ES UK Electrosensitivity UK Providing support and information

Newsletter

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www.es-uk.info
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The 'captured' agencies problem

Agencies which set guidelines for EMFs, including RF, adopt views similar to the 'military-industrial' clique. Like a 'conspiracy', this denies long-term, non-thermal, effects, such as EHS.

World Health Organization (WHO), the United Nations (UN)'s agency

ICNIRP, the World Health Organization's agency

The WHO, the UN's agency, arbitrarily denied non-thermal effects in 1972 and EHS as caused by EMFs in 2004, although EHS from EMFs was known in 1746. One WHO review found 'high certainty of evidence' that EMFs cause cancer, but its other reviews denied established harm. ICNIRP, the WHO's agency, still promotes unprotective short-term heating guidelines.

UKHSA, the DHSC's agency, and COMARE, the UKHSA's committee

The UK Health Security Agency (UKHSA), the DHSC's agency, and COMARE, its committee on EMFs, still follow ICNIRP's unprotective guidelines which harm people with EHS.

(Nyberg NR et al, "The EU prioritises economics over health in the rollout of RF technologies" *Rev Environ Health*, 2022; Nyberg NR et al, "The EU assessments of RFR health risks – another hard nut to crack" *Rev Environ Health*, 2023; Deruelle F: "Microwave RFs, 5G, 6G, graphene nanomaterials: Technologies used in neurological warfare" *Surg Neruol Int*, 2024)

ICBE-EMF: WHO reviews 'no assurance of safety'

The independent International Commission on the Biological Effects of Electromagnetic Fields convincingly demonstrated the flaws and weaknesses in all but one of the WHO's 12 reviews.

- 'Due to serious methodological flaws and weaknesses in the … reviews and meta-analyses on health effects of RF-EMF exposure, the WHO-commissioned systematic reviews cannot be used as proof of safety of cell phones and other wireless communication devices.'
- ICNIRP limits 'which were established by applying arbitrary uncertainty factors to their putative adverse threshold dose, lack scientific credibility'.
- However, the WHO's animal cancer review, with 'high certainty of evidence' for heart schwannomas and 'moderate certainty of evidence' for brain gliomas, should be used to set exposure limits, as could the adverse effects on male fertility, pregnancy and birth outcome.

(ICBE-EMF: "The WHO-commissioned systematic reviews on health effects of RFR provide no assurance of safety" *Environ Health*, 2nd October 2025) *See page 9 of this Newsletter.*

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ES-UK

Electrosensitivity UK (ES-UK)

Aims: 1. To help people suffering from Electrosensitivity (ES).
2. To educate the public about ES and related areas.

www.es-uk.info
Registered Charity No.: 1103018
Founded 2003
BM Box ES-UK, London, WC1N 3XX
Telephone: 0845 643 9748
enquiries@es-uk.info

Support ES-UK

Paypal (on the website)
Cheques to: Electrosensitivity UK, to:
The Treasurer, BM Box ES-UK, London, WC1N 3XX
from whom you can obtain a Standing Order, Direct Debit, Gift Aid and Legacy declaration forms. *Please donate £25 or more per year for printed Newsletters (published as material becomes available) and support if you can afford it.*

Explainer Videos: SciAni, ES-UK YouTube;
Resources on www.es-uk.info:
Letters to Doctors *Disability information*
EMF Guidelines *Housing* *Planning*
Public Health *Shielding*
ES Directory (suppliers)
ES-UK Leaflet
ES and EHS: A Summary (2013)
Select ES and EHS Studies (with links)
Newsletters (including Archive):
electrosensitivity-uk@protonmail.com
Post: BM Box ES-UK, London, WC1N 3XX
Mailing: S. Dacre. *Editor:* M. Bevington.

Thank you

The trustees are very grateful for further generous donations. These will help the charity's aims of providing information for all and support for people harmed by RFR and EMFs.

ES-UK Advisory Panel

We would like to establish an Advisory Panel to encourage a wide input of ideas on current issues. It could meet once or twice a year, using Zoom where possible but with handwritten contributions welcome. Do write in or email (contact details above) if you would like to be put on the list.

Grants to further ES-UK's two aims

Trustees envisage small grants of up to £100 (max. 3 a year) to encourage individuals or groups to further ES-UK's two aims. This could help towards hiring a hall, printing information literature, advertising in local magazines, inviting a speaker, or paying for a market or fair stall. Please apply to: Grant Applications, ES-UK, with your name, address and tel. number and email if available, giving a brief summary of your plan, when and where, with any relevant expertise. A report and photos for the Newsletter would be welcome.

Well done - keep writing!

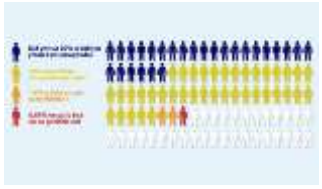
Congratulations to the many supporters of ES-UK who contact their GPs, MPs and local councillors about how the exceedingly high levels of EMFs affect them personally. Some replies now seem to imply greater awareness that the UKHSA's ICNIRP's heating-only limits are unprotective for EHS which is caused by non-thermal EMFs.

Don't suffer in silence! Inform those still unaware of non-thermal effects.

ES-UK EXPLAINER VIDEOS

What is Electromagnetic Hypersensitivity?
3 min. English: Link
Beth yw Hypersensitifrwydd Electromagnetig?
Welsh: Link

How do radio frequency radiation and electromagnetic fields affect human beings?
3 min., English: Link



The Hidden Health Risks of Wi-Fi in Schools – What Parents & Teachers Should Know
2 min. English: Link
Peryglon Iechyd Cudd Wi-Fi mewn Ysgolion - Yr Hyn y Dylai Rhieni ac Athrawon ei Wybod
Welsh: Link

Does Radiation from Mobile Phones and Wi-Fi Affect Human Health?
4 min. English: Link.

ES-UK YouTube Channel
https://www.youtube.com/@ES-UK

ES-UK BOOKLET

Social Exclusion Due To Electromagnetic Pollution: A Belgian Perspective
by Gérald Hanotiaux: excerpts selected and translated from the French by Annelie Fitzgerald. Link.
To order a printed copy of this booklet, please contact es-uk.info and make a donation of £10/copy towards printing and postage.

WALES

Wiserwirelesswales.org
Bumper stickers printed on waterproof vinyl, measuring 25cm x 5cm (you can cut off the website address if you wish), are available from www.wiserwirelesswales.org at £10 for 5 (including P&P).

SCIENCE ON EHS

'All forms of life can respond to Magnetic Fields (MFs)'

Interdisciplinary research has established that all forms of life can respond to MFs. Research shows that human cryptochromes exhibit magnetosensitivity. Most existing provocation studies have failed to confirm EHS as an environmental illness. We attribute this to a fundamental lack of understanding of the mechanisms and processes involved, which have resulted in the design of inappropriate and inadequate tests. We conclude that future research into EHS needs a quantum mechanistic approach on the basis of existing biological knowledge of the magnetosensitivity of living organisms.

(Henshaw DL, Philips A: "A mechanistic understanding of human magnetoreception validates the phenomenon of electromagnetic hypersensitivity (EHS)" *Int J Radiat Biol*., 2024) Link (Free Open Access)

EHS biomedical: first empirical evidence that highly sensitive individuals can perceive EMR

Identifying individuals at risk of developing EHS is important. Those with heightened sensory processing sensitivity (SPS; the ability to perceive, process, and react to environmental stimuli, approximately 25% to 30% of the population) are of special interest. In 225 men and 225 women, women had higher general EHS prevalence than men (13.3% vs. 5.3%), higher mean values on perceived sensitivity for 5 out of 9 categories of EM equipment (computers, electrical appliances, fluorescent lighting, mobile phones, and television) and they had higher scores on the three EHS Scales … in addition to higher SPS and CNS scores. The present study provides the first empirical evidence that highly sensitive individuals are capable of perceiving EMR. … driven by SPS, not gender.

(Watten RG, Volden F, Trå HV: "Sensory Processing Sensitivity, and Not Gender, Drives EHS and Nature Connection" *Ecopsychology*, 2024)

EHS and poor DNA break management; two types of EHS

EHS may be linked to the management of DNA single- or double-strand breaks, in an ANSES (French Agency) study. EHS is associated with a high risk of cancer and aging through delayed radiation-induced ATM protein nucleoshuttling in fibroblasts. It involves oxidative stress and phosphorylation, comparable with hyper-radiosensitivity. The study also defines two types of electrosensitivity.

1st type of electrosensitivity: weak symptoms in the absence of EM exposure but strong reactions during exposures (LBHR: Low Background and Highly Responsive), highly predisposed to cancer.

2nd type: notable symptoms in the absence of EM exposure and a modest reaction to exposures (HBLR: High Background and Lowly Responsive), a subgroup spontaneously presenting (in the absence of exposure) double-strand DNA breaks and deficiencies in their recognition by repair pathways. The HBLR type would be associated with a high risk of accelerated aging.

(Sonzogni L et al., *Int J Mol Sci*., 2025; André Fauteux: "EHS may be linked to poor DNA break management: French study" *EMF News, La Maison du 21e siècle magazine*, 25th June 2025)

EHS correlates with immune responsivity to oxidative stress; LDLox

… a self-reported EHS patient whose symptoms include severe headaches, generalized fatigue, cardiac arrhythmia, attention and memory deficit, and generalized systemic pain within minutes of exposure to telecommunications (Wifi, cellular phones), high tension lines and electronic devices. Tests for cerebral, cardiovascular, and other physiological anomalies proved negative, as did serological tests for inflammation, allergies, infections, auto-immune conditions, and hormonal imbalance. However, further investigation revealed deficits in cellular anti-oxidants and increased radical scavenging enzymes, indicative of systemic oxidative stress. … a large increase in circulating antibodies for oxidized Low-Density Lipoprotein (LDLox), byproducts of oxidative stress accumulating in membranes of vascular cells. Because a known primary effect of EMF exposure is to increase the concentration of cellular oxidants, … pathology in this patient may be causally related to a … increase in LDLox … [triggering] an exaggerated auto-immune response consistent with EHS symptoms.

(Thoradit T et al.: "Hypersensitivity to man-made EMFs (EHS) correlates with immune responsivity to oxidative stress: a case report" *Commun Integr Biol*. 2024)

Coloured tattoos and MRI magnetic fields

40% of 5 subjects with coloured tattoos experienced transient symptoms of warmth and itch. After the magnetic stimulation, 2 patients from the group with a coloured tattoo indicated that during the procedures they felt a feeling of warmth and slight itching of the skin in the place of exposure to magnetic fields. In the control group, no side effects were noted. 17 cases of abrupt and painful burning sensations from tattoos had been listed by 2020.

(Pasek J et al.: "Interaction between variable magnetic field with low magnetic induction value and body tattoos - a preliminary observational single center study" *Electromagn Biol Med*., 2025;
Alsing KK et al.: "Tattoo complications and magnetic resonance imaging: a comprehensive review of the literature" *Acta Radiol*., 2020)

Mobiles and stroke

The investigation confirmed a causal relationship between the duration of mobile phone use and an increased risk of stroke suggesting significant implications for public health.

(Jin R et al., *Medicine (Baltimore)*, 2025)

Mobile use, eyes and mental health

Prolonged smartphone use, exceeding 20 min at a time, can lead to physical (eyes) and mental health issues. (Dandumahanti BP et al.: *J Eye Mov Res*., 2025)

Brain development damage

Key cellular events for brain ontogenesis are likely to undergo changes with RF-EMF 900 MHz exposure during early development at regulatory thresholds. (Bodin R et al., *Neurotoxicology*, 2025)

RF-EMF genotoxicity: revise guidelines

Exposure duration and real-world signals are the most important factors influencing genotoxicity and cancer risk. These genotoxic findings support precautionary measures alongside existing thermal-based exposure guidelines.

(Weller SG et al., *Front Public Health*, 2025)

Laptops and mobiles: increased male infertility

Specific genetic variants and EMFs increase the risk of azoospermia. Gene variants alone elevated azoospermia risk 7.71 in younger, 2.63 in older, further exacerbated with radiation exposure with odds ratio of 26.23 in younger, 24.98 in older.

(Pal S et al., *Mol Biol Rep*., 2025)

High home RF reduces problem-solving and personal-social skills

Problem solving and personal-social skills reduced by high RF at home: "People need to wake up". (Setia MS et al., *Cureus*, 2025); Burdick S: "'People Need to Wake Up': Babies in Homes With High Levels of Wireless Radiation Have Triple the Risk of Develop. Delays" *The Defender*, 20th Aug 2025)

RF for 4, not 2, minutes deforms sciatic nerves

Continuous RF for 4 minutes, but not 2 minutes, causes severe deformation of sciatic nerves of both myelinated and non-myelinated nerve fibres.

(Özkumur G et al., *Agri*., 2024)

RF thyroid effects at 0.22% ICNIRP's heat limits

RF at 0.22% of ICNIRP heating limits changed rats' thyroid endocrine and histological parameters. (Sarhad ZS et al., *BMC Res Notes*, 2025)

VERY HIGH TRANSIENTS IN ELECTRIC CARS

A comprehensive survey found that people in electric vehicles are bathed in surprisingly strong EM pulses. These transients are fast bursts of energy, implicated in numerous health controversies over the last 40 years. Peak fields often exceeded the current European Council reference limits. In special cases, e.g. starting the engine, the fields could be far higher, up to 100 µT —up to 12 times those limits (measured in a hybrid). The abdomen is repeatedly exposed to ~3-4 µT, below ICNIRP's short-term limit, but childhood leukaemia is linked to long-term 0.3-0.4 µT — 10 times lower. Accelerating and braking produce the most dangerous transients, associated in 1994 with lung cancer, itself related to intrinsic cellular EMFs.

Rear wheel drive electric vehicles may have smaller fields than front-wheel drive.

Milham's plea for more research was dismissed —most aggressively by 'captured' ICNIRP's Frank de Vocht in 2016: "Further discussion on whether [Dirty Electricity] has any effects on human health…is meaningless."

(Louis Slesin: "Wake-Up Call for EV Industry: "Astonishingly High" Magnetic Fields Compliance Protocol Ignores Peak Pulses", *Microwave News*, 11th September 2025; Armstrong B et al., *Am J Epidemiol*., 1994; Peinado P et al., *Nature*, 2025; Murthy GPP et al., *Measurement*, 2026)

Names for EHS and The OneName Project

Dear Letters Editor, ES-UK

Re: The OneName Project

The proposed term "EMR-S" is still baffling to the unaware. Any new descriptive term needs to be one that already contains a word that all members of the public immediately recognise and have sympathy for.

Whilst waiting outside a local shop, due to being unable to tolerate the Wi-Fi within, I was asked by another customer why I was waiting there for my item. I replied that I was, "Allergic to Wi-Fi", which brought a gasp and expression of great concern for my wellbeing, as she said, "Oh goodness, how do you manage? – Wi-Fi is EVERYWHERE!" I have had similar responses from others when using this descriptive term "allergy".

The public understand the word "allergy" and are aware how life-threatening it can be for the sufferer. They don't question it or blame the victim. Not does it threaten their own lifestyle choices. Indeed, it has given me the opportunity to explain such effects as the increase in subdermal mast cells, similar to histamine release in other types of allergy. And I advise that this is occurring in EVERYONE, not just ES/EHS sufferers. That attracts some curiosity.

I propose a new OneName - "Electro-allergy". It is simple, self-explanatory, easy for non-believers to understand, and does not blame the sufferer since allergy is generally related to environmental allergens.

Perhaps ES-UK could run a proposal and take votes from the wider ES/EHS community with regard to such a name change?

With best wishes,
Janet Menage, M.A. M.B. Ch.B. (retired GP), Wales, UK
15th July 2025

Names for EHS. What do you think?

Do contact the Newsletter if you have ideas on names for EHS, the Editor writes. Do you think 'allergy', 'intolerance', 'biological effects', being a 'victim' or '(hyper)-sensitivity' are more accurate, more inclusive, and easier to understand?

The term 'Radiation' in EMR-S makes it an RF subset of EHS. The term 'Syndrome' sounds like an illness or deviant medical condition rather than an allergy, intolerance, or sensitivity.

OneName Project's 'EMR-S'

The OneName Project's definition of EMR-S:

"EMR Syndrome [EMR-S] is the new unifying name for a well-documented medical condition associated with exposures to electromagnetic radiation (EMR) and electromagnetic fields emitted by modern wireless technologies"

(Ruth F. Moss, Director of SafeTech Westchester (north of New York City) and founder of the OneName Project, "The OneName Project Summary" EMR Syndrome Alliance email, 1st August 2025).

EMP VICTIMS
Electromagnetic Pollution Victims

Like Asbestos … Discrimination … Abuse … Poisoning … the Plague

'From Silence To Strength:
Global Stories of EMF Sensitivity'

One-minute video testimonies of 18 people suffering the EMF Plague from seven countries.

What began as a European initiative — an effort to help elected officials and doctors understand that synthetic EMF is incompatible with organic biology — has become something much more. It's now a global movement, with over 4,375 *[20th November 2025]* signatories and 18 video testimonies that are capturing attention around the world.

What makes this effort different? No intermediaries. You see and hear directly from those affected. EHS victims speaking for themselves—in their own words, in short one-minute videos.

Together, these messages paint a vivid picture of what it means to live with EHS in the 21st century. One week later, now 31 video testimonies.

(Keith Cutter: "From Silence To Strength: Global Stories of EMF Sensitivity" *EMF Remedy*, 30th April 2025, 44 min.)

https://empvictims.org/

Video

Have you chosen your addressee?

EMP Victims invites you to send the international Appeal
"ELECTRO HYPERSENSITIVITY IS A HUMANITARIAN EMERGENCY"
to the personalities of your choice:
- elected officials,
- administrative managers,
- healthcare personnel,
- presidents of associations
- journalists and influential personalities...

Let us together build a body of legal evidence to advance the recognition of the toxicity of artificial Electromagnetic Fields.

To participate:
- Send the Appeal by registered mail with proof of receipt
- Send us proof of receipt.

We will add it to the list already published.

Living with an intolerance to wireless technology

By Janet Menage, GP (retired), Wales

BMJ 2025; 390:r1288, 23rd July 2025. Rapid response to: Living with an intolerance to medication. Link

Dear Editor,

Steven Comyns helpfully enlightens us about the stress of living with an intolerance to medication. What is often overlooked is a similar cohort of people who live with the difficulties incurred by intolerance to the RF EMFs generated by wireless technology. This ubiquitous 'Electrosmog' surrounds us all on a daily basis.

EMF expert Dr. Magda Havas estimates that 35% of the population now struggles with symptoms related to exposure to RF microwaves from wireless devices, such as Wi-Fi, smart-phones, tablets, smart-meters, and mobile phone masts, with 3-10% of people being "hyper-sensitive" –Electrical Hypersensitivity, EHS.

Symptoms include: fatigue, headache, insomnia, irritability, lack of concentration (brainfog), cardiac arrhythmias, tinnitus, low mood and other physical and neuropsychiatric effects (1).

Historically, it was thought to be a type of Microwave Sickness (2). In addition to tinnitus, there can be unilateral, high frequency hearing loss on the side of mobile phone use (3).

Mechanisms include effects on the blood and autonomic nervous system leading to enhanced sympathetic response and downgraded para-sympathetic response (ie. 'fight or flight') (4) (5).

The WHO radioprotection programme multi-national study on the effects of RF EMF exposure on cancer in laboratory animals revealed a high certainty of evidence for gliomas, malignant heart schwannomas, and moderate for lung carcinomas, phaeochromocytomas and hepatoblastomas (6).

The WHO's International Agency for Research on Cancer (IARC) designated EMFs a Class IIB carcinogen in 2011, but, following further evaluation, there is now sufficient evidence to reclassify it as a Class I carcinogen – ie similar to tobacco and asbestos (7).

Although there exists an ICD-10 code (W90) for exposure to RFR, the medical profession often appears unwilling to consider this as a possible environmental trigger for illness in their patients (8). One helpful clue is that patients have sometimes noted that their symptoms are associated with EMF exposure (eg using a mobile phone). They then feel well when away from the device but feel ill again on re-exposure (9).

Sometimes EHS sufferers are not taken seriously and there have been cases where the patient has been sectioned under the Mental Health Act for describing such an attribution of their symptoms (10).

One might wonder whether irrational acts such as driving into crowds of pedestrians might be influenced by driver irritability from exposure to high levels of in-vehicle wireless technology (11).

Whilst not universally medically recognised, EHS is a real, biological phenomenon, not a nocebo reaction. As doctors we all remember the misclassification of CFS/ME as "all in the head".

Intolerance to RF EMFs occurs not only in RFR workers and the military, but also the general public, who are increasingly surrounded by pulsed, polarised EMR at work, school and home (12). Indeed, the Swedish government has funded shielding in hospitals for patients so affected (13).

Let us hope that the medical profession is now willing to educate itself on this topic so as to be better able to serve patients. Since ample, good science is available (14) (15), there is no longer any excuse to passively accept the platitudes of the communications industry based on outdated, thermal standards.

(1)https://www.sciencedirect.com/science/article/pii/S0891061815000599?via%...)
(2) https://academic.oup.com/occmed/article-abstract/51/1/66/1422266?redirec...
(3) https://pmc.ncbi.nlm.nih.gov/articles/PMC3918279/
(4) https://pubmed.ncbi.nlm.nih.gov/24192494/
(5)https://www.sciencedirect.com/science/article/abs/pii/S019701861830634X?...
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(7)https://pubmed.ncbi.nlm.nih.gov/30196934/
(8) https://icd.who.int/browse10/2019/en#/W85-W99
(9) https://www.onedaymd.com/2023/07/the-unsettling-rise-of-microwave.html
(10) Personal communication
(11) https://www.bbc.co.uk/news/live/cn5xnlkegz0t
(12) https://pubmed.ncbi.nlm.nih.gov/17178584/
(13) https://www.eiwellspring.org/ehs/HospitalAccommodationsOfEHSPatientsInSw...
(14) https://bioinitiative.org/research-summaries/
(15) https://pmc.ncbi.nlm.nih.gov/articles/PMC7139347/

THE 'CAPTURED' WHO's FLAWED REVIEWS

The mainstream independent **International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF)** has published a comprehensively damning critique of the WHO's 11 seriously flawed reviews. The exception was one without an inappropriate meta-analysis wrongly aggregating different types of studies. This found 'high certainty of evidence' for cancer. This study, with other evidence, can help replace the WHO's agency ICNIRP's unprotective short-term thermal limits with long-term non-thermal limits.

"Due to serious methodological flaws and weaknesses in the conduct of the reviews and meta-analyses on health effects of RF-EMF exposure, the WHO-commissioned Systematic Reviews (SR) cannot be used as proof of safety of cell phones and other wireless communication devices.

However, the animal cancer SR, which was rated as "high certainty of evidence" for heart schwannomas and "moderate certainty of evidence" for brain gliomas, provided quantitative information that could be used to set exposure limits based on reducing cancer risk.

The multiple and significant dose-related adverse effects found in the SRs on male fertility and pregnancy and birth outcome should also serve as the basis for policy decisions to lower exposure limits and reduce human reproductive risks.

The report of harmful effects (e.g., cancer, reproductive toxicity, etc.) at doses below the adverse health effect threshold claimed by ICNIRP demonstrates that current exposure limits to RF-EMF, which were established by applying arbitrary uncertainty factors to their putative adverse threshold dose, lack scientific credibility." *[red colour highlight added]*

(Melnick RL et al.; International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF): "The WHO-commissioned systematic reviews on health effects of radiofrequency radiation provide no assurance of safety" Environ Health, 2025. Link)

WHO Reviews 'Failure'

For close to 15 years, the WHO has been struggling to set out its views on the health effects of RFR. It hasn't been going well, and it just got worse. All but one of the 12 RF systematic reviews receive a failing grade from the ICBE-EMF, which issued a public warning: What the WHO has accomplished to date is so flawed that it should scrap what's been done and start afresh.

This would not be the first time the WHO went back to square one on RFR. In 2014, after two years of preparation, the WHO released a draft of a new RF–health assessment (EHC), but soon afterwards the project was quietly shelved.

(L. Slesin: "WHO Gets an 'F' on RF: ICBE-EMF: Health Reviews Suffer from Faulty Analysis & ICNIRP Bias" *Microwave News*, 3rd Oct. 2025)

WHO Reviews: 'numerous flaws'

"We uncovered numerous flaws, including the exclusion of relevant studies, reliance on weak studies, inappropriate combining of studies ... and undisclosed biases among the authors," stated Ron Melnick, the lead author of the ICBE-EMF critique.

WHO authors' ties to the wireless industry

ICBE-EMF published a supplemental document with examples of the WHO review authors' ties to the wireless industry (Link) and called for a "thorough and more independent review".

WHO Reviews: 'simply inadequate'

"The WHO-commissioned systematic reviews are simply inadequate to conclude that wireless radiation is safe," ICBE-EMF Chair John Frank, a physician and epidemiologist at the University of Edinburgh and professor emeritus of public health at the University of Toronto, said. It would "mislead the public" to present the WHO's reviews as evidence that current wireless radiation exposure guidelines are safe, he said.

WHO reviews 'improperly combined studies'

ICBE-EMF reported that the WHO reviews' authors excluded relevant studies, relied on weak ones and improperly combined studies with widely differing exposure conditions. These methodological flaws skewed the reviews' conclusions.

Dr Moskowitz said leading experts warn against mathematically summarizing study findings when the studies are too few or too different. Instead, reviewers should describe the studies in words, as a narrative review, not a numerical meta-analysis.

Additionally, ICBE-EMF published a supplemental document explaining how most of the reviews yielded unreliable results (Link).

(Suzanne Burdick: "Scientists Say WHO Reviews Downplay Risks Linked to Cellphone Radiation" *The Defender*, 16th October 2025)

READERS' COMMENTS

Switched off mobiles – but still active!

"My family were staying. They are all careful over mobiles because of my ES. However, after agonising pain, we discovered a mobile phone in a bag some rooms away had been switched off, to help me. However, it was emitting sharp frequent spikes of radiation. Only on airplane mode did the radiation spikes stop. All very embarrassing!"
[With a battery still inside, 'off' is now only for some software, but not for all hardware. Use a tin? – Ed.]

LED lights: terrible pains

"I was on an Airbus A320 and couldn't work out why I was in such agony. When I switched off the LED reading lights, very soon all was fine."

Image by Daniel Agrelo from Pixabay

'It's time to ban mobiles and masts'

"I was finishing a meal with family in a restaurant and suddenly had a nasty headache and I couldn't think straight while chatting. I looked around to see the cause and finally noticed someone was using his mobile at a nearby table. It's time for the government to ban mobiles and masts."

Airbnb: Switching off Wi-Fi

"When booking Airbnb, I always ask whether I can switch off the Wi-Fi at night. It's easy where the router switch is accessible. One Airbnb specially installed a switch since the router was in the loft. I've been caught by electric heaters with difficult Wi-Fi controls and TVs with Wi-Fi."

Avoiding Airport Security Scanners

Millimeter scanners use non-ionising RF-EMF and X-ray scanners use ionising EMF. You can refuse scans and opt for a traditional pat-down.

Three reports of how people avoid scans:

- "I ask for a pat-down because of my disabling neurological condition. I don't use a letter because no one needs a letter to be recognised as having a disability, as with vision, hearing or mobility disabilities, although I usually wear a 'Invisible' or 'Hidden' Disability' lanyard."
- "I got through airport security without any request to be screened. I showed the security staff the paperwork. The 'opt out' regulations seemed not to convince them but showing them Michael Bevington's letter did the trick ["Intolerance to Electromagnetic Radiation"', stating: "this person suffers from Intolerance to Electromagnetic Radiation ...", available on ES-UK website Resources at §6.1], and the woman in security said that she had heard of the condition."
- "As well as my doctor's letter, I also wear the 'Invisible' or 'Hidden' Disability' lanyard and go through the Disabled Channel. This is recognised and works well at any airport."

[Green cards and lanyards are for Sensory Perception Disabilities – Ed.]

Irradiated friends

"Twice after we've had friends round at home for the evening. I've suffered my usual sensitivity symptoms some 10 hours later, although they were not using mobiles. However, they had been exposed to lots of Wi-Fi and mobile radiation, giving their bodies stronger EM fields than usual."

Nausea from an invisible mobile phone

"One afternoon I was in a small museum with few other visitors. I was suddenly hit by very powerful nausea typical of EHS. I had no idea why. I was feeling awful and sure I'd be sick so I headed to the exit. On the way I passed someone previously invisible to me behind a tall display

case using her mobile phone. When she had left that room I felt perfectly healthy again."

Wired two-step verification

"For two-step verification and one-time passcodes (OTP) on my wired laptop, without using a mobile phone, I receive either (a) landline telephone calls (e.g. banks, NHS and other logins) or (b) use an online 'Step-Two' downloadable verification App on my laptop for the OTP (e.g. Patient Access). When necessary, I've explained that I don't use a mobile for health reasons."

COPPER LANDLINES

Copper landlines to 31st January 2027

BT has postponed the deadline for replacing old copper landlines with digital phonelines to 31st January 2027. BT has agreed more time is needed for vulnerable customers. Up to two million customers rely on personal health or emergency alarms which have not yet been adapted to fibre cables which require an electricity supply even during a power cut.

To gain a year, inform BT if you are a vulnerable customer and do not want a fibre cable and prefer to keep your copper wired connection. Do not allow BT to bully you into submission early. No proof is necessary. Previously anyone over 70 could be classified as vulnerable but this has been changed to include people of any age. Examples of vulnerability could include claiming disability allowance or being anxious about the switch. This includes people living in remote areas prone to power cuts and with no mobile reception. Contact BT on 0330 1234 150, and try to speak to someone, pressing 1,1,5, and simply say 'I am a vulnerable customer' and explain why you don't want to switch. The 1.5 million people not wired up to the internet may be able to keep using their old landlines until 2030 if they live in an area without fibre optics.

(Toby Walne: "Five magic words you must say to BT if you DON'T want to switch to a digital landline" *Daily Mail*, 22nd May 2024)

IN MEMORIAM

George Parker (26th May 1943-1st August 2025)

"Having endured more than twice the 40 years of EM suffering that I have experienced, I stand in admiration of the way he constantly and generously shared his journey and knowledge with others."

"He was such a lovely, caring, intelligent and wise man. I know he is in a better place now, with his beloved Joan and has the peace he so longed for...he only wanted to be left alone by the EMFs, but it just never happened. Rest in peace my fellow EMF warrior."

"He was a true gentleman, courageous to the end."

(Keith, Liz and Cheryl, on Keith Cutter, *EMF Wisdom*, 1st August 2025)

Meris Michaels (-19th June 2025)

Our beloved Meris Michaels lived in Geneva and participated in all the battles that helped publicize the Phonegate health scandal, even before the creation of Phonegate Alert (2018). Meris was American. She voluntarily translated thousands of articles from French into English. She helped Dr. Marc Arazi translate his book *Phonegate* into English. Meris, thank you for your kindness, your light, and for who you were—a truly beautiful person. (Linda Orr-Easo: "Hommage à Meris Michaels qui vient de nous quitter" *Equipe Phonegate*, 20th June 2025)

DEVICES AND IMPLANTS

AirPods and auditory processing disorder

For AirPods 4, the SAR of the left earbud, which talks to the mobile and to the right earbud, is 1.19, and of the right 0.11 W/kg (averaged over 1g., back facing the phantom). Some AirPods 4 have Active Noise Cancellation. RFR can affect the body's calcium channels, nervous system, and can trigger anxiety. Many teenagers have unexplained headaches or difficulty in concentrating. Symptoms like tinnitus stop when they stop using wireless earbuds, as Dr. Stephanie McCarter noted. Renee Almeida, an adult audiology clinical lead at Imperial College Healthcare NHS Trust, said that "We can see that listening skills are suffering" and that there is a surge in auditory processing disorder – where the brain has trouble understanding sounds and spoken words.

[The brain's left hemisphere controls comprehension, speech and logical thinking. Adverse neurological effects occur well below AirPods' RF levels – Ed.]

Joel M. Moskowitz: "AirPods: Are Apple's New Wireless Earbuds Safe? (Blood-Brain Barrier research)" *Saferemr.com*, 13th Jan.2025; "Could airpods damage your child's hearing? experts say…" *MovieGuide*, 9th April 2025)

Apple Watch: 'burn marks and blisters'

Thousands of people with Apple Watches are reporting circular burn marks randomly appearing on their wrists, ranging from red skin to seeping blisters. One customer wrote: "I've had my watch for over two years and have only recently started getting burn marks on my arm from wearing it." Another said: "I've been wearing my watch for almost three years now. I woke up when it happened and felt that my watch was very hot. My skin turned leathery over the reddened part." Apple told many it was an allergy or cleaning problem. One wearer wrote: "The mark was exactly under one of the sensors." Some did not believe the marks were an allergic reaction and claimed doctors had said they were burns.

(Andrew Ellison: "Apple Watch wearers report 'burn marks and blisters'" *The Times*, 20th January 2024)

Intraocular lens implant (IOL) and graphene

Ann, a supporter of ES-UK, reports that she tried to research ahead of her cataract operation whether intraocular lens implants (IOL) contain any graphene. This is not listed in the Bausch & Lomb leaflet. Graphene is an electrical conductor which she thinks could increase her EMF reactivity. Ann discovered in 2012 that she was EHS when she switched on her new Wi-Fi-enabled printer and experienced pressure in the chest and ears, which went away when the printer was switched off. The same had happened two years earlier with an electronic mouse-repelling device. She had seven mercury fillings removed, which improved her health, but she is still hampered with no-go zones in public areas because of Wi-Fi and mobile phones. She believes that wireless technology should be saved for essentials. She refuses Wi-Fi gadgets in her home, uses a landline and does not have a 'smart' phone.

Scanners, Bluetooth, inverters, etc.

Dave Bourke from Australia reported that when he was diagnosed with EHS, his doctor mostly followed Belpomme's & Irigaray's diagnosis procedure (*Int J Mol Sci*., 2020). Some tests came back too high or too low, others "normal". He improved within weeks but relapses when over-exposed.

He cleaned up his EMF environment and also wears a shielded hat or beanie most of the time, and sometimes also shielded shirt, unless dirty electricity or ELF is high or he is in a very low RF area like the countryside. He still cannot be in high exposure areas for more than a short time without planning several days afterwards to recover, but it's a lot better than 4 years ago.

His worst exposures are mm-wave security scanners at airports, bluetooth/FSK devices, VLF DE from inverters, smart watches and super-market fridges and smoke alarms. On a bad day, in traffic he can feel alternators, ignition coils and spark plugs in his car and cars around him, which is a sign to go to the countryside for a day off.

LIMITS and SAFEGUARDING

Updated IGNIR website

The International Guidelines on Non-Ionising Radiation's updated website https://ignir.org. provide science-based advice and guidance on health and environmental effects of man-made EMFs and EMR. It has links to key documents, Compliance Forms for EMF Surveyors, EMF Appliances, Homes and Schools.

Setting the RFR safety limit

The Spring 2024 Newsletter noted a proposed NOAEL of 0.05 V/m. This gives a public health safety limit 10 x lower of 0.005 V/m. Based on genotoxicity and RFR's enhancement of gamma radiation effects, Dr Panagopoulos suggests:

Short term: 1,000 µW/m2 = 0.6 V/m

Long term: 10 uW/m2 = 0.06 V/m

Mobile genotoxicity compared with gamma radiation shows the ICNIRP RF limits are ~45,000 times less stringent than gamma EMF limits.

(Panagopoulos DJ: "Mobile telephony radiation exerts genotoxic action and significantly enhances the effects of gamma radiation in human cells" *Gen Physiol Biophys*., 2023)

Exposure levels: 'captured' study's 'no change' or independent's 'increase'?

A study by authors including Wiart of Télécom ParisTech, Huss and Röösli of the 'captured' private group ICNIRP and Dongus author of one of the much-criticised WHO reviews, claimed that their measurements did not indicate change in of RF-EMF outdoor exposure levels 2016-2023 despite increased mobile data by 8 times.

In contrast, a study by independent authors found that monitoring August 2022 to October 2024 in Greece's five largest cities "indicated a gradual increase in EMF exposure at 3.6 GHz, driven by the growing penetration of 5G infrastructure and devices. Notably, this band exhibited higher maximum-to-median power density ratios compared to other frequency bands, attributable to active antenna systems' characteristics and traffic variations. … 30-min averaged values significantly reduced these variations. …"

(Beláčková, L., et al., Temporal Change of Outdoor RF-EMF levels … , *Environ Res*. 2025; Iakovidis S et al, 5G EMF Exposure at 3.6 GHz in Greece Using Data From Frequency-Selective Monitoring Sensors, *Biolelectromagnetics*, 2025)

Hawai'i County: mast setback for homes, schools

Hawai'i County, the Big Island, has limited how close cell towers may be to homes and schools. "The passage of Bill 24 is a notable victory because, to my knowledge, Hawai'i County, with a population of over 200,000, is the largest community in the U.S. with 600-foot installation setbacks," said Environmental Health Trust Legal Fellow Zoe Berg. In many zones the towers must be placed more than 600 feet from homes and schools and at least 120% of the mast's height.

(EHT: "Hawai'i County Passes Law Keeping Cell Towers Away from Homes and Schools" *EHT*, 10th July 2025)

RF & 5G: young 'particularly vulnerable'? Cancer

The UK and EU Horizon project GOLIAT (5G expOsure, causaL effects, and rIsk perception through citizen engAgemenT) aims to monitor RF-EMF, provide novel insights into its health effects, and understand how exposures and risks are perceived and best communicated. GOLIAT is led by Mònica Guxens, a Barcelona epidemiologist. It runs 2022-2027, with hubs at Exeter and Bristol. Some authors are linked with 'captured' ICNIRP. So far only healthy young adults have been tested, not the ill, pregnant, elderly, EHS or children.

The UKRI website states that "Particularly vulnerable populations may include young people and workers in industries where 5G is deployed."

However, Frank de Vocht, a Bristol epidemiologist formerly chair of the UKHSA's COMARE subcommittee on EMFs and now a commissioner of the 'captured' clique ICNIRP, said "there is likely little reason for concern".

Yet, in 2025, a WHO review confirmed that RF-EMFs cause cancer, as known since 1953.

(Mevissen M et al, *Environ Int*., 2025; UKRI: "Understanding the possible effects of 5G on our health" *UKR*, 4th September 2024)

UK Research and Innovation GOLiAT

Understanding Electromagnetic Hypersensitivity (EHS)

Published in Open Access Government, *January 2025, Edition 45, pp.58-59*
https://www.openaccessgovernment.org/article/understanding-electromagnetic-hypersensitivity-ehs/186204/

Electromagnetic hypersensitivity: Michael Bevington, Chair of Trustees at Electrosensitivity UK, explains the health risks associated with exposure to radiofrequency radiation and electromagnetic fields and why more robust action is needed to protect public health

Electromagnetic Hypersensitivity (EHS) is a physical reaction to radiofrequency radiation (RFR) and electromagnetic fields (EMFs). These come from mobile phone masts, mobile phones, Wi-Fi, Bluetooth, smart meters, and similar devices, as well as power lines and electric motors.

Typical short-term symptoms are headaches, dizziness, brain fog, memory loss, muscle pains, heart palpitations, anxiety, depression, nosebleeds and skin rashes. Long-term symptoms, often subconscious, range from cancer and infertility to neurological and cardiovascular harm.

Short-term symptoms cease when the RFR and EMFs causing them are removed. Long-term symptoms can be irreversible.

Identifying the effects of Electromagnetic Hypersensitivity

One problem in recognising EHS is measuring RFR and EMFs when no one can see them, and few can feel them. Consequently, it can take years for someone to link their symptoms to these exposures. Perhaps 95% never make this link, especially where RFR and EMFs are synergistic with other pollutants such as air particulates or chemicals.

Another problem is cumulative and delayed effects. People with EHS may not react immediately but over hours, days and weeks as their bodies become increasingly 'hyper' sensitive. Genomic changes may take years to appear.

Image by Gordon Johnson from Pixabay

Thirdly, effects can be different on different occasions. Thus, temperature changes, having eaten or being hungry, time of day, and humidity can all cause different effects from specific RFR or EMF exposures.

Fourthly, most effects are subconscious. Frequency and amplitude RFR modulations produce low-frequency effects. Plant sensitivity to geomagnetic disturbances from the 11-year sunspot cycle was recognised 200 years ago, and human sensitivity more recently, where changes in magnetic fields can affect every cell membrane. People with EHS can react to increases of five nanoTesla (nT) in a man-made magnetic field of, say, 12 nT. Although many cancers are subconscious, people with EHS may feel acute symptoms around the affected tissues for cancers affected by RFR or EMFs.

Fifthly, the mechanisms are complex. Animals use geomagnetic fields for navigation, involving quantum processes, such as the radical pair mechanism, in cryptochromes and biomagnetite, also found in humans. Downstream pathways include voltage-gated channels, iron levels and compromised myelin.

Quantifying and diagnosing people with EHS

All human brains appear sensitive to natural EMFs. In the theta range, these include the Schumann Resonance, which encircles the earth at 7.83 Hz and is linked with sleep and decreased anxiety.

For man-made RFR and EMFs, there is a wide spectrum of sensitivity. Children's neurological development is especially sensitive, and autism has been linked to prenatal exposures. Some 20% of people do not appear to react consciously, whereas some 30% can have specific conscious reactions, like sensitivity to light, an EMF, especially LEDs and CFLs, or painful ears when using a mobile but not a corded phone at nonthermal levels. About 3% of the population is moderately affected, and 1.6% is severely affected. An estimated 0.65% have restricted access to work unless accommodations are made.

Some genetic haplotypes are nearly ten times more common in people with EHS. Some viruses and high exposures from phone masts, smart meters, or Wi-Fi installations can also trigger hypersensitivity.

Physicians experienced in assessing people with EHS make a diagnosis through a full clinical history. Physical markers can also help, such as fMRI scans showing brain damage, pulsed ultrasound tomosphygmography scans showing changed cerebral blood perfusion and a few individualised but common markers, such as reduced melatonin and increased histamine, indicating oxidative stress, chronic inflammation and mitochondrial dysfunction.

Image by David Zydd from Pixabay

Solving the challenges of EHS

The first need is a greater awareness of electromagnetic hypersensitivity. Both ICNIRP and ICBE-EMF found that some people, but not all, are particularly vulnerable to EHS symptoms. The Scientific Consensus International Report on EHS by 32 worldwide experts confirmed that EHS is a 'distinct neuropathological disorder'. It also stated that 'there is no proof that EHS symptoms or EHS itself are caused by psychosomatic or nocebo effects', contradicting the WHO's arbitrary decision in 2004 to conflate physical EHS with a different, psychological condition. By averaging test results without individual positive reactions, those supporting the wireless industry deny the existence of EHS, still clinging to Schwan's invalidated myth of 1953 that the only adverse effects of RFR are thermal, through heating the body one degree averaged over six or 30 minutes. In fact, EHS was first described in 1746 and established in 1932, and the symptoms, first recorded in 1733, can occur in children and unaware adults without prior psychological conditioning.

Secondly, the equality rights of EHS people to a safe environment for living and working need further protection. Some people badly affected by EHS are forced to live in forests or wildernesses if they can find areas free of RFR or forced to stop working and visiting towns, family, and friends. Since 2001, some courts worldwide have required the removal of smart meters and masts and specified schools free of Wi-Fi and mobiles for children with EHS.

Thirdly, nonthermal limits are needed. Some countries still use ICNIRP's heating-only limits, which do not protect against long-term non-thermal effects like EHS and cancer. Thus, under heating limits, eight case studies in Sweden showed that some, but not all, people suffered EHS symptoms within days from 5G masts activated near their homes or workplaces. The symptoms stopped when they moved to areas with less RFR. Protective non-thermal international limits like Bioinitiative 2012, EUROPAEM 2016 or IGNIR are needed. These nonthermal public limits should be below the RFR 'No Observable Adverse Effect Level' (NOAEL) of ~0.05 V/m.

Fourthly, RFR needs an updated cancer classification. At present, both EMF and RFR are 2B possible carcinogens. Leading experts state that new evidence requires RFR to be reclassified as a class 1 known carcinogen. Indeed, since the 1990s, insurers have refused underwriting except as high risk like other cancer agents such as asbestos. RFR replacements could include infrared and Li-Fi technology if proved safe. Above all, medical training and public health regulation need greater awareness of manmade environmental RFR and EMFs. These affect every aspect of human life, especially for those with electromagnetic hypersensitivity.

Image by Gordon Johnson from Pixabay

ELECTROSENSITIVITY: KEY FACTS

Electrosensitivity is being physically affected by electric, magnetic and electromagnetic fields (EMFs), *e.g.* RF, voltage transients ('dirty electricity', VLF), power lines and ELF.

- **Radio frequency radiation** (RFR) and ELF EMFs are emitted by mobile phones, phone masts, Wifi, smart meters, Bluetooth, Fitbits, radio and TV masts etc.
- **Voltage transients** ('dirty electricity') and very low frequency can be emitted from induction cooker hobs, battery chargers, CFL and some LED lights etc.
- **Power lines** (extremely low frequency EMFs) produce electric and magnetic fields, like transformers, electric motors, hair dryers, shavers, washing machines.

Electrosensitivity is a spectrum condition:

- Everyone is electrosensitive since all cells in the body can react subconsciously to magnetic and electric fields and RF EMFs.
- Some people are more consciously sensitive to EMFs than others.
- Some people are hypersensitive, severely disabled by EMFs.

Electrosensitivity is also called:

- EMF-Biological Effects: EMF Syndrome
- EMF Intolerance Syndrome
- *[RF]* Electromagnetic Radiation Syndrome
- *[RF]* Microwave / Radio Wave Sickness

Electrosensitivity covers a wide range of conscious and subconscious reactions, like other environmental allergies or sensitivities, such as to particular foods, pollens or amounts of sunshine.

- The conscious adverse symptoms of Electrosensitivity (ES), like headaches, physical weakness and muscular pains, were first recorded from 1733 by scientists researching the effects of electricity.
- More disabling Electromagnetic Hypersensitivity (EHS) was first recorded in 1746.
- In the 19th and early 20th centuries telegraph lines, electricity supplies and radio caused conscious symptoms among workers. Simultaneously, most people were affected subconsciously by the 'diseases of civilisation'.
- Since then, conscious effects, and subconscious ones like disturbed sleep, cancers, infertility and heart problems, spread more widely, with computers, mobile or cordless phones, Wifi and smart meters.

SOLUTION: removal of man-made RF/EMF exposures causing intolerance

HISTORY: SCIENCE

1733: ES: non-thermal adverse symptoms, EMF
1746: EHS: hypersensitivity specific symptoms, EMF
1893: ES: specific non-thermal adverse symptoms, RFR
1926: RFR non-thermal lethal effects on some mice
1930: Non-thermal effects primary, heating secondary
1932: EHS: hypersensitivity specific symptoms, RFR
1945: Military use of non-thermal RFR in warfare
1953: Cancer, an ES symptom, from non-thermal RFR
1991: ES shown in provocation tests, screened subjects
1995: RF causes DNA breaks, which can lead to cancer
2000: More brain tumours on side of head near phone
2002: More ES symptoms near mast than further away
2003: Risk of cancer x 3 nearer mast than further away
2014: Genetic variants associated with EHS
2015: Cerebral blood hypoperfusion in people with EHS
2017: 3d fMRI: EHS brain harm; RF antibiotic resistance
2018: NTP study confirms mobile phones cause cancer
2019: Subconscious human magnetoreception shown
2021: Scientific Consensus by 32 Experts on real EHS
2022: Ecological study confirms proof of EHS
2023-24: Health studies: EHS symptoms near 5G masts
2024: NOAEL-based safety limit: 0.005 V/m proposed
2024: Mobile phones linked to prostate and skin cancer
2024: Phone masts cause unrepairable genetic damage
2025: WHO review: 'high certainty' RF causes cancer

HISTORY: REGULATORY

1935: 1st RFR guidelines USSR: non-thermal & thermal
1957: US 'conspiracy' imposing Schwan's thermal myth
1968: US law: public must be protected from RF/EMF
1974: Health & Safety at Work Act protects ES workers
1990s: Insurers: RFR high risk only, like cancer asbestos
2001: WHO/IARC classifies ELF as a 2B cancer agent
2001: Geneva: mast dismantled, residents compensated
2002: WHO/ICNIRP recognise 'sensitive' ES people
2006: UK employers remove RFR for ES people
2007: UK £15k compensation for EHS discrimination
2009: EU Parl.: biological, not ICNIRP heating, limits
2009: EU Parl.: protect EHS and grant them equality
2010: Equality Act protects people disabled by ES
2011: WHO/IARC classifies RFR as a 2B cancer agent
2012: NHS consultants and GPs diagnose physical ES
2012: Courts accept ES and award compensation/fines
2013: H&SC Act: local authority duty to improve health
2017: US city stops phone mast after cancer cluster
2019: France: smart meters removed for health reasons
2021: US Court: FCC must assess non-thermal effects
2021: Court: ES person is interested party in siting mast
2022: US city bans phone mast after ES symptoms harm
2022: UK court: removal of Wifi/phones for EHS person
2022: US: $187,300 for RFR injuries to Havana officials
2024: EMF light sensitivity: LED streetlights replaced

ELECTROSENSITIVITY: KEY FACTS

Radio Frequency Radiation *(3 MHz – 300 GHz)* ***Adverse Biological Effects and Limits*** *NB: Specific frequencies not listed* Firstenberg, *Some Biological Effects of Radio Waves*, 2022; Powerwatch.		μW/m²
Cosmic Background Level, ~1,800 MHz		~ 0.0000000001
Genetic alterations– E.Coli		0.000000001
Natural Background Level, all frequencies		0.000001
Human sensitivity		**~ 0.000001**
	Altered EEG	0.00001
	Immune effects - mice	0.0001
International Scientific Limits, Bionitiative, Building Biology, EUROPAEM, IGNIR, Seletun, etc.		≥ 0.1
Adverse Biological Effects	Conditioned 'avoidance' reflex – rats	0.1
	Premature aging - pine needles; smaller growth rings - trees	0.24
	100 yards from home Wifi	4
	Disturbed sleep, abnormal blood pressure, digestive problems, weakness, pain, anxiety	20
	100 yards from a mobile phone, peak power	40
	1 mile from a mobile phone mast	1 –100
	Disturbed metabolism, changes: EEG, heart liver, spleen, testes, brain: rats, rabbits	600
	Irreversible infertility - mice	1,680
	Childhood leukaemia, <12 km from TV mast	2,000
	Impaired motor function, memory and attention; altered sex ratio (fewer boys)	3,000
	Blood-brain barrier impaired by mobile phones	4,000
	Altered calcium flux in brain tissue	6,000
	Tinnitus, buzzing and other auditory effects	20,000
	Leukaemia, skin melanoma and bladder cancer, near TV and FM mast	50,000
	Head and chest exposure from a laptop on a table	80,000
	Metal redistributed in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin	100,000
	Head and chest exposure from a mobile phone on a table	1,500,000
	Mobile phone against the brain; laptop on the lap exposure to genitals	17-20,000,000
	ICNIRP: Arbitrary, unscientific, unprotective, thermal limits, averaged 6 or 30 min.	≤40,000,000

ELF EMF Biological Effects and Limits *(Bevington, 2013, p.48, Table 7, Link)*			
Background Level (earth's static MF: 22,000-67,000 nT)		0.0001 V/m	0.0002 nT
Sandbar Sharks: behavioural threshold (Crawford et al, 2024)		0.2 nV/m	
Human subconscious sensitivity	Aurora Disturbance (solar flare)		0.0004 nT rise/fall at 0.0013 nT
	Schumann Resonance		0.05 nT
	*Transmembrane, **retina effects (Attwell, 2003)	*0.6μV/m,**10mV/m	>100 nT diastolic BP (Dimitrova,2004)
Human conscious sensitivity	Power lines (some EHS people)		~5 nT rise/fall at ~7 nT
IGNIR 2018 limit, for children, elderly and EHS *(*excluding MRI etc.)*		1 V/m (average)	*100 nT
Below/*100m from 400 kV overhead power line (Swiss, 2005; RPS, 2014)		~5,000 / *0.24 V/m	*210 nT
Childhood Leukaemia: Relative Risk x 3.8 (Feychting et al, 1993)			≥ 300 nT
ICNIRP 1998 limit, 50 Hz		5,000 V/m	200,000 nT

ABBREVIATIONS

ASSESSMENTS
EIA environmental impact assessment
HRA health risk assessment

CONDITIONS
CFS chronic fatigue syndrome
EHS electromag. hypersensitivity
EI environmental intolerance
ES electrosensitivity
FI functional impairment
HS Havana (EHS) Syndrome
MCS multiple chemical sensitivity
ME myalgic encephalomyelitis
MS multiple sclerosis
MWS microwave sickness

DEVICES
ATA analogue telephone adaptor
CFL compact fluorescent light
LED light-emitting diode
ONT optical network terminal
SM (wireless) smart meter

METRICS
m:milli 10^{-3}; μ:micro 10^{-6};n:nano 10^{-9};p:pico10^{-12}
k: kilo 10^{3}; M: mega 10^{6}; G: giga 10^{9}; T: tera 10^{12}

NON-THERMAL
Frequencies (F):
ELF *extremely low frequency*
VLF *very low f.*, VHF *very high f.*
UHF *ultra high f.* *(microwave)*
Hz *Hertz (one cycle per second)*
kHz *kiloHertz*, MHz *megaHertz*
GHz *gigaHertz*, THz *teraHertz*

Magnetic fields: mG. *milliGauss*
μT, nT *microTesla*, *nanoTesla*

Electric fields, transients:
V/m Volts per metre
G-S Graham-Stetzer *(transients)*

NON-THERMAL & THERMAL
dBm decibel-milliWatts *(each 3: x2)*
μW/m² microWatt per metre squared *(power density)*

THERMAL
SAR specific absorption rate *(heat)*
W/kg Watts per kilogram *(SAR heat)*

PHYSICAL AGENTS
CME coronal mass ejection *(geomagnetic disturbance)*
GEC global electrical circuit *(atmospheric electricity)*
EF electric field
MF magnetic field
EMF electromagnetic field
RFR radio frequency radiation

PRINCIPLES
ALARA as low as reasonably achievable
HC10 harmful concentration at 10%
HFP health first principle
NDP non-discrimination principle
NET no effect threshold
NOAEL no observable adv. effect level
PP precautionary principle

ELECTROSENSITIVITY: KEY FACTS

CONSCIOUS SPECIFIC SYMPTOMS

- Anxiety
- Asthma
- Cancer
- Confusion
- Cramp
- Depression
- Diarrhoea
- Dizziness
- Fatigue
- Hair loss
- Headache, brain pain
- Heart palpitations
- Indigestion
- Irritability
- Light sensitivity
- Memory loss
- Menstrual changes
- Muscle/nerve pains
- Nausea
- Noise sensitivity
- Nosebleeds
- Restless legs
- Sinusitis
- Skin rashes
- Sleep disturbance
- Smell sensitivity
- Thirst, Tics, Tinnitus
- Visual effects

SUBCONSCIOUS SYSTEMIC EFFECTS

- Brain wave changes (alpha); Chromosomal aberrations
- Cancer: bioelectrical dysregulation, DNA breaks
  - e.g. brain, breast, prostate, skin, thyroid
- Cell cycle disturbance, mitochondrial dysfunction
- Cell membrane depolarisation, ion channel effects
- Fertility reduced, changes in offspring, more females
- Heart: changes to rate, variability, cerebral perfusion
- Immune system: chronic inflammation, oxidative stress
- Nervous (peripheral and central) system effects:
  - Demyelination, axonal and microglia, PIEZO 1/2
  - Hippocampus: enzymes, proteins
  - Hormonal: cortisol, testosterone
- Skin: mast cell degranulation, allergic sensitivity

CAUSES

- Bluetooth, TETRA, Wifi
- CFLs, LEDs, transients
- Cordless DECT phones
- Mobile phones, masts
- Powerlines, transformers
- Smart meters, Fitbits

MECHANISMS

- BBB. Cilia. Hairs. Cryptochromes
- Demyelination. DNA damage
- Genetic variants. Glial/synapses
- Magnetite. NALCN. Pineal gland
- Radical Pairs. Retina. ROS. SCN
- Voltage-gated ion channels (VGIC)

PATHWAYS *(like some Ultrasound effects)*

- Antioxidant glutathione. Metabolism
- GABA. Hormones: melatonin, thyroid
- LDLox, oxidative stress (like ionising rad.)
- Metal implants, dental amalgam, fluoride
- Protein expression: ERK, Hsp70, p53 etc.
- Signalling: Ca, CaSR, NMDA, T cells, TGF

FUNCTIONAL IMPAIRMENT AND EHS SYMPTOMS

- Electrical Hypersensitivity (EHS), established since 1746, is an environmental systemic spectrum syndrome.
- EHS is caused by the person's exposure to RFR/EMF.
- EHS disables people with a range of symptoms which vary as the condition and its causes change in severity.
- Symptoms are disabling, causing functional impairment under the Health & Safety 1974 and Equality 2010 Acts.

EHS SYNDROME: CLINICAL DIAGNOSIS

- Clinical history: cause/effect from exposure/symptoms.
- The absence of symptoms when the RFR/EMF source is removed (positive reverse provocation testing).
- Multiple biomarkers, but only a few may be elevated or suppressed, depending on RF/EMF toxicity; GC-MS.
- Brain blood perfusion and 3d fMRI scans, where the potential benefits outweigh health risks of an MRI scan.

PREVALENCE IN UK 67m POPULATION

- 0.65%, 435,500 people: work restricted because of EHS
- 1.2%, 800,000 people: severe electrical hypersensitivity
- 3.6%, 2.4m people: moderate electrical sensitivity
- 100% subconsciously sensitive, 80% chronic inflammation

TREATMENT: AVOIDANCE OF RFR/EMF

- Avoid RFR: e.g. masts, mobiles, smart meters, Wifi
- Keep: 10m from mobiles in use, 100m from Wifi
- Live: 500m from masts, 600m from powerlines
- Protect sleep: e.g. military nets, shielded rooms.

NON-IONISING (RFR/EMF) and IONISING RADIATION

Both cause oxidative stress and cancer; sensitivity varies.
24 hours of mobile phone harms DNA like 1,600 X-rays.
Both: primary non-thermal effects, thermal secondary.
Both: hormetic (change low/high dose), no threshold.
MFs engender genomic instability like other carcinogens, such as ionising radiation and chemical carcinogens.

NATURAL RFR/EMF EFFECTS

All life in the Earth's biosphere is electrically sensitive to natural geomagnetic and global electrical circuit changes at levels far below most man-made electrosmog. An EMF increase of 20-30% triggers health effects via VGIC.

EHS HEALTH EFFECTS CAUSED BY EMFs, NOT HEAT

No experiment proves that EMFs below Infrared involve quantized photons, meaning EMFs, not heat, cause EHS.

RESEARCH INTO ES AND EHS

ES research started in 1730 at the Royal Society, London.
Centres for research into ES and EHS include:
ARTAC Paris, Breakspear Herts, EMC Dallas USA, DARPA Caltech USA, HUSM Lleida, CES Moscow, UC San Diego USA, Toronto WCH, JMU Virginia USA.

ICD-10 CODES

- ICD-10: W90.0 (RFR); W90.8 (ELF); Z58.4 (radiation).
- EHS, known since 1746, does not have an ICD-10 code.

ELECTROSENSITIVITY: KEY FACTS

SCIENTIFIC MAINSTREAM CONSENSUS NON-THERMAL & THERMAL EVIDENCE

- All scientific weight of evidence; not an arbitrary claim
- Established long-term (and short-term) effects
- Established non-thermal (and thermal) adverse effects
- All ES symptoms recognised as harm, e.g. cancer, EHS
- EMF/RFR harm to wildlife and biosphere recognised
- 32 International Independent Experts, 2021:
  EHS is a 'neuropathological disorder', not psychological.
  Scientific Consensus International Report on EHS, 2021

INTERNATIONAL PROTECTIVE SCIENTIFIC GUIDELINES

Bioinitiative 2012,
Building Biology (sleeping areas) 2015,
EUROPAEM 2016,
IGNIR 2018,
Seletun 2010

IMPARTIAL MAINSTREAM ORGANISATIONS USING ESTABLISHED SCIENTIFIC EVIDENCE

These independent groups include experts on real ES and accept the NTP and WHO/IARC cancer classifications.

Bioinitiative Group https://bioinitiative.org
EHT: Environmental Health Trust, USA https://ehtrust.org
EMF Scientist: International EMF Scientist Appeal link
EPA: Environmental Protection Agency, USA
ES-UK: Electrosensitivity UK https://www.es-uk.info
EUROPAEM: European Acad. for Environ. Medicine link
IARC: International Agency for Research on Cancer link
ICBE-EMF: International Commission on the Biological Effects of Electromagn. Fields (ICBE-EMF) icbe-emf.org
ICEMS: Internat. Commission on EM Safety www.icems.eu
IEMFA: International EMFs Alliance https://www.iemfa.org
IGNIR: Internat. Guidelines on Non-I. Rad. https://ignir.org
NTP: National Toxicology Program, USA link
PHIRE: Physicians' Health Init Rad. & Envir. phiremedical.org

1st MYTH: UNSCIENTIFIC THERMAL-ONLY CLAIM

- Ongoing 'conspiracy' from 1957 to impose Schwan's unscientific short-term heating-only myth of 1953
- Arbitrary: no evidence 1°C rise causes e.g. cancer, EHS
- Unprotective against ES symptoms e.g, cancer, EHS
- Unprotective of wildlife and the earth's biosphere
- 'Cherry-picking' by biased industry cartel 'fronts'

2nd MYTH: INVALIDLY PRETENDING EHS IS EPh

WHO Backgrounder 296 (2005) confuses two different conditions, (a) physiological EHS, known since 1746, and (b) psychological EPh (Electrophobia, IEI-EMF), a nocebo effect known since 1903. EPh's prior conditioning cannot apply to children, unaware adults, animals and in warfare. *(But ICNIRP recognises non-thermal ES adverse effects,2002)*

ARBITRARY, UNPROTECTIVE THERMAL GUIDELINES

FCC 1998, ICNIRP 2020

'FRONT', FRINGE AND SINGLE-VIEWPOINT GROUPS, UNPROVEN DENIALS, 'JUNK' SCIENCE & MYTHS, 'CONSPIRACY' & MISINFORMATION

Many are secret 'captured agencies' with no experts on EHS and ignore the NTP and WHO/IARC cancer classifications.

DHSC: Depart. for Health & Social Care (*follows ICNIRP*)
- UKHSA: UK Health Security Agency (*advises* Ofcom/DCMS)
- COMARE: Com.on Med.Aspects of Radiat. & the Envir.
- EAHS: EMF and Health Subgroup (2022-); AGNIR (1990-2017) Pub. Health Engl. (PHE)'s Advis.Gp on NI Rad.

FCC: Federal Communications Commission, USA
GLORE: Global Coord. of Res. & Health Pol. on RF EMFs
SCHEER: Sci. Comm. on Health Env & Em Risk (*Eur.Com.*)
ITU: Internat. Telecommunications Union (*UN agency*)
WHO: World Health Organiz.(*UN agency*): - EMF Project
- ICNIRP: Int.Com.on Non-Ion.Rad.Prot.(*WHO agency*)
- *WHO† is subject to Int. Atomic Energy Agency (IAEA) ††*
- *IAEA is subject to Int. Comm. on Radiol. Prot. (ICRP)*
- *WHO/ICNIRP recognises ES risk: to 2004, from 2018*

† WHO has no jurisdiction over national health work. †† WHA 12-40.

Electric Field [Red = thermal metric]	Back-ground level	***International Radio Frequency Radiation Guidelines and Reference Levels*** *(3 MHz-300GHz)*						
		Non-thermal and Thermal effects				**Thermal effects only**		
		Long-Term and **Short-Term**				**Short-Term** only *(6–30 minutes); not Long-Term***		
	Safe for wildlife, humans	*Peak*				*Averaged*		
		Scientific				***Arbitrary, Unscientific***		
		Protective for most humans				***Unprotective for humans, especially sensitives***		
	Johans-son *et al.*	USSR		Bioinitiative	EUROPAEM, IGNIR	USA Schwan	ICNIRP USA FCC	ICNIRP, WHO
		Occup.	Public					
	1997	1935	1967	2012	2016, 2018	1953***	1982, 1998***	2020***
V/m	~0.00002	6	1.9	0.03 - 0.05	≤ 0.002 - 0.2 *	194	61	≤123
μW/m²	0.000001	100,000	10,000	3 to 6	0. 1 to 100	100,000,000	10,000,000	≤40,000,000
dbm	< - 90	-1	-11	- 26 to - 23	≤ - 40 to - 10	+ 50	+ 40	≤ + 46
W/kg	(SAR) < 0.00002	Seletun (2010)		0.0003		1980,1984: 0.08 whole body; 1.6/2.0 head; 4.0 limbs		
(No Observable Adverse Effect Level) Safety Level				(< 0.05) 0.005 V/m§		*WHO/ICNIRP's Thermal Limits are Unprotective*		

** Wifi: 0.02 V/m (20 mV/m) = 0.03% ICNIRP heating limits.* *§0.005 V/m = 0.01% ICNIRP heating limits.* ***WHO 2003: duration needed*
****Excludes implants, long-term effects and non-thermal effects.*

Further information: www.es-uk.info