

Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure

Submission by: Dave Ashton

Dear Secretary, Department of Health and Human Services,

Thank you, and your Department, for carrying out this Request for Information. I hope that you receive many high quality submissions that help to inform the debate, and that ultimately contribute to the development of genuinely protective EMF limits.

Please note that 3 appendices accompany my submission; these are A.I. responses to a number of my queries concerning smartphone background transmissions, proximity sensors and antenna details.

2: In your response, please describe which perspective(s) your comments represent...

I'm writing as an individual who suffers from Electromagnetic Hypersensitivity (EHS). I have limited my responses to the questions in this Request for Information that have the most relevance to my condition, and to some scientific and regulatory changes that I believe need to happen.

I'd like to put my response into context. I have been hypersensitive to RF/EMFs for nearly twenty years, and I experience adverse, and incapacitating, symptoms linked to RF/EMFs on a daily basis. It is this lived experience, rather than any arrogance on my part, that allows me to state - with complete certainty – that the RF/EMF protection offered by the the Federal Communications Commission (FCC) and the International Commission on Non Ionizing Radiation (ICNIRP) is less than effective.

These limits may protect against significant heating from short-term exposures to radiofrequency radiation. What they do not do is to protect the population, or the wider environment, from chronic non-thermal exposures. Electromagnetic Hypersensitivity is just one example of an adverse health condition that exists, despite the implementation of thermally-based safety limits. A significant amount of scientific literature shows that it is not the only one.

Previous health-related scandals have shown us that, all too often, commercial interests are allowed to eclipse public health concerns. Everyone now knows of the practices of Big Tobacco, which were aimed at sowing doubt, and delaying the inevitable day of reckoning for as long as possible.

The case of the electrical and wireless industries is comparable to that of Big Tobacco, although on a much greater scale. The electrification of every aspect of our lives now exposes the entire population to extremely low frequency EMFs, from overhead power-lines, electrical infrastructure, household wiring and electrical devices, more or less everywhere. The move to electric and hybrid vehicles extends this exposure.

Ubiquitous wireless infrastructure is not just furthering commercial interests, i.e. the technology/telecommunications industries, but it is also critical for the operation of the military and for governments. History shows that the RF/EMF safety limits, and the entire regulatory structure, have been developed to accommodate these interests at the expense of public health.

A key part of maintaining the status quo is the dismissal of any scientific studies demonstrating adverse non-thermal effects, to label concerned individuals and groups as 'activists', and to claim that Electromagnetic Hypersensitivity is the 'nocebo effect' – i.e. a psychological issue.

It is ironic that beneficial effects of certain non-thermal RF/EMF exposures are accepted, while adverse effects of other types of non-thermal RF/EMF exposures are so often dismissed. It is also ironic that those countries that **do** maintain precautionary (i.e. substantially lower) RF/EMF limits are under sustained pressure from the telecoms industry, and the World Health Organisation, to 'harmonize' (or relax) their limits, in line with ICNIRP's.

Meanwhile, all of the warnings, made over so many years, are dismissed. We are complex bioelectric beings, and yet we are assured that our mandated exposure to 'electrosmog' – so long as it is within the 'safety limits' - will have no adverse consequences. None of us have the right to opt out of this biological experiment.

In summary, the existing RF/EMF limits, and specifically the FCC's limits in this case, do not protect individuals with Electromagnetic Hypersensitivity, or prevent the condition from developing in the first place. As with smoking, there will inevitably come a tipping point when measures will be taken to address the RF/EMF problem. But, by then, it will be too late for many.

3. We invite individuals, families, caregivers, healthcare professionals, and organizations to share experiences regarding potential adverse health effects they believe may be associated with exposure to RF/EMFs...

My health is adversely affected by both anthropogenic and naturally-occurring RF/EMFs, as well as by some other stressors. My account of being hypersensitive to RF/EMFs, and of the process by which I self-diagnosed my condition, was recently published in a peer-reviewed paper [1].

a. The type(s) of wireless technology or RF/EMF source(s) involved...

My paper [1] included a summary of these, and this is an expanded list:

- Mobile (cell) phones
- DECT cordless phones
- Mobile masts (cell towers)
- Tetra (Terrestrial Trunked Radio) masts
- Wi-Fi
- Bluetooth/Zigbee wearables and gadgets
- Microwave ovens
- Laptops (wireless or not)
- Smart meters
- Radio and tv transmitters
- Radar installations
- Overhead power lines
- Electrical household wiring
- Electrical devices and infrastructure (both DC and AC)cybrid / electric vehicles
- Etc.

b. The nature, duration, frequency, and approximate timing of the reported exposure(s).

This is a difficult question to answer, as when I initially became hypersensitive to RF/EMFs, in around 2007, I had no idea what was happening, and it took some years for me to finally link cause to effect. As I was unaware of both RF/EMFs and Electromagnetic Hypersensitivity at that time, and as I didn't have the meters with which to measure exposures, unfortunately I can't provide this level of detail.

From the time when my symptoms started up to the present day, my condition has remained much the same, and I continue to experience a complex mix of RF/EMF exposures, day and night, regardless of where I am, and what I am doing.

In the real world, RF/EMF exposures are concurrent. So, when at home, and when the power is switched on at the consumer unit, I am being exposed to ELF frequencies and “dirty electricity” from electrical devices and wiring. I am simultaneously exposed to RF/EMFs from external sources, such as mobile masts, tv and radio transmitters, passing vehicles, wireless devices in neighbouring properties, and transmissions from overhead satellites and air traffic. In public places, there may be different, or additional, RF/EMF sources.

I may also be concurrently exposed to naturally-occurring EMFs, including light frequencies, ultraviolet radiation, infrared radiation, ionising radiation, as well as EMFs associated with geomagnetic or solar activity and meteorological conditions - for example, coronal mass ejections, precipitation or lightening.

Given all of these overlapping and concurrent RF/EMF exposures, both natural and man-made, and all with their individual characteristics (frequency, intensity, pulsing, modulation, polarization, etc.), it would be very difficult to isolate a single exposure, or a particular type or group of exposures, and provide details about their nature, duration, frequency and timing of exposures. For one thing, I would need some way of accurately measuring these RF/EMF emissions, of untangling the specific details for each one, and of correlating them with adverse effects that I am experiencing. No easy task!

The other issue is that the effect of these RF/EMF exposures on me is cumulative. So, even if I could identify and quantify one single exposure, the effects of that exposure may last for some time, and this is multiplied when there are many concurrent exposures – as is obviously the case in the real world. And individual RF/EMF exposures may be stopping or starting at any one time.

'Electrosmog' as a whole never stops; it just fluctuates over time – and so do my symptoms. There is a general pattern though; I generally feel better (i.e. I have less severe symptoms) in the morning, and much worse in the evening. It seems to me that a reasonable night's sleep repairs at least some of the damage that has been done by my cumulative exposure to RF/EMFs the preceding day.

Another observation is that since I did become hyper-sensitive to EMFs, my condition has remained fairly stable, albeit with peaks and troughs in terms of the severity of the symptoms. My hypothesis, for what it's worth, is that this is because the stressor (RF/EMFs) is ever-present, and my body responds to it with a fair degree of consistency. I have not got 'better', but neither have I got dramatically worse.

Despite the complexity of concurrent exposures, and their cumulative effects over time, close proximity to RF/EMF sources – for example a Wi-Fi router, an active phone, a smart meter,

overhead power-lines, an electrical device, or fluorescent lighting, does noticeably worsen my symptoms, and adverse effects experienced can then be transient, or persist for some time.

In summary then, I can only really respond to this question by saying: “it depends”.

c. The potential adverse health effects experienced

I briefly note the main adverse health effects that I experience in my paper [1]. My symptoms overall are consistent with those that are experienced by other EHS people, and they are well described in the papers that I refer to [1, references 15-17].

d. When potential adverse health effects first appeared relative to when exposure began...

A long time had elapsed between the onset of my incapacitating symptoms and my realisation that numerous EMF exposures, of different types and intensities, were factors. So, in other words, I can't identify which individual exposures, at which time, initiated the very first adverse health effects that I experienced, which were in any case intermittent at first.

2007 was certainly the year when I 'tipped over' into Electromagnetic Hypersensitivity. Years of previous RF/EMF exposures no doubt contributed to this, along with co-exposures to other agents. I note, for example, the considerable overlap that appears to exist between Electromagnetic Hypersensitivity and Multiple Chemical Sensitivity – another so-called 'idiopathic' health condition.

As to when RF/EMF exposures began, it's not flippant to say that this was presumably in the womb. Also, with the benefit of hindsight, there were a number of episodes that occurred prior to 2007 that may have hinted that I was particularly susceptible to RF/EMFs, although these were short-lived.

So, to summarise, I (like everyone else), have been exposed to RF/EMFs for all of my life, but it was only in 2007 that I became hypersensitive to them.

e. Whether medical evaluation or treatment was sought, including any diagnoses received...

In [1], I summarise my experience in having a variety of medical tests carried out, in an attempt to obtain a diagnosis. I was referred by General Practitioners to a succession of consultants and specialists, but the results were always the same; they couldn't find anything of significance. Quite often, “stress” was suggested, prescription drugs were prescribed, and my symptoms then worsened.

Once I paid for more sophisticated tests, the results did achieve greater significance, although I was never formally diagnosed with Electromagnetic Hypersensitivity. That was left to me to work out.

I tried many treatment modalities – physiotherapy, cranio-sacral therapy, chiropractic treatment, cognitive behavioural therapy, nutritional therapy and counselling – but none of it was effective. However, some of the physiotherapy work, particularly on my neck and upper back, did result in a short-lived improvement.

Ironically though, it was when receiving 'electrotherapy' treatment that previous suspicions about Electromagnetic Hypersensitivity were confirmed. Rather than making me better, the

application of electrical micro-currents to my skin, on my back, greatly increased my sensitivity.

f. Whether steps to reduce or eliminate exposure were taken...

As soon as I understood that I had become hypersensitive to RF/EMFs, I took some initial steps to reduce my exposures [1]. I replaced a DECT cordless phone with a corded phone, I stopped using my mobile (cell) phone, and my RF-emitting electricity meter was replaced with an older analogue meter.

I also tried to shield some of the EMFs that were entering my house from neighbouring properties, using various shielding methods. Later on, my wife (who is also EHS) and I relocated to a house where the environmental EMFs are generally lower, and where there is some distance between our house and neighbouring properties.

5 What existing national and international exposure standards, guidelines, or regulatory frameworks should federal health agencies consider when evaluating the potential adverse health effects of human exposure to RF/EMF?

n. What scientific, technical, or regulatory changes by federal health agencies, if any, would improve the assessment, disclosure, and regulation of wireless radiation exposure?

I believe that there needs to be a philosophical change in the U.S. RF/EMF regulatory framework, so that instead of prioritising commercial interests, for example by rolling out novel wireless technologies (such as 5G and 6G) first, and worrying about any potential health implications later, the health of U.S. citizens and of the environment is instead given primacy.

To achieve this, I believe that the responsibility for reviewing, co-ordinating and executing scientific research, synthesising RF/EMF evidence from across agency boundaries, and setting protective RF/EMF-related standards and limits, should be redirected from bodies which have a documented history of being associated with commercial, engineering and military interests, and of setting RF/EMF exposure limits that disproportionately favour these interests.

Scientific changes

I make some suggestions relating to gaps in the existing scientific knowledge, and on how scientific research could perhaps be better co-ordinated, in my responses to question 16 and 17.

Technical changes

As a number of publications note [2-9], the existing FCC and ICNIRP RF/EMF standards, limits and regulatory frameworks do not fully protect the public, and the environment, from detrimental effects associated with exposure to RF/EMFs. Also, the FCC limits do not cover all of the non-ionising portion of the electromagnetic spectrum.

Biologically-based RF/EMF limits have been proposed, including the BioInitiative 2012 Limits [10], the EUROPAEM EMF limits [11], and the Building Biology limits [12]. These are set so as to prevent adverse effects from both non-thermal and thermal exposures.

Initial adoption of any of these alternative , pending the development of revised RF/EMF standards and exposure limits following a major U.S. scientific review and risk assessment, would

undoubtedly extend the protection afforded to American citizens.

Tighter RF/EMF regulations and exposure limits would be opposed by the industries concerned, but, as with the tobacco companies before them, these organisations would adapt to the new requirements.

Regulatory changes:

The revolving door between the FCC and the telecommunications industry that it regulates has been discussed [13]. It should not be able to 'mark its own homework' by having responsibility for managing RF/EMF limits. Instead, this responsibility should be redirected.

6. What scientific evidence exists about potential adverse health effects caused by current exposure limits?

Other respondents will provide many scientific references about adverse health effects that occur within the current limits, including Electromagnetic Hypersensitivity (EHS). However, I also think that the anecdotal experiences of EHS individuals, whilst not 'scientific', are important to take into account, as they supplement scientific research, and may help in the development of improved methods to study the subject.

Much of the existing literature concerning Electromagnetic Hypersensitivity has serious limitations [14,15], and I would argue that these can lead to flawed conclusions being drawn about the condition [16,17] – chief among which is the proposition that it is, in essence, of psychological, rather than of physiological, origin (the 'nocebo effect').

Rather than cite individual EHS studies, many of which I believe are methodologically flawed, I'll instead list below some of the statements and calls that have been made by scientists, medical experts and politicians about the condition.

Parliamentary Assembly of the Council of Europe, Resolution 1815: The potential dangers of electromagnetic fields and their effect on the environment [18]

8. ...the Assembly recommends that the member states of the Council of Europe:

8.1 in general terms:

8.1.1 take all reasonable measures to reduce exposure to electromagnetic fields, especially to radio frequencies from mobile phones, and particularly the exposure to children and young people who seem to be most at risk from head tumours;

8.1.2 reconsider the scientific basis for the present standards on exposure to electromagnetic fields set by the International Commission on Non-Ionising Radiation Protection, which have serious limitations, and apply ALARA principles, covering both thermal effects and the athermic or biological effects of electromagnetic emissions or radiation;

8.1.3 put in place information and awareness-raising campaigns on the risks of potentially harmful long-term biological effects on the environment and on human health, especially targeting children, teenagers and young people of reproductive age;

8.1.4 pay particular attention to “electrosensitive” people who suffer from a syndrome of intolerance to electromagnetic fields and introduce special measures to protect them, including the creation of wave-free areas not covered by the wireless network;

International EMF Scientist Appeal, signed by 271 EMF scientists from 45 nations [19]

'...we recommend that the United Nations Environmental Programme (UNEP) convene and fund an independent multidisciplinary committee to explore the pros and cons of alternatives to current practices that could substantially lower human exposures to RF and ELF fields. The deliberations of this group should be conducted in a transparent and impartial way. Although it is essential that industry be involved and cooperate in this process, industry should not be allowed to bias its processes or conclusions. This group should provide their analysis to the UN and the WHO to guide precautionary action.'

1. children and pregnant women be protected;
2. guidelines and regulatory standards be strengthened;
3. manufacturers be encouraged to develop safer technology;
4. utilities responsible for the generation, transmission, distribution, and monitoring of electricity maintain adequate power quality and ensure proper electrical wiring to minimize harmful ground current;
5. the public be fully informed about the potential health risks from electromagnetic energy and taught harm reduction strategies;
6. medical professionals be educated about the biological effects of electromagnetic energy and be provided training on treatment of patients with electromagnetic hypersensitivity;
7. governments fund training and research on electromagnetic fields and health that is independent of industry and mandate industry cooperation with researchers;
8. media disclose experts' financial relationships with industry when citing their opinions regarding health and safety aspects of EMF-emitting technologies; and
9. white-zones (radiation-free areas) be established.

International Commission on the Biological Effects of EMFs: Electromagnetic Hypersensitivity (EHS) is a humanitarian crisis that requires an urgent response [20]

'EHS is a multisystemic physical response, with symptoms that can vary among individuals due to anatomical and physiological differences. Symptoms can include sleep problems, fatigue, headache, dizziness, heart palpitation, tinnitus (ringing in the ear), skin rash, chemical sensitivity, visual, sensory, and mood disturbances. The US National Council on Disability's 2022 Health Equity Framework, recognizes that “electrical hypersensitivity is associated with the use of wireless communications and electrical technologies and other sources of non-ionizing radiation, which may trigger disabling and life-threatening cardiac, respiratory, neurological, and other adverse physical reactions.” '

Federal Research Priorities

16. What are the highest priority research gaps regarding EMF and RF radiation and public health that the federal health agencies should address?

Electromagnetic Hypersensitivity

Electromagnetic Hypersensitivity is a public health issue, and it is one that highlights the inadequacy of the existing RF/EMF regulatory framework and safety limits. The inherent limitations of a number of the EHS provocation studies conducted so far have led to questionable conclusions being drawn, and new scientific methods [eg. 21-23] are urgently required if the condition is to be properly understood, addressed, and – ideally – prevented from occurring in the first place.

Due to the controversy over the aetiology of the condition, and the lack of agreed biomarkers, its prevalence is unknown. Self-reported figures vary across countries, with anywhere between 1.5% and 13% of the population reporting that they are EHS [24]. The population in the U.S. is currently around 342,000,000 people [25]. Assuming the lowest end of this range is applicable, this would suggest that over 5 million U.S. citizens may be suffering from Electromagnetic Hypersensitivity, which would presumably represent a major public health issue if true.

In France, a major scientific research program on "Radiofrequencies and health" has recently been initiated, and this includes a number of research questions concerning Electromagnetic Hypersensitivity. The text below is copied from the 2026 ANSES/PNR EST Call for Proposals [26]:

RFES 3.1. Investigation of tools to characterise subjects declaring themselves electrohypersensitive (EHS), physiological markers, biological markers, specific genetic markers.

RFES 3.2. Investigation of mechanisms that could explain electromagnetic hypersensitivity (for instance production of neurotransmitters, study of cryptochromes, etc.).

RFES 3.3. Investigation of links between the characteristics of electromagnetic fields (frequency, strength, modulation, temporal shape of signals, etc.) and the symptoms experienced by individuals declaring themselves EHS (mainly through innovative protocols, etc.).

RFES 3.4. Investigations to explain the relationship between EHS and MCS11, migraine, tinnitus, fibromyalgia, and medically unexplained syndromes more generally.

RFES 3.5. Investigation of vulnerability factors (for example comparative studies using control populations and populations with medically unexplained syndromes).

RFES 3.6. Research on the dynamics of the autonomic nervous system in individuals declaring themselves EHS (analysis of ortho/parasympathetic balance from heart rate variability and other exploration techniques).

RFES 3.7. Research on the use, effectiveness and possible side effects of therapeutic measures (management of symptoms or conditions such as tinnitus and migraine) for subjects declaring themselves EHS; treatments used.

RFES 3.8. Research on metabolism and cerebral blood flow, the blood-brain barrier (using high-resolution imaging techniques) for individuals declaring themselves EHS.

RFES 3.9. Research on the effects of an MRI test (tolerance) on individuals declaring themselves EHS, compared with control subjects.

RFES 3.10. Sociological studies to understand the caregiver-patient relationship for individuals declaring themselves EHS.

RFES 3.11. Sociological comparison of subjects declaring themselves EHS in different countries.

Rationale: With the growing exposure of the population to novel wireless and electrical technologies, such as 5G/6G, wireless power charging and electric vehicles, and the exposure of the entire population to a complex mix of RF/EMF frequencies 24/7, there is an urgent need to better understand Electromagnetic Hypersensitivity, its prevalence, treatment options, and, most importantly, how it can be prevented.

'Havana Syndrome'

'Havana Syndrome', with its severely incapacitating symptoms, has been well documented [27,28]. The U.S. Government is reported to have purchased a Havana Syndrome device, which is said to operate by means of rapidly pulsed microwave radiation [29]. It is suggested that the intensity of radiation used to produce these health effects could fall within the current RF/EMF limits – i.e. that it could be 'non-thermal' in nature [30].

Also, the similarity between a number of Havana Syndrome and Electromagnetic Hypersensitivity symptoms is striking. A hypothesis that the conditions may be somehow linked, for example through exposure to pulsed microwave radiation, could be examined.

Rationale: Scientific research should urgently confirm whether pulsed microwaves cause Havana Syndrome, in order to protect military and diplomatic staff who may be the subject of attacks. Any potential overlap between 'Havana Syndrome' and Electromagnetic Hypersensitivity should also be studied, as there could be profound implications for the entire population if pulsed microwaves were found to be a factor.

Replication and progression of NTP / Ramazzini Institute studies

The NTP cell phone studies [31] found clear evidence of a link between radiofrequency radiation and cancer in laboratory animals, and these results were supported by results from the Ramazzini Institute [32]. The NTP subsequently went on to conduct additional animal experiments, but these were abruptly halted. A joint study from Korea and Japan aimed to verify the original NTP findings, but the methodology used has been called into question [33].

Given the significance of the NTP cell phone study results, thought should be given to co-ordinating replication studies and resuming the aborted follow-up studies. This is brought into focus by the recent call by the Ramazzini Institute:

'The Collegium Ramazzini therefore emphasizes, considering the new evidence, the urgent need to re-evaluate radiofrequency cancer hazard by IARC and that any risk assessment by WHO should be based on a cancer hazard evaluation by IARC.' [34]

Rationale: Many experimental results, particularly those from the NTP and the Ramazzini Institute, have demonstrated that non-thermal RF/EMF exposures can result in a number of adverse health impacts, including, but not limited to, cancer and DNA damage. There is an urgent

need to replicate these 'gold standard' studies to either refute or confirm their findings, and also to conduct additional toxicology research on novel technologies and frequencies (5G, 6G etc.).

Concurrent RF/EMF exposures

The public is concurrently exposed to many different types of RF/EMFs, at different frequencies and intensities, and possessing other complex characteristics (eg. pulsing and modulation). These are of both anthropogenic and natural origin. However, most, if not all, scientific studies on RF/EMFs do not take concurrent RF/EMF exposures into account, and so do not necessarily reflect real-world RF/EMF exposures.

Rationale: There is an urgent need for scientific studies to be conducted that bear a closer relationship to real world, concurrent EMF exposures.

RF/EMF co-exposures

The public may be concurrently exposed to RF/EMFs and other agents – for example, ionising radiation, chemicals, drugs and vaccines. A relatively small number of scientific studies have examined synergies that may exist between EMFs and other risk factors, potentially leading to adverse health effects.

Rationale: There is an urgent need for scientific studies that consider concurrent exposures to EMFs and other agents, to evaluate whether synergies can be present, and to better reflect the complex nature of real-world RF/EMF exposures.

RF/EMF exposures from smartphones kept next to the body

Modern smartphones are continually emitting background RF/EMFs, even when they are not in active use. These transmissions include 'handshake' communications with the nearest cell tower, as well as with nearby wireless devices, such as Wi-Fi routers and Bluetooth devices. The periodicity of these background transmissions can vary widely (see Appendix 1: Comprehensive Analysis of Smartphone Background RF Transmissions).

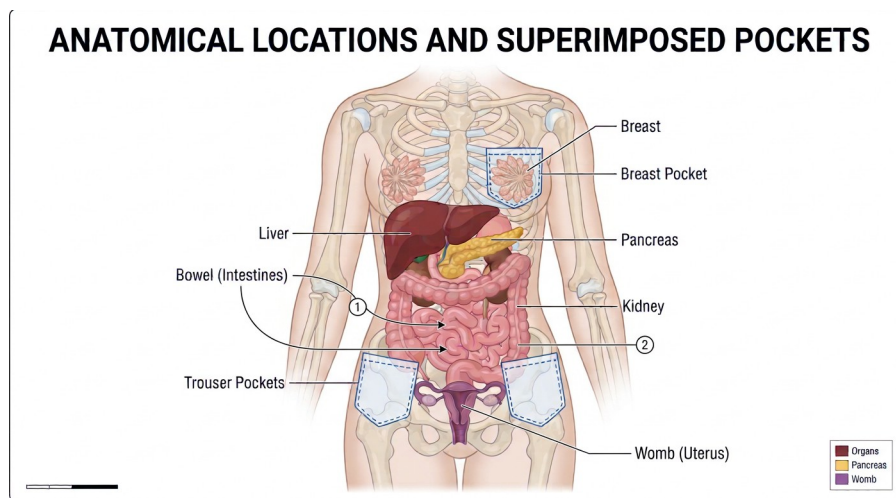
Proximity sensors on the phones limit the power of these transmissions if, for example, a phone is stored in a pocket next to the body, but their frequency of transmissions remains unchanged (see Appendix 2: Smartphone Proximity Sensors and Background RF Transmissions). There are nuances to the degree to which setting a phone to flight mode eliminates these background transmissions, without further user intervention in order to manually disable short-range radios.

Modern smartphones have a significant number of antennas (see Appendix 3: Smartphone RF Exposure & Antenna Matrix), and disabling all of the background transmissions can be problematic. Most smartphone users will probably not even be aware that their phones are still emitting radiation when they are not being used, and are stored in a pocket, or even in a bra.

Also, if there is a weak signal from the nearest cell tower, the phone may boost its power, in order to maintain communications with it. This may have the effect of overriding the 'throttling' of RF emissions by the SAR sensors.

A number of cancers, including prostate, bowel, womb, kidney, breast, pancreatic and liver, have recently been reported to be unexpectedly rising among people aged under 50 in the US, the UK, and the Netherlands [35]. The reasons for this increase are not known, but given the locations of

these cancers, it is possible that chronic exposure to the background RF/EMF transmissions from smartphones that are stored in pockets could be implicated:



(AI-generated image)

These background RF/EMF transmissions from modern smartphones, which contain many antennas, need to be quantified in terms of the frequencies used, the periodicity of the transmissions, the intensity, and the pulse and modulation characteristics of the various wireless technologies used. Any potential link between cancer in these particular organs and these exposures needs to be explored.

Rationale: Many people will be unaware that their smartphones are transmitting RF/EMFs even when not in use, and they will routinely store keep phone in a pocket, next to the body, and in the vicinity of a number of organs. Also, many people will also be unaware that they are able to adjust the phone's settings in order to eliminate at least some of these background transmissions.

Objective information relating to the behaviour of phones while not in active use, and when stored next to the body, needs to be assessed, along with any potential health impacts.

Testing for phones with excessive SAR levels

The French advocacy organisation, Phonegate Alert, has published details of phones that have exceeded the applicable SAR limits during testing, and that have consequently been withdrawn from the French market, or had software fixes installed so that they comply with regulatory limits [36]. The U.S. should follow suit.

Rationale: Phones should be tested under real-world conditions (e.g. with zero separation distance) to ensure compliance with the RF/EMF limits.

Research gaps not taken forward by ICNIRP

ICNIRP published a list of gaps in the scientific knowledge that it recommended should be examined, but it also included some research areas where it did not identify a 'data gap' [37]. Despite this, conducting scientific research on the areas that it didn't feel are worth investigating may be worthwhile:

- Blood brain barrier integrity
- Brain physiology and function
- Neurodegenerative disorders
- Vestibular function
- Auditory function
- Male fertility, reproduction and embryo/fetus development
- Oxidative stress

17. How can federal health agencies improve coordination of EMF and RF radiation research?

In order to improve co-ordination, it seems to me that US federal health agencies would first have to assume the jurisdiction that is currently held by the FCC over the non-ionising portion of the electromagnetic spectrum. (I appreciate that this would require legislative changes.)

As a regulator, the FCC should not mark its own homework by having overall responsibility for the RF/EMF limits. This presents a clear conflict of interest, given its close working relationship with the industries that have to comply with them [13].

In addition, the historical development of the RF/EMF standards and limits by NCRP, IEEE/ICES and ANSI has been criticised on a number of grounds [2-9].

Concern has been expressed about the impartiality of these bodies. For example, IEEE/ICES, which developed the RF/EMF standards used by the FCC, includes representatives from the telecommunications, engineering and military sectors [38].

IEEE is a technical organisation and ICES is its standards development committee, responsible for electromagnetic fields [39]. IEEE/ICES has close links with ICNIRP; for example, the current SC6: EMF Dosimetry Modeling sub-committee Co-Chair [38] is also the current Chair of ICNIRP [40].

In an ideal world, it seems to me that federal health agencies should be responsible for:

- facilitating and co-ordinating domestic scientific research on all aspects of human and non-human exposure to RF/EMFs, and collaborating with international scientific research projects. On the basis of 'the polluter pays', industry funding could contribute to the costs, via rigorously-enforced firewalls to eliminate potential conflicts of interest.
- considering all portions of the non-ionising portion of the electromagnetic spectrum, and all evidence streams (including the effects of chronic non-thermal exposures, effects on flora and fauna, effects on vulnerable individuals, effects of co-exposures with other agents, effects of concurrent exposures, and so on).
- synthesising the evidence (by means of an expert oversight committee).
- developing RF/EMF standards/exposure limits based on the synthesised evidence, and - where scientific uncertainty persists - the application of the the precautionary principle.

Co-ordinating scientific research

I think that a first step would be performing a comprehensive review of the existing scientific

literature, for the whole of the non-ionising portion of the electromagnetic spectrum, covering both human and non-human scientific research. This should also include research produced by non industry-affiliated groups, including the BioInitiative Report and the International Commission on the Biological Effects of EMFs.

Also, a critical review could be undertaken of the FCC and ICNIRP exposure limits, as well as the lower RF/EMF limits that exist in a number of other countries.

In addition, the following should feed into such a review, as they become available:

- The Monograph resulting from any re-evaluation of radiofrequency radiation by the International Agency for Research on Cancer (IARC).
- The World Health Organisation Environmental Health Criteria on Radiofrequency Radiation, and the accompanying Technical Report (Scoping Review of the Scientific Literature) and Radiofrequency Research Agenda.
- The results of the “Radiofrequencies and Health” research program currently underway in France.
- Further scientific publications from the European Union's CLUE-H research consortium.
- Scientific evidence submitted to the FCC, in response to its call for comments on “RF Exposure Issues” (ET Docket No. 13-84).
- Scientific evidence submitted to this HHS Request for Information.

Agency responsibilities

I'm not an expert on U.S. Government agencies, but here are my ideas on how overall responsibility for RF/EMF scientific and regulatory co-ordination could possibly be achieved.

- FCC – responsible for managing and regulating the radiofrequency portion of the electromagnetic spectrum, but not responsible for RF/EMF exposure standards, guidelines and exposure limits.
- EPA – Conducts reviews on human safety and environmental risks from RF/EMFs.
- FDA – Monitors RF/EMF emissions from electronic devices.
- NIEHS/NTP – Undertakes toxicological testing, and conducts other primary research on RF/EMFs.
- OSHA – regulates RF/EMF workplace exposures.
- ICNIRS* – a suggested cross-agency scientific and technical committee that would review and synthesise scientific evidence, and produce RF/EMF standards and limits.

* Inter-agency Committee on Non-Ionising Radiation Safety

18. Please identify any additional scientific evidence, technical information, data, or recommendations that federal health agencies should consider...

One of the ICBE-EMF papers mentioned a statement made by ICNIRP [41], with which I (somewhat surprisingly) agree:

'People being protected

Different groups in a population may have differences in their ability to tolerate a particular NIR exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups.

Some guidelines may still not provide adequate protection for certain sensitive individuals nor for normal individuals exposed concomitantly to other agents, which may exacerbate the effect of the NIR exposure, an example being individuals with photosensitivity. Where such situations have been identified, appropriate specific advice should be developed-within the context of scientific knowledge.'

However, if the intention is to offer the best possible protection to all species that are, or could be, adversely affected by exposure to anthropogenic RF/EMFs, I would extend the scope of revised RF/EMF limits to also include flora and fauna.

References

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