products/cell-phones/children-and-cell-phones>

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Children and Cell Phones

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Cell Phones

Health Issues

Reducing Exposure: Hands-free Kits and Other Accessories

Interference with Pacemakers and Other Medical Devices

Hearing Aids and Cell Phones

Children and Cell Phones

Current Research Results

Radiofrequency Background

The scientific evidence does not show a danger to any users of cell phones from RF exposure, including children and teenagers. The steps adults can take to reduce RF exposure apply to children and teenagers as well.

- Reduce the amount of time spent on the cell phone
- Use speaker mode or a headset to place more distance between the head and the cell phone.

Some groups sponsored by other national governments have advised that children be discouraged from using cell phones at all. For example, The Stewart Report from the United Kingdom made such a recommendation in December 2000. In this report a group of independent experts noted that no evidence exists that using a cell phone causes brain tumors or other ill effects. Their recommendation to limit cell phone use by children was strictly precautionary; it was not based on scientific evidence that any health hazard exists.

Content current as of:

12/04/2017

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



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141 Northwest Point Blvd
Elk Grove Village, IL 60007-1019
Phone: 847/434-4000
Fax: 847/434-8000
E-mail: kidsdocs@aap.org
www.aap.org

Reply to
Department of Federal Affairs
Homer Building, Suite 400 N
601 13th St NW
Washington, DC 20005
Phone: 202/347-8600
Fax: 202/393-6137
E-mail: kids1st@aap.org

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July 12, 2012

The Honorable Julius Genachowski
Commissioner
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Dear Chairman Genachowski:

The American Academy of Pediatrics (AAP), a non-profit professional organization of 60,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists dedicated to the health, safety and well-being of infants, children, adolescents, and young adults strongly supports the proposal for a formal inquiry into radiation standards for cell phones and other wireless products. The Academy encourages the Federal Communications Commission (FCC) to vote to move forward with this inquiry in an expeditious manner.

The FCC has not assessed the standard for cell phone radiation since 1996. According to industry groups, approximately 44 million people had mobile phones when the standard was set; today, there are more than 300 million mobile phones in use in the United States. While the prevalence of wireless phones and other devices has sky-rocketed, the behaviors around cell phone uses have changed as well. The number of mobile phone calls per day, the length of each cell phone call, and the amount of time people use mobile phones has increased, while cell phone and wireless technology has undergone substantial changes. Many more people, especially adolescents and young adults, now use cell phones as their only phone line and they begin using wireless phones at much younger ages.

Multiple letters to the FCC, FDA and Congress

- The FCC has not reviewed the standard since 1996.
- The FCC exposure limit is based only on heat.
- Concerns have been raised that long term RF exposure affects the brain and may be connected to brain cancer.
- The average RF energy disposition in children is 2x higher in the brain and 10x higher in bone marrow of the skull.
- FCC limits need to be updated to protect children and pregnant women.
- FCC regulations need to reflect real world use.

EHTrust.org



Systematic Review – gold standard, *not done*

Step 1: Problem formulation and protocol development

Step 2: Search for and select studies for inclusion

Step 3: Extract data from studies

Step 4: Assess quality of individual studies

Step 5: Rate confidence in the body of evidence

Initial confidence by key features of study design	Factors decreasing confidence	Factors increasing confidence	Confidence in the body of evidence
High (++++) 4 Features	<ul style="list-style-type: none">• Risk of bias• Unexplained inconsistency• Indirectness• Imprecision• Publication bias	<ul style="list-style-type: none">• Large magnitude of effect• Dose response• Residual confounding<ul style="list-style-type: none">– Studies report an effect and residual confounding is toward null– Studies report no effect and residual confounding is away from null• Consistency<ul style="list-style-type: none">– Across animal models or species– Across dissimilar populations– Across study design types• Other<ul style="list-style-type: none">– e.g., particularly rare outcomes	High (++++)
Moderate (+++) 3 Features			Moderate (+++)
Low (++) 2 Features			Low (++)
Very low (+) ≤ 1 Feature			Very low (+)

If the only available body of evidence receives a "very low confidence" rating, then conclusions for those outcomes will not move on to Step 6

Step 6: Translate confidence ratings into evidence of health effects

Step 7: Integrate evidence to develop hazard identification conclusions

“The principles of systematic review can be successfully applied to environmental health questions to provide greater objectivity and transparency to the process of developing conclusions.”

The Office of Health Assessment and Translation framework: A 7 Step Process

- Captures and synthesizes all relevant information
- Is collaborative, transparent, addresses bias

Rooney et al., Systematic review and evidence integration for literature-based environmental health science assessments. Environ Health Perspect 122:711–718

<https://ehp.niehs.nih.gov/doi/10.1289/ehp.1307972>

What do US Health Agencies say about the NTP study?



What did the studies find?

The NTP studies found that high exposure to RFR (900 MHz) used by cell phones was associated with:

- **Clear evidence of tumors in the hearts of male rats.** The tumors were malignant schwannomas.
- **Some evidence of tumors in the brains of male rats.** The tumors were malignant gliomas.
- **Some evidence of tumors in the adrenal glands of male rats.** The tumors were benign, malignant, or complex combined pheochromocytoma.



Cell Phones and Cancer Risk

“The primary outcomes observed were a small number of cancers of Schwann cells in the heart and non-cancerous changes ([hyperplasia](#)) in the same tissues for male rats, but not female rats, nor in mice overall.”



“We disagree with the conclusions of their final report...”

“We must thoroughly evaluate and take into consideration the totality of the data...”

Yet no systematic review, no report, no citations, no FDA peer review..

Three tips “if you are worried” about cell phone radiation.



Nothing on the NTP

“research is investigating acoustic neuromas”



Nothing on the NTP and sends you to the FCC.

Current Research Results

f

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Print

Cell Phones

Health Issues

Reducing Exposure: Hands-free Kits and Other Accessories

Interference with Pacemakers and Other Medical Devices

Hearing Aids and Cell Phones

Children and Cell Phones

Current Research Results

Radiofrequency Background

Is there a connection between certain health problems and exposure to radiofrequency fields via cell phone use?

The results of most studies conducted to date indicate that there is not. In addition, attempts to replicate and confirm the few studies that did show a connection have failed.

According to current data, the FDA believes that the weight of scientific evidence does not show an association between exposure to radiofrequency from cell phones and adverse health outcomes. Still, there is consensus that additional research is warranted to address gaps in knowledge, such as the effects of cell phone use over the long-term and on pediatric populations.

The World Health Organization's International Agency for Research on Cancer Classified Radiofrequency Fields as Possibly Carcinogenic to Humans on May 31, 2011.

The International Agency for Research on Cancer (IARC), through the [Monographs program](#), seeks to identify environmental factors that can increase the risk of cancer in humans. IARC uses the following categories to classify environmental agents:

Group 1: Carcinogenic to humans.

Group 2A: Probably carcinogenic to humans.

Content current as of:
05/02/2019

The Department of Interior, 2014



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

FEB - 7 2014



In Reply Refer To: (ER 14/0001) (ER 14/0004).

Mr. Eli Veenendaal
National Telecommunications and Information
Administration
U.S. Department of Commerce
1401 Constitution Avenue, N.W.
Washington, D.C. 20230

Dear Mr. Veenendaal:

The Department of the Interior (Department) has reviewed the above referenced proposal and submits the following comments and attachment for consideration. Because the First Responder Network Authority (FirstNet) is a newly created entity, we commend the U.S. Department of Commerce for its timely proposals for NEPA implementing procedures.

The Department believes that some of the proposed procedures are not consistent with Executive Order 13186 Responsibilities of Federal Agencies to Protect Migratory Birds, which specifically requires federal agencies to develop and use principles, standards, and practices that will lessen the amount of unintentional take reasonably attributed to agency actions. The Department, through the Fish and Wildlife Service (FWS), finds that the proposals lack provisions necessary to conserve migratory bird resources, including eagles. The proposals also do not reflect current information regarding the effects of communication towers to birds. Our comments are intended to further clarify specific issues and address provisions in the proposals.

“However, the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 8 2002

OFFICE OF
AIR AND RADIATION

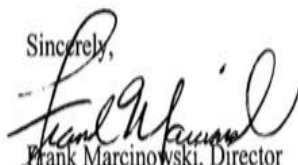
Janet Newton
President
The EMR Network
P.O. Box 221
Marshfield, VT 05658

Dear Ms. Newton:

Thank you for your letter of January 31, 2002, to the Environmental Protection Agency Administrator Whitman, in which you express your concerns about non-thermal effects of radiofrequency (RF) radiation and the adequacy of the Federal Communications Commission's RF radiation exposure guidelines. The Administrator has asked us to critically examine the issues you bring to our attention, and we will be responding to you shortly.

We appreciate your interest in the matter of non-thermal RF exposure, possible health risks, and Federal government responsibility to protect human health.

Sincerely,


Frank Marciniowski, Director
Radiation Protection Division



EPA

US development of safety standards halted.

- EPA fully defunded from EMF in 1996.
- No health/safety agency has jurisdiction or authority over health/environmental cell antenna emissions.

“Federal health and safety agencies have **not yet** developed policies concerning possible risk from long-term, non thermal exposures”

-Robert Hankin, EPA 2002



Scientists 2019 Letters to the FDA

“Are there technical comments by the FDA that substantiate the FDA’s conclusions that NTP’s study did not find “clear evidence” of carcinogenicity for RF-EMF.

Specifically what are the FDA’s conclusions regarding the schwannomas of the heart in male rats, the brain gliomas in the male rats, the DNA damage, and the cardiomyopathy of the heart?

We respectfully request that you indicate the specific review process through which such an evaluation was undertaken and share with us the FDA evaluation, which we expect is in a report with citations for the research that was analyzed.

Did the FDA ever share their disagreements or concerns with the NTP at any time—before and/or after the peer review? If so, please provide the comments of the FDA to the NTP.

The FDA [nominated](#) cell phone radiation emitted from wireless communication devices to the NTP in 1999 and specifically stated that “animal experiments are crucial because meaningful data will not be available from epidemiological studies for many years due to the long latency period between exposure to a carcinogen and the diagnosis of a tumor” and that such studies would “provide the basis to assess the risk to human health.” Did the FDA inform the NIEHS/NTP at any time over the last 20 years since this nomination that animal research would *not* be sufficient to determine risk to public health from cell phone radiation?

Further, please clarify if it is now the FDA’s position that animal research is no longer relevant to human health? If this is the case, will animal studies no longer be used to assess cancer risks from food contaminants, and how does the FDA propose to treat pharmacological testing of animals in support of pharmaceutical registration processes?

The FDA states, “We believe the existing safety limits for cell phones remain acceptable for protecting the public health.” However, the FCC limits on allowable radiofrequency exposures are based on the assumption that only thermal RF levels can cause harm. The NTP studies were carefully controlled to minimize any potential thermal effects of RF on exposed animals, yet cancers and other adverse health effects were found at these nonthermal levels. Please provide the FDA’s scientific documentation that evaluates the current FCC limits in light of the NTP and Ramazzini studies to understand how the FDA can state FCC limits are adequate to protect human health.

Will the FDA be performing a quantitative risk assessment? If so, please provide a timeline. If not, please explain how and why that decision was made.”

“Even though some parties claim that the RF exposure evaluation procedures for phones should require testing with a “zero” spacing – against the body – this is unnecessary.”

-FCC December 4, 2019 item



“Guidance from the FCC Laboratory continue recommending that device manuals include operating instructions and advisory statements for RF exposure compliance. This information allows users to make informed decisions on the type of body-worn accessories and operating configurations that are appropriate for their usage.”



France: Order of November 15, 2019 relating to the display of the specific absorption rate of radioelectric equipment and to consumer information NOR: SSAP1834792A

TYPES OF INFORMATION TO APPEAR UNDER THE SECTION “PRECAUTIONS FOR USING THE APPLIANCE”

Information on the behavior to adopt to reduce exposure to radiation emitted by radio equipment

- Use the radio equipment under good reception conditions to reduce the amount of radiation received.
- Use a hands-free kit or a loudspeaker, if suitable for radio equipment. Make reasonable use of radio equipment such as the mobile phone, by children and adolescents, for example by avoiding night-time communications and by limiting the frequency and duration of calls.
- Keep radio equipment away from the belly of pregnant women.
- Keep radio equipment away from the lower abdomen of adolescents.

Dated November 15, 2019.

-The Minister of Solidarity and Health, Agnès Buzyn

The Minister of Economy and Finance, Bruno Le Maire

https://beta.legifrance.gouv.fr/loda/texte_lc/LEGITEXT000039388366/2020-07-01

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Microwave Emissions From Cell Phones Exceed Safety Limits in Europe and the US When Touching the Body

OM P. GANDHI¹ (Life Fellow, IEEE)

Department of Electrical and Computer Engineering, The University of Utah, Salt Lake City, UT 84112, USA

e-mail: gandhi@ece.utah.edu

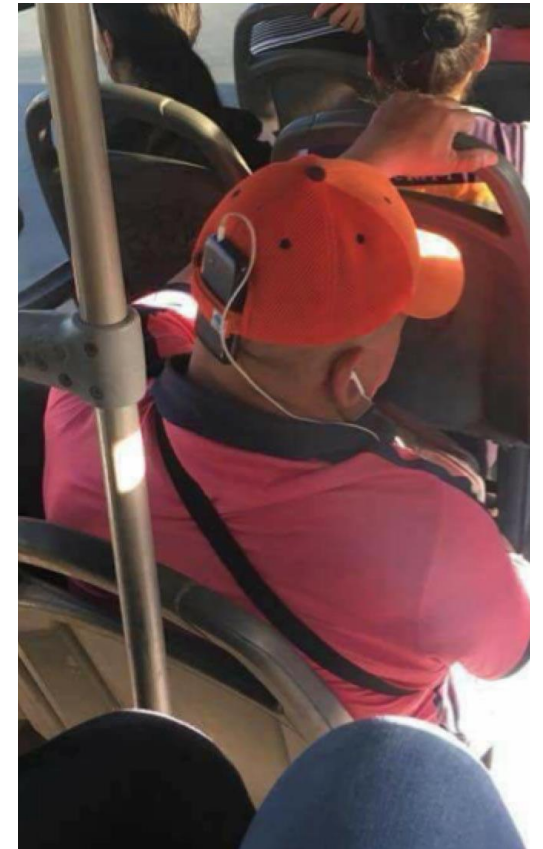
ABSTRACT In our publications, we have shown both from measurements and computer modeling that the specific absorption rate (SAR) reduces by 10%–15% for every millimeter separation of the cell phone on account of rapidly diminishing EM fields in the near-field region of the cell phone antenna. This rapid reduction of SAR depending on the antenna and its location on the handset has been shown, both computationally and experimentally, regardless of the phantom model such as a flat phantom suggested for SAR compliance testing of devices in contact with the body, for a sphere phantom, and for head-shaped models used for SAR compliance testing of cell phones. Unfortunately, our observations in the past were based on SARs of only three cell phones. Expecting that the SARs for cell phones may exceed the safety limits for body contact, cell phone manufacturers have started to recommend that the devices can be used at 5–25 mm from the body even though it is difficult to see how to maintain this distance correctly under mobile conditions. The National Agency ANFR of France recently released the cell phone SAR test data for 450 cell phones that measure 10-g SARs reducing by 10%–30% for each millimeter distal placement from the planar body phantom. Their data corroborate our findings that most cell phones will exceed the safety guidelines when held against the body by factors of 1.6–3.7 times for the European/ICNIRP standard or by factors as high as 11 if 1-g SAR values were to be measured as required by the U.S. FCC.

2016: French Agency ANFR SAR test data on over 400 cell phones found of those tested at 0mm most violated European limits (Phonegate Association).

- European Union changed separation distance to a maximum of 5mm
- 17+ Phone models in France taken software updated or removed from market.
- Phonegate Association has launched lawsuits against several carriers.
- French Ministers are calling for 0mm separation distance in phone testing.

Gandhi 2019 study finds the FCC equivalent of ANFR data = phones could have measured SARs up to 11 times FCC limit.

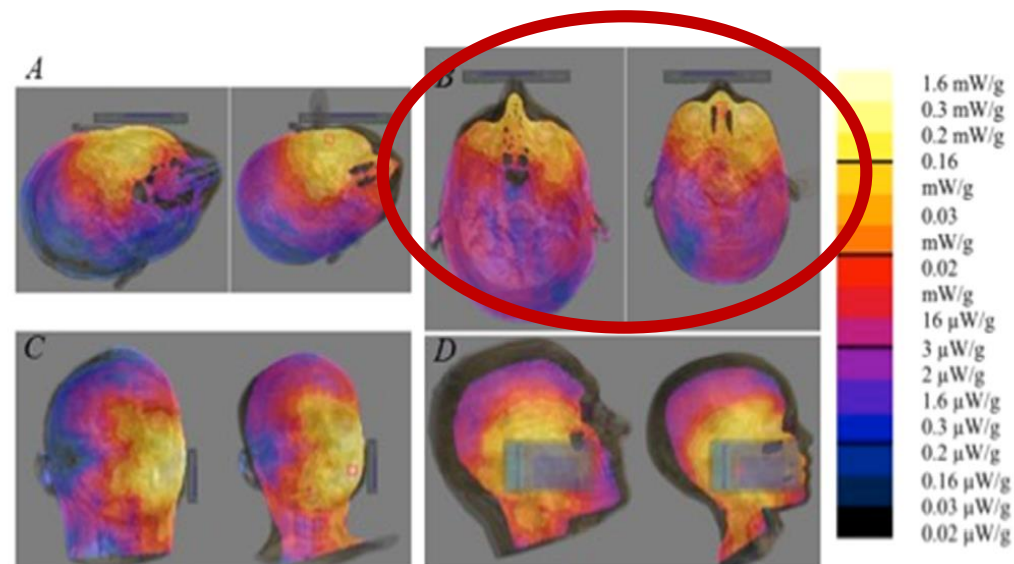
FCC: "...our existing exposure limits are set with a large safety margin, well below the threshold for unacceptable rises in human tissue temperature. Thus, even if certified or otherwise authorized devices produce RF exposure levels in excess of Commission limits under normal use, such exposure would still be well below levels considered to be dangerous, and therefore phones legally sold in the United States pose no health risks."





What is the impact from long term exposure to phones at close distances?

What is the impact of long term cell phone radiation exposure to the young developing eye?



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Environmental Research

journal homepage: www.elsevier.com/locate/envres



Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality


C. Fernández^{a,*}, A.A. de Salles^b, M.E. Sears^{c,d}, R.D. Morris^d, D.L. Davis^{d,e}

People are unaware that wireless devices have instructions to keep a distance. .



"Information Regarding
Exposure to Radio Frequency
Energy
...This device should be installed
and operated with a minimum
distance of 20 cm
between the radiator
and your body"

All-new
echo dot Kids Edition
+
echo glow



Front

Volume up
Mic off button

Ac
Vc

Roll over image to zoom in

Let them listen independently

With an improved speaker, kids can enjoy their favorite songs even more. And because Echo Dot Kids Edition was made for younger ears, it automatically filters explicit songs from Amazon Music, Apple Music, Spotify, or Pandora.

"Alexa, play Kidz Bop."

zom music Apple Music audible Spotify iHeartRADIO pandora

Characters kids love to hear from

FreeTime Unlimited connects kids to fun and educational skills from brands like Disney and Nickelodeon, kid-friendly music, podcasts, and more than 1,000 Audible books.

ervice

[Amazon Device Support](#) › [Alexa Feature Help](#) › [Alexa and Alexa Device Terms, Warranties, and Notices](#) › [Legal & Compliance \(On-Device\)](#) ›

Safety & Compliance

- [Alexa Guard Safety FAQs](#)
- [Amazon Echo \(1st Generation\) Safety & Compliance](#)
- [Amazon Echo \(2nd Generation\) Safety & Compliance](#)
- [Amazon Echo \(3rd Generation\) Safety & Compliance](#)
- [Amazon Smart Plug Safety & Compliance](#)
- [Amazon Tap Safety & Compliance Information](#)
- [AmazonBasics Microwave Safety & Compliance](#)
- [Echo Auto Safety & Compliance](#)
- [Echo Connect Safety & Compliance](#)
- [Echo Dot \(1st Generation\) Safety & Compliance Information](#)
- [Echo Dot \(2nd Generation\) Safety & Compliance](#)
- [Echo Dot \(3rd Generation\) Safety & Compliance](#)
- [Echo Dot \(with clock\) Safety & Compliance](#)
- [Echo Dot Kids Edition Safety & Compliance Information](#)
- [Echo Dot Kids Edition \(2019 release\) Safety & Compliance](#)
- [Echo Input Safety & Compliance](#)
- [Echo Link Amp Safety & Compliance](#)
- [Echo Link Safety & Compliance](#)
- [Echo Plus \(1st Generation\) Safety & Compliance](#)
- [Echo Plus \(2nd Generation\) Safety & Compliance](#)
- [Echo Show Safety & Compliance](#)
- [Echo Show \(2nd Generation\) Safety & Compliance](#)
- [Echo Show 5 Safety & Compliance Information](#)
- [Echo Show 8 Safety & Compliance Information](#)
- [Echo Spot Safety & Compliance](#)
- [Echo Sub Safety & Compliance](#)
- [Echo Studio Safety & Compliance](#)
- [Echo Flex Safety & Compliance](#)
- [Amazon Smart Oven Safety & Compliance](#)
- [Echo Frames Safety & Compliance](#)
- [Echo Buds Safety & Compliance](#)
- [Echo Glow Safety & Compliance](#)

Over 20 Governments Recommend Reducing RF -Especially to Children

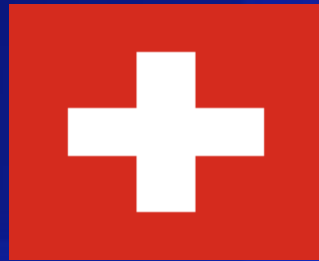
"Government advice is to be on the safe side and limit mobile phone use by children."



United Kingdom



Russia



Switzerland



Finland



Ireland



Germany



Belgium



Greece



Israel



Turkey



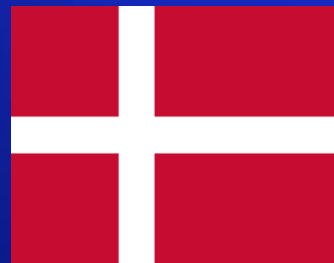
Austria



Singapore



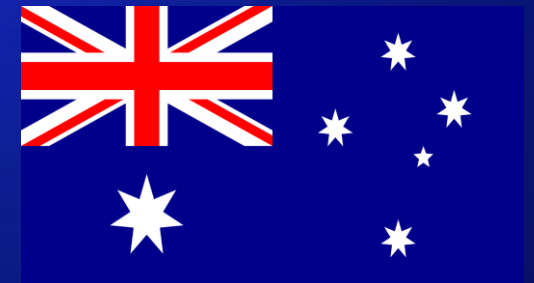
France



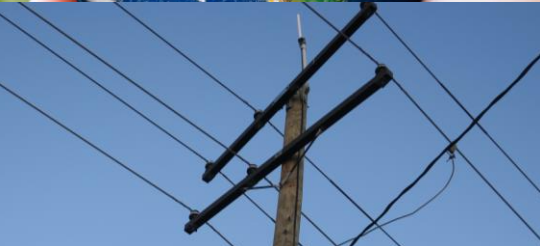
Denmark



India



Australia



Policy to Reduce EMF	Country
Lower ELF- EMF limits, in sensitive areas and minimizing exposures to new homes/schools. France- “Zone of Caution”	Coatia, Finland, France, Israel, Italy, Netherlands, Norway , Slovenia, Switzerland, Germany, Spain, Belgium (Wallonia, Flanders) Denmark, Liechtenstein, Lithuania, Poland
Official government advice on cell phones. Steps/recs to minimize RF-EMF	Belgium, Switzerland, French Polynesia, Finland, Ireland, Germany, Greece, Israel, Turkey, Singapore, France, United Kingdom, Russia, Denmark, India, Australia, Austria, Cyprus, Canada, Italy, Korea, Sri Lanka, Croatia, Krakow Poland, European Parliament Resolution 1815, US-Connecticut, California, Maryland Council Report on Wi-Fi in Schools (CEHPAC)
Cell tower/ network limits below ICNIRP	Belarus, Bulgaria, China, Lithuania, Poland, Russia, Belgium, Chile, Greece, India, Israel, Italy, Liechtenstein and Switzerland.
Ban on mobile phone ads to children	France, Belgium, French Polynesia, Russia
Ban on sale of phones designed for children	Belgium, France
SAR cell phone radiation labeling (on device, packaging, point of sale)	France, Israel, India, Belgium, Russia, Korea
Wi-Fi ban in nurseries & kindergartens	France, Israel, Ghent Belgium, French Polynesia, Cyprus, Hospitalet Spain
Wi-Fi Off/Minimized in elementary	France, Israel, Cyprus, Growing list of schools/districts worldwide
Publicly available measurements of cell tower radiation levels.	France, Greece, Turkey, India, Israel, French Polynesia, Croatia, Bulgaria, Tunisia. www.ehtrust.org

FDA states they are “working with” IEEE and ICNIRP and links to outdated 2010 WHO Release

Cell Phone Industry Actions

Although the existing scientific data do not support a change in FDA regulation of cell phones, the FDA has urged the cell phone industry to take a number of steps, including:

- Support additional research on possible biological effects of radiofrequency fields for the type of signal emitted by cell phones;
- Improve cell phone design by minimizing radiofrequency exposure to the user; and
- Cooperate in providing cell phone users with the latest scientific information on health concerns caused by radiofrequency exposure.

Safety Standards

The FDA also is working with voluntary standard setting bodies such as the Institute of Electrical and Electronics Engineers (IEEE), the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and others to assure that safety standards continue to adequately protect the public.

Additional Resources

- [NAS Report - Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication Devices](#)
- [World Health Organization: Electromagnetic Fields and Public Health: Mobile Phones](#)
- [International Agency for Research on Cancer Press Release](#)

International Agency for Research on Cancer



PRESS RELEASE
N° 200

17 MAY 2010

Interphone study reports on mobile phone use and brain cancer risk

The Interphone Study Group today published their results¹ in the *International Journal of Epidemiology* ([direct media link](#)). The paper presents the results of analyses of brain tumour (glioma and meningioma) risk in relation to mobile phone use in all Interphone study centres combined. This interview-based case-control study, which included 2708 glioma and 2409 meningioma cases and matched controls was conducted in 13 countries using a common protocol. Analyses of brain tumours in relation to mobile phone use have been reported from a number of cohort and case-control studies, including several of the national components of Interphone. No studies, however, have included as many exposed cases, particularly long-term and heavy users of mobile phones, as this study.

Background

Mobile phone use has increased dramatically since its introduction in the early-to-mid 1980's. The expanding use of this technology has been accompanied by concerns about health. In the late 1990s, several expert groups critically reviewed the evidence on health effects of low-level exposure to radiofrequency (RF) electromagnetic fields, and recommended research into the possible adverse health effects of mobile telephone use.

Co-ordination of a multinational effort in cancer research

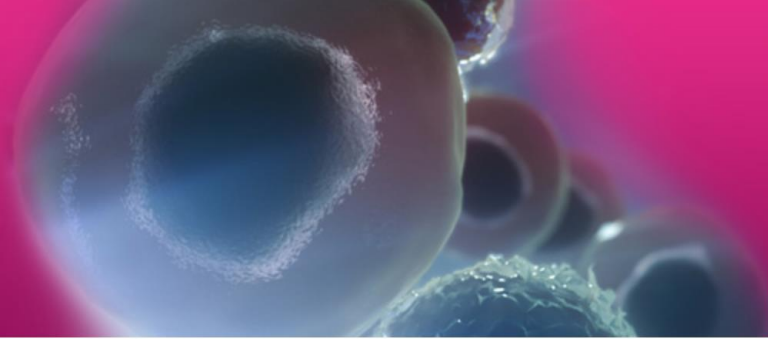
As a result, the International Agency for Research on Cancer (IARC) coordinated a feasibility study in 1998 and 1999, which concluded that an international study of the relationship between mobile phone use and brain tumour risk would be feasible and informative.

Scope of the Interphone study

Interphone was therefore initiated in 2000 as an international set of case-control studies in 13 countries around the world² focusing on four types of tumours in tissues that most absorb RF energy emitted by mobile phones: tumours of the brain (glioma³ and meningioma⁴), of the acoustic nerve (schwannoma⁵), and of the parotid gland⁶. The objective was to determine whether mobile phone use increases the risk of these tumours. Interphone is the largest case-control study of mobile phone use and brain tumours yet and includes the largest numbers of users with at least 10 years of exposure.

IEEE is an Industry group

ICNIRP is an invite only, industry loyal started with industry money and the first Chairman was Michael Repacholi who also started the WHO EMF Project with industry money funneled through Adeleide Hospital.



World Health Organization (WHO), radiofrequency radiation and health - a hard nut to crack (Review) Hardell 2017

- **International Commission on Non-Ionizing Radiation Protection (ICNIRP)** is an industry loyal NGO “a serious conflict of interest.”
- Evidence has been published which indicated that members of ICNIRP have written scientifically incorrect and misleading information.
- Five of the six members of the Core Group in charge of the (WHO EMF) draft are affiliated with ICNIRP
- Non-thermal biological effects from RF radiation are dismissed as scientific evidence of adverse health effects in the Monograph.

WHO International Agency for the Research on Cancer *is not the same* as the WHO EMF Project

“Michael Repacholi immediately set up a close collaboration between WHO and ICNIRP (being head of both organizations) inviting the electric, telecom and military industries to meetings. He also arranged for large part of the WHO EMF project to be financed by the telecommunication industry's lobbying organizations; GSM Association and Mobile Manufacturers Forum, now called Mobile & Wireless Forum (MWF)”

Montgomery County Federal Court Challenge to the FCC

The FCC Should Complete The 2013 Review Before Issuing Orders

“If the new 5G environment, in fact, poses health risks, any prior rollout of 5G will have potentially injured citizens of Montgomery County and other municipalities, including sensitive populations like children, that cannot be undone. ***Such a result would be unconscionable.***”

“[t]hese and other studies examine a number of RF-related risks, such as carcinogenicity, DNA damage and genotoxicity, reproductive impacts (e.g. low sperm counts), and neurologic effects (e.g. behavioral issues in children). They also identify adverse physiological mechanisms that could be triggered by RF exposures and cause non-thermal effects, such as stimulating cell proliferation, altering cell membrane function, and modulating synthesis of proteins involved in inflammatory and immunologic processes.”

[Read the Montgomery County Petition to the FCC here.](#)

[Putting the Cart Before the Horse – The FCC’s “5G First, Safety Second” Policy](#) BY: ALBERT CATALANO, Counsel, ERIC GOTTING, Partner, and TIMOTHY DOUGHTY, Associate, Keller and Heckman, LLP. Washington,DC : Municipal Lawyer / The Journal of Local Government Law, Sep/Oct, 2019, pp. 14-17.

<https://www.montgomerycountymd.gov/cable/Resources/Files/Towers/ZTAFiles/RF%20Appeal%20Summary%20from%20IMLA.pdf>

[The Berkshire-Litchfield Environmental Council Amicus Brief, Appendix](#)

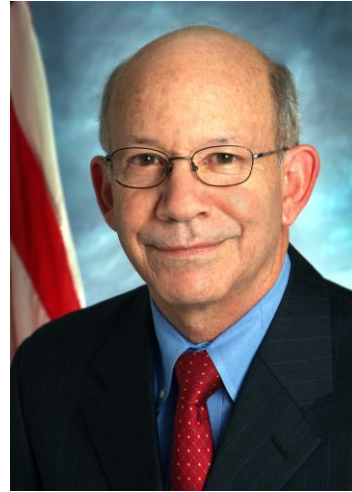
Officials Requesting 5G Safety Data from the FCC & FDA



Sen. Richard Blumenthal
Connecticut



Rep. Anna G.
Eshoo
California



Rep. Peter DeFazio
House Transportation and
Infrastructure Committee
Chairman



Rep. Thomas Suozzi
New York



State Sen James F.
Gaughran (5th District New
York)

- 5G safety determinations with scientific citation from FCC and health agencies requested. No report received.
- FCC says RF limits do not need to be changed relying on a letter from the FDA -one paragraph.
- “We are flying blind on health and safety” Senator Blumenthal in Senate Commerce hearing.
- Scientists communication with FDA reveals no FDA reports, no systematic review, no scientific documentation of FDA’s disagreement with NTP and their position on RF limits.
- FDA, NCI, CDC, EPA webpages downplay science on adverse effects of EMF.
- [LETTERS FROM CONGRESS TO FCC](#), [SCIENTIST LETTERS TO POLICYMAKERS ON 5G HEALTH EFFECTS](#)

Letters From Elected Officials to the FCC and FDA

To the FCC

November 19, 2019 [Letter to the FCC from Rep. Daniel Lipinsky IL](#) on the FCC Review of RF Health Effects and Cell phone test systems that allow excesses above the legal limit. The Chicago Tribune investigation is mentioned.

September 13, 2019, [Letter from Rep DeFazio and Rep Suozzi Letter to the FCC on Chicago Tribune Study](#)

December 3, 2018, [Letter from Senator Richard Blumenthal \(Connecticut\) and Rep Anna G. Eshoo \(California\) to the FCC](#)

April 16, 2019, [Letter from Rep Thomas Suozzi \(New York\) to the FCC](#)

April 15, 2019, [Letter from Rep. Peter A. DeFazio \(Oregon\) to the FCC](#)

July 23, 2019, [Letter from Senator James F. Gaughran \(New York\)](#)

“My constituents are concerned that until they can be sure that living in close proximity to cell antennas will not cause adverse health effects, we would like to see these “small cells” shut down and removed from our neighborhoods. We are also concerned with the long-term 24/7 exposure to 2G, 3G, and 4G that are currently in our neighborhoods. They are especially concerned with the more vulnerable populations such as children, fetus in the womb, and the immune compromised.”

March 28, 2019, [Letter from Representative Andy Kim \(New Jersey\) to the FCC](#)

US FCC Chairman Pai’s *Response* to Members of Congress Regarding the Potential Impact of 5G Deployment on RF Exposure

FCC Chairman Pai has a dedicated [FCC webpage on 5G safety](#) with all of his letters responding to Congress.

December 17, 2018, [Letter from the FCC to Senator Richard Blumenthal \(Connecticut\) and Rep Anna G. Eshoo \(California\)](#)

April 30, 2019, [Letter from the FCC to Rep Thomas Suozzi \(New York\)](#)

April 30, 2019, [Letter from the FCC to Rep. Peter A. DeFazio \(Oregon\)](#)

April 30, 2019, [Letter from the FCC to Representative Andy Kim \(New Jersey\)](#)

In a 2019 US Senate hearing on 5G where Blumenthal asks industry representatives about any research on the human health impact of 5G wireless technology and was told that industry is not supporting such research. [Watch Video.](#)

Letters from Elected Officials to the FDA

July 18, 2019, [Senator Anna Eschoo \(CA\) and Senator Jeff Merkley \(OR\) Letter to the FDA](#)

[LETTERS FROM CONGRESS TO FCC](#)

[SCIENTIST LETTERS TO POLICYMAKERS ON 5G HEALTH EFFECTS](#)



FCC Streamlining the 5G/Wireless “Small Cell” Buildout

No Environmental Review; Strips States/Local Authority

2018 FCC orders re streamlining 5G/Wireless infrastructure

Eliminating environmental and historic preservation review of wireless installations.

- Appeal brought by the Natural Resources Defense Council, 19 Native American Tribes, EHT advisor attorney Edward Myers and others.
- August 2019 US Court of Appeals for DC ruled installations of small cell sites cannot bypass impact reviews on the environment and historic preservation.

Limiting the abilities of cities and states to regulate “small cell” sites (fees, shot clocks).

- Coalition of nearly 100 cities, towns, counties, and associations of localities suing the FCC arguing that the FCC lacks the statutory authority.
- Case transferred from the Tenth Circuit Court of Appeals to the Ninth Circuit, U.S. Court of Appeals.
- Rep. Anna Eshoo, D-CA introduced “Accelerating Wireless Broadband Development by Empowering Local Communities Act of 2019”

[Edward B. Myers Request](#)

[2018 Press Release](#)

[NRDC petition for review of the FCC order](#)

FCC vacates those portions of the Commission's 2018 Second Report and Order that exempted certain small wireless facilities from federal environmental and historic preservation review.

"As a result of the court's decision and this rule revision, deployments of small wireless facilities are subject to review to the same extent as larger wireless facilities pursuant to the National Historic Preservation Act (NHPA)⁵ and the National Environmental Policy Act of 1969 (NEPA).⁶"

October 8, 2019, in response to decision on *United Keetoowah Band of Cherokee Indians v. FCC* by the U.S. Court of Appeals for the District of Columbia Circuit.

What does this mean?

In short: All wireless facilities should meet NEPA requirements.

3 Bipartisan Bills on 5G Passed the House

The House has passed three bipartisan 5G bills, which [passed out of the House Energy & Commerce Committee in November.](#)

The bills are primarily about considering and strategizing and encouraging, rather than commanding, which helped them get that bipartisan support. They must still get Senate approval and the President's signature, but both are likely.

H. Res. 575, "express[es] the sense of the House of Representatives that all stakeholders in the deployment of 5G communications infrastructure should carefully consider and adhere to the recommendations adopted at the Prague 5G security conferences.

H.R. 2881, the Secure 5G and Beyond Act of 2019, directs the President to develop a "Secure Next Generation Mobile Communications Strategy" in consultation with the heads of FCC, NTIA, and Department of Homeland Security, as well as the DNI and Secretary of Defense."

H.R. 4500, the Promoting United States Wireless Leadership Act of 2019, directs NTIA to "encourage participation by trusted American companies and other stakeholders in standards-setting bodies, and to offer technical assistance to stakeholders that do elect to participate, in the course of developing standards for 5G networks and future generations of communications networks."

"The House continues to pass legislation that will help keep the American people safe. The whole-of-government approach of the Secure 5G and Beyond Act will force the Trump Administration to get serious about protecting Americans as 5G services are deployed," said E&C Chairman Frank Pallone (D-N.J.) and Communications Subcommittee Chairman Mike Doyle (D-Pa.). "The timing is particularly important given the increased risk of cyberattacks arising from the conflict with Iran. All three of these bills are important for securing America's wireless future, and we hope they won't languish in the Senate."

"These bipartisan bills will help us achieve a national priority for the United States: winning the global race to 5G. This technology holds the key to the possibility of self-driving cars, the Internet of Things, telemedicine, rural broadband, and many other doors we have yet to open," said E&C ranking member Greg Walden (R-Ore.) and Communications Subcommittee ranking member Bob Latta (R-Ohio). Our legislation from the Energy and Commerce Committee will help develop a strategy to secure 5G wireless networks across the United States, solidify America's position as a global 5G leader, and ensure our national security interests are upheld in international 5G standards. The future of connectivity in America relies on 5G and we urge swift action in the Senate to send these bipartisan measures to President Trump's desk," Walden and Latta said.

John Eggerton, Multichannel News, Jan 8, 2020

<https://www.multichannel.com/news/5g-bills-pass-house>

-



What You Need To Know About Pregnancy and Wireless Radiation

BabySafe Project- over 200 doctors, educators and experts are signatories.

“As a research scientist and physician...I am deeply concerned about the growing exposure to cell phone and other wireless radiation.”

-Hugh Taylor, MD PhD, Chief Obstetrics at Yale New Haven Hospital

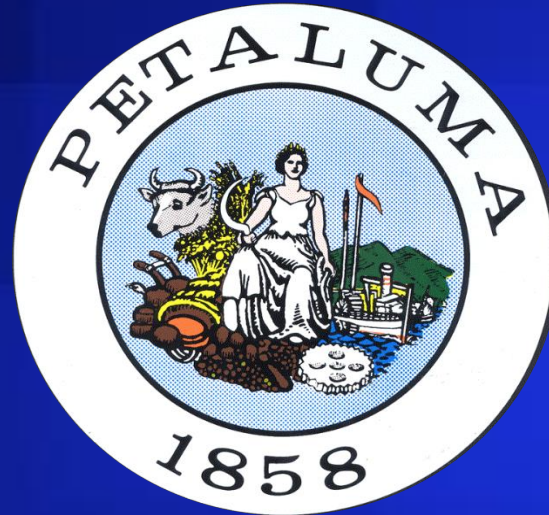
- **Avoid carrying your cell phone on your body (e.g. in a pocket or bra).**
- **Avoid holding any wireless device against your body when in use.**
- **Use your cell phone on speaker setting or with an “air tube” headset.**
- **Avoid using your wireless device in cars, trains or elevators.**
- **Avoid cordless phones, especially where you sleep.**
- **Whenever possible, connect to the internet with wired cables.**
- **When using Wi-Fi, connect only to download, then disconnect.**
- **Avoid prolonged or direct exposure to Wi-Fi routers.**
- **Unplug your home Wi-Fi router when not in use (e.g. at bedtime).**
- **Sleep as far away from wireless utility meters (i.e. “smart” meters) as possible.**

US Cities Pass Protective Ordinances

Local authorities are passing 5G urgency ordinances to retain authority over ROWS.



- installation of small cells on public utility easements in residential neighborhoods is prohibited
- 500 ft separation from schools
- 500 foot setback for multi-family residences in commercial districts
- 1500 ft separation



- 1,500 feet min separation.
- No small cell shall be within 250 feet of any residence.



- Annual recertification fees
- Applicant must pay for legal notices of public hearing.



- Small cells prohibited in residential zones
- 1500 feet separation
- City to study citywide fiberoptic cable network.



Mayor Baccini orders the suspension of the 5G

The first citizen: "There is a lack of scientific data to prove the innocuous nature of the new radio frequencies"



"We are convinced that our territory is the exclusive habitat for psycho-physical well-being and we do not intend to endanger it with invasive and dangerous technologies, at least until the competent authorities attest to the health safety of these new but unexplored technologies",
-Mayor of Bagno di Romagna
Marco Baccini

5G Moratoriums in 120 Cities
in Italy



Over a dozen cities in Italy have passed resolutions to halt 5G



International Opposition to the 5G Rollout

USA: Nationwide protests and several cities passing protective ordinances on “small cells.”

- Los Altos: not in residential, 500 foot set back from schools.
- Petaluma CA: no small cell shall be within 500 feet of any residence.
- Fairfax and Mill Valley CA: small cells prohibited in residential zones
- Mason, Ohio: No small cells in residential areas or within 100 feet of residential property
- Burlington, Massachusetts, annual recertification fees for small cells.
- Hallandale Beach Florida 5G Small Cell Tower Resolution



Italy: 120 Local governments issuing resolutions.

Switzerland: Resolutions by the Cantons of Geneva, Neuchatel and Vaud. Country to monitor levels.

United Kingdom: *Several* Council Resolutions opposing 5G.

Belgium: Brussels rollout hated amidst deliberations on raising the allowable RF limits.

Ireland: 5 City Councils Resolutions to halt 5G: Clare, Roscommon, Leitrim, Wicklow and Sligo





COUNTRIES WORLDWIDE ARE TAKING ACTION ON CELL
PHONES

[Learn More](#)

Additional Information

Electromagnetic Hypersensitivity (EHS) Tip Sheet

Peterborough Ontario recommendations include:

- Notify all meeting attendees to set mobile phones to airplane mode at the start of the meeting. Temporarily disable City owned WAP device(s) in immediate proximity to the meeting room.
- Temporarily disable Nexicom owned WAP (Wireless) device(s) in immediate proximity to the meeting room.
- Turn off or minimize amount of fluorescent lighting and older style LED lighting in the meeting room.
- Consider booking meeting rooms with adequate windows to the exterior for natural daylighting.
- <https://ehtrust.org/peterborough-ontario-canada-issues-information-on-accommodation-measures-for-electromagnetic-hypersensitivity/>

Accommodations, Litigation

(Multiple accommodations at work and in schools are not made public.)

- Spain: Since 2011 multiple court judgments for people disabled.
- 2013 BC Teachers Federation Resolution supports members with ES
- 2013 Australia, 2013 McDonald and Comcare: McDonald paid 75% salary.
- 2014: LA School District: Teacher accommodated to Wi-Fi free classroom
- 2015 France Marine Richard Case, 2018 Court of Social Security of Yvelines,
- 2019: France 13 Plaintiffs Electric Meters- The Tribunal de Grand Instance of Bordeaux
- Southern California: Lawyers moving forward to enforce ADA in Telecom Act.

<https://ehtrust.org/science/electromagnetic-sensitivity/>

Format: Abstract ▾

Send to ▾

Neurol Sci. 2017 May;38(5):797-810. doi: 10.1007/s10072-017-2850-8. Epub 2017 Feb 17.

Mobile phone use and risk of brain tumours: a systematic review of association between study quality, source of funding, and research outcomes.

Prasad M¹, Kathuria P², Nair P², Kumar A², Prasad K².

Author information

- 1 Department of Community Medicine, Postgraduate Institute of Medical Sciences, Rohtak, 124001, India, Haryana. manya.2311@gmail.com.
- 2 Department of Neurology, All India Institute of Medical Sciences, Ansari Nagar East, AIIMS Campus, New Delhi, 110029, India.

Abstract

Mobile phones emit electromagnetic radiations that are classified as possibly carcinogenic to humans. Evidence for increased risk for brain tumours accumulated in parallel by epidemiologic investigations remains controversial. This paper aims to investigate whether methodological quality of studies and source of funding can explain the variation in results. PubMed and Cochrane CENTRAL searches were conducted from 1966 to December 2016, which was supplemented with relevant articles identified in the references. Twenty-two case control studies were included for systematic review. Meta-analysis of 14 case-control studies showed practically no increase in risk of brain tumour [OR 1.03 (95% CI 0.92-1.14)]. However, for mobile phone use of 10 years or longer (or >1640 h), the overall result of the meta-analysis showed a significant 1.33 times increase in risk. The summary estimate of government funded as well as phone industry funded studies showed 1.07 times increase in odds which was not significant, while mixed funded studies did not show any increase in risk of brain tumour. Metaregression analysis indicated that the association was significantly associated with methodological study quality ($p < 0.019$, 95% CI 0.009-0.09). Relationship between source of funding and log OR for each study was not statistically significant ($p < 0.32$, 95% CI 0.036-0.010). We found evidence linking mobile phone use and risk of brain tumours especially in long-term users (≥ 10 years). Studies with higher quality showed a trend towards high risk of brain tumour, while lower quality showed a trend towards lower risk/protection.

Industry money effects the quality of results (Prasad 2017)

Format: Abstract ▾

Send to ▾

Postgrad Med J. 2011 Sep;87(1031):643-51. doi: 10.1136/pgmj.2009.047027rep.

Republished review: systematic review and meta-analysis of psychomotor effects of mobile phone electromagnetic fields.

Valentini E¹, Ferrara M, Presaghi F, De Gennaro L, Curcio G.

Author information

1 Department of Health Sciences, University of L'Aquila, Coppito (AQ), Italy.

Abstract

OBJECTIVES Over the past 10 years there has been increasing concern about the possible behavioural effects of mobile phone use. This systematic review and meta-analysis focuses on studies published since 1999 on the human cognitive and performance effects of mobile phone-related electromagnetic fields (EMF). **METHODS** PubMed, Biomed, Medline, Biological Sciences, PsychInfo, PsycARTICLES, Environmental Sciences and Pollution Management, Neurosciences Abstracts and Web of Science professional databases were searched and 24 studies selected for meta-analysis. Each study had to have at least one psychomotor measurement result as a main outcome. Data were analysed using standardised mean difference (SMD) as the effect size measure. **RESULTS** Only three tasks (2-back, 3-back and simple reaction time (SRT)) displayed significant heterogeneity, but after studies with extreme SMD were excluded using sensitivity analysis, the statistical significance disappeared ($\chi^2(7)=1.63$, $p=0.20$; $\chi^2(6)=1.00$, $p=0.32$; $\chi^2(10)=14.04$, $p=0.17$, respectively). Following sensitivity analysis, the effect of sponsorship and publication bias were assessed. Meta-regression indicated a significant effect ($b1/40.12$, $p<0.05$) only for the 2-back task with mixed funding (industry and public/charity). Funnel plot inspection revealed a significant publication bias only for two cognitive tasks: SRT (Begg's rank correlation $r=0.443$; Egger's test $b=-0.652$) and the subtraction task (Egger's test $b=-0.687$). **CONCLUSIONS** Mobile phone-like EMF do not seem to induce cognitive and psychomotor effects. Nonetheless, the existence of sponsorship and publication biases should encourage WHO intervention to develop official research standards and guidelines. In addition, future research should address critical and neglected issues such as investigation of repeated, intensive and chronic exposures, especially in highly sensitive populations such as children.

“The existence of sponsorship and publication biases should encourage WHO intervention to develop official research standards and guidelines. In addition, future research should address critical and neglected issues such as investigation of repeated, intensive and chronic exposures, especially in highly sensitive populations such as children.”



No cover
image
available

Volume 93, Issue 3
7 February 2001

Article Contents

Abstract

SUBJECTS AND METHODS

Cellular Telephones and Cancer—a Nationwide Cohort Study in Denmark ^{FREE}

Christoffer Johansen ✉, John D. Boice, Jr., Joseph K. McLaughlin, Jørgen H. Olsen

JNCI: Journal of the National Cancer Institute, Volume 93, Issue 3, 7 February 2001, Pages 203–207, <https://doi.org/10.1093/jnci/93.3.203>

Published: 07 February 2001 **Article history ▼**

Supported by grants from the two Danish operating companies (TeleDanmarkMobil and Sonofon); by the International Epidemiology Institute, Rockville, MD; and by the Danish Cancer Society.

The Danish Cohort Studies Contaminated “control group”- Corporate subscribers were in the control group.
Inadequate exposure information- No information was gathered on how often or for how long each day an individual used a cell phone. No information was gathered on cordless landline phone use.

WI-FI AND HEALTH: REVIEW OF CURRENT STATUS OF RESEARCH

Kenneth R. Foster* and John E. Moulder†

Abstract—This review summarizes the current state of research on possible health effects of Wi-Fi (a commercial name for IEEE 802.11-compliant wireless networking). In response to public concerns about health effects of Wi-Fi and wireless networks and calls by government agencies for research on possible health and safety issues with the technology, a considerable amount of technology-specific research has been completed. A series of high quality engineering studies have provided a good, but not complete, understanding of the levels of radiofrequency (RF) exposure to individuals from Wi-Fi. The limited number of technology-specific bioeffects studies done to date are very mixed in terms of quality and outcome. Unequivocally, the RF exposures from Wi-Fi and wireless networks are far below U.S. and international exposure limits for RF energy. While several studies report biological effects due to Wi-Fi-type exposures, technical limitations prevent drawing conclusions from them about possible health risks of the technology. The review concludes with suggestions for future research on the topic.
Health Phys. 105(6):561–575; 2013

Key words: electromagnetic fields; health effects; radiation protection; radiofrequency

to the Internet by laptop computers, although IEEE 802.11 protocols are used for other communications devices, including some electric utility meters.

Initially developed as a wireless replacement for Ethernet cable to connect computers to local area networks, IEEE 802.11 is now the basis of virtually all wireless local area networks present in homes, offices, and other environments. At present, virtually every laptop computer and SmartPhone comes equipped with a Wi-Fi client, and one recent study estimated that 61% of American households presently have Wi-Fi for Internet access (Thota 2012). Increasingly, household devices are incorporating Wi-Fi interfaces to allow remote programming and data acquisition: bathroom scales, gaming devices, audio equipment, household thermostats, and running shoes. While numerous wireless networking technologies are available, virtually all of the WLANs with which an ordinary citizen would be

Acknowledgments—This work was funded by the Wi-Fi Alliance, Washington, DC, and Mobile Manufacturers Forum, Brussels, Belgium. Neither organization had any role in the research for, or preparation of, the manuscript; and they had no knowledge of the contents or conclusions of this review prior to submission for publication. The opinions in this review are those of the present authors only.

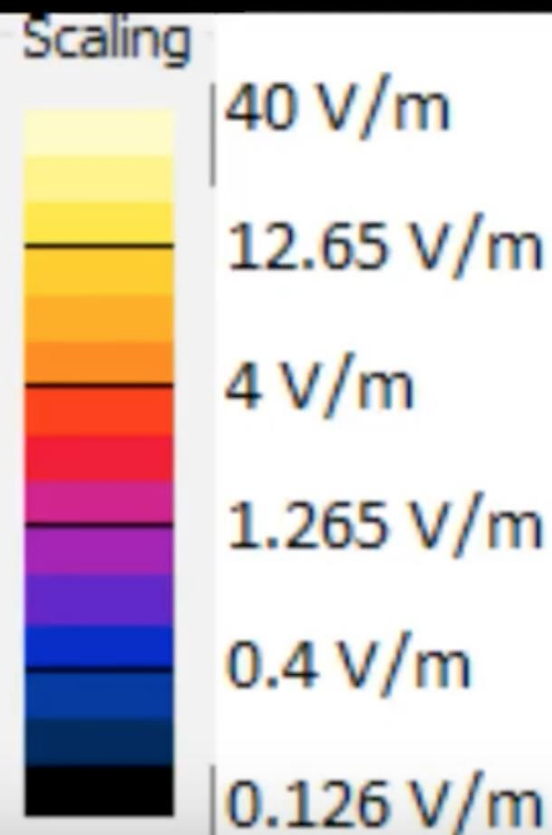
2.45 GHz (Wi-Fi)
34 Year Old Male
Notebook on Lap



Fernandez 2017

Environmental Health Trust

ENVIRONMENTAL
HEALTH TRUST



Don't irradiate me *learn how to protect me...*

The radiation is possibly carcinogenic (Class 2B - WHO, 2011)



2019 Children's Health Campaign to Reduce Direct and Passive Wireless Radiation Exposure from Technology
by the Cyprus Committee on Environment and Children's Health in collaboration with the Cyprus Office of the
Commissioner of Environment

Archbishop Makarios Hospital Replaces Wi-Fi with Ethernet in Pediatric Units



ΝΟΣΟΚΟΜΕΙΟ ΑΡΧΙΕΠΙΣΚΟΠΟΣ ΜΑΚΑΡΙΟΣ ΙΙΙ

Μονάδα Εντατικής Θεραπείας Παιδών



**Στόχος μας
είναι να σώσουμε
ζωές**

Σβήσαμε το Wi-Fi

Προφυλάξτε αυτούς που αγαπάτε!
Κρατήστε κινητά & τάμπλετς
μακριά από τους θαλάμους



Η Διεύθυνση του NAM ΙΙΙ, οι γιατροί και το προσωπικό της ΜΕΘΠ,
μαζί με τους γονείς, σε συνεργασία και με την
«Εθνική Επιτροπή Περιβάλλον και Υγεία του Παιδιού»
μειώνουμε την ακτινοβολία από κινητά, 4G & Wi-Fi.

Learn how to protect me...
The radiation is possibly carcinogenic (Class 2B - WHO, 2011)

Simple advice on how to protect children at home

1. Use **wired** connections for your devices (laptops, televisions, video game consoles etc.);
2. **Deactivate all wireless connections** of your devices (Wi-Fi, 4G, Bluetooth);
3. Turn the **routers off** at night and when not in use, especially when children are at home;
4. **Deactivate** your cell phones when you sleep;
5. Use your tablets, cell phone or other wireless devices **only when needed, and keep distance** from children and pregnant women;
6. Prefer a **landline telephone** whenever possible. This applies both for adults as well as children;
7. Children should only use wireless devices for a limited time period proportionately to their age, and **always in flight mode and with the Wi-Fi deactivated**;
8. The use of cell phones is **not recommended** for children under 16 years of age. It **must be limited and** always with the use of wired headset or speakerphone.

"Demand from the kindergarten and school
to use only wired internet connection"



Archbishop Makarios Hospital Campaign

- Wi-Fi replaced with ethernet in Pediatric Intensive Care Unit and Neonatal unit.
- Parents are educated to keep cell phones away from children and out of the pediatric units.



The European Commission Report on Emerging Health and Environment Risks *The Impact of 5G - “High”*

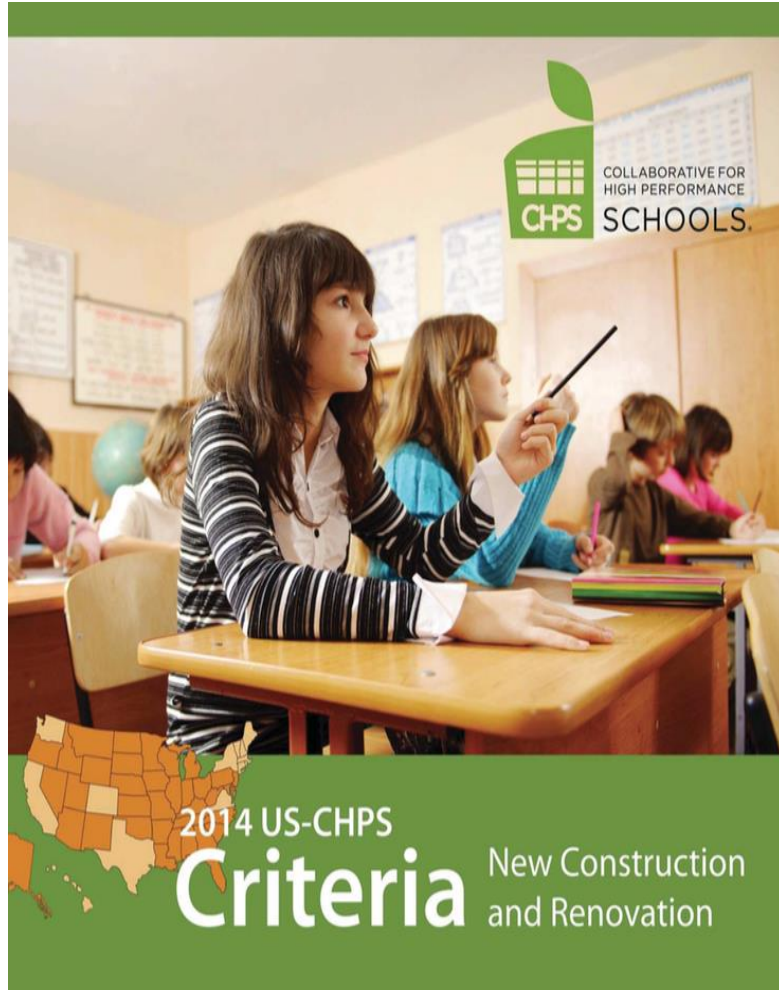
Section 4.4 Potential effects on wildlife of increases in electromagnetic radiation

“The lack of clear evidence to inform the development of exposure guidelines to 5G technology leaves open the possibility of unintended biological consequences.”

- Russell 2018, Di Ciaula 2018, Aerts 2017, Pall 2018 papers referenced.

Collaborative For High Performance Schools

Low EMF Classroom Criteria 2014



EQ 15.1 to EQ 15.2.3

- Correct school wiring errors.
- ELF limit: 1 mG (new const) and 2 mG (existing)

Low EMF Best Practices for Technology

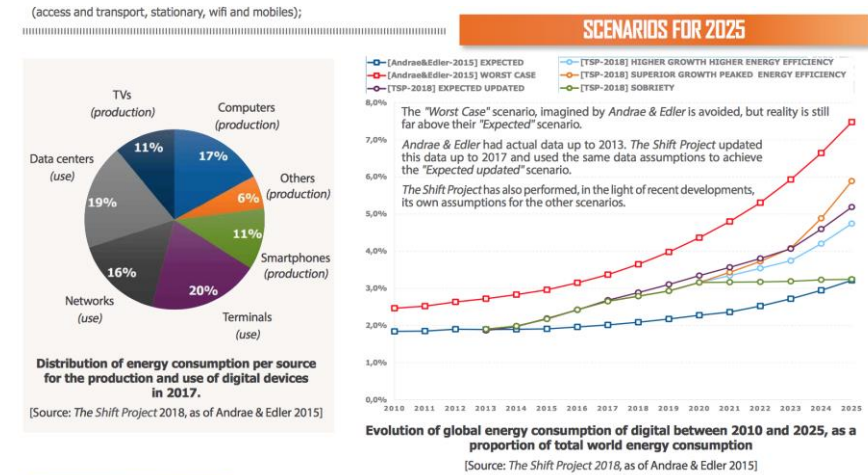
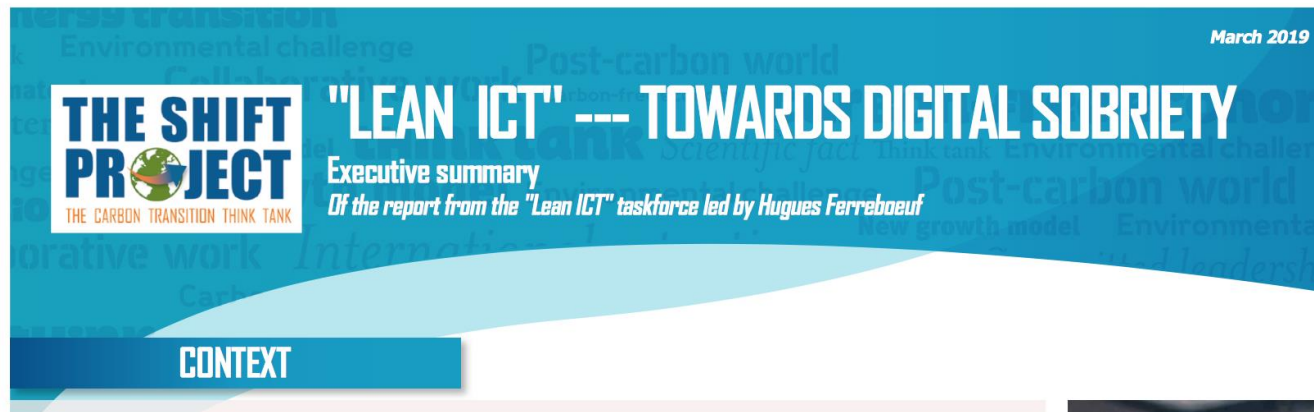
- Wired not wireless network.
- Hardwired phones (not cordless)
- Devices on desk; operation on lap/body prohibited
- Ensure devices have wired capability & physical switch to disable Wi-Fi.
- Prohibit the use of cell phones/PDA in instructional areas.

www.ehtrust.org



The Shift Project 2019 Report

"LEAN ICT: TOWARDS DIGITAL SOBRIETY": OUR NEW REPORT ON THE ENVIRONMENTAL IMPACT OF ICT



“The current trend for digital overconsumption in the world is not sustainable with respect to the supply of energy and materials it requires.”

“ The reasons behind the strong growth in digital energy consumption are multiple but we can, on the basis of an initial analysis, identify 4 main sources: the smartphone phenomenon; the multiplication of the peripherals of daily life (or “connected living”);the rise of the Industrial Internet of Things (IIoT); the explosion of data traffic.”

“The energy consumption of Information and Communication Technologies (ICT) is increasing by 9% every year. It is possible to limit this growth to 1.5% per year by moving to sober digital practices. The digital transition as it is currently implemented participates to global warming more than it helps preventing it. The need for action is therefore urgent. “



2019 Report: “5G Deployment: State of Play in Europe, USA, and Asia”

“Increased exposure may result not only from the use of much higher frequencies in 5G but also from the potential for the aggregation of different signals, their dynamic nature, and the complex interference effects that may result, especially in dense urban areas.”

“The 5G radio emission fields are quite different to those of previous generations because of their complex beamformed transmissions in both directions – from base station to handset and for the return.

“Although fields are highly focused by beams, they vary rapidly with time and movement and so are unpredictable, as the signal levels and patterns interact as a closed loop system. This has yet to be mapped reliably for real situations, outside the laboratory.”

“...the problem is that currently it is not possible to accurately simulate or measure 5G emissions in the real world.”

Blackman C, Forge S. [5G Deployment: State of Play in Europe, USA, and Asia](#). European Parliament, 2019.



Printable resources
at EHTrust.org



What Parents Need To Know About Safe Technology

"Parents should not panic over the latest research, but it can be used as a good reminder to limit both children's screen time and exposure from cell phones and other devices emitting radiation from electromagnetic fields (EMF)."
THE AMERICAN ACADEMY OF PEDIATRICS, 2014

"Children are disproportionately affected by environmental exposures, including cell phone radiation."
THE AMERICAN ACADEMY OF PEDIATRICS, 2011

What Does the Science Say about Wireless and Children?

- Children have thinner skulls. Research shows that children's developing brains, eyes and bone marrow absorb this radiation three to ten times deeper than adults.
- The World Health Organization's International Agency for the Research on Cancer classified wireless radio frequency radiation as a Class IIb Possible Human Carcinogen in 2011. Cell and cordless phones are linked to increased brain tumors. Risks are highest for those who first used a phone under the age of twenty.
- A landmark study by the National Toxicology Program found "clear evidence" of cancer, heart damage and DNA damage in rats exposed daily to wireless radiation.
- A 2010 study found an impact on memory in teenagers who used cell phones in the hand for just a year. Published research also links wireless exposure to hyperactivity, behavior problems, damaged sperm, and altered brain development.
- Wireless radiation at very low levels has been shown to change brain activity. In 2013, NIH researchers found brain glucose metabolism increased from cell phone radiation.
- A 2011 Yale Medicine study found increased hyperactivity and memory problems after

Worldwide Countries are Taking Protective Action

Belgium, France, Australia, Russia, the United Kingdom, India, Finland, Turkey, Canada and the European Union have all taken measures to reduce children's exposure to wireless radiation by strict regulations and increasing information fact sheets for their citizens on how to reduce exposure to children.

Read the Manufacturer's Advice Written in Fine Print on Wireless Device Manuals

FROM THE SAMSUNG GALAXY S3 LAPTOP MANUAL:

"Take precautions during Wi-Fi connections. Keep safe distance from pregnant women's stomachs or from lower stomachs of teenagers. To ensure compliance with RF exposure: The laptop PC must be used with a minimum of 20.9 cm antenna separation from the body."

Protect Yourself

CELL PHONES AND BREAST CANCER

Women are developing breast cancer in the exact same place they kept cell phones in their bras, according to an increasing number of medical reports. Cell phones emit microwave radiation linked to brain cancer and damaged DNA. Cell phone manuals contain fine print directing users to put some distance between the phone and the body.

Learn how to reduce your exposure. Do not carry your cell phone in your bra.

More at EHTrust.org

DOCTORS' RECOMMENDATIONS

- 1. PROTECT YOUR BODY**
Do not carry cell phones in your pockets or bra. No lap-tops or tablets on your lap.
- 2. PROTECT YOUR BRAIN**
Prefer a corded landline phone. Hold cell phones away from the head and body by using speakerphone.
- 3. PROTECT YOUR FERTILITY & YOUR PREGNANCY**
No wireless devices near reproductive organs or near a pregnant woman's abdomen.
- 4. REDUCE WIRELESS**
Turn off Wi-Fi and use cords to connect routers, phones, computers and other devices. Airplane Mode ON with Wi-Fi OFF turns off wireless.
- 5. DO NOT SLEEP WITH YOUR CELL PHONE**
Cell phones and Wi-Fi devices are radiating even when not in use. Power off all devices at night, and keep them out of the bedroom.



International Society of Doctors for Environment

“5G networks in European Countries:
appeal for a standstill in the respect of
the precautionary principle”

April 2018

“We believe it should be unethical to ignore the available evidence waiting a possible “a posteriori” demonstration of health damages in the presence of a present and potentially manageable risk for public health. “

Albania	National Association of Hygienists of Albania (NAHA)
Algeria	Association for the Protection of the Environment and Sustainable Development (APEDD); Association des jeunes pour la protection et la sauvegarde de l'environnement (AJVPSE)
Argentina	Asociación Argentina de Médicos por el Medio Ambiente (AAMMA)
Australia	Doctors for the Environment (Australia) Inc. (DEA)
Austria	Ärztinnen und Ärzte für eine Gesunde Umwelt (ÄGU) - ISDE Austria
Bangladesh	Environment and Social Development Organization (ESDO)
Belgium	Belgische Artsen voor het Milieu - Médecins Belges pour l'Environnement
Belgium	HECTOR asbl - Health and Environment Care Technical Organisation
Brazil	Medicos pelo Ambiente (MEPA)
Canada	Canadian Association of Physicians for the Environment (CAPE)
Ecuador	Corporación para el Desarrollo de la Producción y el Medio Ambiente Laboral
France	L'Association pour la Recherche Thérapeutique Anti-Cancéreuse, ARTAC
Germany	Ökologischer Ärztebund (ÖÄB)
India	Orissa State Volunteers and Social Workers Association (OSVSWA)
Italy	Associazione Medici per l'Ambiente - ISDE Italia
Kenya	Association of Physicians and Medical Workers for Social Responsibility, PSR Kenya
Macedonia	Zdruzenie na Doktori za zivotna sredina MADE
Malta	SahhAmbjent
Pakistan	Sustainable Development Policy Institute (SDPI)
Pakistan	National Integrated Development Association (NIDA Pakistan)
Netherlands	Nederlandse Vereniging voor Medische Milieukunde (NVMM)
Serbia	Society of ecologists in health-care (SEHC)
Sweden	Läkare för Miljön (LfM)
Switzerland	Ärztinnen und Ärzte für Umweltschutz, Médecins en Faveur de l'Environnement, Medici per l'Ambiente (AefU)
Turkey	Cevre Icin Hekimler Dernegi
Ukraine	Green Doctors - Ukrainian Association of Doctors for the Environment
UK	British Society for Ecological Medicine (BSEM)
USA	Physicians for Social Responsibility (PSR)
Uzbekistan	Center Perzent - The Karakalpak Center for Reproductive Health and Environment

25

Feb '14

Belgium bans sale of mobile phones designed for children

by Andy Furniere, journalist

Recent articles: Environment minister wants to ban plastic shopping bags, Valentine's campaign raises awareness of sexual violence, VUB professor has not been sentenced to death, says ambassador



SUMMARY

From 1 March, mobile phones designed to attract young children can no longer be sold in Belgium because of radiation levels considered dangerous

"Increases the risk of brain cancer," says radiation expert

From 1 March, it will be illegal in Belgium to sell mobile phones designed specifically for children below the age of seven. The government is banning the sale of and advertisements for mobile phones in the form of a toy, such as a cuddly bear, meant for children younger than seven.



Guy Vandenbosch, radiation expert at the University of Leuven (KU Leuven) supports the measure. "Using a cell phone increases the risk of brain cancer for young children because of the radiation that is released," he told *De Morgen*.

The law also stipulates that the radiation value (SAR) of each mobile phone has to be mentioned when it is sold or being advertised. Each mobile phone will come with the statement: "Think about your health, use your mobile phone moderately, call

Berkeley California: Cell Phone *Right To Know* Ordinance

Proposed in 2010 (San Francisco Ordinance), passed in 2015 and immediately slapped with a lawsuit

“If you carry or use your phone in a pants or shirt pocket or tucked into a bra when the phone is ON and connected to a wireless network, you may exceed the federal guidelines for exposure to RF radiation. ~~This potential risk is greater for children.~~”



Radiofrequency Instructions to Keep a Distance in Cell Phones and Wireless Devices

This fine print is hidden deep in manuals/operating systems/online.



"To reduce exposure to RF energy, use a handsfree option, such as the built in speakerphone, the supplied headphones, or other similar accessories. **Carry iPhone at least 10mm away from your body** to ensure exposure levels remain at or below the as tested levels." – **Apple iPhone 4**



Keep safe distance from pregnant women's stomach or from lower stomach of teenagers...To ensure compliance with RF exposure guidelines the Notebook PC must be used with **a minimum of 20.8 cm antenna separation** from the body."
– **Samsung 3G Laptop**



"To comply with FCC RF exposure requirements, the base unit must be installed and **operated 20 cm (8 inches) or more** between the product and all person's body."

–**Panasonic DECT Home Cordless Phone**

Phones exceed government limits at body contact. #Phonegate

2019 ANSES Report: The Toxic Effects of Blue Light

Irreversible Vision Loss

Short-term phototoxic effects associated with acute exposure and long-term effects associated with chronic exposure, can increase the risk of developing age-related macular degeneration (ARMD)”

Children’s developing eyes do not have protections to filter blue light from retina until adulthood.

Sleep

“Even very low levels of exposure to blue light in the evening disrupts biological rhythms and therefore sleep. ANSES stresses that the screens of computers, smartphones and tablets are major sources of blue-rich light, and children and adolescents, whose eyes do not fully filter blue light, are a particularly susceptible population.”



“The amount of light received by the retina in the blue band can be large and have phototoxic effects on the eye and a disruptive effect on biological rhythms.”

[ANSES Press Kit Summarizing the ANSES Findings](#)



Belgium Electromog Appeal 344 Doctors and Health Professionals from Belgium

“On the eve of the deployment of 5G, Belgian health professionals sound the alarm

We ask that federal, regional and local public take their responsibilities and the necessary measures to obtain:

- the application of the precautionary principle to protect the population, especially the youngest,
- ban on WiFi in kindergartens, nursery schools and places with young children,
- stopping the deployment of WiFi and connected objects in schools and the return to unconnected or wired alternatives,



POSITION on 5G Deployment in Cyprus by the Cyprus Medical Association and the Cyprus Committee on Environment and Children's Health



Submitted to Cyprus Parliamentary Committees on Environment and Health 19 Sep 2019

Ministry to present a) implementation plan - estimates of the additional exposure. (b) scientific evidence assuring health and (c) a reliable methodology for measuring the exposure.

Exposure reduction must be regulated by legislation that must provide:

- IMPLEMENTATION OF 5G-FREE PROTECTION ZONES** for schools, playgrounds and hospitals.
- PROHIBITION** of the use of wireless internet and wireless devices e.g. tablets and mobiles in kindergartens and schools at least up to the age of 15 .



Louisiana House Resolution 145
Requests the Department of Environmental Quality in
conjunction with the Louisiana Department of Health to
study the effects of evolving 5G technology

“...WHEREAS, peer-reviewed studies on this topic show the potential for wide-range effects; and

WHEREAS, 5G technology requires small cellular towers to be placed a short distance apart, closer than existing towers, at telephone pole height, and will operate in conjunction with the 3G and 4G technology infrastructure; and”

California Governor Vetoes Small Cell Streamlining Bill

“This bill goes too far by usurping city and county zoning authority for infrastructure development, and it potentially imposes reimbursable, state-mandated costs on cities and counties” -CA State Department of Finance



City Leaders Gather to Oppose SB649

Image: @evaspiegel ABC7

- Over 300 cities and 47 (out of 58) counties opposed.
- Over 100 organizations including the AARP, EWG, Sierra Club
- Letters from medical doctors and scientists worldwide warning of health impacts.
- Firefighter stations were carved out of the bill due to longtime concerns about health impacts

Local leaders oppose state law that could turn utility poles into cell phone towers

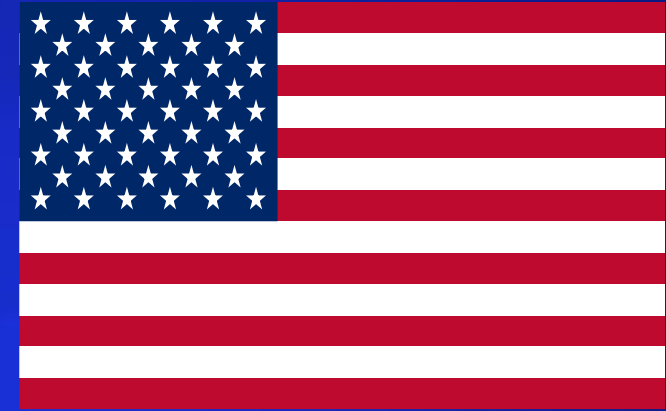


At a press conference Wednesday, attorney and radio frequency engineer Jonathan Kramer discusses the plastic pipe boxes which he said show the size of telecommunications equipment that could be placed on sidewalks and utility poles without local government consent. Long Beach Councilmember Al Austin and other community leaders held a press conference to oppose the proposed law, SB 649, on Wednesday, Aug. 30, 2017, in Long Beach. (Steve McCrank, Daily Breeze/SCNG)

United States Policy & Action

Laws to Investigate Health Effects

- Oregon: SB283 Health authority to review research on EMF health effects with focus on schools
- New Hampshire: Commission to study health effects of 5G
- Louisiana: Health and Environment authorities to study impacts of 5G



Public Health Recommendations

- American Academy of Pediatrics
- California and Connecticut Department of Health
- San Francisco & Burlingame California, Greenbelt Maryland

Proclamations

- 5G: Portland, OR; Hallandale Beach FL; Greendale, WI
- Cell Phone Radiation : Maine, Pembroke Pines Florida and Jackson Hole Wyoming
- Electrical Hypersensitivity: Colorado, Connecticut, Broward, FL, Portland Oregon

Radiofrequency Radiation in Schools

- Maryland council recommends wired, not wireless, in schools
- Los Angeles Schools Banned cell towers on school grounds and uses RF limit 10,000 less than FCC
- San Francisco Teacher Union resolution to share California advisory to all students and parents.
- Private schools restricting and removing Wi-Fi
- Montgomery County, MD; Ashland & Worcester MA; , Petaluma, CA; Public School districts best practices include device on table, not on lap.

Environmental Health Trust Resources

EHTrust.org Click on links to Download



[Postcards for printing](#)

Do's and Don'ts for Safe Technology		
Technology	Do's	Don'ts
Cell Phones	<ul style="list-style-type: none">Use a speakerphone or airtube headset.Turn the power off if you need to add a phone in your pocket.Choose a wired phone when you can, especially for long calls.Set airplane mode ON with your QPOT more often.Power off cell phones in a car, bus, train, airplane, elevator.	<ul style="list-style-type: none">When using the phone, never touch your head or body with the phone.Don't use a cell phone when the network signal is weak, because the radiation from the phone is higher.Don't carry a cell phone in your bra. Don't carry a cell phone in any clothing pocket.Don't sleep with a cell phone or tablet or any wireless electronics near your head.
Home Phones	<ul style="list-style-type: none">Get a Corded Phone for your home.Keep your antenna.Run lines into all the rooms where you need a phone.Use a wired VOIP system.	<ul style="list-style-type: none">Do not use a cordless home phone. The DECT phone base constantly emits microwave radiation. Many people have their bases directly beside their beds, and this is a significant source of microwave radiation to be removed from sleep areas.
Printers	<ul style="list-style-type: none">Use cords to connect to them.If it must use a Wi-Fi printer, set the Wi-Fi function to its lowest setting.Purchase a non-Wi-Fi printer.	<ul style="list-style-type: none">Don't place a wireless printer in your office near your microwave. Wireless printers constantly emit microwave radiation and should not be located near our bodies per the manufacturer's instructions.
Tablets and Laptops	<ul style="list-style-type: none">Use Tablets and Laptops with ethernet connections. Set the Wi-Fi to OFF and the Airplane/Flight mode to ON. Download applications so that kids can use the tablet with the Wi-Fi off.	<ul style="list-style-type: none">Don't use wireless enabled laptops if ethernet is available. Don't use a laptop for your car. Don't forget to turn the Wi-Fi connection off when you are not using it.
Internet Routers	<ul style="list-style-type: none">Get Fully Wired (cable/fiber) System. Many internet providers allow you to manage the Wi-Fi power signal online and you can simply turn the Wi-Fi off through the internet. Non-wired routers can be requested and ethernet cords can be used at home.	<ul style="list-style-type: none">Don't leave your Wi-Fi router on all the time.If you must keep your Wi-Fi router, always power it off at least at bedtime and during the day when it is not in use. If there is no switch, unplug, simply unplug it from the electrical outlet.Don't use routers or Wi-Fi access points which add significant microwave radiation into the home.

[Do's and Don'ts for Safe Technology at Home](#)

Questions and Answers about Wi-Fi in Schools

Why are doctors concerned about cell phones and all other types of wireless in schools?
All wireless devices (including cell phones, cordless landline phone, any item with Wi-Fi or bluetooth capability, etc.) generate and emit an invisible electromagnetic radiation called radiofrequency (RF). A growing amount of scientific research links this wireless radiation to serious effects on health—such as memory and sleep problems, headaches, cancer, and damage to reproduction, brain development, and DNA. 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.

Where can I find expert opinions about wireless effects on health?
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.

[Questions and Answers on Wi-Fi and Cell Phones in Schools](#)



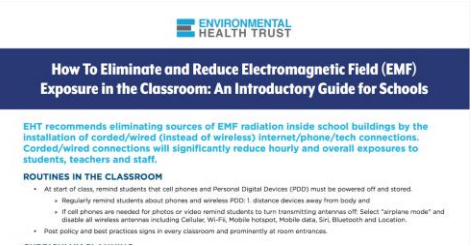
[New Jersey Educational Association PDF](#)



[What Parents Need to Know About Safe Technology](#)



[Posters on Safe Technology](#)



[Checklist on How to Reduce EMF and Wireless Radiation for Schools](#)



[Social Media Graphics to Share](#)



* Latest published review

Pall M., Wi-Fi is an important threat to human health, Environmental Research Volume 164, July 2018, Pages 405-416

Avendaño, C., et al. “Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation.” Fertility and Sterility, vol. 97, no. 1, 2012, pp. 39-45.

Isabel Wilke, (Review Paper) “Biological and Pathological Effects of the 2.45 GHz on Cells, Fertility, Brain and Behavior”, Umwelt-Medicine-Gesellschaft (2018)

Hedendahl, Lena K., et al. “Measurements of Radiofrequency Radiation with a body-borne exposimeter in Swedish schools with Wi-Fi.” Frontiers in Public Health 5 (2017): 279.

Akdag, M.Z., et al. “Does prolonged radiofrequency radiation emitted from Wi-Fi devices induce DNA damage in various tissues of rats?” Journal of Chemical Neuroanatomy, vol. 75, pt. B, 2016, pp. 116-22.

Dasdag, S., et al. “Effects of 2.4 GHz radiofrequency radiation emitted from Wi-Fi equipment on microRNA expression in brain tissue.” International Journal of Radiation Biology, vol 91, no. 7, 2015, pp. 555-61.

Papageorgio, C.C., et al. “Effects of Wi-Fi signals on the p300 component of event-related potentials during an auditory haying task.” Journal of Integrative Neuroscience, vol. 10, no. 2, 2011, pp. 189-202.

Oni, M.O., D.B. Amuda and C.E. Gilbert. “Effects of radiofrequency radiation from WiFi devices on human ejaculated semen.” International Journal of Recent Research and Applied Studies, vol. 9, no. 2, 2011, pp. 292-4.

Shahin, S., et al. “2.45 GHz Microwave Irradiation-Induced Oxidative Stress Affects Implantation or Pregnancy in Mice, Mus musculus.” Applied Biochemistry and Biotechnology, vol. 169, 2013, pp. 1727–51.

Lerchl, Alexander, et al. “Tumor promotion by exposure to radiofrequency electromagnetic fields below exposure limits for humans.”

[More Research at
EHTrust.org](#)