

## HEALTH IMPACT OF 5G

### BRIEFING

#### Executive Summary

1. There is an exponential increase in electrosmog at much higher manmade frequencies than we are used to.
2. The government and the telecoms industry is presenting the 5G roll out now as being quite innocuous and just more of the same as for 2G – 4G with no further radiation risk. But, given the information in this note, government representations are intentionally misleading. For comparison purposes, a microwave oven uses 2.5GHz as do Apple airpods. The 5G rollout is laying the groundwork for a cataclysmic expansion in man-made radiation on earth up to 300GHz under current guidelines. The US has just started consultation to use up to 3,000GHz (6G) and it is likely that in due course, the UK will follow. The direction of travel is clear.
3. It is important that local councils pause and consider the health impacts now.
4. This case is not simply about 5G. It is about manmade radiofrequency radiation (“RFR”) generally. The earth has its own electromagnetic fields and its own beat which is referred to as the Schumann Resonance at 7.83Hz. The frequency of our brain waves is also at 7.83Hz. We are electrical and magnetic beings and our cells interact with electrical and magnetic stimuli.
5. There are widespread concerns amongst the medical research communities around the world that the current ICNIRP (International Commission on non-Ionizing Radiation Protection) electromagnetic frequency radiation (“EMR”) also known as radiofrequency radiation (“RFR”) guidelines are not fit for purpose, in that they only address EMF heating effects, and not the many other potential effects at a cellular or physiological level. The ICNIRP guidelines are the default guidelines used by the UK government and government agencies to set limits on exposure to EMFs.
6. There is already a huge body of work by specialist biochemists, scientists and doctors citing adverse effects on health of prolonged exposure to pulsed high frequency EMF radiation at levels well below the ICNIRP-recommended guideline maxima, and the members of ICNIRP, the EU's SCENHIR and the WHO EMF project, actually represent a minority view amongst scientists and health researchers.
7. This situation should not be exacerbated by the introduction of widespread millimetreWave (mmWave) EMR into the public realm as part of the next stage of 5G rollout, as is currently occurring by DCMS/Ofcom in the UK, until it is definitively proven on an internationally peer-reviewed basis that subjecting the public to potentially ubiquitous and enduring mmWave EMR alongside existing 2G, 3G, 4G, Wi-Fi, Smart Meter, and IoT radiation, will not result in any adverse health consequences.

8. To date, it is understood that there has been no research anywhere specifically addressing the potential biological and health effects of mmWave RFR on humans, animals and insects.
9. As you will see from the note below 5G comprises a bundle of frequencies which include mmWaves. It is not acceptable for the public to be exposed to large numbers of small cells emitting a massive amount of additional man-made radiation at lower frequencies and mmWave radiation in the 26GHz, 40GHz and 66-71GHz bands as part of the next stages of 5G rollout, until sufficient very focussed and appropriate research has been completed, to demonstrate that there are no adverse biological and health effects. Otherwise the government will effectively be treating the general population as live subjects in a UK-wide 'in vivo' experiment on mmWave radiation.
10. This is not acceptable not least because this is a breach of the Nuremburg Code (see further below) and the "Precautionary Principle" must be applied. To do otherwise could expose the NHS to massive costs downstream if there are generalised adverse effects that will then need to be treated by the NHS.
11. It is noteworthy that some Lloyds of London Underwriters are already excluding the potential effects of non-ionising RF radiation from their terms of liability cover, as are Swiss Re.
12. Until widespread use of the mmWave bands is deemed safe for long-term human exposure, based on evidenced and peer-reviewed research, mobile phone companies must cease and desist from making any plans to release any portion of the 26GHz band for public 5G use (whether experimental/trial or commercial). Any existing trial use of the 26GHz band for 5G small cells in various UK cities must be strictly time-limited and terminated when feasible pending confirmation that the long-term irradiation of the general population with 26GHz and 40 GHz and 70GHz RF signals is safe.
13. If that were not enough, another factor comes into play: Microwave radiation creates "A Brillouin precursor ... [is] a very fast pulse of radiation, which when it enters the human body, may generate a burst of energy that can travel much deeper than predicted by conventional models."
14. From the contents of this note, you will see that there is a large body of evidence of harm from EMR which is being ignored by the ICNIRP and the UK government.
15. Thank you in advance for your urgent consideration of these potentially alarming public health issues.

This note deals with the following issues.

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## 1. What is 5G

16. Simply put, 5G stands for 5<sup>th</sup> Generation of the telecommunications network. These words describe the different stages of development of the carriage of data over waves. Each generation is an evolution of the network from the previous generation.
17. 1G was the carriage of voice data, 2G brought international roaming, texts and sim cards (the data in bus shelters use 2G), 3G enabled voice, video and internet in a mobile scenario and 4G was the convergence of multimedia (and pretty much everything goes) and technology.

<https://www.quora.com/What-are-the-differences-between-1G-2G-3G-4G-and-5G>

18. So, 5G is a progression from 4G and brings multiple antenna, millimetre wave, small cells, Li-Fi and all the new technologies from the previous decade together which could be used to give 10Gb/s to a user, with an unseen low latency, and allow connections for at least 100 billion devices. Speed of delivery to a device is said to be at least 100 times faster than 4G. You can read about the breakthrough from 4G to 5G at the link below:

<https://www.bbc.co.uk/news/technology-22507512>

19. The debate about 5G has arisen from the fact that it will use a higher frequency of the wave spectrum to deliver its data. The higher the frequency, the bigger the data

load which can be carried. 5G is set to use millimeter waves (microwaves which are the same as are used in your microwave oven) to deliver its data load. That's where the problem lies.

20. Of course, its not the whole story because current EMFs from 4G do have health impacts to EHS sufferers. Some health impacts are set out in the slides of a presentation below which was given during a public meeting in 2014 to the European Economics and Social Committee:

<https://www.eesc.europa.eu/resources/docs/dr-jamieson---revised-presentation.pdf?sfns=mo>

It spells out clearly that low level EMFs are harmful to humans.

21. If you have limited time and want a swift way into the issues, I would urge you to read the BioInitiative report at:

<https://bioinitiative.org/table-of-contents/>.

22. That document should bring you up to speed with the issues quite quickly.
23. It is helpful to start by noting that the frequency of EMFs is expressed in hertz (Hz) or cycles per second. Multiples used are 1000 Hz or 1 kilohertz (kHz); 1 000 000 Hz or 1 megahertz (MHz) and 1 000 000 000 Hz or 1 gigahertz (GHz).
24. 5G is currently the apex of the RFR electrosmog covering the UK and, indeed, many countries in the world. Prof Denis Henshaw describes 5G as wifi on steroids.
25. 5G is not a particular frequency. It is a reference to the speed of data transfer of 100 gigabit per second (gbps) (including an ability to download a video to your phone in under 3 seconds). This would facilitate the Internet of Things, essentially machines talking in real time to other machines – washing machines ordering more washing tablets from Sainsburys, robots receiving commands from other robots including drones, driverless cars and the like.
26. To see the way in which the industry talks about 5G speed, do see below:

<https://www.cnet.com/news/5g-uk-two-networks-offer-fastest-speed-and-best-coverage/>

194Mbps. O2's average of only 86Mbps is a bit of a letdown.

EE did, however, achieve the fastest single speed in the country with 576Mbps down in one location in London, beating Vodafone's 450Mbps and O2's 232Mbps there.

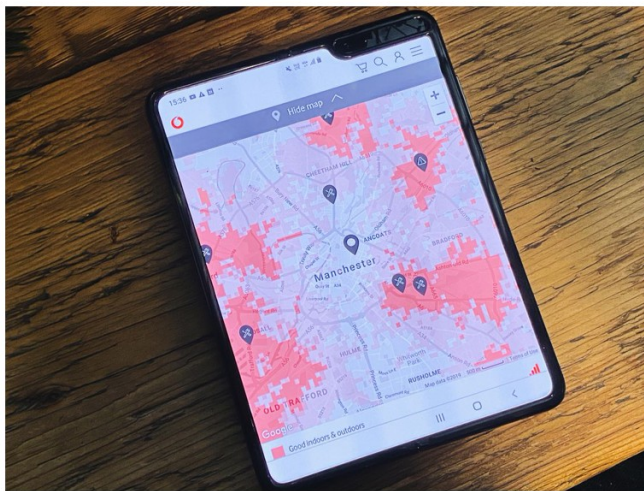
### Which is the best network for 5G in the UK?

Right now it's a two-horse race between EE and Vodafone.

With both its coverage and average speeds falling behind, O2's 5G service needs time to mature before it's worth your money.

Deciding between EE or Vodafone is mostly a balancing act of top speeds and coverage. You can potentially achieve higher speeds on Vodafone's network. But with only 34 5G-enabled towns and cities covered (and not full coverage within each of those areas), you'll have to work harder to find them.

I found EE's speeds to be, on average, slightly slower, but its coverage more widespread. At the time of publishing, EE has activated 5G in 50 towns and cities in the UK, although to significantly varying degrees of coverage within them. London's 5G coverage is extremely broad thanks to well over 200 5G towers, but Newcastle, for example, has only one 5G tower, with 20 more set for activation later in 2020.



Vodafone's coverage map of Manchester shows that much of the city center isn't covered by 5G. It's restricted at the moment to certain patches of the suburbs.

Andrew Hayle/CNET

27. To deliver the speed promised by 5G, telecoms companies will use a bundle of frequencies from 700MHz to 66GHz and possibly higher. 4G uses up to about 3.5GHz. There is no consensus of exactly how 5G will be delivered and the strategy differs from company to company and within the government and its agencies.

28. But, to get an idea of how it is expected to work, do see the **DCMS 5G strategy document of March 2017**:

[https://www.scribd.com/document/462499223/DCMG-5G-Strategy-07-03-17-5G-Strategy-For-Publication?secret\\_password=Qe6j5WbJvuFriMYS2rey](https://www.scribd.com/document/462499223/DCMG-5G-Strategy-07-03-17-5G-Strategy-For-Publication?secret_password=Qe6j5WbJvuFriMYS2rey)

29. Ofcom awarded licenses for 28GHz in 2017 and the below explains their thinking on which frequencies will be rolled out (**Ofcom Enabling Wireless Innovation Through Local Licensing – July 2019**):

[https://www.scribd.com/document/462501475/Ofcom-July-2019-Enabling-Wireless-Innovation-Through-Local-Licensing?secret\\_password=5P4UeFsGLewlf8WNfYzC](https://www.scribd.com/document/462501475/Ofcom-July-2019-Enabling-Wireless-Innovation-Through-Local-Licensing?secret_password=5P4UeFsGLewlf8WNfYzC)

30. A map of 28GHz licenses given in 2017 is below (**Spectrum Bands and Licence Areas for 28GHz**):

### Spectrum Access 28 GHz licences, frequencies and regions



	27.8285 – 28.0525 GHz paired with 28.8365 – 29.0605 GHz	28.0525 – 28.1645 GHz paired with 29.0605 – 29.1725 GHz	2 x 28 MHz	28.1925 – 28.3045 GHz paired with 29.2005 – 29.3125 GHz	2 x 28 MHz	28.3325 – 28.4445 GHz paired with 29.3405 – 29.4525 GHz	
	(2 x 224 MHz)	(2 x 112 MHz)		(2 x 112 MHz)		(2 x 112 MHz)	
A	Arqiva	Telefónica UK		Arqiva		UK Broadband	
B		Vodafone		Telefónica UK		UK Broadband	
C		Telefónica UK		Vodafone		UK Broadband	
D		Vodafone			UK Broadband		UK Broadband
E							
F		Telefónica UK			UK Broadband		UK Broadband
G							
H							
I							
J		Vodafone			UK Broadband		UK Broadband
K							
L		Telefónica UK			UK Broadband		UK Broadband
M							
N		Telefónica UK			UK Broadband		(Spectrum traded to Arqiva Ltd at 6 locations)

Region A:	Greater London
Region B:	Greater Manchester, Merseyside & Cheshire
Region C:	West Midlands, Warwickshire, Staffordshire, Worcestershire, Shropshire & Herefordshire
Region D:	Isle of Wight, Hampshire, Berkshire & Oxfordshire
Region E:	Essex, Hertfordshire & Buckinghamshire
Region F:	Suffolk, Norfolk, Bedfordshire, Cambridgeshire & Northamptonshire
Region G:	Derbyshire, Lincolnshire (other than North & North East Lincolnshire District Councils), Leicestershire, Nottinghamshire & Rutland
Region H:	Kent, Surrey, East Sussex & West Sussex
Region I:	East Riding of Yorkshire, North, West & South Yorkshire, North & North East Lincolnshire District Councils
Region J:	Tyne and Wear, Durham, Northumberland, Cumbria & Lancashire
Region K:	Bristol, Devon, Cornwall and the Isles of Scilly, Dorset, Somerset, Wiltshire & Gloucestershire
Region L:	Scotland
Region M:	Wales
Region N:	Northern Ireland

Spectrum Access complying with IR 2048 – First awarded December 2000
Spectrum Access complying with IR 2048 – First awarded February 2008

Spectrum Access frequency packages				
National (Arqiva)	27.8285 – 28.0525 GHz	paired with	28.8365 – 29.0605 GHz	(2 x 224 MHz)
Package 1	28.0525 – 28.1645 GHz	paired with	29.0605 – 29.1725 GHz	(2 x 112 MHz)
Guard-band				(2 x 28 MHz)
Package 2	28.1925 – 28.3045 GHz	paired with	29.2005 – 29.3125 GHz	(2 x 112 MHz)
Guard-band				(2 x 28 MHz)
Package 3	28.3325 – 28.4445 GHz	paired with	29.3405 – 29.4525 GHz	(2 x 112 MHz)



January 2017

31. GSMA<sup>1</sup> extols governments to use up to 66GHz (**GSMA to Govts Re 26-40 and 66GHz WRC 19 Open Letter**):

[https://www.scribd.com/document/462502012/GSMA-to-Govts-Re-26-40-and-66GHz-WRC-19-Open-letter?secret\\_password=ZJHd0rbHANA6xmHKSKW8](https://www.scribd.com/document/462502012/GSMA-to-Govts-Re-26-40-and-66GHz-WRC-19-Open-letter?secret_password=ZJHd0rbHANA6xmHKSKW8)

32. Ofcom put their plans in the document below:

[https://www.scribd.com/document/462574029/Ofcom-Enabling-5g-Uk?secret\\_password=4ZkITpP59C5XVuBihkUm](https://www.scribd.com/document/462574029/Ofcom-Enabling-5g-Uk?secret_password=4ZkITpP59C5XVuBihkUm)

33. Telecoms companies keep their strategy close to their chest. It is hard to find the 5G strategy of telecoms company so one has to rely on information disclosed as part of local council enquiries or Parliamentary processes. It does feel like one is shooting in the dark a bit which is surprising given the principle of citizens' entitlement to

<sup>1</sup> The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with over 350 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors

environmental information in the Aarhus Convention. See, for example, Cornerstone's comms on some plans (joint venture between Telefonica (O2) and Vodafone):

<https://www.scribd.com/document/462499848/Cornerstone-General-Background-Info-Doc>

34. DCMS Future Telecoms Infrastructure Review (undated) with our highlights is below. It confirms that higher frequencies above 20GHz will need to be used albeit they consider in some "hotspots" which are likely to be towns with heavy footfall in order to drive the benefits.

[https://www.scribd.com/document/462837886/Government-Future-Telecoms-Infrastructure-Review-JLC-Highlights?secret\\_password=trh5ZLLSjHQxz8Niv2RH](https://www.scribd.com/document/462837886/Government-Future-Telecoms-Infrastructure-Review-JLC-Highlights?secret_password=trh5ZLLSjHQxz8Niv2RH)

35. Before the World Radiocommunications Conference at the end of 2019, GSMA called on governments to identify spectrum in the 26, 40 and 66GHz bands. It called for 26GHz and 28GHz which it said was needed for 5G. The reference to sub-1 GHz is to the frequencies such as 700MHz which the UK intends to use as the backbone of the 5G infrastructure. So you can see the direction of travel.

<https://www.gsma.com/spectrum/resources/26-ghz-28-ghz/>

36. Extracts showing the call for these frequencies is at **Schedule 4**.

37. The industry touted financial rewards of 5G are huge and hover around US\$3 trillion over the next 15 years. Tax revenues to the UK, particularly are touted at £185 billion over the next 15 years. Do see GSMA's statements about the value of this technology in other parts of the world (**GSMA Full Report 5G Regional Spotlights**):

<https://www.scribd.com/document/462583669/GSMA-Report-Full-Report-5G-Regional-Spotlights>

38. In the diagram below, the UK is shown in red and green. Red refers to support for 26GHz and green refers to support for testing 28GHz.

**MOMENTUM IS PICKING UP**



**KEY**

- Supports 26 GHz
- Supports 28 GHz
- Testing 26 GHz
- Testing 28 GHz

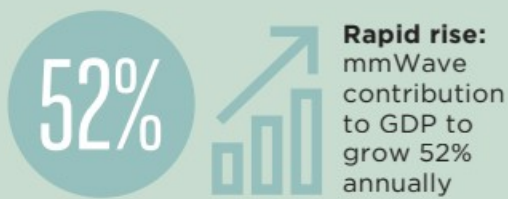
Source: GSMA Intelligence  
June 2019

In addition to supporting and trialling mmWave bands, 26 GHz has also been licensed for 5G in countries such as Italy and 28 GHz has been licensed in Japan, South Korea, Uruguay and the U.S. for 5G. Hong Kong is licensing both bands

**GDP impact of mmWave spectrum by 2034**



**THE GROWING IMPORTANCE OF MMWAVES**



The share of 5G services using mmWaves

**Read More**

The GSMA's spectrum team's policy position on 5G spectrum is available at:  
<https://www.gsma.com/spectrum/5g-spectrum-policy-position/>

The team's policy position on WRC-19 Agenda Item 1.13 is available at:  
<https://www.gsma.com/spectrum/wrc-series/>

Read more about the socio-economic benefits of mmWave spectrum, including 26 and 28 GHz, at:  
<https://www.gsma.com/spectrum/resources/mmwave-5g-benefits/>

October 2019



39. You may readily understand, by the astronomic sums being bandied about, that the governments around the world are enticed by the promise of massive tax windfalls. It is simplistic to say that these promises seem like a bribe to governments, but such sums may be clouding their vision of the reality of this technology.
40. This may be why they seem so keen to clear the way for this technology and to ignore overwhelming and scientifically proven health concerns. There is certainly a conflict of interest when the governments who are promised such sums are also in charge of legislation to roll out this technology. In layman's terms, 'the fox is in charge of the hen house'.
41. The table below attempts to show the development of the bundle of frequencies which may be used to deliver the 5G promise in the UK:

Timeline	Body	Frequency	Comments
2017	Ofcom	28GHz	<ul style="list-style-type: none"> <li>Licenses it to many companies</li> </ul>
2018/19	Ofcom	66GHz	<ul style="list-style-type: none"> <li>Allows it to be used for 'test beds'</li> </ul>
Early 2018	Ofcom auctions of frequencies for 5G	2.3Ghz 3.4GHz	<ul style="list-style-type: none"> <li>2.3GHz (to O2/Telefonica) and</li> <li>3.4GHz (to Vodafone, O2, H3G, EE)</li> </ul>
2019	Local councils	3G and 4G around 600mHz – 2.3GHz range	<ul style="list-style-type: none"> <li>5G can mean densification of signal using current 3G or 4G frequencies</li> <li>Antennae are being placed on every lamp post in many areas around the country</li> <li>This is resulting in 5G capability at much lower frequencies than those which will be auctioned and go live in the future</li> <li>Antennae on every lamp post is being actioned by local councils around the country pursuing a "green" or "smart cities" agenda but in reality putting in the backbone infrastructure for 5G</li> </ul>
2019/20	Ofcom	3.6GHz – 3.8GHz 700MHz	<ul style="list-style-type: none"> <li>The next bands to be auctioned during this/next year are the 3.6GHz – 3.8GHz and 700MHz bands and the auctions are currently expected to take place in 2020, with auction applications likely to open in December 2019</li> </ul>
Future	Ofcom	26GHz 37- 43.5GHz 66 - 71GHz	<ul style="list-style-type: none"> <li>The final spectrum bands for 5G to be auctioned possibly in the next couple of years are the very controversial mmWave bands of 26GHz and possibly also the 37-43.5GHz and 66 - 71GHz bands)</li> <li>It is these that enable the much-vaunted ultra low latency (low delay) and very high capacity data capabilities of 5G, but they have a very short range, hence the</li> </ul>

Timeline	Body	Frequency	Comments
			<p>particular need for very small cells for these bands that is being complained about.</p> <ul style="list-style-type: none"> <li>All of these later 3 bands first need to be definitively agreed globally as being assignable to 5G use by the ITU-R WRC (World Radio Conference) which meets later this month 28 Oct to 22 Nov. in Sharm el Sheikh</li> </ul>

42. These frequencies, when used in wireless devices (which are inherently electrical), produce electromagnetic fields which interact with human cells, electrical impulses and chemical reactions causing disturbances, illness, damage and harm.

43. The current rollout by the industry is starting with existing 4G frequencies but densifying the infrastructure by putting up thousands more masts, antennae, microcells, picocells and the like to carry these frequencies to do the data transfer. Then, over time, this infrastructure will and indeed, must, gradually move up to higher frequencies as the anticipated exponential increase in demand uses up the crowded space of these lower frequencies.

44. This is how Ericsson explains how these high frequency small cells will work:

[https://www.scribd.com/document/462833776/Ericsson-5g-Roll-impact-Dec-2017?secret\\_password=oRICfbxYZXPECWyIXqBC](https://www.scribd.com/document/462833776/Ericsson-5g-Roll-impact-Dec-2017?secret_password=oRICfbxYZXPECWyIXqBC)

## 2. Why are people concerned about health re 5G

45. There are people in the UK and abroad who suffer from the effects of electromagnetic frequencies and are recognized medically to be Electromagnetically Hypersensitive (“EHS”).

46. They suffer a range of symptoms when they come into contact with EMFs including headaches, fatigue, disturbed sleep, tingling, pains in limbs, head or face, stabbing pains, brain-fog and impaired cognitive function, dizziness, tinnitus, nosebleeds, palpitations and others.

47. I have set out in **Schedule 1**, the biological effects at various frequencies set out in the Bioinitiative report <https://bioinitiative.org/table-of-contents/>

48. I have set out in **Schedule 2**, a letter from Dr Andrew Tressider setting out some of the medical symptoms which are experienced by those who suffer from electro sensitivity.

49. Accepted biological effects of EM fields include: increased childhood leukaemia, adverse effects on sperm production, pregnancy, embryo development and

hormones; there are links with depression, Motor Neurone and Parkinson's diseases, several cancers, behavioural problems and cataracts (see **Schedule 2**).

50. Other studies show reduced fertility, neurological damage, DNA damage, cell death (apoptosis), oxidative stress and cardiac effects which are but a few of those recognised by modern scientific studies referred to below. The studies also show significant risks to insect, plant and bird life.
51. Mechanisms include: changes in calcium influx, failure of repair of DNA breaks, blood brain barrier permeability, heat shock protein production, disruption of vital melatonin production (e.g. by blue light from screens), general sympathetic (stress) upregulation of the body and disruption of cell to cell signaling. The overall effect may be to age us all more quickly (see also **Schedule 2**).
52. Below are some stories. One is from a woman in Kentish Town who wrote to me last year. She has consented to her story being circulated. She has corresponded with PHE who has denied any liability or ability to intervene. When 5G was turned on at an antenna 6m from her house, she started suffering the following symptoms which she has not suffered before:
- a persistent headache;
  - nausea;
  - high levels of anxiety;
  - palpitations;
  - a constant humming sound in her ears;
  - itching skin; and
  - other symptoms which recede when she goes into green wooded spaces.

53. Her note is below:

Hi Jessica,

someone posted your Ham&High letter on Nextdoor, where I came across it. Many thanks for taking the time to write it!

I am now writing to you to share with you our recent personal experience with 5G.

We live in a terraced house in Kentish Town and there is a council block facing the back of it.

In May this year an earlier mobile phone mast installation on the roof of this block was "upgraded" to 5G. I was told at the time that this is the first such installation of 200 planned for Camden alone. I was also told that local engineers have no access to the control panels. In our case the infrastructure or hardware(?) is made and supplied (apparently for free) by Huawei and is being operated remotely by Huawei engineers.

Our bedroom is approx. 5-6 meters away from the public exclusion zone around the two antennas directly facing us.

My first response was to get in touch with the Camden New Journal, write to Public Health England and my MP, Keir Starmer whom I also went to see in person at his surgery. I also sent various FOI requests to the council.

Tom Foot of the CNJ initially seemed very keen to look into the issue and asked me to forward all the communication but has since gone quiet.

All the official respondents are unanimously hiding behind the ICNIRP "guidelines" (I assume you are familiar with who the ICNIRP are?) and PHE more or less confirmed that we are now guineapigs (no adverse effects anticipated, but should the evidence change they'll let us know....).

I alerted PHE to the fact that some tenants of the council block have to walk through the exclusion zone in order to reach their flat and also told them that tree surgeons had been sent into this zone to "reshape" one of two very large trees near the antennas. PHE responded that there should be warning signs and/or cordoned off areas but this is still not the case.

Various big law firms I approached hoping they might be interested in looking into this unprecedented threat to our privacy and health (and theirs!) didn't show any interest either.

Whilst trying to alert others to this issue I also did everything I could to inform myself. An accoustimeter I purchased showed ridiculously high rf readings in our house and garden, especially at night. An emf expert has since confirmed these.

As I began to feel unwell and also utterly unsafe in our home we decided to relocate to Germany for a while and we ended up staying there for nearly three months.

Since our return we have been sleeping under an emf bed canopy and we also brought back a German system which plugs into the electricity circuit of the house and is designed to mitigate the adverse effects of the radiation. These two measures are enabling us to be in our home of twenty years at least for the time being.

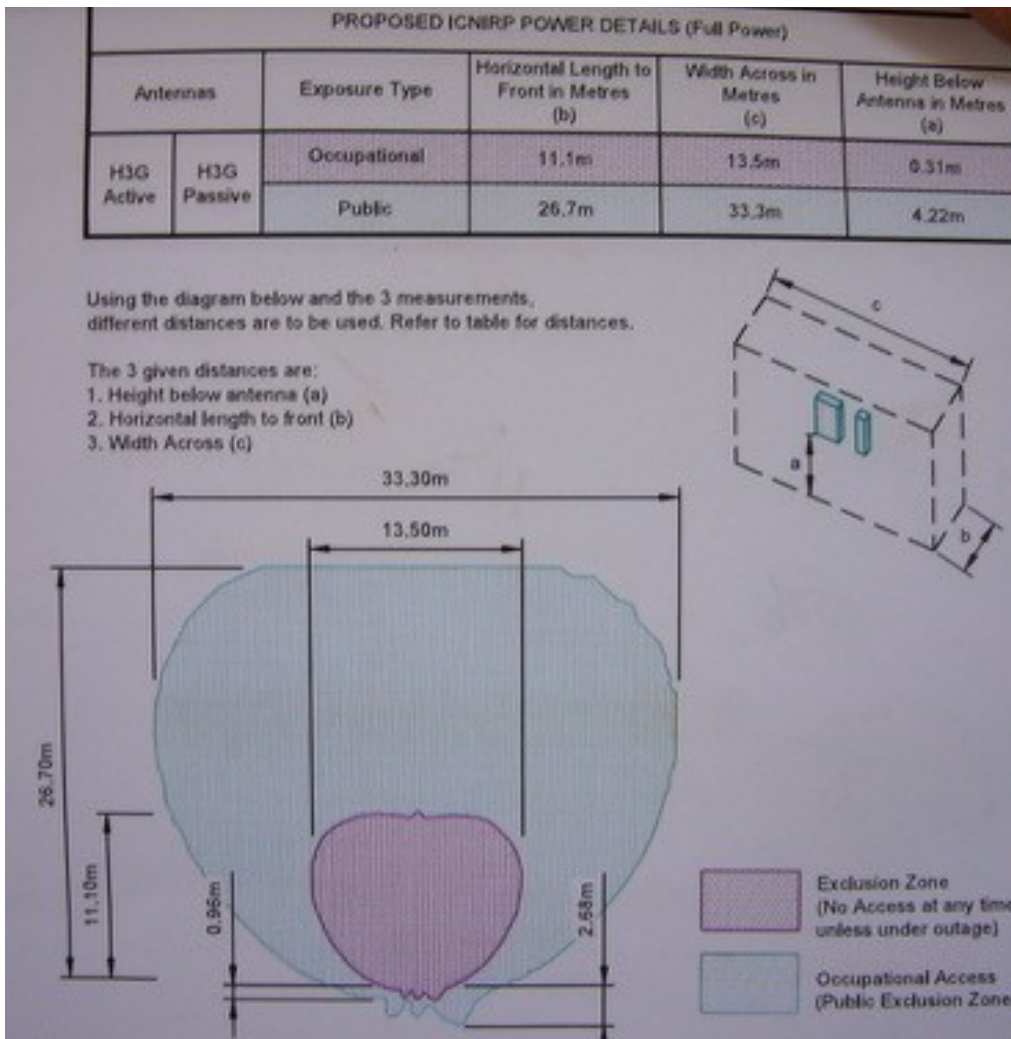
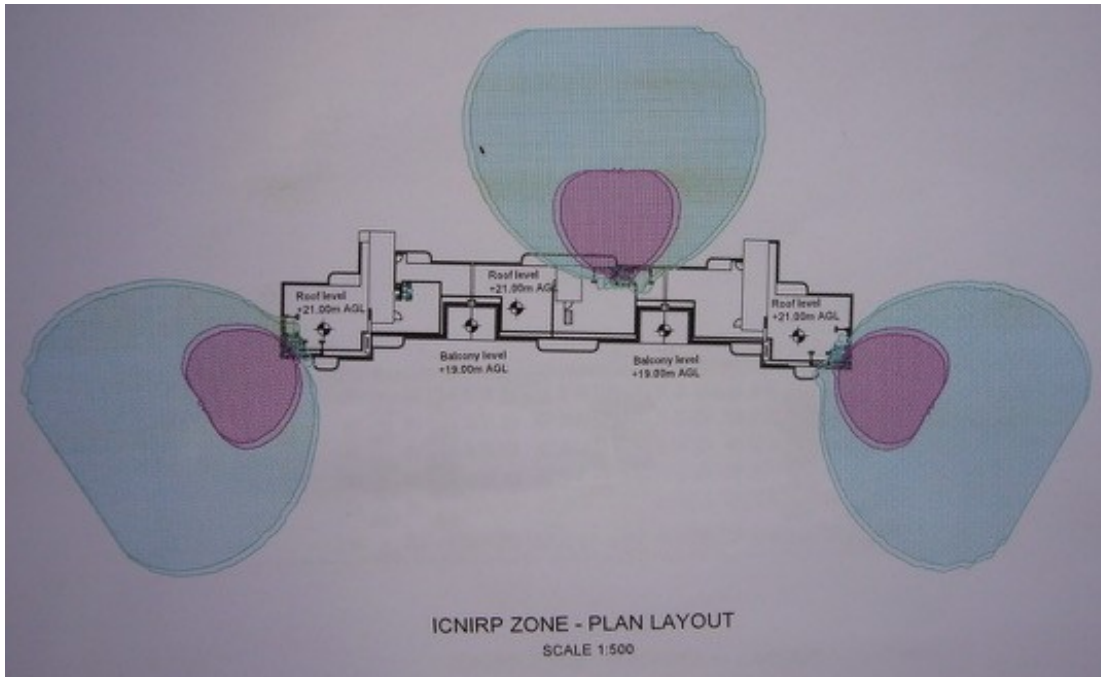
As things stand I don't have much hope that we will be allowed to return to our previous life without a 24/7 watchtower monitoring our every move and microwaving us and the wildlife in our garden in the process. The law is not on our side.

But maybe there is still a little bit of time to initiate some debate about where we seem to be going and stop this madness going any further. Who decides that we will have no choice but to live in "smart" cities and a toxic digitalised environment????

Please get in touch if you would like me to send you all the various letter exchanges or if you would like to meet up sometime.

Best wishes and thanks again for your attempts to raise awareness

54. Below are pictures of the exclusion zones on the council building caused by the 5G antenna:



55. Next is a story which I found during my research relating to a woman who had a mobile phone mast put up right outside of her house some years ago.

#### Home sweet home

We have a lovely home, but a mobile mast has been put up right next to it. Do we have a choice? No; none. Even though we protested and successfully objected so that our local planners refused, along came an HM Planning Inspector to tell us it wouldn't look bad to them, and that's all that matters. So up it went.

Now I have problems sleeping, my partner has headaches and my daughter has started having nosebleeds. Who will believe me? I know there are lots of people and families out there like ours experiencing the same, but no-one accepts what we are saying. The collusion is staggering between the industry that says we just don't understand, police who say it will 'all prove to be unfounded' and the protection authorities who say there is no evidence, whatever we say and however many of us say it. Then the industry is lobbying government and asking for more de-regulation, because they are slipping behind in international competitiveness and not making as much money as they want. And the government stands by and will not even listen to MPs in the House of Commons who want proper debate, and a slow-down in this hateful race, until we know more.

My partner was then approached by O2 Airwave because he runs a business with a convenient location for a TETRA mast. He knows that the people who work for him are worried so he asked the NRPB for a current statement on safety, and whether he can tell his employees that TETRA will not affect them.

And the NRPB told him that he 'must make his own mind up on that', and by the way, some people say that low frequency microwaves like TETRA have been used for weapons or mind control, but there is no evidence. He didn't ask that!

#### A cruel dilemma

So we put our lovely home on the market to move on. We feel we can't risk the children living with this radiation so close. Maybe their school is protected by the planning rules, but our home isn't.

What do we do? Protest and risk drawing attention to our house? Or keep quiet and hope no-one notices the silver monstrosity by the garden fence? If we protest and can't sell, we can't get away. And then we will be told that it is because we have scared people off, not because of the mast itself, because without us they would not have worried! But it is really making us unwell!!

We decided we must tell everyone who asks that the mast has been declared OK. It has a certificate that says it is operating according to the

guidelines, and that the NRPB says it is probably safe. If we say that the NRPB says it *is* safe we could be held to account for lying.

We wrote to the local planning office to seek advice. What do we legally have to say to people buying our house? Does this fear of ours (that our symptoms are from the mast, and may be bad in the long term as well as very unpleasant all the time), count as something material to be declared about the property? The planners refused to advise us, and suggested we seek our own legal advice.

Am I getting this right? It appears that since the government has chosen not to protect us from something that they certainly know may not be harmless, we must pay to find out if we must warn prospective buyers of the danger they say probably does not exist? And if the legal advice is that we must inform prospective buyers? Isn't that like warning them off? How extraordinary.

A family viewed our house, with happy little children. It is a lovely house, and the rooms are bright, a good size and well-proportioned. It is an ideal family home. *I don't want them to buy it.* But I want to get away. I want to sleep again, and for us all to be happy and well.

Mr Blair; Mr Prescott; Mr Clark; Sir William Stewart, at the Health Protection Agency. None of you seems to care. Is my family an acceptable casualty in the cause of your politics? Forgive me if I believe down to my toes that we have lost democracy, lost our human rights and that you have abdicated all responsibility.

56. Please see the articles below referring to health impacts in Switzerland when their 5G was switched on in 102 locations in Geneva.

<https://mdsafetech.org/2019/07/20/the-first-report-of-5g-injury-from-switzerland/>

57. And finally, please see below the story of the fight against 5G in the US - Local Soccer Mom Versus Multi Billion 5G Industry.

Deb Persampire, an American mother, decided to do something when she found out about the 5g rollout in her town, on her street and outside her house. Without her knowledge and apparently without regard for her safety and that of her children; her local council had instructed the installation of 'small cell' towers all over town.

Her story is your story, the same thing is happening in the UK. EE and Vodaphone are rolling out 5G technology which recent scientific studies have shown to be harmful to human development and function. Please view the video and share widely

<https://www.youtube.com/watch?v=6M7YFI0I9kI&feature=youtu.be>

### 3. What do some doctors say

58. Do see the letter from Dr Andrew Tressider who is also a trustee of the ES-UK ([www.es-uk.com](http://www.es-uk.com)) at **Schedule 2** and his paper at **Schedule 3**. At its heart is the caution that EMFs cause illness in some people.

59. It may also be helpful to point you to the European Commission's 'non-binding guidelines' on EMF. Pages 87 – 89 covers some possible symptoms, not just those associated with over-exposure

<http://ec.europa.eu/social/BlobServlet?docId=14741&langId=en>

60. An extract from the above is below:

High frequency fields (100 kHz to 300 GHz)

Exposure to high frequency fields below the relevant action level (AL) may cause interference with the normal functioning of active implanted medical devices or bodyworn medical devices. Any malfunction could have potentially serious consequences.

Passive medical implants that are metallic may serve as absorbing antennas resulting in local increases in RF exposure of tissues and possible injury.

The first indication of exposure to high frequency fields may be the sensation of warmth as the worker or parts of their body are heated by the field. However this may not always be the case and feeling warm is not a reliable warning signal. It is also possible to 'hear' pulsed fields between 300 kHz and 6 GHz, so clicking, buzzing or hissing noises may be heard by exposed workers.

Prolonged exposure of the whole body can result in a rise in body temperature.

Increased temperature of only a few degrees can lead to mental confusion, fatigue, headache and other symptoms of heat stress. High physical workloads, or working in hot and humid conditions will increase the likelihood of these effects. The severity of the symptoms also depend on the physical condition of the worker, whether they are dehydrated or not, and on the clothing they are wearing.

Partial body exposure can lead to localised heating or 'hot spots' in muscles or internal organs, and also cause superficial burns which appear instantly on exposure. Serious internal injury is possible without obvious burns on the skin. Strong local overexposure may cause damage to muscles and surrounding tissues in exposed limbs (medial compartment syndrome), which develops instantly or within a few days at most. In general terms, most tissues can tolerate increases in temperatures for short periods without harm, but a temperature of 41 °C for more than 30 minutes will produce damage.



A temporary lowering of sperm count is possible with exposures that cause substantial heating of the testis, and heating may increase the risk of miscarriage in early pregnancy.

The eye is known to be sensitive to heat, and very high exposure well above the ELV may cause inflammation of the sclera, iris or conjunctiva. Symptoms can include redness, pain in the eyes, sensitivity to light and pupillary constriction. Cataracts (opacities of the lens) are rare but a possible late effect of exposure, and can take weeks or months to develop following exposure. There are no reports of effects occurring years after exposure.

For higher frequency fields (around 6 GHz and above) energy absorption becomes increasingly superficial. These fields will be absorbed by the cornea of the eye, but exposures well above the ELV will be required to cause burns. The skin will also absorb these high frequency fields and at sufficiently high exposures this may result in pain and burns.

Workers may suffer electric shock or contact burns from touching working antennas or from contact with large metallic, ungrounded objects, such as cars, in the field. Similar effects may occur when an ungrounded worker touches a grounded metallic object.

These burns may be superficial or deep within the body. Metallic implants, including dental fillings and body piercings (as well as jewellery and some tattoo pigments), can concentrate the field leading to localised heating and thermal burns. High exposure of the hand may also result in nerve damage.

Case reports of overexposed workers suggest other symptoms may also be possible.

These include headaches, bowel upset, lethargy, and long-lasting feelings of 'pins and needles' in the exposed tissues.

Stress reactions may be associated with actual or suspected overexposure.

61. You may want to review the site for Physicians for Safe Technology which has a whole section on 5G Telecommunications and lists numerous biological effects and impacts:

<https://mdsafetech.org/5g-telecommunications-science/>

62. The 2018 European Commission Scientific Committee on Health, Environment and Emerging Risks (SCHEER) regularly updates emerging risks to public and environmental health. In their 2018 European Commission Statement on Emerging Health and Environmental Issues lists e cigarettes, perflourinated compounds, plastics, nanoparticles and also includes virtual reality and electromagnetic radiation, especially 5G technologies. They state "The lack of clear evidence to inform the development of exposure guidelines to 5G technology leaves open the possibility of unintended biological consequences."

[https://ec.europa.eu/health/scientific\\_committees/scheer\\_en](https://ec.europa.eu/health/scientific_committees/scheer_en)

63. The report below states at page 14:

<https://mdsafetech.files.wordpress.com/2019/02/scheer-report-emerging-concerns-2018-russell-mentioned.pdf>

“On the horizon, a new generation of even shorter high frequency 5G wavelengths is being proposed to power the Internet of Things (IoT). The IoT promises us convenient and easy lifestyles with a massive 5G interconnected telecommunications network. However, the expansion of broadband with shorter wavelength radiofrequency radiation highlights the concern that health and safety issues remain unknown. Controversy continues with regard to harm from current 2G, 3G and 4G wireless technologies. 5G technologies are far less studied for human or environmental effects” (Russell, 2018).”

and

“5G networks will soon be rolled out for mobile phone and smart device users. How exposure to electromagnetic fields could affect humans remains a controversial area, and studies have not yielded clear evidence of the impact on mammals, birds or insects. The lack of clear evidence to inform the development of exposure guidelines to 5G technology leaves open the possibility of unintended biological consequences”

#### 4. The government, its agencies and mobile service providers have washed their hands of health issues

64. There is no doubt that 5G will have massive commercial benefits. The connectivity of over 100 billion devices, self driving cars, nano-technology, remote medical interventions and applications which have not yet been thought about. But, at what cost to human health?

##### **The Prime Minister**

65. The Prime Minister’s position was set out in his speech to the United Nations in September, 2019.

<https://www.gov.uk/government/speeches/pm-speech-to-the-un-general-assembly-24-september-2019>

66. I set out his text below for ease of reference:

Mr President, Your Excellencies, Ladies and Gentlemen, faithful late night audience.

It is customary for the British Prime Minister to come to this United Nations and pledge to advance our values and defend our rules, the rules of a peaceful world.

From protecting freedom of navigation in the Gulf, to persevering in the vital task of achieving a two-state solution to the conflict in the Middle East. And of course I am proud to do all of these things.

But no-one can ignore a gathering force that is reshaping the future of every member of this Assembly. There has been nothing like it in history. When I think of the great scientific revolutions of the past - print, the steam engine, aviation, the atomic age - I think of new tools that we acquired but over which we - the human race - had the advantage, which we controlled. That is not necessarily the case in the digital age.

You may keep secrets from your friends, from your parents, your children, your doctor – even your personal trainer – but it takes real effort to conceal your thoughts from Google. And if that is true today, in future there may be nowhere to hide. Smart cities will pullulate with sensors, all joined together by the “internet of things”, bollards communing invisibly with lamp posts, so there is always a parking space for your electric car, so that no bin goes unemptied, no street unswept, and the urban environment is as antiseptic as a Zurich pharmacy.

But this technology could also be used to keep every citizen under round-the-clock surveillance. A future Alexa will pretend to take orders. But this Alexa will be watching you, clucking her tongue and stamping her foot. In the future, voice connectivity will be in every room and almost every object: your mattress will monitor your nightmares; your fridge will beep for more cheese, your front door will sweep wide the moment you approach, like some silent butler; your smart meter will go hustling - if its accord - for the cheapest electricity.

And every one of them minutely transcribing your every habit in tiny electronic shorthand, stored not in their chips or their innards - nowhere you can find it, but in some great cloud of data that looms ever more oppressively over the human race - a giant dark thundercloud waiting to burst and we have no control over how or when the precipitation will take place. And every day that we tap on our phones or work on our ipads - as I see some of you doing now - we not only leave our indelible spoor in the ether but we are ourselves becoming a resource. Click by click, tap by tap.

Just as the carboniferous period created the indescribable wealth - leaf by decaying leaf - of hydrocarbons, data is the crude oil of the modern economy and we are now in an environment where we don't know who should own these new oil fields. We don't always know who should have the rights or the title to these gushers of cash and we don't know who decides how to use that data.

Can these algorithms be trusted with our lives and hopes? Should the machines - and only the machines - decide whether or not we are eligible for a mortgage or insurance or what surgery or medicines we should receive? Are we doomed to a cold and heartless future in which computer says yes - or computer says no with the grim finality of an emperor in the arena? How do

you plead with an algorithm? How do you get it to see the extenuating circumstances and how do we know that the machines have not been insidiously programmed to fool us or even to cheat us?

We already use all kinds of messaging services that offer instant communication at minimal cost. The same programmes, platforms, could also be designed for real-time censorship of every conversation, with offending words automatically deleted, indeed in some countries this happens today. Digital authoritarianism is not, alas, the stuff of dystopian fantasy but of an emerging reality.

The reason I am giving this speech today is that the UK is one of the world's tech leaders - and I believe governments have been simply caught unawares by the unintended consequences of the internet; a scientific breakthrough more far-reaching in its everyday psychological impact than any other invention since Gutenberg. And when you consider how long it took for books to come into widespread circulation, the arrival of the internet is far bigger than print. It is bigger than the atomic age - but it is like nuclear power in that it is capable of both good and harm - but of course it is not alone as new technologies seem to race towards us from the far horizon.

We strain our eyes as they come, to make out whether they are for good or bad - friends or foes? AI - what will it mean? Helpful robots washing and caring for an ageing population? or pink eyed terminators sent back from the future to cull the human race?

What will synthetic biology stand for - restoring our livers and our eyes with miracle regeneration of the tissues, like some fantastic hangover cure? Or will it bring terrifying limbless chickens to our tables.

Will nanotechnology help us to beat disease, or will it leave tiny robots to replicate in the crevices of our cells? It is a trope as old as literature that any scientific advance is punished by the Gods. When Prometheus brought fire to mankind in a tube of fennel, as you may remember, that Zeus punished him by chaining him to a tartarean crag while his liver was pecked out by an eagle and every time his liver regrew the eagle came back and pecked it again and this went on for ever - a bit like the experience of Brexit in the UK, if some of our parliamentarians had their way.

In fact it was standard poetic practice to curse the protos heurtes - the person responsible for any scientific or technical breakthrough. If only they had never invented the ship, then Jason would never have sailed to Colchis and all sorts of disasters would never have happened. And it is a deep human instinct to be wary of any kind of technical progress.

In 1829 they thought the human frame would not withstand the speeds attained by Stephenson's rocket and there are today people today who are actually still anti-science.

A whole movement called the anti-Vaxxers, who refuse to acknowledge the evidence that vaccinations have eradicated smallpox and who by their

prejudices are actually endangering the very children they want to protect. And I totally reject this anti-scientific pessimism.

I am profoundly optimistic about the ability of new technology to serve as a liberator and remake the world wondrously and benignly, indeed in countless respects technology is already doing just that.

Today, nanotechnology - as I mentioned earlier - is revolutionising medicine by designing robots a fraction of the size of a red blood cell, capable of swimming through our bodies, dispensing medicine and attacking malignant cells like some Star Wars armada. Neural interface technology is producing a new generation of cochlear implants, allowing the gift of hearing to people who would not otherwise be able to hear the voices of their children.

A London technology company has worked out how to help the blind to navigate more freely with nothing more than an app on their smartphones - new technologies, produced in Britain, helping the deaf to hear and the blind to see. And we used to think that printing was something you did to run off a boarding card.

Now a British company has used 3D printing to make an engine capable of blasting a rocket into space. In African countries, millions of people without bank accounts can now transfer money using a simple app; they can buy solar energy and leap in one transaction from no electricity to green power. And new advances are making renewable energy ever cheaper, aiding our common struggle against climate change.

Our understanding of the natural world is being transformed by genome sequencing. The discovery of the very essence of life itself. The secret genetic code that animates the spirit of every living being and allows medical breakthroughs the like of which we have never known. Treatments tailored to the precise genetic makeup of the individual.

So far, we have discovered the secrets of less than 0.3 percent of complex life on the planet. Think what we will achieve when – and it is a matter of when – we understand 1 or 2 percent, let alone 5 or 10 percent.

But how we design the emerging technologies behind these breakthroughs – and what values inform their design – will shape the future of humanity. That is my point to you tonight my friends, my Excellencies - At stake is whether we bequeath an Orwellian world, designed for censorship, repression and control, or a world of emancipation, debate and learning, where technology threatens famine and disease, but not our freedoms.

Seven decades ago, this General Assembly adopted the Universal Declaration of Human Rights with no dissenting voices, uniting humanity for the first and perhaps only time behind one set of principles. And our declaration - our joint declaration - upholds “freedom of opinion and expression”, the “privacy” of “home or correspondence,” and the right to “seek...and impart information and ideas”. Unless we ensure that new

technology reflects this spirit, I fear that our declaration will mean nothing and no longer hold.

So the mission of the United Kingdom and all who share our values must be to ensure that emerging technologies are designed from the outset for freedom, openness and pluralism, with the right safeguards in place to protect our peoples. Month by month, vital decisions are being taken in academic committees, company boardrooms and industry standards groups. They are writing the rulebooks of the future, making ethical judgements, choosing what will or will not be rendered possible.

Together, we need to ensure that new advances reflect our values by design. There is excellent work being done in the EU, the Commonwealth, and of course the UN, which has a vital role in ensuring that no country is excluded from the wondrous benefits of this technology, and the industrial revolution it is bringing about. But we must be still more ambitious.

We need to find the right balance between freedom and control; between innovation and regulation; between private enterprise and government oversight. We must insist that the ethical judgements inherent in the design of new technology are transparent to all. And we must make our voices heard more loudly in the standards bodies that write the rules.

Above all, we need to agree a common set of global principles to shape the norms and standards that will guide the development of emerging technology.

So - here's the good news - I invite you next year to a summit in London, a wonderful city, where by the way it is not raining 94 per cent of the time, and where at one stage - when I was Mayor of London - we discovered that we had more Michelin starred restaurants even than Paris. The French somehow rapidly recovered - by a process that I wasn't quite sure was entirely fair. But we still have by far, in the UK, by far the biggest tech sector - fintech, biotech, meditech, nanotech, green tech - every kind of tech - in London - the biggest tech sector anywhere in Europe, perhaps half a million people working in tech alone.

I hope you will come there, where we will seek to assemble the broadest possible coalition to take forward this vital task, building on all that the UK can contribute to this mission as a global leader in ethical and responsible technology. If we master this challenge – and I have no doubt that we can – then we will not only safeguard our ideals, we will surmount the limits that once constrained humanity and conquer the perils that once ended so many lives.

Together, we can vanquish killer diseases, eliminate famine, protect the environment and transform our cities. Success will depend, now as ever, on freedom, openness and pluralism, the formula that not only emancipates the human spirit, but releases the boundless ingenuity and inventiveness of mankind, and which, above all, the United Kingdom will strive to preserve and advance.

Excellencies, Ladies and Gentlemen, thank you for your kind attention.

Published 25 September 2019

67. You may be forgiven for thinking that the Prime Minister was not in favour of 5G. But you will notice the absence of one important fact in his speech – HEALTH. He spoke merely of “security”.
68. I was one of a group of people who delivered various petitions calling on the government to pause the roll out of 5G and to use the Precautionary Principle. We were not even given the courtesy of a response.

### **Other agencies**

69. There are many government agencies tasked with ensuring that our environment is free from harmful agents. Some of those involved in the electromagnetic frequency or radiation space in the UK are set out in **Schedule 4**.
70. A few words about Ofcom. Ofcom confirmed in an FOI that their remit does not include health and the effects of RFR.

[https://www.scribd.com/document/462574431/Ofcom-Response-to-FOI-Not-Do-Health-Environmental-and-Health-Impact-of-5G-Networks-Research?secret\\_password=XSxsJWeSoJvAk5KZC1s](https://www.scribd.com/document/462574431/Ofcom-Response-to-FOI-Not-Do-Health-Environmental-and-Health-Impact-of-5G-Networks-Research?secret_password=XSxsJWeSoJvAk5KZC1s)

71. They state:

“We do not, however, hold risk analysis data of the impact on the environment from 5G technology deployment and consultations concerning the consequences of blanket coverage of non-ionising radiation. This is because we have no statutory duties in this area, it does not fall within our remit and other bodies such as the World Health Organisation (“WHO”) and Public Health England are better placed to address such issues.

As the UK communications regulator, we regulate mobile networks’ use of radio frequencies in the UK. We are not, however, responsible for determining the levels of exposure to the Electromagnetic Field (“EMF”), the emissions produced by mobile base stations, that are safe for the public. Mobile Network Operators (“MNOs”) are responsible for ensuring that their base stations comply with the relevant EMF safety limits. As and when the MNOs upgrade their networks to deploy 5G technology, they must continue to ensure their mobile base stations stay within these limits.

Public Health England is the relevant organisation responsible for advising the UK Government on EMF exposure and it also provides advice to national authorities on EMF issues.”

72. Central to PHE’s advice is that exposures to radio waves should comply with the guidelines published by the International Commission on Non-Ionizing Radiation

Protection (ICNIRP). It states that ICNIRP is formally recognised by the World Health Organization (WHO).

73. PHE's advice on safe levels is at:

<https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health>

74. The advice states:

“PHE's main advice about radio waves from base stations is that the guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) should be adopted for limiting exposures. ICNIRP is formally recognised as an official collaborating non-governmental organisation by the World Health Organization (WHO) and the International Labour Organization (ILO). ICNIRP is also consulted by the European Commission.

After reviewing the evidence, ICNIRP set guidelines to avoid excessive heating of the body, an established impact of exposure which can have detrimental effects. The ICNIRP guidelines apply to frequencies up to 300 gigahertz and cover exposures arising from new 5G base stations as well as from older technologies.

ICNIRP's radiofrequency guidelines were published in 1998. However, ICNIRP restated these in 2009 following its own updated review of the scientific evidence. ICNIRP concluded that the scientific literature published since the 1998 guidelines provided no evidence of any adverse health effects below the restrictions in the guidelines and did not necessitate an immediate revision of its guidelines.

Radio-wave exposure levels can be measured or calculated and are usually expressed in terms of their power density in watts per square metre, or as a fraction of the ICNIRP guideline level.”

75. In relation to Monitoring Exposure, it states:

“The radio-wave exposure level produced by base stations depends on their output powers, the directional characteristics of their transmitting antennas and where people can be exposed in relation to the antennas. In general, being closer to an antenna results in higher exposures, but the most powerful antennas tend to be mounted high up on masts or buildings, and they are designed to direct most of their power towards the horizon, so exposure levels beneath antennas are small. Antennas located nearer to street level and inside buildings are designed to communicate over short distances and transmit with lower power levels than antennas mounted at height. People can access directly in front of these types of antennas, but the exposure levels are low due to the low output powers.

The maximum output power from each base station is set by operators to balance call/data traffic across the different sites that make up the network.



The actual output power at any given time depends on the amount of calls and data being handled and use of excessive power at any given site reduces the capacity of the network for other users. So, optimising transmitted powers to be the minimum needed to carry out communications effectively is an important feature of efficient network design. It also tends to keep public exposures low.

The strength of the radio waves from base-station antennas falls off very quickly with increasing distance. So, radiofrequency fields at ground level and in places normally accessible to the public are many times below guideline levels. Where guidelines can be exceeded, normally within a few metres directly in front of the most powerful antennas, exclusion zones are implemented to restrict access.”

76. The UK government rejects the view that 5G will add significantly to exposure levels. It states on various of its websites:

"while a small increase in overall exposure to radio waves is possible when 5G is added to the existing network, the overall exposure is expected to remain low".

77. The government further asserts that the frequency range of the 5G signals being introduced is within the non-ionising band of the electromagnetic spectrum and well below those considered harmful by the ICNIRP.

"The exposure that 5G will produce has been considered in great depth by ICNIRP, with the restrictions set well below the lowest level of 5G-related radio frequency that has been shown to cause harm," says Prof Croft.

78. The World Health Organisation states that electromagnetic frequency exposures below the limits recommended in the ICNIRP guidelines do not appear to have any known consequence on health.

79. PHE flies the flag for ICNIRP.

80. Interestingly, **ICNIRP's guidelines are voluntary for the telecoms industry and not mandatory**. They are afforded the luxury of filling in a self-certificate confirming that they have complied with ICNIRP's guidelines. Once they provide this, it is prima facie evidence of compliance and a local council cannot enquire into their compliance with such guidelines further.

81. The PHE advice on safe levels state under the heading "Protection measures":

"The ICNIRP guidelines have been incorporated into the 1999 EU Council Recommendation on limiting exposure of the general public to radio waves (1999/519/EC), which the UK Government supported. Subsequently, European technical standards have been published that apply to base stations and other types of radio-emitting products and which limit their radio emissions such that exposure guidelines are not exceeded.

Measures are in place to reduce risks to employees of the companies and to the general public. The ICNIRP guidelines are applied through UK health and safety legislation whereby companies deploying and operating communication networks are required to carry out suitable and sufficient risk assessments, as well as put in place measures to reduce the identified risks so far as reasonably practicable. In controlling risks arising from EMF exposure, the HSE refer to compliance with the ICNIRP guidelines.

The ICNIRP guidelines are applied through the Government's National Planning Policy Framework for England. The framework describes the information about local community consultation and compliance with the ICNIRP exposure guidelines that should accompany planning applications and also explains that local planning authorities should not seek to determine health safeguards if the proposal meets ICNIRP guidelines for public exposure.

Industry has voluntarily committed to comply with the ICNIRP guidelines and to provide certificates of compliance with planning applications for base stations.”

82. ICNIRP's guidelines were first published in 1998 and updated in 2010 and again in March 2020 when they increased exposure levels four times from 10V/m under the 1998 guidelines to 40V/m under the 2020 guidelines. The latest version is March 2020 which replaces the 1998 guidelines but leaves in place the 2010 guidelines relating to extremely low frequency. They are dealt with further below.
83. You will see from these submissions that many have all washed their hands of the impact on health of 5G and leave those who suffer health consequences with no recourse or place to turn for help.
84. At present, neither the government nor its agencies are prepared to take account of the health impacts found in over 1800 scientific papers – a list and explanation of those papers are set out in the 1557 pages of the Bioinitiative report.
85. The government and its agencies justify its their position by stating that they operate within the international ICNIRP guidelines which states that there is no harm from EMFs below the limits which the ICNIRP set. The evidence to confirm that Public Health England has washed their hands in this way in **Schedule 5**.
86. 5G rollout is the policy of the Department of Digital, Media, Culture and Sport:  
  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/597421/07.03.17\\_5G\\_strategy\\_-\\_for\\_publication.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/597421/07.03.17_5G_strategy_-_for_publication.pdf)
87. Health is not mentioned anywhere in the whole document - nor have any risk assessments been published here. One of the biggest risks is actually to the Treasury - with decreasing numbers of healthy taxpayers left in 10-15 years time perhaps, whilst in the document there are all sorts of applications of technology discussed that none of us need or want – not at the cost of our health.

88. A risk assessment is legally compulsory for such a project, not just by PHE, but also by each local council whose workers are working within the public spaces of the borough and exposed to radiation.

<http://www.hse.gov.uk/pubns/indg163.pdf>

89. While the above link relates to The Control of Electromagnetic Fields at Work Regulations 2016 in the context of medical MRI but applies to EMR generically. The link to the regulations are at:

<http://www.legislation.gov.uk/uksi/2016/588/regulation/4/made>

90. The regulations generally require employers to ensure that worker exposure to EMFs does not exceed certain exposure limit values (ELVs).
91. It is unknown whether a risk assessment has been carried out by any of the mobile service operators or PHE.
92. Any risk assessment which should have been done is required to take account of all up to date science and not merely outdated and industry biased guidelines. Even without the legal grounds, on a simple moral basis, if society is to be taken on a voyage, it would be nice to know that the ship was seaworthy, the captain sober, the crew alert and competent, the navigation aids effective, all relevant charts consulted, and a good lookout kept for icebergs, (even for unsinkable ships)... (we had one of those a hundred years or so ago...).
93. While your council may not be expected to anticipate unforeseeable risks, you have now been told in these submissions of one serious risk and you cannot now unknow them.
94. As you know already, for planning purposes, as long as a mobile service operator delivers a certificate to the local council that the frequency for their mast is within the ICNIRP guidelines, the council is directed not to set health guidelines different from ICNIRP's guidelines. Many councils interpret this to mean that any objection to the siting can then only be made on aesthetic grounds – “does it look good in the chosen location”. This interpretation has denuded the public of the right to complain about masts and other RFR products on the basis of damage to their health and that is wrong.
95. For the reasons set out in these submissions I suggest that this is a targeted assault on the rights of citizens, their property and their human rights.
96. I have set out in **Schedule 8** some of the Parliamentary debates, mentions and discussions referring to 5G and health concerns. You will see that all arguments stop with reference to the ICNIRP guidelines which state that there is no health harm for human interaction with frequencies below their limits so any concerns re health are misplaced.

97. The backstop of the ICNIRP Guidelines seem to be the magical panacea for all concerns.
98. Every government agency, some Members of Parliament, eg Keir Starmer QC and Tulip Siddip are all given the ICNIRP line and look no further (see **Schedule 9**).
99. **This total subjugation of the eyes and ears of the citizenry protection mechanism is faultless and have rendered them all deaf to the pleas of sufferers.**

#### **Mobile service providers**

100. Mobile service providers seem to have washed their hands of the health effect of their EMFs. Some refer to the ICNIRP guidelines. Vodafone, Telefonica SA (O2) and BT plc (EE) all rely on the ICNIRP guidelines. When I wrote to Three (3), it did not respond.

## 5. How do the UK agencies interact with the international agencies and ICNIRP

101. Many of the people involved belong to the groups which make up the PHE, COMARE, WHO AND ICNIRP.
102. PHE relies on ICNIRP.
103. COMARE relies on WHO which relies on ICNIRP.
104. The following is a helpful interface of PHE, DHSC, ICNIRP and WHO as at October 2019.
105. NRPB/HPA/PHE, the UK's agency concerned with public health and radiation and sponsored by the Department of Health and DHSC, adopted the 1998 ICNIRP guidelines.
106. The ICNIRP guidelines are based on ICNIRP's general approach and principles, published in 2002.
107. The World Health Organization does not set guidelines. It has entrusted this role to the private self-elected group ICNIRP, spun out of another private group concerned with nuclear radiation.
108. ICNIRP 1998 guidelines  
<https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>
109. ICNIRP 2002 general approach  
<https://www.icnirp.org/cms/upload/publications/ICNIRPphilosophy.pdf>

110. WHO 2006 (RF) reliance on ICNIRP

<https://www.who.int/peh-emf/publications/facts/fs304/en/>

111. WHO 2007 (ELF) reliance on ICNIRP

<https://www.who.int/peh-emf/publications/facts/fs322/en/>

<https://www.whatdotheyknow.com/request/574110/response/1376200/attach/3/PHE%20RF%20Advice%20Summary%2018%20Dec%202018.pdf>

112. PHE's COMARE reliance on WHO, 2018 (minutes, 2.12)

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/786270/COMARE\\_121\\_minutes\\_-\\_final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786270/COMARE_121_minutes_-_final.pdf)

113. Some information on the various bodies above is below:

**COMMITTEE ON THE MEDICAL ASPECTS OF RADIATION IN THE ENVIRONMENT (COMARE)**

**121st meeting, Thursday 22nd November 2018**

**Skipton House, London**

2.12 The Chair informed members that there had been continued correspondence from the UK & Commonwealth EMF Action Group on several issues, including attendance at meetings as observers and interest in the formation of a working group for non-ionising radiation (NIR) issues. The Chair has discussed the working group suggestion with DHSC in regard to the committee's work programme. While health issues associated with electromagnetic fields (EMFs) are within COMARE's remit, the formation of a NIR working group now is not considered a productive use of the committee's time. COMARE has received no specific requests for advice on NIR issues. The Chair reminded members that the World Health Organisation (WHO) is currently undertaking a review on radiofrequency electromagnetic fields and the committee would not wish to duplicate this work. It was proposed that following publication of the WHO report, the committee could review the document and produce a statement. Members were advised that there is UK engagement with WHO through the international EMF project. Members discussed the remit of the committee for NIR work and the balance with work on ionising radiation issues. Members were content with the proposal to review the WHO report and to maintain a watching brief on NIR issues.

**WORLD HEALTH ORGANIZATION  
ORGANISATION MONDIALE DE LA SANTE**

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direct /+4122)791

In reply please refer for: E15-445-11

Prière de rappeler la référence:

Gruppe Hans U. Jakob  
Flühli 17  
CH 3150 Schwarzenburg  
Switzerland

14. September 2001

Dear Sir

...

ICNIRP is an independent scientific commission of eminent scientists established by the International Radiation Protection Association (IRPA) to provide advice on non-ionizing radiations in the same way as the International Commission on Radiological Protection (ICRP) has done for ionizing radiation for over 65 years. It is an independent and separate organization. **It is not "under-organization of WHO"** as stated in your letter.

However, ICNIRP is **one of a very large number of NGOs** in official relations with WHO and it has been working with WHO on matters related to the protection of people from exposure to non-ionizing radiation. These radiations include EMF, UV, static fields and ultrasound. ICNIRP uses WHO's health risk assessments to draft guidelines on human exposure limits, which have now been accepted for guidance or mandated into law in many countries.

...

gez.

**Ann Kern**

Executive Director, Sustainable Development  
and Healthy Environment

cc:

M. Marta Mauras, Deputy Secretary-General's Office, UN, New York  
Mr. Patrizio Civili, Assistant Secretary-General for Policy, Coordination and  
Inter-Agency Affairs

xxxx

**Government response to the Stakeholder Advisory Group on extremely low frequency electric and magnetic fields (ELF EMFs) (SAGE) recommendations**

**2009**

5. The UK adopted the 1998 ICNIRP<sup>5</sup> EMF public exposure guidelines in terms of the 1999 European Recommendation (1999/519/EC)<sup>6</sup>. The

electricity industry currently complies with these guidelines on a voluntary basis.

13. The same NRPB 2004 publication recommended the adoption in the UK of the international (ICNIRP) guidelines based on the known science but also “that government should consider the possible need for further precautionary measures.” Precaution is mentioned because of the uncertainty in the science.

29. The Government recommends that the electricity industry takes appropriate action to identify any homes and schools that do not currently meet the ICNIRP requirements because of the proximity of high voltage power lines, and addresses the need for remedial actions to ensure that exposures do not exceed the relevant ICNIRP guidelines.

42. It is for EU Member States to determine the circumstances in which the adoption of the ICNIRP guidelines is appropriate in terms of the EU recommendation. In this regard, the UK Government considers that exposure for potentially significant periods of time might reasonably be regarded as referring to residential properties, and to properties where members of the public spend an appreciable proportion of their time. The ICNIRP guidelines are formally incorporated into the planning system for radio telecommunications but not in regard to overhead power lines, so in taking forward actions in response to the SAGE report the Government will take the opportunity to consider this matter further.

47. In the light of the above advice, we recommend that the electricity industry take steps to identify any existing homes and schools that do not meet the ICNIRP requirements because of the proximity of high voltage power lines and to consider what remedial actions might be taken to ensure that exposures do not exceed the relevant guidelines.

### **Summary of Advice from Public Health England on Exposure to Radiofrequency Electromagnetic Fields**

**12 May 2017**

Central to PHE advice is that exposures to radio waves should comply with the guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). ICNIRP is formally recognised by the World Health

Organization (WHO). PHE has also issued precautionary advice to discourage the

non-essential use of mobile phones by children.

(available at eg

<http://www.mardenvillage.co.uk/wp-content/uploads/2017/06/PHE-RF-Advice-Summary-12-May-2017.pdf>)

## **Summary of Advice from Public Health England on Exposure to Radiofrequency Electromagnetic Fields**

**[February 28 2018]**

Central to PHE advice is that exposures to radio waves should comply with the guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). ICNIRP is formally recognised by the World Health Organization (WHO). PHE has also issued precautionary advice to discourage the non-essential use of mobile phones by children.

(available at eg

<https://www.whatdotheyknow.com/request/574110/response/1376200/attach/3/PHE%20RF%20Advice%20Summary%2018%20Dec%202018.pdf>)

### **Electromagnetic fields and public health**

Exposure to extremely low frequency fields

Backgrounder 322

June 2007

<https://www.who.int/peh-emf/publications/facts/fs322/en/>

#### *International exposure guidelines*

Health effects related to short-term, high-level exposure have been established and form the basis of two international exposure limit guidelines (ICNIRP, 1998; IEEE, 2002). At present, these bodies consider the scientific evidence related to possible health effects from long-term, low-level exposure to ELF fields insufficient to justify lowering these quantitative exposure limits.

6. Electromagnetic fields and public health

a) Base stations and wireless technologies

Backgrounder 304

May 2006

<https://www.who.int/peh-emf/publications/facts/fs304/en/>

### **Protection standards**

International exposure guidelines have been developed to provide protection against established effects from RF fields by the International



Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998) and the Institute of Electrical and Electronic Engineers (IEEE, 2005).

National authorities should adopt international standards to protect their citizens against adverse levels of RF fields. They should restrict access to areas where exposure limits may be exceeded.

114. Of course, ICNIRP provides a disclaimer to its guidelines as below:

“ICNIRP undertakes all reasonable measures to ensure the reliability of information presented on the website, but does not guarantee the correctness, reliability, or completeness of the information and views published. The content of our website is provided to you for information only. We do not assume any responsibility for any damage, including direct or indirect loss suffered by users or third parties in connection with the use of our website and/or the information it contains, including for the use or the interpretation of any technical data, recommendations, or specifications available on our website.”

115. This does beg the question “Who is ultimately liable”. Here is a body which is advising the world’s governments of safety of their people and it does not accept responsibility for its work.
116. Do see the Council of Europe’s article confirms its views on the dangers of EMFs which is at **Schedule 12**.

## 6. So, what are the ICNIRP guidelines and what’s wrong with them

117. There are some fundamental criticisms of these guidelines, not least of which is that these guidelines were set for short term exposure and not for long term exposure to EMF. The guidelines are, therefore, outdated and need to be reviewed.
118. One such criticism is by Joel Moskowitz. His criticism of ICNIRP guidelines is below:
- <https://www.saferemr.com/2018/07/icnirps-exposure-guidelines-for-radio.html>
119. If you scroll down to July 2018 you will see what he says about it.
120. There are other criticisms which state that the ICNIRP has dismissed scientific research linking cancer to those living near phone masts. They have been criticised by a number of professionals. Some are set out below.
121. One such criticism is from the Council of Europe in 2011 as below:

"it is most curious, to say the least, that the applicable official threshold values for limiting the health impact of extremely low frequency electromagnetic fields and high frequency waves were drawn up and proposed to international

political institutions (WHO, European Commission, governments) by the ICNIRP, an NGO whose origin and structure are none too clear and which is furthermore suspected of having rather close links with the industries whose expansion is shaped by recommendations for maximum threshold values for the different frequencies of electromagnetic fields" (The rapporteur's memorandum attached to a resolution adopted by the Standing Committee of the Parliamentary Assembly of the Council of Europe in May 2011)

122. Another is at:

<https://ehtrust.org/us-scientist-criticizes-icnirps-refusal-to-reassess-cell-phone-radiation-exposure-guidelines-after-us-national-toxicology-program-studies-show-clear-evidence-of-cancer-in-experimental-animals/>

123. Sarah Starkey sets out a blistering, detailed and reasoned critique of the guidelines below:

[https://www.jrseco.com/wp-content/uploads/Starkey\\_2016\\_ICNIRP.pdf](https://www.jrseco.com/wp-content/uploads/Starkey_2016_ICNIRP.pdf)

124. Michael Bevington sets out a summary critique which is at **Schedule 10** and a more detailed critique which is at **Schedule 11**. See also **Schedule 11A**.

## 7. Current UK safety limits under ICNIRP guidelines

125. It is important to understand how the ICNIRP guidelines work. There are essentially three sets which have been published, 1998, 2010 and 2020. The 2020 ones replace the 1998 ones.

126. Whereas the 1998 guidelines were fairly understandable to the lay person, the 2020 ones are opaque. The 1998 seemed to review the science but by 2020, ICNIRP did not seek to review the science. Instead, it reviewed the reports of other organisations - the SCENIHR reports (2015, 2016 and 2018), WHO (2014) and Swedish Radiation Safety Authority (2018).

127. The 2020 guideline rationale seems much more restrictive in that it looked for "substantiated" data to provide evidence and required the scientific studies to be replicated.

128. The guidelines in 1998 overtly state that they are for short term exposure only and do not consider non-thermal effects. The guidelines rely on heating of the body to establish harm. It refers to power density and mandates that it's the power used with the frequencies which is a prerequisite for harm. You will see below that it does not matter about the power density – in fact, RFR at very low powers still cause harm.

129. This carried on in the 2010 and 2020 reports. They continue to reject any harm to humans from biological and other effects below their guidelines. Their guidelines are not fit for long term effects.

130. Each of the guidelines are now dealt with below.

## 1998 guidelines

131. The 1998 guidelines (replaced by the 2020 guidelines) were for frequencies up to 300GHz and are below:

<https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>

132. Pg 511 of the guidelines set out the limits for the public:

**Table 7.** Reference levels for general public exposure to time-varying electric and magnetic fields (unperturbed rms values).<sup>a</sup>

Frequency range	E-field strength (V m <sup>-1</sup> )	H-field strength (A m <sup>-1</sup> )	B-field (μT)	Equivalent plane wave power density $S_{eq}$ (W m <sup>-2</sup> )
up to 1 Hz	—	$3.2 \times 10^4$	$4 \times 10^4$	—
1–8 Hz	10,000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8–25 Hz	10,000	$4,000/f$	$5,000/f$	—
0.025–0.8 kHz	$250/f$	$4/f$	$5/f$	—
0.8–3 kHz	$250/f$	5	6.25	—
3–150 kHz	87	5	6.25	—
0.15–1 MHz	87	$0.73/f$	$0.92/f$	—
1–10 MHz	$87/f^{1/2}$	$0.73/f$	$0.92/f$	—
10–400 MHz	28	0.073	0.092	2
400–2,000 MHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$0.0046f^{1/2}$	$f/200$
2–300 GHz	61	0.16	0.20	10

<sup>a</sup> Note:

1.  $f$  as indicated in the frequency range column.
2. Provided that basic restrictions are met and adverse indirect effects can be excluded, field strength values can be exceeded.
3. For frequencies between 100 kHz and 10 GHz,  $S_{eq}$ ,  $E^2$ ,  $H^2$ , and  $B^2$  are to be averaged over any 6-min period.
4. For peak values at frequencies up to 100 kHz see Table 4, note 3.
5. For peak values at frequencies exceeding 100 kHz see Figs. 1 and 2. Between 100 kHz and 10 MHz, peak values for the field strengths are obtained by interpolation from the 1.5-fold peak at 100 kHz to the 32-fold peak at 10 MHz. For frequencies exceeding 10 MHz it is suggested that the peak equivalent plane wave power density, as averaged over the pulse width does not exceed 1,000 times the  $S_{eq}$  restrictions, or that the field strength does not exceed 32 times the field strength exposure levels given in the table.
6. For frequencies exceeding 10 GHz,  $S_{eq}$ ,  $E^2$ ,  $H^2$ , and  $B^2$  are to be averaged over any  $68/f^{1.05}$ -min period ( $f$  in GHz).
7. No E-field value is provided for frequencies <1 Hz, which are effectively static electric fields. perception of surface electric charges will not occur at field strengths less than 25 kVm<sup>-1</sup>. Spark discharges causing stress or annoyance should be avoided.

133. Up to 2,000MHz (2GHz), the power density limit is the frequency divided by 200. From 2 – 300GHz, the power density limit is 10V/m2. It states:

### “Basic restrictions

Different scientific bases were used in the development of basic exposure restrictions for various frequency ranges:

- Between 1 Hz and 10 MHz, basic restrictions are provided on current density to prevent effects on nervous system functions;
- Between 100 kHz and 10 GHz, basic restrictions on SAR are provided to prevent whole-body heat stress and excessive localized tissue heating; in the 100 kHz–10 MHz range, restrictions are provided on both current density and SAR; and
- Between 10 and 300 GHz, basic restrictions are provided on power density to prevent excessive heating in tissue at or near the body surface.

134. The guidelines explain why it rejects scientific studies which purport to show biological effects below heating effects (pg 507):

“Overall, the literature on athermal effects of AM electromagnetic fields is so complex, the validity of reported effects so poorly established, and the relevance of the effects to human health is so uncertain, that it is impossible to use this body of information as a basis for setting limits on human exposure to these fields.”

“Exposure to pulsed EMF of sufficient intensity leads to certain predictable effects such as the microwave hearing phenomenon and various behavioral responses. Epidemiological studies on exposed workers and the general public have provided limited information and failed to demonstrate any health effects”

“A large number of studies of the biological effects of amplitude-modulated EMF, mostly conducted with low levels of exposure, have yielded both positive and negative results. Thorough analysis of these studies reveals that the effects of AM fields vary widely with the exposure parameters, the types of cells and tissues involved, and the biological end-points that are examined. In general, the effects of exposure of biological systems to athermal levels of amplitude-modulated EMF are small and very difficult to relate to potential health effects. There is no convincing evidence of frequency and power density windows of response to these fields.”

135. The guidelines confirm that they are designed to limit short term exposure and not for long term exposure.

#### “BASIS FOR LIMITING EXPOSURE

These guidelines for limiting exposure have been developed following a thorough review of all published scientific literature. The criteria applied in the course of the review were designed to evaluate the credibility of the various reported findings (Repacholi and Stolwijk 1991; Repacholi and Cardis 1997); only established effects were used as the basis for the proposed exposure restrictions. Induction of cancer from long-term EMF exposure was not considered to be established, and so these guidelines are based on short-term, immediate health effects such as stimulation of peripheral nerves and muscles, shocks and burns caused by touching conducting objects, and elevated tissue temperatures resulting from absorption of energy during exposure to EMF.

In the case of potential long-term effects of exposure, such as an increased risk of cancer, ICNIRP concluded that available data are insufficient to provide a basis for setting exposure restrictions, although epidemiological research has provided suggestive, but unconvincing, evidence of an association between possible carcinogenic effects and exposure at levels of 50/60 Hz magnetic flux densities substantially lower than those recommended in these guidelines. In-vitro effects of short-term exposure to ELF or ELF amplitude-modulated EMF are summarized.

Transient cellular and tissue responses to EMF exposure have been observed, but with no clear exposure-response relationship. These studies are of limited value in the assessment of health effects because many of the responses have not been demonstrated in vivo. Thus, in-vitro studies alone were not deemed to provide data that could serve as a primary basis for assessing possible health effects of EMF.”

136. It continues at pg 176 under “Use of ICNIRP EMF guidelines” why it rejects data for chronic low level exposure that indicates health effects:

“Developing of exposure guidelines

Recently ICNIRP adopted guidelines on limits of EMF exposure for frequencies up to 300 GHz (ICNIRP 1998a) (see page 101). While all the scientific literature was reviewed, the only adverse effects on humans that were fully verified by a stringent evaluation were short term, immediate health consequences such as stimulation of peripheral nerves and muscles, functional changes in the nervous system and other tissues, shocks and burns caused by touching conducting objects, and changes in behaviour caused by elevated tissue temperatures.

There are also data for chronic low level exposure that indicate that there may also be other health effects. It is, however, ICNIRP's view that in the absence of support from laboratory studies the epidemiological data are insufficient to allow an exposure guideline to be established.”

137. So, the 1998 guidelines are for short term exposure, not for long term exposure and it rejects studies showing health effects of cancer from exposure to EMFs.

### **2010 guidelines**

138. The 2010 guidelines apply up to 10MHz. Even with the updated 2020 guidelines, the 2010 guidelines are preserved for nerve stimulation. These are not dealt with further here.

### **2020 guidelines**

139. The 2020 guidelines apply from 100 kHz to 300 GHz and are below:

<https://www.icnirp.org/cms/upload/publications/ICNIRPrfgdl2020.pdf>

140. As mentioned these guidelines are opaque. Rather than have a power density limit for exposure, ICNIRP has moved fully to a Specific Absorption Rate approach for different parts of the body depending on the frequency and power.
141. These slides which ICNIRP used for public consultation in 2018 showed how its heating limits may work (**ICNIRP Radiofrequency Guidelines Public Consultation** - Rodney Croft Chair, ICNIRP RF Guidelines Project Group University of Wollongong, Australia):

[https://www.icnirp.org/cms/upload/consultation\\_upload/ICNIRPCroft\\_PCD\\_BioEM2018.pdf](https://www.icnirp.org/cms/upload/consultation_upload/ICNIRPCroft_PCD_BioEM2018.pdf)

142. These guidelines are based on a narrower field than the 1998 guidelines and have a much tighter requirement of how they consider scientific studies (bold is my emphasis):

“These guidelines specify quantitative EMF levels for personal exposure. Adherence to these levels is intended to protect people from all substantiated harmful effects of radiofrequency EMF exposure. To determine these levels, ICNIRP first identified published scientific literature concerning effects of radiofrequency EMF exposure on biological systems, and established which of these were both harmful to human health<sup>3</sup> and scientifically substantiated. This latter point is important because ICNIRP considers that, in general, reported adverse effects of radiofrequency EMFs on health **need to be independently verified, be of sufficient scientific quality and consistent with current scientific understanding, in order to be taken as “evidence” and used for setting exposure restrictions.** Within the guidelines, “evidence” will be used within this context, and “substantiated effect” used to describe reported effects that satisfy this definition of evidence. The reliance on such evidence in determining adverse health effects is to ensure that the exposure restrictions are based on genuine effects, rather than unsupported claims. However, these requirements may be relaxed if there is sufficient additional knowledge (such as understanding of the relevant biological interaction mechanism) to confirm that adverse health effects are reasonably expected to occur.

143. Being “consistent with current scientific understanding” is not how science works. If science today remained “consistent with current scientific understanding” in the last century, we would still believe the earth was flat. This is a euphemism for ICNIRP saying if you don’t agree with us, we can ignore you.

144. The guidelines further state that:

“Although the present guidelines replace the 100 kHz to 10 MHz EMF frequency range of the ICNIRP (2010) guidelines, the science pertaining to direct radiofrequency EMF effects on nerve stimulation and associated restrictions within the ICNIRP (2010) guidelines has not been reconsidered here”

145. So ICNIRP’s current guidelines have not considered any further science regarding nerve stimulation from 100kHz to 10MHz and rely on science reviewed in 2010 so they are 10 years out of date. The guidelines finish:

“Instead, the present process evaluated and set restrictions for adverse health effects other than direct effects on nerve stimulation from 100 kHz to 10 MHz, and for all adverse health effects from 10 MHz to 300 GHz. The restrictions relating to direct effects of nerve stimulation from the 2010 guidelines were then added to those derived in the present guidelines to form the final set of restrictions. Health and dosimetry considerations related to

direct effects on nerve stimulation are therefore not provided here [see ICNIRP (2010) for further information].”

146. In relation to extremely low frequencies and its 2010 guidelines, ICNIRP accepts that there are gaps in its knowledge which is set out in its paper below (ICNIRP STATEMENT GAPS IN KNOWLEDGE RELEVANT TO THE “GUIDELINES FOR LIMITING EXPOSURE TO TIME-VARYING ELECTRIC AND MAGNETIC FIELDS (1 HZ–100 KHZ) – submitted on 17 December, 2019 and published in 2020:

<https://www.icnirp.org/cms/upload/publications/ICNIRPIfgaps2020.pdf>

147. And it goes on to state that it developed an algorithm to determine the gaps in knowledge. It also states that it has now formed a group to determine what research is necessary to fill these gaps. So, a computer programme is now determining what research they will consider. Pg 541:

“INTRODUCTION AND PURPOSE The main goal of ICNIRP is to protect people and the environment from detrimental exposure to all forms of non-ionizing radiation (NIR). To this end, ICNIRP provides advice and guidance by developing and disseminating science-based exposure guidelines that provide a framework to limit exposure. Where necessary, ICNIRP uses detailed reviews of the scientific evidence and health risk assessments from other expert groups to help it form a consensus opinion regarding established and potential health effects. This ensures the robustness of its guidelines. However, relevant knowledge gaps can be identified during this process, and ICNIRP recognized that there were some gaps in knowledge when formulating its previous guidelines (ICNIRP 2010, 2013, 2014) but gave few specifics. Thus ICNIRP has now organized a project group that is charged with drafting a research agenda that highlights the gaps in knowledge that have been identified during the development of its guidelines for each frequency range of the NIR spectrum.”

“This Appendix describes the structured approach that was developed by the project group in order to encourage both transparency in methodology and consistency across NIR domains. This methodology provides a means to select the issues considered relevant to guidelines when the results are considered weak or not strong enough or when there are no data with which to characterize a particular phenomenon. METHOD FOR DETERMINING “RESEARCH NEEDS OF RELEVANCE FOR GUIDELINE DEVELOPMENT” ICNIRP sees merit in highlighting NIR research needs so that studies may be conducted that would be beneficial for future guideline development (as distinguished from benefitting science more generally). The Data Gaps Project Group (DG-PG) was formed to identify such research gaps in the different frequency regions of the NIR spectrum, starting with low frequency fields (see main text). In considering how the process should best operate to identify data gaps, it was decided that a structured approach would be useful. For this purpose, a two-step algorithm was developed to identify research needs (Fig. A1). The algorithm was intended to maximize transparency, consistency with other NIR guidelines, relevance to guidelines setting and to avoid recommending research that does not benefit guidelines. However, no

attempt has been made to prioritise the recommendations. Step 1 shows how to evaluate issues related to biological endpoints that have been assessed for the current guidelines (Fig. A1), while Step 2 questions whether there are biological endpoints related to thresholds and dosimetry (Fig. A2); in Fig. A3 the last Step allows to evaluate the relevance of endpoints that have not yet been considered, but might be important to explore for future guidelines. The main goal of these steps is to better identify and so clarify biological endpoints or mechanisms from which guidelines restrictions are derived. In this context, the term “relevant to health” is only used to signify that the biological endpoints or mechanisms have some known association to an adverse health outcome or have been used as a biomarker for a particular disease.”

148. The idea of this indication of research is that:

“Although some areas provide sufficient information and do not suggest that any specific deficiencies exist related to low frequency electric and magnetic fields and health, there are clear gaps in knowledge in other areas. This paper has provided a list of these gaps in knowledge for which additional research would greatly assist ICNIRP and others in the future development of low-frequency exposure guidelines. These research needs were identified using a predefined algorithm, but they were not classified with respect to priority. They have been presented with the explicit intention that 538 Health Physics May 2020, Volume 118, Number 5 [www.health-physics.com](http://www.health-physics.com) researchers and relevant funding bodies will consider addressing these important issues with the overall goal of helping to improve non-ionizing radiation protection.”

149. This restrictive approach, as they are such an influential body, would allow them to influence how future research is done, by whom and who funds it, potentially squewing further research and squeezing out research into non-thermal effects entirely.

150. This is what ICNIRP said about its new guidelines when it was launched (**ICNIRP press release 11 March, 2020**):

[http://icnirp.org/cms/upload/presentations/ICNIRP\\_Media\\_Release\\_110320.pdf](http://icnirp.org/cms/upload/presentations/ICNIRP_Media_Release_110320.pdf):

151. You will see that, for the 2020 guidelines, ICNIRP did not conduct its own research. Instead, it reviewed existing reports on research and set its limits based on what those reports concluded. At pg 486 of the guidelines, it is stated:

“This information was obtained primarily from major international reviews of the literature on radiofrequency EMFs and health. This included an in-depth review from the World Health Organization on radiofrequency EMF exposure and health that was released as a draft Technical Document (WHO 2014), and reports by the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR 2015) and the Swedish Radiation Safety Authority (SSM 2015, 2016, 2018). These reports have reviewed an extensive body of literature, ranging from experimental research to epidemiology, and include consideration of health in children and those individuals thought to be sensitive to radiofrequency EMFs. To complement those reports, ICNIRP also



considered research published since those reviews. A brief summary of this literature is provided in Appendix B, with the main conclusions provided below.”

152. The guidelines also do not make any distinction between pulsed and non-pulsed EMFs because they have determined that there is no evidence that it produces different biological effects by reference to 2 studies (pg 487):

“Similarly, as there is no evidence that continuous (e.g., sinusoidal) and discontinuous (e.g., pulsed) EMFs result in different biological effects (Kowalczyk et al. 2010; Juutilainen et al. 2011), no theoretical distinction has been made between these types of exposure (all exposures have been considered empirically in terms of whether they adversely affect health).”

153. So in 2020, its review considered evidence which was more than 9 years old. How can that be right and acceptable to our government when one considers that it has an onerous obligation to safeguard the nation’s health?
154. Anecdotally, we are told that ICNIRP controlled the way research was conducted for many years. Specifically, they did not want any research done below the 10V/m2 safety limit, claiming you could only find effects above that limit. So all research was directed in that direction to secure grants which did not materialise for research outside of that remit.
155. Dr Alexander Lerchl, a member of the German Commission on Radiological Protection, drew the same conclusions as ICNIRP, until he re-evaluated his own research and found effects well below the safety limits. An article about his volte-face is at **Schedule 6**.
156. Further extracts of the guidelines are at **Schedule 7**.
157. Long before ICNIRP started to review its 1998 guidelines, there were very vocal soundings that serious scientific and medical studies revealing biological effects of a pathological nature have existed since the 1930s concerning radio frequencies and microwaves from radar installations, most notably in the EU memorandum of 2011. The memorandum is at **Schedule 13**.
158. The memorandum stated that studies in the late 1970s also pointed out the harmful effects of protracted exposure to the low or very low frequency electromagnetic fields of electrical transmission lines or computer screens. The WHO’s IARC (International Agency for Research on Cancer) classified these fields as “possibly carcinogenic” for humans (Group 2B) in 2001. How is it that ICNIRP consistently ignores these kinds of results.
159. The 2020 guidelines refer to the 2015 study by Scientific Committee on Emerging and Newly Identified Health Risks (“SCENIHR”). The SCENIHR study is below (Opinion on Potential health effects of exposure to electromagnetic fields (EMF) – Jan 2015):

[https://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_041.pdf](https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf)

160. This study is deeply flawed for reasons which follow. At page 5 of the report it states:

“Some studies raised questions regarding an increased risk of glioma and acoustic neuroma in heavy users of mobile phones. The results of cohort and incidence time trend studies do not support an increased risk for glioma while the possibility of an association” but this does not seem to have made it into the ICNIRP guidelines.

161. The following critique is by Professor Denis Henshaw with whom our team is in regular contact:

“The point is this, if a scientist made the sort of false comments that are in SCENIHR 2015 they would be accused of scientific fraud. So, let's not mince our words: SCENIHR 2015 is fraudulent in a number of places.

You can scroll through the rest of Pall cpt 5 to see just how many papers SCENIHR 2015 does not cite. (They have the flimsy excuse that they did not even look at "poor quality" papers!)

So, your colleagues need to be well prepared for these so-called "Official" reports”

162. Martin Pall's critique of SCENIHR is below under a heading of **Omissions, flaws and falsehoods 5G Risk: The scientific perspective** (pg 41 - 80). He forensically destroys the methods used by SCENIHR, their cherry picking:and conclusions.

[https://www.scribd.com/document/462840169/Pall-5G-Risk-the-Scientific-Perspective-including-SCENIHR-critique?secret\\_password=q2ycOhZb9ayp9PsGkWJA](https://www.scribd.com/document/462840169/Pall-5G-Risk-the-Scientific-Perspective-including-SCENIHR-critique?secret_password=q2ycOhZb9ayp9PsGkWJA)

163. At **Schedule 14** is the full article from Dr Pall followed by further comments from Dr Henshaw on Dr Pall's comments. He is clear that SCENIHR is guilty of scientific fraud. This paper forms a fundamental part of ICNIRP's review culminating in the 2020 guidelines.

164. ICNIRP gave some insight into how they evaluate data in their paper on **ICNIRP STATEMENT GENERAL APPROACH TO PROTECTION AGAINST NON-IONIZING RADIATION PUBLISHED IN: HEALTH PHYSICS 82(4):540-548; 2002** which is below:

<http://www.icnirp.org/cms/upload/publications/ICNIRPphilosophy.pdf>

165. Extracts are at **Schedule 17**.

166. Other critiques are at **Schedule 18**.

## 8. Who is ICNIRP

167. The International Committee on Non-Ionising Radiation Protection (ICNIRP) are a private self appointed body or NGO who together with the Advisory Group on Non-ionising Radiation (AGNIR) and Public Health England (PHE), have somehow ended

up effectively setting microwave radiation exposure 'safety' standards for the populations of large parts of the world since the 1990s.

168. In May 2011, Mr Jean Huss from the EU Committee on the Environment, Agriculture and Local and Regional Affairs in a report entitled "The potential dangers of electromagnetic fields and their effect on the environment" made the following statement on the credibility of ICNIRP.

"The rapporteur underlines in this context that it is most curious, to say the least, that the applicable official threshold values for limiting the health impact of extremely low frequency electromagnetic fields and high frequency waves were drawn up and proposed to international political institutions (WHO, European Commission, governments) by the ICNIRP, an NGO whose origin and structure are none too clear and which is furthermore suspected of having rather close links with the industries whose expansion is shaped by recommendations for maximum threshold values for the different frequencies of electromagnetic fields.

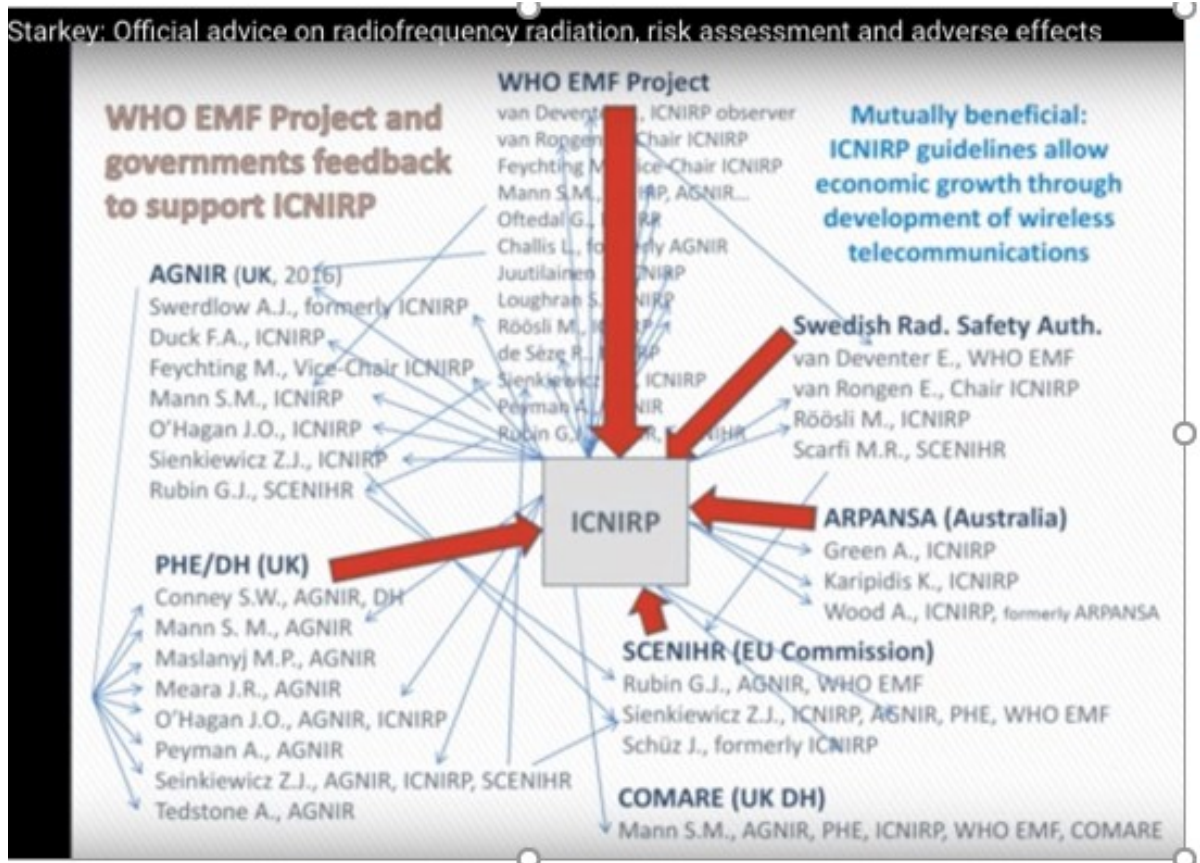
<http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=13137>

169. The below is taken from this link which carried out some investigations about ICNIRP:

<https://multerland.wordpress.com/2019/06/02/icnirp/>

"ICNIRP has in total 13 members, of which 5 did not study anything about EMF. The ICNIRP's total research results on PubMed is 12.615. Of these 12.615 studies are just 95 related with EMFs, wireless exposure, radiation, etc. This is 0,8% of the total. Total impression: the researches show not to find any worrying aspect of EMF. Not found: 4G, 5G, bee collapse, bird collapse, insects, plants, trees, forests, amphibians. Research date: 15 March 2019. This organization pretends to have the skills and the science to guide us, humanity."

170. Dr. Sarah Starkey's video clip of the relationships between members of ICNIRP and other bodies is telling:



171. Many people have asked “who is ICNIRP” and “what is ICNIRP”. One article<sup>2</sup> states:

“An organisation whose origin and structure is none too clear and which is suspected of having rather too close links with the interests of the industries it notionally ‘regulates’. Indeed, how do such bodies mysteriously come about in the first place? NGOs may technically be non-governmental organisations but that doesn’t mean that they are necessarily non-political organisations, so called scientific ‘objectivity’ is always shaped and influenced to some degree by political and economic considerations and NGOs are subject to corporate capture and corruption just as much as a sporting ruling body such as FIFA. How is it that a group of people manage to self appoint themselves as the reliable regulatory body which takes upon itself to decide what is supposedly safe for the rest of us or not?”

172. The article is compelling and helps to provide some background to the amorphous ICNIRP whose power is used by our government as a sword and a shield. We have set out some more passages below as understanding what is ICNIRP and its guidelines is crux to understanding this case (bold is our emphasis).

“Why is the origin and structure of ICNIRP so opaque when the decisions it has made have had direct impacts on the health of billions of people? This is

<sup>2</sup> How ICNIRP, AGNIR, PHE and a 30 year old political decision created and then covered up a global public health scandal

something which is far more than 'curious to say the least' and should be a matter of thorough public investigation considering what is at stake in all of this in terms of global public health. Billions of people may well have been adversely effected by the extremist decisions of this self appointed scientific oracle of health and safety to which the whole world seems to have meekly deferred to without asking any real questions.

In terms of its philosophy, it turns out that ICNIRP is something of a closed ideological shop, in that in order to be accepted or invited to become a member of ICNIRP, one is preliminarily required to strictly adhere to the thermal paradigm in terms of radiation health and safety. This paradigm in terms of its followers and their beliefs, asserts that only short term, extremely high exposure to non-ionising microwave radiation that produces a large thermal effect is deemed to be hazardous to human health. **Once one adopts that position, then all non-ionising radiation that falls below these levels is automatically and universally assumed to be benign. Once this paradigm is also accepted by government and other bodies such as Public Health England, then the burden falls on those subjected to such now completely unregulated sources of radiation to prove that far lower levels of exposure are indeed harmful, whereas conversely, there is no burden on the industry to irrefutably demonstrate that such exposures are completely and utterly safe.** Because in the real world there are no control groups on account of the universal exposure of all the population to such radiation sources then proving irrefutable links between illness and exposure is intensely problematic.

In taking this highly selective approach ICNIRP have effectively inverted the conventions of environmental risk assessments. Don Maisch describes this reversal of principles in the 'Procrustean Approach'.

*The Procrustean Approach – Setting Exposure Standards for Telecommunications Frequency Electromagnetic Radiation*

173. As an aside, do see the link below which explains how this approach is derived:

<https://www.emfacts.com/the-procrustean-approach/>

174. It ends with:

"This thesis contends that, rather than taking a precautionary approach, Western standard setting organisations have actually followed what can best be described as a Procrustean approach. This approach consists of cutting off from consideration scientific data that does not conform to their bed of knowledge. Such an approach can be considered just as inimical to public health protection as was Procrustes' mythical bed for the public of his time.

175. The examination of this approach can be found here:

[file:///F:/New%20Home/Portas%20pilot/5G%20mobile%20masts/5G%20Action%20Group/ICNIRP%20guidelines/The\\_Procrustean\\_Approach.pdf](file:///F:/New%20Home/Portas%20pilot/5G%20mobile%20masts/5G%20Action%20Group/ICNIRP%20guidelines/The_Procrustean_Approach.pdf)

176. The article then continues:

**“Risk assessment for chemicals reversed for non-ionizing electromagnetic radiation**

**It is important to note that when it comes to risk assessment that serves as the basis for Western radiofrequency and microwave (RF/MW) standards there is a fundamental departure from conventional risk assessment as used for chemicals.**

In their 1995 review of risk assessment of environmental chemicals, Fan, Howd and Davis point out that **when assessing human exposure to chemicals, environmental levels are the focus. In other words, protecting the public from toxic effects of chemicals in the environment involves consideration of possible mechanisms of low-level toxicity and likely biological effects at low levels of exposure. In addition, the potential for cumulative (long-term), irreversible effects, such as cancer induction and neurotoxicity, are important considerations.**

There may be debate over what is the lowest level at which a hazard from a chemical may exist, but calculations are aimed at determining the lowest-dose toxic effects to provide human health protection. The obvious adverse effects from high level exposures are not usually a focus of risk assessment as there is no uncertainty on hazards at high-level exposure.

**Just the reverse applies to the risk assessment of possible hazards from human exposure to non-ionizing radiation from extremely low frequency (ELF) electromagnetic fields (EMF) to RF/MW electromagnetic radiation (EMR), as examined in this thesis.**

**This thesis explores reasons why a risk assessment paradigm developed in the so-called ‘Western world’ that only provides protection from obvious adverse effects at high-intensity (acute) exposures unlikely to be encountered in the environment. The possibility of cumulative effects, cancer induction and neurological effects arising from low-intensity exposures that could be encountered in the environment are not a consideration in assessing human health risks [Under ICNIRP’s terms].**

This has been pointed out in a Swiss government agency publication ‘Electrosmog in the Environment’ where it is stated “Exposure limit values [in Western standards/guidelines] ensure protection against recognised, acute effects, but they do not protect against suspected effects at lower radiation intensities, especially with long-term exposure”.

**This thesis proposes that such a radical departure from accepted risk assessment practice is based on reasons that primarily are to ensure the continuing development of both corporate and military technology at the expense of public health considerations.**

This assessment is in agreement with Michaels & Monforton in their observations that **both corporate and a revisionist political influence in the risk assessment process has affected the outcome of supposedly scientific risk assessments to marginalize the interests of the public, while at the same time maximizing the influence of the vested interest corporate sector.**"

177. Our government uses ICNIRP as a sword and a shield. This is what the Chair of ICNIRP said in 2008 at a ." Paolo Vecchia, previous Chairman for ICNIRP, September 2008, RRT conference conference in London EMF & HEALTH - A GLOBAL ISSUE London, UK, 8-9 September 2008 (Slide 16) ([https://www.radiationresearch.org/wp-content/uploads/2018/06/021145\\_vecchia.pdf](https://www.radiationresearch.org/wp-content/uploads/2018/06/021145_vecchia.pdf)):

"The ICNIRP guidelines are neither mandatory prescription's for safety, the "last word" on the issue nor are they defensive walls for Industry or others.

178. Sarah Starkey wrote the article below which gave an excoriating criticism of ICNIRP and identified conflicts of interest among a small cabal who sat on most health agencies around the world.

[https://www.jrseco.com/wp-content/uploads/Starkey\\_2016\\_ICNIRP.pdf](https://www.jrseco.com/wp-content/uploads/Starkey_2016_ICNIRP.pdf)

179. Further critiques are at **Schedule 19**.

## 9. Understanding ICNIRP'S guidelines

180. The 1998 guidelines recommends a power density base line maximum of ten million microwatts per metre squared (10,000,000  $\mu\text{W}/\text{m}^2$  or 10  $\text{W}/\text{m}^2$  or 1000  $\mu\text{W}/\text{cm}^2$ ). Although the 1998 guidelines have been superceded by the 2020 guidelines, it is important to see what our government presented to the nation as being reasonable and adequate to safeguard their health.
181. The best analogy we have heard to understand the interaction of the frequencies and power density is the following:
- Hz is the note - middle C, C 3 octaves above, C 3 octaves below etc
  - $\mu\text{W}/\text{m}^2$  is the strength of the field (in music terms, ppp, pp, p, mp, mf, f, ff, fff)
182. ICNIRP's guidelines refer to a power density because ICNIRP's whole paradigm for setting its guidelines is based on **effects from the heating of the body** during exposure to RFR. It specifically states that there is no harm if there is no heating of the body.
183. As you will see from this Brief, the effects which are suffered by the Claimants and an estimated 800,000 other people in the UK who are electrohypersensitive **are without heating of the body**. Because ICNIRP says there is no harm without heating, **it ignores all science which shows non-thermal effects** (yes, bizarre) and only recognises science which shows thermal effects. We know that asbestos and

cigarette smoke cause harm to the body without heating it yet science which shows no heating of the body from RFR are ignored.

184. We have heard it said that ICNIRP only recruits people to its body who accept that harm only comes from heating of the body. That paradigm allows it to argue for and to promote 10,000,000 times higher levels of exposure than is safe for humans in order to facilitate the speed of the current wireless level of telecoms innovation.

185. This article<sup>3</sup> put it this way:

“In order to give a different perspective, in order to average 10 Watts per square meter in real world field conditions would require frequent massive spikes and peaks of power density from 40 – 200 W/m<sup>2</sup> and higher. ICNIRP state that “For frequencies exceeding 10 MHz (which covers all forms of microwave radiation) it is suggested that the peak equivalent plane wave power density, as averaged over the pulse width does not exceed 1,000 times the Seq restrictions”. In this respect peak power density could go as high as 9.9 KW/m<sup>2</sup> and still remain within the safety ‘guidance’. As far as the biological effects of microwave radiation exposure are concerned it is the pulsed and extreme variations in strength of power density that are of most concern.

To give an additional perspective on the strength of such power density, 100W/m<sup>2</sup> is the lower end of the health & safety power density guidance for a wireless phone charging pad where the energy is only travelling a few millimetres. These levels of power density are simply obscene and would never ever be seen in real world operating conditions.

In 2012, The BioInitiative Report reduced their suggested limit of 2007 from 1mW/m<sup>2</sup> to just 5µW/m<sup>2</sup> or 5 microwatts per square meter. A mobile phone can function at power density levels as low as 0.00003 µW/m<sup>2</sup>, so even the seemingly conservative BioInitiative 5µW/m<sup>2</sup> recommendation of 2012 is still 166,000 times greater than the basic power density required to make or receive a mobile phone call whilst the ICNIRP limit is a completely staggering 333 billion times greater than these basic functional requirements.”

### **Have ICNIRP’s limits ever been tested?**

A rather fundamental question here is has ICNIRP or anyone else for that matter actually tested any of these exposures in anything even remotely approaching real world conditions? I simply do not see how any such thing could be done in laboratory conditions. Have ICNIRP really done testing with the highly erratic pulsed radiation that one sees in the real world from 20-50

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<sup>3</sup> How ICNIRP, AGNIR, PHE and a 30 year old political decision created and then covered up a global public health scandal



multiple sources all acting at the same time and viciously peaking and falling between 1mW/M2 and up to 10KW/m2 thousands of times a second in order to confirm their safety declarations? I doubt even the software to control 20 to 50 signal generators packed into any given area could cope with simulating the erratic behaviour of thousands and thousands of different devices which determine the power density in real world networking conditions. The Stockholm survey listed no less than 20 different RF sources and that is only limited because the EME-Spy 200 exposimeter they used can only log up to twenty different portions of the spectrum (measurements are given in microwatts m2).

Variable	Mean	Median	Min	Max
FM	38.3	3.4	0.0	3,441.2
TV3	4.7	0.0	0.0	308.4
TETRA I	1.2	0.0	0.0	229.3
TETRA II	0.2	0.0	0.0	33.9
TETRA III	0.1	0.0	0.0	26.5
TV4&5	3.0	0.0	0.0	2,206.2
LTE 800 (DL)	977.5	299.5	1.1	52,526.5
LTE 800 (UL)	0.0	0.0	0.0	2.5
GSM + UMTS 900 (UL)	0.0	0.0	0.0	4.5
GSM + UMTS 900 (DL)	1,236.2	459.0	2.5	44,241.5
GSM 1800 (UL)	0.0	0.0	0.0	7.5
GSM 1800 (DL)	78.9	17.8	0.3	8,442.1
DECT	27.3	5.1	0.0	4,614.8
UMTS 2100 (UL)	0.0	0.0	0.0	5.6
UMTS 2100 (DL)	301.8	92.8	0.2	18,445.0
WIFI 2G	0.0	0.0	0.0	203.5
LTE 2600 (UL)	3.9	0.0	0.0	904.7
LTE 2600 (DL)	1,137.5	70.5	0.5	95,522.5
WiMax	0.0	0.0	0.0	2.7
WIFI 5G	0.1	0.0	0.0	105.0
Total	3,810.8	1,312.9	15.2	112,317.7
Total excluding down link	78.8	27.0	0.0	4,616.2

This aggregation of multiple signals of a dynamic nature with complex interference effects was something that the EU's Policy Department for Economic, Scientific and Quality of Life Policies commented on in April 2019. Bear in mind that this report was prepared by the people responsible for

overseeing the roll-out of 5G and was not intended as a critique of 5G technology

***Significant concern is emerging over the possible impact on health and safety arising from potentially much higher exposure to radiofrequency electromagnetic radiation arising from 5G. Increased exposure may result not only from the use of much higher frequencies in 5G but also from the potential for the aggregation of different signals, their dynamic nature, and the complex interference effects that may result, especially in dense urban areas.***

*The 5G radio emission fields are quite different to those of previous generations because of their complex beamformed transmissions in both directions – from base station to handset and for the return. Although fields are highly focused by beams, they vary rapidly with time and movement and so are unpredictable, as the signal levels and patterns interact as a closed loop system. This has yet to be mapped reliably for real situations, outside the laboratory. One aspect, for example, that is not well understood today is the unpredictable propagation patterns that could result in unacceptable levels of human exposure to electromagnetic radiation. While the International Commission on Non-ionizing Radiation Protection (ICNIRP) issues guidelines for limiting exposure to electric, magnetic and electromagnetic fields (EMF), and EU member states are subject to Council Recommendation 1999/519/EC which follows ICNIRP guidelines, the problem is that currently it is not possible to accurately simulate or measure 5G emissions in the real world.*

186. The full article is reproduced at **Schedule 20**. So, to understand ICNIRP's guidelines, you have to consider frequencies separately to the power density.
187. Separately, unfortunately it is being realised that it is not just the intensity of the fields - sometimes it is the signal (the tune) that is the problem - because human cells talk to each other in tunes - so some tunes will 'jam' or interfere with human cell signalling.
188. Are ICNIRP's guidelines safe? The answer, of course, is no. There are other much lower proposals for safe limits of exposure. The range of guidance is quite simply extraordinary and ranges from<sup>4</sup>:
- (a) the Salzburg 2002 recommendation of a maximum indoor home exposure of 1 micro-watt per meter squared (1  $\mu\text{W}/\text{m}^2$  or 0.000,001  $\text{W}/\text{m}^2$ ); to
  - (b) the BioInitiative Report of 2012 recommendation of a maximum exposure of just 5 microwatts per metre squared (5 $\mu\text{W}/\text{m}^2$  or 0.000,005  $\text{W}/\text{m}^2$ ); to

<sup>4</sup> ([https://communityoperatingsystem.wordpress.com/2019/09/12/how-icnirp-agnir-phe-and-a-30-year-old-political-decision-created-and-then-covered-up-a-global-public-health-scandal/?fbclid=IwAR3AWj1g7EhXgh5Cke-mfp5u2yUNAmUQRwrTEPLOHw2Um9H\\_M5HD3v7PP1Y](https://communityoperatingsystem.wordpress.com/2019/09/12/how-icnirp-agnir-phe-and-a-30-year-old-political-decision-created-and-then-covered-up-a-global-public-health-scandal/?fbclid=IwAR3AWj1g7EhXgh5Cke-mfp5u2yUNAmUQRwrTEPLOHw2Um9H_M5HD3v7PP1Y))

- (c) ICNIRP's recommendation of a base line maximum of ten million microwatts per metre squared (10,000,000  $\mu\text{W}/\text{m}^2$  or 10  $\text{W}/\text{m}^2$  or 1000  $\mu\text{W}/\text{cm}^2$ ).

189. See further the table below:

Type of guideline	Body	Recommended safety limits	Power density	Comments
	Salzburg 2002 recommendation	A maximum indoor home exposure of 1 micro-watt per meter squared	1 $\mu\text{W}/\text{m}^2$ <b>0.02v/m</b>	
	Baue Biologie Inst.	Long term exposure	7 $\mu\text{W}/\text{m}^2$ 0.05 v/m	
	BiolInitiative Report of 2012	A maximum exposure of just 5 microwatts per metre squared	5 $\mu\text{W}/\text{m}^2$ <b>0.04v/m</b>  3 $\mu\text{W}/\text{m}^2$ children 6 $\mu\text{W}/\text{m}^2$ adults	<ul style="list-style-type: none"> <li>The range of guidance is quite simply extraordinary and ranges from the to ICNIRP's 10,000,000 microwatts per metre squared. How is it possible for different countries or bodies to have 'standards' that vary by a magnitude of 10 million?</li> </ul>
	EUROPAEM		100 $\mu\text{W}/\text{m}^2$ <b>0.2v/m</b>	
	IGNIR		0.1 – 100 $\mu\text{W}/\text{m}^2$ <b>0.006 – 0.2 v/m</b>	
	ICNIRP	a base line maximum of ten million microwatts per metre squared (10,000,000 $\mu\text{W}/\text{m}^2$ ).	9,000,000 $\mu\text{W}/\text{m}^2$ at 1.8GHz <b>58v/m</b>	<ul style="list-style-type: none"> <li>The ICNIRP guide for safety standards in wireless communications state that a maximum power density of 10 <math>\text{W}/\text{m}^2</math> or 10,000 <math>\text{mW}/\text{m}^2</math> is presented as being a very 'conservative' limit.</li> </ul>

190. Readings must be taken as PEAK v/m. Not average w/m2. The problem occurs because power density is ONLY relevant to heating and it averages the power over time (6 minutes for official RF power density measurements).
191. How is it possible for different countries or bodies to have 'standards' that vary by a magnitude of 10 million?

192. The WHO says electromagnetic frequency exposures below the limits recommended in the ICNIRP guidelines do not appear to have any known consequence on health. The majority scientific view has shown that this is not true.
193. Different countries base their safety guidelines on ICNIRP's guidelines but they don't all use the same safety limits. They differ from country to country. Do see further below.

Type of guideline	Recommended safety limits	Power density	Comments
<b>UK</b>	The UK follows ICNIRP's guidelines	10,000,000 $\mu\text{W}/\text{m}^2$	
<b>US</b>			
	The ICNIRP guide for safety standards in wireless communications state that a maximum power density of 10 $\text{W}/\text{m}^2$ or 10,000 $\text{mW}/\text{m}^2$ is presented as being a very 'conservative' limit. The FCC in the US has the same limits of 1 $\text{mW}/\text{cm}^2$ . Confusingly, the US power density is expressed in $\text{mW}/\text{cm}^2$ as opposed to ICNIRP's and European use of $\text{mW}/\text{m}^2$ . 1 $\text{mW}/\text{cm}^2$ is equal to 10,000 $\text{mW}/\text{m}^2$ which is precisely the same as ICNIRP's levels and the same is true for US occupational levels: 5 $\text{mW}/\text{cm}^2$ = 50 Watts per meter squared.	10,000,000 $\mu\text{W}/\text{m}^2$	<ul style="list-style-type: none"> <li>• <a href="https://communityoperatingsystem.wordpress.com/2019/09/12/how-icnirp-agnir-phe-and-a-30-year-old-political-decision-created-and-then-covered-up-a-global-public-health-scandal/?fbclid=IwAR3AWj1g7EhXgh5Cke-mfp5u2yUNAmUQRwrTEPLOHw2Um9H_M5HD3v7PP1Y">https://communityoperatingsystem.wordpress.com/2019/09/12/how-icnirp-agnir-phe-and-a-30-year-old-political-decision-created-and-then-covered-up-a-global-public-health-scandal/?fbclid=IwAR3AWj1g7EhXgh5Cke-mfp5u2yUNAmUQRwrTEPLOHw2Um9H_M5HD3v7PP1Y</a></li> <li>• US in the form of ANSI and IEEE tend to use 10,000,000 since it is close to their fundamental axiom - Schwan's mistake of 1953. ICNIRP uses figures close to this, 9,200,000, but the FCC (US) SAR standards for phones from the 1980s relate to the US 10,000,000</li> </ul>
<b>Poland</b>	Non-thermal	1,000 $\mu\text{W}/\text{m}^2$	
<b>USSR</b>		100,000 $\mu\text{W}/\text{m}^2$	
<b>Czechoslovakia</b>		25,000 $\mu\text{W}/\text{m}^2$	
<b>Germany</b>		100,000 $\mu\text{W}/\text{m}^2$	
<b>India</b>		10% of ICNIRP = 1,000,000 $\mu\text{W}/\text{m}^2$	

194. The European Parliament's vote of 2009 by 522 to 16 that governments should reject the WHO ICNIRP's short-term heating guidelines as 'obsolete' and replace them with biological long-term guidelines

[https://www.scribd.com/document/462602160/European-Parliament-Vote-2009-522-to-16-EP-EMF-resolution-2APR09?secret\\_password=Ez9TGgq9M3qNd8NRSNYc](https://www.scribd.com/document/462602160/European-Parliament-Vote-2009-522-to-16-EP-EMF-resolution-2APR09?secret_password=Ez9TGgq9M3qNd8NRSNYc)

195. It contains many interesting comments below including:

B. whereas wireless technology (mobile phones, Wi-Fi/WiMAX, Bluetooth, DECT landline telephones) emits EMFs that may have adverse effects on human health,

C. whereas most European citizens, especially young people aged from 10 to 20, use a mobile phone, an object serving a practical purpose and as a fashion accessory, and whereas there are continuing uncertainties about the possible health risks, particularly to young people whose brains are still developing,

22. Calls on the International Commission on Non-Ionising Radiation Protection and the World Health Organisation (WHO) to be more transparent and open to dialogue with all stakeholders in standard setting;

23. Condemns certain particularly aggressive marketing campaigns by telephone operators in the run-up to Christmas and other special occasions, including for example the sale of mobile phones designed solely for children or free call time packages aimed at teenagers;

24. Proposes that the EU's indoor air quality policy should encompass the study of "wireless" domestic appliances, which, like Wi-Fi for Internet access and digital enhanced cordless telecommunications (DECT) telephones, have been widely adopted in recent years in public places and in the home, with the result that citizens are being continuously exposed to microwave emissions;

25. Calls, given its constant concern to improve consumer information, for the technical standards of the European Committee for Electrotechnical Standardisation to be amended with a view to imposing labelling requirements whereby the transmitting power would have to be specified and every wireless-operated device accompanied by an indication that it emitted microwaves;

26. Calls on the Council and Commission, in coordination with the Member States and the Committee of the Regions, to encourage the introduction of a single standard designed to ensure that local residents are subjected to as low a degree of exposure as possible when high-voltage grids are extended;

27. Is greatly concerned about the fact that insurance companies are tending to exclude coverage for the risks associated with EMFs from the scope of liability insurance policies, the implication clearly being that European insurers are already enforcing their version of the precautionary principle;

28. Calls on Member States to follow the example of Sweden and to recognise persons that suffer from electrohypersensitivity as being disabled so as to grant them adequate protection as well as equal opportunities;

29. Instructs its President to forward this resolution to the Council, the Commission, the governments and parliaments of the Member States, the Committee of the Regions, and the WHO.

196. We have not traced through EU procedures what happened since the Parliament's vote, but Michael Bevington's excoriating criticism of ICNIRP's guidelines in Schedule 11 of JLC Note Schedules is worth a careful study.

## 10. The Science

197. Much of it is set out in various reports such as the Bioinitiative report 2019.

198. Another excellent report is over 1,000 pages showing the science in favour of non-thermal effects in a report entitled "THE LARGEST UNETHICAL MEDICAL EXPERIMENT IN HUMAN HISTORY" by Ronald N. Kostoff, Ph.D. Research Affiliate, School of Public Policy, Georgia Institute of Technology

[https://smartech.gatech.edu/bitstream/handle/1853/62452/LARGEST\\_UNETHICAL\\_MEDICAL\\_EXPERIMENT\\_FINAL.pdf?sequence=4&isAllowed=y](https://smartech.gatech.edu/bitstream/handle/1853/62452/LARGEST_UNETHICAL_MEDICAL_EXPERIMENT_FINAL.pdf?sequence=4&isAllowed=y)

199. His bio is in the above article and is impressive. The report is encyclopaedic not simply of the science, but of the harms recorded by relevant studies.

200. I do not seek to replicate all the science here as ultimately this will be a bun fight between what we show the court and what DHSC and PHE show the court.

201. A key point is that ICNIRP keeps to a single minority viewpoint, that the only adverse effect is heating and that this is short-term, against the majority viewpoint that there are proven numerous effects which are not overtly related to heat and can be cumulative, meaning that there are also long-term effects.

## RF AND ELF BIOLOGICAL EFFECTS; MAJORITY AND MINORITY VIEWPOINT GUIDELINES

RF & ELF BIOLOGICAL EFFECTS <i>RF = Radio Frequency</i> <i>ELF = Extremely Low Frequency</i>	MAJORITY VIEWPOINT Long-term, Biological Guidelines Non-thermal, Low-level	MINORITY VIEWPOINT Short-term, Heating Guidelines Thermal
1932 EHS from RF described	<i>Background radiation: 0.00002 V/m</i> <i>0.000001 μW/m<sup>2</sup></i> <i>0.00002 W/kg (SAR)</i> <i>0.02 V/m = 1 μW/m<sup>2</sup></i>	<i>10,000,000 μW/m<sup>2</sup> = 10 W/m<sup>2</sup></i> <i>= 1 mW/cm<sup>2</sup> = 1,000 μW/cm<sup>2</sup></i>
1938 non-thermal effects are basic		
1946 blood rouleaux formation		1953 US: Schwan: short-term heating guidelines: 100,000,000 μW/m <sup>2</sup>
1948 cognition and memory affected		1959 USSR non-thermal guidelines: 100,000 μW/m <sup>2</sup>
1953 cancer from RF		1961 Poland non-thermal guidelines: 100,000 μW/m <sup>2</sup>
1959 magnetoreception		1965 Czechoslovakia non-thermal: 100,000 μW/m <sup>2</sup>
1961 tinnitus from RF		1966 ANSI: vulnerable groups (e.g. circulatory conditions) under moderate environmental conditions
1962 cardiovascular effects		1972 Poland non-thermal guidelines: 1,000 μW/m <sup>2</sup>
1966 EHS from ELF confirmed		1975 Germany non-thermal guidelines: 100,000 μW/m <sup>2</sup>
1974 calcium flux (VGCCs) from RF		1979 Czechoslovakia non-thermal: 25,000 μW/m <sup>2</sup>
1974 blood-brain barrier leakage		1992 US Environmental Protection Agency: susceptible subgroups to be assessed separately
1977 non-linear effects, 'windows'		1999 IARC: x and y rays: class 1 human carcinogen
1979 cancer from ELF		2000 Nordic Council: ICD-10: E1- Allergy
1979 depression, infertility		2000 Sweden: EHS: functional impairment
1980 RF as cancer promoter		2001 IARC: ELF: 2B possible human carcinogen
1981 melatonin reduction		2002 Salzburg Appeal: 100 μW/m <sup>2</sup> maximum (0.2 V/m)
1982 skin cancer		2002 Freiburg Appeal, Germany: 3,000 doctors
1986 ALS, motor neuron disease		2002 ICNIRP: vulnerable need non-thermal guidelines
1991 brain tumours		2005 Irish Doctors' Environmental Association recognizes increase in EHS
1994 DNA damage	2007 IARC: light at night: 2A probable human carcinogen	
1994 mast cell degranulation	2009 EU Parliament: ICNIRP guidelines obsolete	
1995 ELF geomagnetic resonance	2010 Seletun: 170 μW/m <sup>2</sup>	
2000 grounding effects	2011 C.of Europe: protect EHS; ICNIRP serious limitations	
2003 geomagnetic gender effects	2011 IARC: RF: 2B possible human carcinogen	
2004 all subjects sensitive to 60 Hz	2012 Bioinitiative: 3.0 (children) 6.0 (adults) μW/m <sup>2</sup>	
2007 4.0% of pop. electrosensitive	2012 India adopts non-thermal guidelines, 10% of ICNIRP	
2007 1.8% of pop. severely affected	2015 International EMF Scientist Appeal: 250 scientists	
2008 ELF: cancer, genetic variants	2016 EUROPAEM EMF Guidelines: 0.1-100 μW/m <sup>2</sup>	
2009 ELF: Alzheimer's	2017 The 5G Appeal: 250 signatories	
2014 RF: EHS, genetic variants	2017 UK PHE: precautionary advice on children	
2015 oxidative stress confirmed	2018 International Appeal Stop 5G, 150,000 signatories	
2015 EHS reduced cerebral blood flow	2018 IGNIR Guidelines: 0.1-100 μW/m <sup>2</sup> , 0.006-0.2 V/m	
2017 3d fMRI scans for EHS	2018 The EMF Call, for protective limits, 260 signatories	
2017 autoimmune dis. affected by RF		
2018 NTP & Ramazzini confirm cancer		
2019 sufficient animal studies +proven mechanisms =human carcinogen		
2019 magnetoreception confirmed		
		<i>EHS = Electromagnetic Hypersensitivity</i>

M. Bevington, October 7 2019

202. It was discovered in 1948 that RFR causes cancer. In 1953 the US decided to follow Herman Schwan's mistaken and invalidated hypothesis that the only adverse effect is heating. In contrast the USSR and Poland accepted non-thermal effects by the time of their guidelines in 1959. Now up to half the world follows non-thermal guidelines and the rest (ie US, UK etc) follow ICNIRP's thermal short-term guidelines which the EU Parliament voted in 2009 were by then obsolete.

203. The below is from Prof Henshaw in a note to us:

"In any case, I fear that PHE is in no position to take on such studies. Following the strong criticism by Starkey 2016 (attached), the Government disbanded the (HPA/PHE) Advisory Group for non-ionising Radiation (AGNIR), transferring responsibility for advice on EMR safety to COMARE. The latter, however, specialises in ionising radiation, with no experience in cell phone EMR.

I noted the comment by Cllr. Jon Cousins: "*Particularly poignant was Prof. Butler's assertion that 3,400 studies in Medline – the peer review library of journals – indicate quite strongly that radio frequency radiation is not only a carcinogen, but "a neurotoxin and has other deleterious effects on humankind"*".

I would add here that the database of International scientific literature described by Leach *et al*/2018 (attached) reviewed 2,653 scientific papers examining outcomes in humans, animals and in laboratory studies from EMR exposures in the 300 MHz–3 GHz range. There are three times more studies finding a biological “Effect” than those finding “No Effect”. This observation is profound. All studies reporting an “Effect” each has to satisfy statistical significance in its own right (typically at the 95% level - only a 1 in 20 probability of the finding occurring by chance). So the overall findings are particularly clear.

This evidence is too much to ignore. Together, it constitutes proof beyond all reasonable doubt that cell-phone electromagnetic radiation (EMR) is harmful to both animal and human health. In 2011, the International Agency for Research on Cancer (IARC) classified radio frequency EMR as a “2B Possible Human Carcinogen”. IARC has since given the subject High Priority for re-evaluation.”

### **A novel database of bio-effects from non-ionizing Radiation**

<https://doi.org/10.1515/reveh-2018-0017>

Received March 18, 2018; accepted May 6, 2018

**Abstract:** A significant amount of electromagnetic field/ electromagnetic radiation (EMF/EMR) research is available that examines biological and disease associated endpoints. The quantity, variety and changing parameters in the available research can be challenging when undertaking a literature review, meta-analysis, preparing a study design, building reference lists or comparing findings between relevant scientific papers. The Oceania Radiofrequency Scientific Advisory Association (ORSAA) has created a comprehensive, non-biased, multi-categorized, searchable database of papers on non-ionizing EMF/EMR to help address these challenges. It is regularly added to, freely accessible online and designed to allow data to be easily retrieved, sorted and analyzed. This paper demonstrates the content and search flexibility of the ORSAA database. Demonstration searches are presented by Effect/No Effect; frequency-band/s; *in vitro*; *in vivo*; biological effects; study type; and funding source. As of the 15th September 2017, the clear majority of 2653 papers captured in the database examine outcomes in the 300 MHz–3 GHz range. There are 3 times more biological “Effect” than “No Effect” papers; nearly a third of papers provide no funding statement; industry-funded studies more often than not find “No Effect”, while institutional funding commonly reveal “Effects”. Country of origin where the study is conducted/funded



also appears to have a dramatic influence on the likely result outcome.

204. Two major long term experiments which showed the link between cancer and EMFs in male rats were the US Toxicology Study and the Ramazzini Study. We have set out the US Toxicology Study at **Schedule 21**. The Ramazzini Study is at **Schedule 22**.
205. ICNIRP immediately trashed them both and ignored them in May, 2019.

<https://journals.lww.com/health-physics> by  
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ICNIRP NOTE: CRITICAL EVALUATION OF TWO RADIOFREQUENCY  
 ELECTROMAGNETIC FIELD ANIMAL CARCINOGENICITY  
 STUDIES PUBLISHED IN 2018

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

Abstract—Final results are now available from two large animal studies that investigated whether long-term exposure to radiofrequency (RF) electromagnetic fields (EMFs) associated with mobile (or cell) phones or base stations is carcinogenic; these studies hale from the US National Toxicology Program (NTP) and the Ramazzini Institute in Italy, respectively. In both cases, the authors concluded that they had demonstrated that RF EMFs are carcinogenic in male rats but not in female rats or mice (NTP only). The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has evaluated their methods and findings for potential information about the carcinogenicity of exposure to RF EMFs. We found that these studies had important strengths; for example, both followed good laboratory practice (GLP), both used much larger numbers of animals than previous research, and both exposed animals over the whole of their lives. We also noted somemajor weaknesses, including a lack of blinding, difficulties interpreting statistical analyses due to the association between longer lifespans and tumor occurrence in the exposed rats (NTP only), and failure to account for chance. ICNIRP concluded that these substantial limitations preclude conclusions being drawn concerning RF EMFs and carcinogenesis.  
 Health Phys. 118(00):000–000; 2020

206. The science which demonstrates that there are thousands of studies showing harm from RFR is compelling.
207. No one knows for certain what the biological effects of higher frequencies will be. A few studies in section 119 under Millimetre waves are at pages 111-112 of:

<http://www.es-uk.info/wp-content/uploads/2018/05/Selected%20ES%20and%20EHS%20studies.pdf>

208. This was published in 2018 so there will be more studies by now. Of deep concern is the beam-forming and MIMO capacity of 4G+, which could give very high exposures to someone caught in the line of the beams or where beams intersect. A recent Swiss study has shown that “hotspots” occur where the beams intersect and may have concerns for the eyes and skin.

## 11. Why are ICNIRP’s guidelines irrational and wrong?

209. At **Schedule 11B** to this note is a critique of ICNIRP’s guidelines Dr. Leendert Vriens Physicist, former Philips Research Fellow. This is well worth a read as it criticises the ICNIRP 2020 guidelines.
210. A quick recap on the information given above re ICNIRP’s guidelines.
211. The ICNIRP guidelines started in 1998 and have been revised twice. Once in 2010 and once in 2020.
212. The 2010 guidelines apply up to 10MHz. The 2020 guidelines replace the 100 kHz to 10 MHz EMF frequency range of the 2010 guidelines but retain guidelines relating to direct nerve stimulation and associated restrictions. The retained 2010 guidelines are not considered further in these instructions.
213. The 2020 ones replace the 1998 ones. They apply from 100 kHz to 300 GHz. But the flaws in the 1998 guidelines are carried over and amplified in the 2020 guidelines.
214. The 1998 guidelines set an exposure limit of 10V/m<sup>2</sup> from 2 – 300GHz. This was changed in the 2020 guidelines to 40V/m.
215. The 2020 guidelines include the 1998 guidelines in their list of reports referenced for their exposure limits so both guidelines are critiqued below.
216. PHE uses ICNIRP’s guidelines, not under contractual arrangements with ICNIRP, as far as we can tell, but simply because it is “recognised as an official collaborating NGO by the WHO and the ILO” according to DHSC’s response to our letter before action.

Best practice principles relating to scientific evidence can be described as:

- (a) Independence from bias or conflict of interest;
- (b) The need for peer review;
- (c) The need for corroboration and benchmarking of expert evidence against internal documents;
- (d) The need for referencing of the existing literature base;
- (e) Transparency and the ability to verify using three principles used by the Competition and Markets Authority:
  - (i) Clarity and transparency
  - (ii) Completeness

- (iii) Replicability of results
  - (f) Analysis is context sensitive (so clinical notes need not be peer reviewed)
217. The fundamental problems with ICNIRP's 1998 and now 2020 guidelines are set out below. The 1998 guidelines have been reviewed by various scientists who have criticised them as being inadequate to protect public health.
218. Dr Neil Cherry (who is now deceased – but there are other experts who we are sure can make similar statements) states that they are “seriously and fatally flawed, with a consistent pattern of bias, major mistakes, omissions and deliberate misrepresentations. Adopting it fails to protect public health from known potential and actual health effects”<sup>5</sup> He states further that there is good reason to consider the ICNIRP to be insufficiently representative, accountable, transparent, and independent of industrial/political influence; indeed, a well respected team of investigative journalists recently branded it a “*cartel*”.
219. And PHE and DHSC have been told time and again about these failings and particularly about the suffering of those with EHS and they have ostensibly failed to enquire as to the authenticity of the representations made to them or to take any form of investigative action to address the complaints being levelled at them.
220. This is no longer about the exercise of a wide discretion, but of a lazy and intentionally obstructive bias against moving away from a conflict of interest riddled position. That omission is in breach of best practice and of the duty to protect the public's health.
221. In addition to all of the information about to be set out below, the 2020 guidelines have been roundly criticised by Michael Bevington, Trustee of ES-UK while they were still draft guidelines in 2018. They have not changed much from the draft. His paper is set out in full in **Schedule 23**.
222. The critiques of the guidelines can be summarised as below:
- (a) The exposure limits are set on the basis of heating of the body by more than 1° C generated by exposure to radiation. As a consequence, ICNIRP rejects any health impacts which are caused other than by heating of the body (EHS sufferers do not have heating of the body when they experience debilitating symptoms).
  - (b) The 1998 guidelines are predicated on the premise that if no heating of the body occurs after 6 mins of exposure, such exposure is safe 24 hours a day, 7 days a week, 365 days a year. We think this also applies to the 2020 guidelines. This is also irrational and unsupported by science as an appropriate measure.
  - (c) The guidelines are for short term exposure only and not for long term exposure. This is stated overtly in the 1998 guidelines. The 2020 guidelines state that they apply to long term exposure but the body of the guidelines only refers to short term exposure.

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<sup>5</sup> 10/2/99, Neil Cherry, Criticism of the Proposal to adopt the ICNIRP Guidelines for cell sites in New Zealand, ICNIRP guideline critique

- (d) They use heating values based on an adult's body, not on a child's body – children's bodies are smaller and the effect of radiation on them is greater. The guidelines do not account for that.
- (e) Their fundamental principle is that the power of the exposure is important to potential damage but EHS sufferers can feel the impacts at very low powers.
- (f) The guidelines also do not make any distinction between pulsed and non-pulsed EMFs.
- (g) The 2020 guideline rationale seems much more restrictive in that it looked for "substantiated" data to provide evidence and required the scientific studies to be replicated. Given that each experiment is unique in terms of its lab environment and other factors, it is difficult exactly to replicate experiments with adverse findings.
- (h) The 1998 guidelines seemed to review the body of science before they were proposed but by 2020, ICNIRP did not seek to review the science. Instead, it reviewed the reports of other organisations - the SCENIHR reports (2015, 2016 and 2018), WHO (2014) and Swedish Radiation Safety Authority (2018) and looked at a few other studies, but only those which related to effects connected with the heating of the body.
- (i) The 2020 guidelines dismiss key scientific studies which show a link between cancer and EMFs. The Secretary of State for DHSC must use guidelines based on objective and independent assessments of the science, and epidemiological evidence, which is extremely strong and consistent and not a simple adoption of a flawed and scientifically and legally challengeable approach and exposure level. The ICNIRP guidelines dismiss important peer reviewed research on nebulous grounds.
- (j) Rather than have a power density limit for exposure, the 2020 guidelines have moved fully to a Specific Absorption Rate approach for different parts of the body depending on the frequency and power. This is more difficult for the lay person to understand and therefore not 'clear' or 'transparent' rendering reliance on these guidelines irrational.
- (k) The guidelines are grossly inappropriate for public health protection. They are scientifically challengeable because they are based on serious errors and omissions.
- (l) The Nolan Principles of behaviour in public office have not been observed by PHE or DHSC.
- (m) Irrationality is implied by the decision-maker taking into account irrelevant matters, such as the (relatively minor) public financial costs implied by various proper and intuitive remedial measures vs. the major human, environmental, economic, and other costs of failing to act and the fact of major public revenues being generated by wireless industry licensing/taxation etc.
- (n) Irrationality is implied by the failure of the decision-maker apparently to take into account relevant matters, such as already known, submitted, and emerging data

demonstrating harm as well as international (and presumably also domestic) reports of real-world harm associated with the activation of transmitter sites, etc.

- (o) Irrationality is further shown when PHE's stance is considered against the precautionary approach developed by the UK's Inter-Departmental Group on Risk Assessment vs. the fact of the existence of relatively risk-free alternatives.
  - (p) Irrationality of PHE's stance is also evident in various acts of bad faith including the patent, unacknowledged, and uncorrected scientific fraud that is the non-peer reviewed 2012 AGNIR report and its unacknowledged and uncorrected knowingly false/misleading framing in public health statements/guidance, as well as multiple unacknowledged and unremedied examples of COMARE knowingly misinforming/misleading various stakeholders.
  - (q) Irrationality is measured when considered against the relatively low bar where human rights are concerned, and perhaps also matters pertaining to environmental degradation – particularly irreversible and intergenerational damage potentially extending to ecosystem level and thus having implications for human as well as broader ecological welfare, resilience, and sustainability.
  - (r) There are deep concerns in UK's scientific community that the quality of scientific study today is so sub-standard as to be fraudulent and misleading.
  - (s) There is a lack of credible policy, guidance and risk assessment unadorned by papers riddled with criticisms of bias, conflicts of interest, deliberate disregard of existing research and non-peer reviewed reports etc in DHSC and PHE in relation to non-ionising radiation.
  - (t) PHE have been told time and again by various parties that 5G is an experiment contrary to the Nuremburg Code on UK residents, yet they do nothing to investigate these concerns.
  - (u) There is evidence that telecoms companies are "war-gaming" the science. These accusations must have reached PHE's ears but they do nothing to investigate the position of the industry. This echoes the position of the tobacco companies set out in Mr Justice Green's judgement in the Tobacco case.
  - (v) ICNIRP members are riddled with conflicts of interest. Dr Mann who is the real mover and shaker behind non-ionising radiation at PHE (he is an employee of PHE) is also a member of ICNIRP and the WHO. Conflicts of interest are rife through the industry. A best practice standard is demanded of our government.
223. We do not deal with evidence of all of these grounds but set out some to demonstrate further the points which are being made.

## 12. Detail of grounds of irrationality

224. Let's look now at some of the grounds of irrationality in more detail. The discontinuous lettering below corresponds to the particular grounds of irrationality above.
- A. The exposure limits are set on the basis of heating of the body by more than 1° C generated by exposure to radiation. As a consequence, ICNIRP rejects any health impacts which are caused other than by heating of the body (EHS sufferers do not have heating of the body when they experience debilitating symptoms)**
225. This is an arbitrary measure which is unsupported by science as being an appropriate measure. Irrationality is evident in the adoption of such a clearly (scientifically) illogical and morally reckless approach: essentially based on (hiding behind) the presumption of zero health effects at long-duration/multiple-frequency/sub-thermal levels of exposure – especially in view of (even a fraction of) the (mounting) evidence to the contrary.
226. The comments below relate to the 1998 guidelines but they are equally true for the 2020 guidelines as they contradict the guidelines fallacy that health damage only occurs if the body heats up.
227. Dr William Adey in his paper “Frequency and Power Windowing in Tissue interactions with Weak Electromagnetic Fields” confirms that raising tissue temperature orders of magnitude less than 0.1C may result in major physiological, and behavioural changes only within windows in frequency and incident energy”.
228. He postulates that material forming a sheet on cell membrane surfaces appears to be the site of detection of these weak molecular and neuroelectric stimuli. According to Dr Neil Cherry, Dr Adey is one of the world's leading and most experienced, most scientifically published and respected EMR researchers.
229. Adey (1979) reviewed a large body of research on neurophysiologic effects of RF/MW radiation and included human biometeorological research on circadian rhythms in human subjects isolated from sunlight and EMR. This and other experiments showed that “ionic changes in amplitude modulation RF/MW fields are much more related to modulated frequency than intensity of signal”.
230. Biochemists have confirmed that RF/MW alters signal transduction (EG Luben (1995), Byus (1994), alters melatonin and damages the immune system.
231. There is a wealth of laboratory evidence of cellular and animal changes at extremely low exposure levels to RF/MW radiation, accompanied by a massive body of epidemiological research which shows adverse health effects in human beings down to extremely low life-time mean exposure levels of chronic exposures.
232. Dr Cherry states that “it is simply not scientifically credible to claim that there are no established non-thermal effects and hence a public exposure standard that protects

against warming by 1° C is adequate and should be adopted as a guideline in New Zealand". While his comments relate to New Zealand, they are equally applicable to the UK's predicament.

**F. The guidelines also do not make any distinction between pulsed and non-pulsed EMFs**

233. This is a crucial point. There are a few experiments which have studied the effects of pulsed EMFs. Pulsed EMFs is the nature and essential characteristic of man-made EMFs. The constant switching on and off of the EMFs as data packets are sent to and from users to base stations make a difference in how the human body responds to the signals.

234. Natural EMFs don't switch on and off and our bodies are used to such EMFs. But the pulse makes a difference to how our bodies respond to the signals.

235. Certainly the 1998 guidelines did not make any distinction between pulsed and non-pulsed EMFs. We have to check regarding the 2020 guidelines.

236. The 2020 guidelines also do not make any distinction between pulsed and non-pulsed EMFs because they have determined that there is no evidence that it produces different biological effects by reference to 2 studies (pg 487):

"Similarly, as there is no evidence that continuous (e.g., sinusoidal) and discontinuous (e.g., pulsed) EMFs result in different biological effects (Kowalczyk et al. 2010; Juutilainen et al. 2011), no theoretical distinction has been made between these types of exposure (all exposures have been considered empirically in terms of whether they adversely affect health)."

237. This position is deeply flawed.

**G. The 2020 guideline rationale seems much more restrictive in that it looked for "substantiated" data to provide evidence and required the scientific studies to be replicated. Given that each experiment is unique in terms of its lab environment and other factors, it is difficult exactly to replicate experiments with adverse findings**

238. The 2020 guidelines are based on a narrower and tighter definition of how they consider scientific studies than the 1998 guidelines (bold is my emphasis):

"These guidelines specify quantitative EMF levels for personal exposure. Adherence to these levels is intended to protect people from all substantiated harmful effects of radiofrequency EMF exposure. To determine these levels, ICNIRP first identified published scientific literature concerning effects of radiofrequency EMF exposure on biological systems, and established which of these were both harmful to human health<sup>3</sup> and scientifically substantiated. This latter point is important because ICNIRP considers that, in general, reported adverse effects of radiofrequency EMFs on health **need to be independently verified, be of sufficient scientific quality and consistent with current scientific understanding, in order to be taken as "evidence" and used for setting exposure restrictions.** Within the guidelines,

“evidence” will be used within this context, and “substantiated effect” used to describe reported effects that satisfy this definition of evidence. The reliance on such evidence in determining adverse health effects is to ensure that the exposure restrictions are based on genuine effects, rather than unsupported claims. However, these requirements may be relaxed if there is sufficient additional knowledge (such as understanding of the relevant biological interaction mechanism) to confirm that adverse health effects are reasonably expected to occur.

239. Being “consistent with current scientific understanding” is not how science works. If science today remained “consistent with current scientific understanding” in the last century, we would still believe the earth was flat. This is a euphemism for ICNIRP saying if you don’t agree with us, we can ignore you.

240. Many peer-reviewed studies which show harm to humans from EMFs have been ignored by ICNIRP even though they are of sufficient scientific quality.

241. We recall that Mr Justice Green in the Tobacco case made the comment below:

“Einstein said that of 100 scientists, 99 may agree, but what if the remaining one was correct? The history of science as we know it is a long story of theories once accepted as true being abandoned or changed!”

242. The definition of what evidence is accepted by ICNIRP is patently and overtly to exclude evidence which shows harm to humans from EMFs. This shows bias and a lack of independence in itself which should be red flags to PHE and DHSC to investigate further. But, they do nothing.

**H. The 1998 guidelines seemed to review the body of science before they were proposed but by 2020, ICNIRP did not seek to review the science. Instead, it reviewed the reports of other organisations - the SCENIHR reports (2015, 2016 and 2018), WHO (2014) and Swedish Radiation Safety Authority (2018) and looked at a few other studies, but only those which related to effects connected with the heating of the body**

243. You will see that, for the 2020 guidelines, ICNIRP did not conduct its own research. Instead, it reviewed existing reports on research and set its limits based on what those reports concluded. At pg 486 of the guidelines, it is stated:

“This information was obtained primarily from major international reviews of the literature on radiofrequency EMFs and health. This included an in-depth review from the World Health Organization on radiofrequency EMF exposure and health that was released as a draft Technical Document (WHO 2014), and reports by the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR 2015) and the Swedish Radiation Safety Authority (SSM 2015, 2016, 2018). These reports have reviewed an extensive body of literature, ranging from experimental research to epidemiology, and include consideration of health in children and those individuals thought to be sensitive to radiofrequency EMFs. To complement those reports, ICNIRP also considered research published since those reviews. A brief summary of this



literature is provided in Appendix B, with the main conclusions provided below.”

244. We can do no better than Mr Justice Green in the Tobacco case when he said (bold is our emphasis):
320. I now move away from internal documents to the next aspect of methodological best practice which concerns the efficacy of researchers and experts addressing the existing literature base. I start with the criticism made by the Secretary of State that the tobacco companies and their experts failed to grapple with the pre-existing evidence base which has been generated over a number of decades by scientists and researchers worldwide. The Claimants’ experts however attack that evidence as fundamentally unsound as a matter of principle, and, in any event, superseded by their up to date regression analysis. The Defendant makes three points which concern: (i) the intrinsic value of the existing literature base which is based upon successive pieces of peer reviewed material; (ii) the evidential value of consistency between the outcome of peer reviewed research; and (iii) evidential problems related to selectivity of prior research.
321. **The first point relates to the importance of best practice to the evolution of research over time. Research is a progressive process; one researcher builds upon the research of another. Over time advances emerge from this iterative and incremental process and the sum is thus far more than the individual parts. This steady process is enhanced because along the way each prior piece of prior research has been generated according to best practice. This is important because when experts, in the context of litigation, refer to prior sources and state that they are peer reviewed and independent this is capable of carrying weight as a probative badge of quality. And conversely if an expert’s report ignores prior research or only selects research which has not been peer reviewed or which is not independent this logically is an indicator of lesser quality.**
322. The second point concerns the probative value of consistent source evidence. The greater the volume of best practice compliant evidence pointing in a single direction the more likely it is that the thrust of that evidence should be taken as indicative of the correct result or answer. This is important because where the accumulated weight of the prior (independent, peer-reviewed) research points in one direction the fact that there may be limitations in individual pieces of research becomes of much less significance. Hence when experts include as part of their analysis a comprehensive review of source material and where that material meets best practice standards then the direction of travel of the evidence is a stand-alone factor which adds probative weight to the particular expert’s opinion.

323. The third and related point concerns selectivity: the correctness of an answer cannot be decided simply by weighing the evidence in support of it. In a wide ranging consultation on a controversial topic where views are polarised there may frequently be a significant volume of well crafted and persuasive material that can be pointed to as supporting one side or the other. But it is precisely because of this that the decision maker must exercise judgment having systematically reviewed all of the evidence in the round. If following such a review it can be seen that there is a common thread or widespread consensus then “volume” in that sense may be influential. In *R (on the application of British Academy of Songwriters Composers and Authors et Ors v Secretary of State for Business innovation and skills* [2015] EWHC 1723 (Admin) at paragraph [229] the Court stated:

**“229. ...the ability of any court to conduct an intensive review will depend also upon the evidence put before it by the parties. In this case the manner in which the attack on the economic logic of the decision has been advanced makes it difficult to accept. If a Court is to overturn an economic assumption made by a decision maker then it has to have before it all of the evidence that the decision maker considered so that it can be assessed in the round.** It cannot be open to a Court to reject the Defendant's assessment if only a small portion of the relevant evidence is relied upon for that challenge. By its nature - and especially in relation to an issue which splits an industry and stimulates partial submissions reflecting defined economic interests - if only that portion of the evidence which reflects but one side of the argument is put before the court then it will, inevitably, appear to be a powerful and coherent body of evidence which is inconsistent with the decision maker's reasons. However, that might be for the very reason that it is only a portion of the evidence that was before the decision maker. To then say that there is a coherent body of evidence that contradicts the decision is true but an inapposite conclusion since it does not necessarily indicate that the impugned decision was outwith the decision maker's proper discretion. In this case submissions inviting rejection of the Defendant's economic pricing-in theory have rested upon only a small portion of the actual evidence before the decision maker. I have now read the contrary evidence. Submissions made have not focused upon why these other experts are wrong nor have they Judgment Approved by the court for handing down. Tobacco Packaging Page 161 sought to weigh the pros and cons of competing economic theories”.

324. I agree with all of the three points made by the Secretary of State and summarised above in this regard. They each provide yardsticks which may be applied to evidence.

245. We say that the ICNIRP guidelines are of low quality because it dismisses many pertinent studies which have been peer reviewed. They blindly adopt ICNIRP's guidelines without themselves interrogating it to see what studies have been relied on.
246. Julian Glassford has set out in excruciating detail why ICNIRP's guidelines cannot be relied on and cogent evidence showing harm and neither DHSC or PHE move to investigate the claims.
247. The 2020 guidelines refer to the 2015 study by Scientific Committee on Emerging and Newly Identified Health Risks ("SCENIHR"). The SCENIHR study is below (Opinion on Potential health effects of exposure to electromagnetic fields (EMF) – Jan 2015):
- [https://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_041.pdf](https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf)
248. This study is deeply flawed for reasons which follow. At page 5 of the SCENIHR report it states:
- “Some studies raised questions regarding an increased risk of glioma and acoustic neuroma in heavy users of mobile phones. The results of cohort and incidence time trend studies do not support an increased risk for glioma while the possibility of an association” but this does not seem to have made it into the ICNIRP guidelines.
249. The following critique is by Professor Denis Henshaw with whom our team is in regular contact:
- “The point is this, if a scientist made the sort of false comments that are in SCENIHR 2015 they would be accused of scientific fraud. So, let's not mince our words: SCENIHR 2015 is fraudulent in a number of places.
- You can scroll through the rest of Pall cpt 5 to see just how many papers SCENIHR 2015 does not cite. (They have the flimsy excuse that they did not even look at "poor quality" papers!)
- So, your colleagues need to be well prepared for these so-called "Official" reports”
250. Martin Pall's critique of SCENIHR is at the link below under a heading of Omissions, flaws and falsehoods 5G Risk: The scientific perspective (pg 41 - 80). He forensically destroys the methods used by SCENIHR, their cherry picking and conclusions.
- [https://www.scribd.com/document/462840169/Pall-5G-Risk-the-Scientific-Perspective-including-SCENIHR-critique?secret\\_password=q2ycOhZb9ayp9PsGkWJA](https://www.scribd.com/document/462840169/Pall-5G-Risk-the-Scientific-Perspective-including-SCENIHR-critique?secret_password=q2ycOhZb9ayp9PsGkWJA)
251. It is clear that SCENIHR is guilty of scientific fraud. This paper forms a fundamental part of ICNIRP's review culminating in the 2020 guidelines.

**I. The 2020 guidelines dismiss key scientific studies which show a link between cancer and EMFs. The Secretary of State for DHSC must use guidelines based on objective and independent assessments of the science, and epidemiological evidence, which is extremely strong and consistent and not a simple adoption of a flawed and scientifically and legally challengeable approach and exposure level. The ICNIRP guidelines dismiss important peer reviewed research on nebulous grounds**

252. Dr Cherry confirms that “it is easy to make strong and general dismissive and critical statements. The INCIRP statement does this all the time. It is more difficult and much more time consuming to carefully consider each claim and every paper cited in making those claims”.

253. He goes to state that he shows “clearly and conclusively that there is a bias against finding and acknowledging adverse effects to the extent that most of the available scientific studies which show effects are ignored, the ones chosen are largely misrepresented, misinterpreted and misused.”

254. The guidelines dismiss papers which show significant effects using incorrect, inappropriate and unjustified means.

255. A small number of studies are cited and reviewed, out of a large set of available material which shows potential, probably, taken together, actual adverse health effects. Both the 1998 and 2020 guidelines ignore whole bodies of research and the research results of complete disciplines, eg, biometeorology.

256. He continues “this happens so consistent, systematically, demonstrably and blatantly that we can only conclude there is an unscientific motive behind the assessment and its conclusions”.

**J. Rather than have a power density limit for exposure, the 2020 guidelines have moved fully to a Specific Absorption Rate approach for different parts of the body depending on the frequency and power. This is more difficult for the lay person to understand and therefore not ‘clear’ or ‘transparent’ rendering reliance on these guidelines irrational**

257. The 2020 guidelines are not understandable to non-scientists and we would argue are not, therefore, ‘clear’ or ‘transparent’ as required by the competition market principle. Mr Justice Green stated:

“Clarity and transparency focus upon the need for clear presentation of results and conclusions including precise and clear statements of the methodology used, the assumptions made, and the justifications of the methodology and the assumptions. Such evidence must be comprehensible. The fact that the recipient is an expert regulator does not mean that all of its officials are capable of interpreting complex econometric or statistical analyses. This is a recognition that complex evidence must be made digestible to non-specialists. It is a point of real practical significance in a case such as the present.”

258. He further makes the important point:

“Submissions should be understandable to non-economists, and [CMA] economists should be able to determine how the analysis enables the parties’ economic experts to reach the submitted conclusions”.

259. This should apply equally to the PHE’s reliance on ICNIRP’s guidelines which are opaque to the lay person.

**K. The guidelines are grossly inappropriate for public health protection. They are scientifically challengeable because they are based on serious errors and omissions**

260. Do see a note from Joel Moskowitz PhD below regarding the effect of millimeter waves on the skin and the way that these are portrayed in the 2020 guidelines.

261. He concludes that “In conclusion, there is an urgent need for research on the biological and health effects of mm-waves because, using the currently available evidence on skin effects, the claims that “we know skin and human health will not be affected” as well as the claims that “we know skin and human health will be affected” are premature assumptions that lack sufficient scientific basis.”

**From:** Joel M. Moskowitz PhD [<mailto:jmm@berkeley.edu>]

**Sent:** Monday, June 1, 2020 10:25 PM

**To:** CHE-EMF

**Subject:** Physiological effects of millimeter-waves on skin and skin cells: An overview of the to-date published studies

**Physiological effects of millimeter-waves on skin and skin cells: An overview of the to-date published studies**

Dariusz Leszczynski. Physiological effects of millimeter-waves on skin and skin cells: An overview of the to-date published studies. **Reviews on Environmental Health**. in press.

ABSTRACT

The currently ongoing deployment of the 5th generation of the wireless communication technology, the 5G technology, has reignited the health debate around the new kind of radiation that will be used/emitted by the 5G devices and networks – the millimeter-waves. The new aspect of the 5G technology, that is of concern to some of the future users, is that both, antennas and devices will be continuously in a very close proximity of the users’ bodies. Skin is the only organ of the human body, besides the eyes, that will be directly exposed to the mm-waves of the 5G technology. However, the whole scientific evidence on the possible effects of millimeter-waves on skin and skin cells, currently consists of only some 99 studies. This clearly indicates that the scientific evidence concerning the possible effects of millimeter-waves on humans is insufficient to devise science-based exposure limits and to develop science-based human health policies. The sufficient research has not been done and, therefore, precautionary measures should be considered for the deployment of the 5G, before the sufficient number of quality research studies will be executed and health risk, or lack of it, scientifically established.

QUOTE from the DISCUSSION section

“..., the recently published guidelines by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) [103], stating that the ICNIRP proposed mm-waves radiation exposure limits are protecting users from health effects of mm-waves are only an assumption that is not sufficiently based on scientific evidence because the research on effects of mm-waves on skin has not been performed. This is why any claims, including ICNIRP’s, that the current safety limits protect all users, no matter of their age or their health status, have no sufficient scientific basis. The safety limits that are suggested to protect from health effects of mm-waves are based on scientifically unsupported assumptions as seen from the evidence presented in Tables 1-4...”

CONCLUSION of the REVIEW

In conclusion, there is an urgent need for research on the biological and health effects of mm-waves because, using the currently available evidence on skin effects, the claims that “we know skin and human health will not be affected” as well as the claims that “we know skin and human health will be affected” are premature assumptions that lack sufficient scientific basis.

**Paper (in press): Skin and mm-waves**

**TABLES**

**Table 1 HUMANS volunteer studies**

**Table 2A rat studies**

**Table 2B mouse studies**

**Table 3 Studies of Human cells**

**Table 4 Studies of Animal cells**

**Related Posts:**

[5G Wireless Technology: Millimeter Wave Health Effects](#)

[5G Wireless Technology: Is 5G Harmful to Our Health?](#)

[Scientists and Doctors Demand Moratorium on 5G](#)

["We Have No Reason to Believe 5G is Safe" \(Scientific American\)](#)

[Scientific American Created Confusion about 5G's Safety: Will They Clear It Up?](#)

Joel M. Moskowitz, Ph.D., Director  
Center for Family and Community Health  
School of Public Health  
University of California, Berkeley

## Electromagnetic Radiation Safety

Website: <https://www.saferemr.com>

Facebook: <https://www.facebook.com/SaferEMR>

Twitter: @berkeleyprc

**O. Irrationality is further shown when PHE's stance is considered against the precautionary approach developed by the UK's Inter-Departmental Group on Risk Assessment vs. the fact of the existence of relatively risk-free alternatives**

262. There is a group called the "Interdepartmental Liaison Group on Risk Assessment". They prepared the UK government's position on the Precautionary Principle. This group does not meet any more but we believe that the principle is still active.

<https://webarchive.nationalarchives.gov.uk/20190701152341/https://www.hse.gov.uk/aboutus/meetings/committees/ilgra/pppa.htm>

263. The Interdepartmental Liaison Group on Risk Assessment (ILGRA) is an informal committee of officials from all major Government Departments responsible for developing policy on, and promoting the practical application of risk assessment and risk management.

264. Since the group first reported to Ministers in 1996, the trend for networking and co-ordination of policies across Departments and Agencies has accelerated. Moreover, the mechanism developed by ILGRA is fully in line with that trend.

265. Extracts from the report are below. They present an account of ILGRA's efforts over the past two years to stimulate more efficient and effective ways for regulating and managing risks. It does this by building on good practice developed within Departments and by improving the information base on issues that are common to many areas of Government.

"Despite the gains that have been made in protection of health and safety and the environment, Government Departments and Agencies are being increasingly pressed for public explanations of the basis of decisions in these areas. Recent events have made it clear that though people want to be reassured about the food they eat, the air they breathe and potential risks to their health and safety, they do not want their freedom to be unduly restricted. They want to be free to choose if they wish. This requires good information consistently presented and good decisions by Government on issues where individual choice is not the only consideration. It is, of course, just such developments that led to the establishment of ILGRA.

In this report we describe the progress that we have made to help Departments improve their approaches to risk-management, and identify the areas that we need to concentrate on in future. These include the need for Departments to describe comprehensively their frameworks for characterising a problem, obtaining the necessary information to evaluate options to address it, and adopting decisions, while actively engaging stakeholders. Moreover,

there is a need for Departments to improve the ways they communicate on risk issues, and to be clearer on the role of experts and on the uses and limitations of scientific and economic analysis in the decision-making process.

266. There is an interesting section on the burden of proof, hierarchy of control measures and review which is below in considering the application of the Precautionary Principle. There is also a summary of the European Principles on the Precautionary Principle below.

#### Burden of proof

25. The general presumption in western societies is that the regulator has to demonstrate reasonable grounds to intervene (Annex 1). However, invocation and application of the precautionary principle carries a general presumption that the burden of proof shifts away from the regulator [19] having to demonstrate potential for harm towards the hazard creator having to demonstrate an acceptable level of safety.

26. One consequence is that invoking the precautionary principle shifts the onus to provide the scientific evidence for risk assessment from the regulator to the hazard creator. This is exemplified in licensing or approval regimes imposed to address more serious hazards considered to merit a strongly precautionary approach, such as nuclear power generation and pesticides. In such permissioning regimes the requirements on applicants or holders of licences or approvals to provide scientific evidence can be onerous, and can include action to reduce scientific uncertainty.

27. However, in practice the extent to which a permissioning regime shifts the burden of proof away from the regulator is variable, reflecting a mixture of policy and scientific factors. For example, the UK regimes for licensing nuclear power stations and approving pesticides both require applicants to provide the scientific evidence needed to assess risk. However, in the nuclear regime the applicant does a risk assessment and the regulator challenges why risks cannot be reduced further [20]. In contrast, in the pesticide regime the regulator undertakes the risk assessment and demonstrates an acceptable level of safety [21]. In short, flexibility is needed and the extent to which the burden of proof shifts towards the hazard creator is determined case-by-case.

28. There are, however, exceptions to the general rule that invoking the precautionary principle puts the onus on the hazard creator to provide the scientific information needed for risk assessment (paragraph 26 above). Where there is significant value for society in reducing uncertainty, yet there is little or no prospect of the work being done by the private sector, it may be appropriate for Departments to act in the public interest by, for example, undertaking research to plug information gaps. Examples of such situations include research to establish the nature and extent of any adverse effects resulting from climate change, or to investigate a generic range of pharmaceuticals that has the potential to address a prominent disease or condition.



### Key point

Unless there are constraints, the presumption should be that:

- as a general rule, the hazard creator should provide, as a minimum, the information needed for decision-making; but
- Departments should retain flexibility to determine 'regime-by-regime' the extent to which the burden of proof should shift towards the hazard creator in demonstrating presence of risk or degree of safety.

### Hierarchy of control measures

29. Invocation of the precautionary principle should trigger consideration of the whole range of risk management options, which could include, for example, information and guidance, publicity campaigns, stronger enforcement and/or larger penalties, and of course, research to reduce uncertainty. An outright ban on an activity or product should be a last resort.

30. Nevertheless, within this position regulators should be able to impose on hazard creators a preferred hierarchy of controls that follows established good practice in risk reduction. For example, good risk management practice in health, safety and environmental protection starts from the position that, wherever practicable, it is better to avoid hazards by substitution or careful process/equipment design than to 'bolt-on' measures to reduce the risks. This would be particularly true for hazards where there are considerable uncertainties in the estimates of the risks attached to them.

### Review

31. Decisions reached by invoking and applying the precautionary principle should be:

- kept under active review;
- revisited when further information that reduces uncertainties becomes available, and modified as appropriate [19].

### Key point

Decisions reached by invoking and applying the precautionary principle should be actively reviewed to:

- ensure that the action taken resulted in what was intended; and
- check whether decisions previously reached need to be modified to take account of, for example, advances in technology, new knowledge about the risks from research, or any other information which may reduce uncertainty in the nature and likelihoods of potential consequences.

### Annex 2

European Resolution on the precautionary principle (paragraph 5)

In summary, the Resolution on the precautionary principle, which was endorsed by Heads of Government at a General Affairs Council at Nice in December 2000, provides that:

- use should be made of the precautionary principle where the possibility of harmful effects on health or the environment has been identified and preliminary scientific evaluation proves inconclusive for assessing the level of risk
- the scientific assessment of the risk must proceed logically in an effort to achieve hazard identification, hazard characterisation, appraisal of exposure and risk characterisation
- risk management measures must be taken by the public authorities responsible on the basis of a political appraisal of the desired level of protection
- all stages must be conducted in a transparent manner, civil society must be involved and special attention must be paid to consulting all interested parties as early as possible
- measures must observe the principle of proportionality, taking account of short-term and long-term risks; must not be applied in a way resulting in arbitrary or unwarranted discrimination; and should be consistent with measures already adopted in similar circumstances or following similar approaches
- measures adopted presuppose examination of the benefits and costs of action and inaction, and the examination must take account of social and environmental costs and of the public acceptability of the different options possible
- decisions taken in accordance with the precautionary principle should be reviewed in the light of developments in scientific knowledge.

267. Even if PHE considers the science to be uncertain based on the representations made by numerous people with concerns about 5G, they should already have invoked the Precautionary Principle on the basis of the above tests. Not to do so is, in our view, irrational.

**P. Irrationality of PHE's stance is also evident in various acts of bad faith including the patent, unacknowledged, and uncorrected scientific fraud that is the non-peer reviewed 2012 AGNIR report and its unacknowledged and uncorrected knowingly false/misleading framing in public health statements/guidance, as well as multiple unacknowledged and unremedied examples of COMARE knowingly misinforming/misleading various stakeholders**

268. AGNIR was disbanded in 2016 after an excoriating article by scientist Sarah Starkey on massive conflicts of interest by members of AGNIR.

269. Yet PHE still refers to their findings as evidence for their unsupportable position. Of course, PHE itself is now facing being disbanded.

**A. PHE have been told time and again by various parties that 5G is an experiment contrary to the Nuremburg Code on UK residents, yet they do nothing to investigate these concerns**

270. Here is what The Planetary Association for Clean Energy, Inc. (“PACE”), a non-governmental organization in special consultative status to the UN, says about it in their submission to the UN:

“PACE believes that 5G, together with previous generations of wireless technology, is an experiment on humanity that constitutes cruel, inhuman and degrading treatment under General Assembly resolution 39/46 of 10 December 1984. [24]”

271. This submission was made to the UN’s Human Rights Council Fortieth session 25 February–22 March 2019

Agenda item 3 Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development

The Secretary-General has received the following written statement which is circulated in accordance with Economic and Social Council resolution 1996/31. [11 February 2019]

See the full submission to UN - <https://undocs.org/A/HRC/40/NGO/217> - Feb 2019

**U. There is evidence that telecoms companies are “war-gaming” the science. These accusations must have reached PHE’s ears but they do nothing to investigate the position of the industry. This echoes the position of the tobacco companies set out in Mr Justice Green’s judgement in the Tobacco case**

272. An example of such info is in the submission by PACE to the UN above, where it is stated:

“Among others, Professor Emeritus Henry Lai, a leading bioengineer at the University of Washington who produced groundbreaking work on the effects of low-level radiation on DNA, faced full-scale efforts to discredit his work when he published it in 1995. [5] In an internal company memo leaked to a scientific publication, Motorola described its plan to “war-game” and undermine his research. [5]”

273. The reference is set out in the link below and is entitled “How Big Wireless War-Gamed the Science on Risks, While Making Customers Addicted To Their Phones”:

References - <http://www.guineapigsappeal.org/un/references.pdf>

274. The Motorola internal memo is mentioned in this news video which is referred to in the above reference:

<https://www.youtube.com/watch?v=un-vXlzlOo&feature=youtu.be>

- V. ICNIRP members are riddled with conflicts of interest. Dr Mann who is the real mover and shaker behind non-ionising radiation at PHE (he is an employee of PHE) is also a member of ICNIRP and the WHO. Conflicts of interest are rife through the industry. A 'best practice' standard is demanded of our government**

275. In the submission by PACE to the UN above, it is stated:

“Working groups focused on health impacts of EMR at the International Commission on Non-Ionising Radiation Protection (ICNIRP), the Scientific Committee on Emerging and Newly Identified Health Risks, the Institute of Electrical and Electronics Engineers, the International Electrotechnical Commission and the International Telecommunication Union, for example, are notoriously plagued by conflicts of interests and/or directly working with the industry. [15]”

276. The PACE submission also sets out the following:

WHO, ICNIRP, SCENIHR, ITU, conflicts of interests are the norm.

Martin L. Pall - Response to 2018 ICNIRP Draft Guidelines and Appendices on Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (100 kHz to 300 GHz) - Washington State University, October 8th 2018. <https://tinyurl.se/pall>

There appears to be a conflict of interest between the WHO and ICNIRP – Vallisoletana Association of people affected by mobile phone antennas (AVAATE), July 10th 2015.

[http://www.avaate.org/IMG/pdf/escrito\\_web\\_icnirp\\_ingles\\_final.pdf](http://www.avaate.org/IMG/pdf/escrito_web_icnirp_ingles_final.pdf)

SCENIHR members' history (bias and conflicts of interest)

[https://www.stralskyddsstiftelsen.se/wp-content/uploads/2015/09/Annex\\_1\\_SCENIHR\\_Experts\\_2015.pdf](https://www.stralskyddsstiftelsen.se/wp-content/uploads/2015/09/Annex_1_SCENIHR_Experts_2015.pdf)

Bias in the assessment of Electromagnetic Fields (EMF) - Over 40 NGOs lodge a complaint to the European Ombudsman over SCENIHR report – Swedish Radiation Protection Foundation, 2015.

<https://www.stralskyddsstiftelsen.se/2015/03/bias-in-the-assessment-of-electromagneticfields-emf/>

Conflicts of interest at IEEE's International Committee on Electromagnetic Safety - ICES (SCC-39) Annual Report: 2014 – 2015 Includes Technical Committee 34 (Product Safety Relative to the Safe Use of Electromagnetic

Energy) and Technical Committee 95 (Safety Levels with Respect to Human Exposure to Electric, Magnetic and Electromagnetic Fields) - Submitted by Ron Petersen, Secretary, SCC-3929, November 2015. See pages 19 to 23.

<https://betweenrockandhardplace.files.wordpress.com/2016/09/scc39-annual-report-2014-2015.pdf>

<https://www.mdpi.com/2312-7481/5/2/31>

Conflicts of Interest and Misleading Statements in Official Reports about the Health Consequences of Radiofrequency Radiation and Some New Measurements of Exposure Levels by **Susan Pockett**

School of Psychology, University of Auckland, Auckland 1142, New Zealand

*Magnetochemistry* **2019**, *5*(2),

31; <https://doi.org/10.3390/magnetochemistry5020031>

**Received: 29 March 2019 / Revised: 23 April 2019 / Accepted: 25 April 2019 / Published: 5 May 2019**

Abstract

Official reports to governments throughout the Western world attempt to allay public concern about the increasing inescapability of the microwaves (also known as radiofrequency radiation or RF) emitted by “smart” technologies, by repeating the dogma that the only proven biological effect of RF is acute tissue heating, and assuring us that the levels of radiation to which the public are exposed are significantly less than those needed to cause acute tissue heating. The present paper first shows the origin of this “thermal-only” dogma in the military paranoia of the 1950s. It then reveals how financial conflict of interest and intentionally misleading statements have been powerful factors in preserving that dogma in the face of now overwhelming evidence that it is false, using one 2018 report to ministers of the New Zealand government as an example. Lastly, some new pilot measurements of ambient RF power densities in Auckland city are reported and compared with levels reported in other cities, various international exposure limits, and levels shown scientifically to cause biological harm. It is concluded that politicians in the Western world should stop accepting soothing reports from individuals with blatant conflicts of interest and start taking the health and safety of their communities seriously. **[View Full-Text](#)**

277. The 2020 guidelines refer to three reports prepared by the Swedish Radiation Safety Authority (SSM) in 2015, 2016 and 2018). It should be noted that Mr Van Rongen and Switzerland’s **Martin Röösl**i are both members of ICNIRP and members of this panel.

### 13. Electrohypersensitivity

278. 4% of the UK (2.7m) has EM sensitivity (UK government-sponsored survey), about 1.2% (804,000) severe sensitivity, 0.65% restricted work, and up to 80% subconscious sensitivity (e.g. chronic inflammation).

279. Electrosensitivity was first described in the medical literature in 1932. It began with electrical, radio and radar workers. Since then it has spread into the general population, as wireless devices became common
280. Interestingly, a lot of the people who 'sense' EMR may have above average hearing, and, anecdotally, it has been said that EHS is more common amongst people who are musical.
281. There is a body of thought that being sensitive to RFR may be due to a sixth sense. ICNIRP recognises that magnetite (cells which detect magnetic fields through magneto-reception) has been found in humans but they dismissed it because they did not know what it did.
282. Kirschvink et al 1992 (PNAS) was the seminal observation of magnetite in the human brain. At least in magnetotactic bacteria it is "assembled" under gene control - quite a feat!
283. The other two papers are also of interest, showing that magnetite in the human body can detect ELF and RF EMFs!

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7139347/?fbclid=IwAR3tiJmbZJG9vAXAmHX-xyE2WPpxsThU9sZm12bFd-qIDWjOfRWfZLvwTU>

284. If it is a sixth sense, why do some people get it and other don't. Professor Henshaw postulates that it may be because EHS people are a distinct group like those with a genetic predisposition to cancer. The second is that we are all electrosensitive but EHS people are at the highly affected part of the distribution. He prefers the latter option, but the truth is we do not know.
285. The science of a sixth sense is not as developed as other science about EHS which now has a well developed body of science. Rather than a sixth sense, it is easier to consider EHS as an allergy to RFR.
286. An excellent summary of the science related to EHS is by Michael Bevington and can be found here:

SELECTED STUDIES ON ELECTROSENSITIVITY (ES) AND ELECTROMAGNETIC HYPER-SENSITIVITY (EHS), 4th edition (March 26th 2018) with over 2,000 studies and references

[https://www.scribd.com/document/462824039/Selected-ES-and-EHS-Studies-2018-by-ES-UK?secret\\_password=aZuRSUoqhAHUpb9JYZ3p](https://www.scribd.com/document/462824039/Selected-ES-and-EHS-Studies-2018-by-ES-UK?secret_password=aZuRSUoqhAHUpb9JYZ3p)

287. See also Electromagnetic hypersensitivity (EHS, microwave syndrome) – Review of Mechanisms, Yael Stein (MD)<sup>a,b,\*</sup>, Iris G. Udasin (MD):

[https://www.scribd.com/document/462823401/Stein-Udasin-2020-EHS-Review-of-Mechanisms?secret\\_password=hqLAK5OgpQMXySzQjrEI](https://www.scribd.com/document/462823401/Stein-Udasin-2020-EHS-Review-of-Mechanisms?secret_password=hqLAK5OgpQMXySzQjrEI)

288. The summary states:

“Electromagnetic hypersensitivity (EHS), known in the past as “Microwave syndrome”, is a clinical syndrome characterized by the presence of a wide spectrum of non-specific multiple organ symptoms, typically including central nervous system symptoms, that occur following the patient's acute or chronic exposure to electromagnetic fields in the environment or in occupational settings. Numerous studies have shown biological effects at the cellular level of electromagnetic fields (EMF) at magnetic (ELF) and radio-frequency (RF) frequencies in extremely low intensities. Many of the mechanisms described for Multiple Chemical Sensitivity (MCS) apply with modification to EHS. Repeated exposures result in sensitization and consequent enhancement of response. Many hypersensitive patients appear to have impaired detoxification systems that become overloaded by excessive oxidative stress. EMF can induce changes in calcium signaling cascades, significant activation of free radical processes and overproduction of reactive oxygen species (ROS) in living cells as well as altered neurological and cognitive functions and disruption of the blood-brain barrier. Magnetite crystals absorbed from combustion air pollution could have an important role in brain effects of EMF. Autonomic nervous system effects of EMF could also be expressed as symptoms in the cardiovascular system. Other common effects of EMF include effects on skin, microvasculature, immune and hematologic systems. It is concluded that the mechanisms underlying the symptoms of EHS are biologically plausible and that many organic physiologic responses occur following EMF exposure. Patients can have neurologic, neuro-hormonal and neuro-psychiatric symptoms following exposure to EMF as a consequence of neural damage and over-sensitized neural responses. More relevant diagnostic tests for EHS should be developed. Exposure limits should be lowered to safeguard against biologic effects of EMF. Spread of local and global wireless networks should be decreased, and safer wired networks should be used instead of wireless, to protect susceptible members of the public. Public places should be made accessible for electrohypersensitive individuals.”

289. There is also a very good recent study below of EHS and multiple chemical sensitivity (MCS) - [Dominique Belpomme](#)<sup>1,2,3,\*</sup> and [Philippe Irigaray](#)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7139347/?fbclid=IwAR3tiJmbZJG9vAXAmHX-xyE2WPpxsThU9sZm12bFd-qIDWjOfRWfZLvewTU>

290. EHS in artistic terms, is an allergy to RFR, exhibited by symptoms which could lead to death. In broad terms, the body is swamped by RFR, it has chemical, biological and physics related effects and symptoms of illness result. Some people react badly to peanuts, vaccines or chemotherapy. It depends on the individual and the drug. In this case, it is RFR.
291. There is a key difference between the initial detector which senses magnetic fields, and the subsequent biological response. For example, the ear senses music, but the brain decides whether it likes it or not.

292. The body starts shutting down when the intensity of the waves become too much giving signs to remove oneself from the offending pollutant.
293. EHS sufferers are in effect, wifi refugees.
294. PHE in their pre-action letter to us referred to the 2005 WHO paper which stated that EHS does not exist.

<https://www.who.int/peh-emf/publications/facts/fs296/en/>

295. PHE in doing so relied on a 15 year out of date position with no intention of updating their views. How is that reasonable?
296. Here is another paper in 2011 whose abstract is below:

[https://www.scribd.com/document/462823819/EHS-Evidence-for-a-Novel-Neurological-Condition?secret\\_password=vTXRv77GmQV49VuP0GJO](https://www.scribd.com/document/462823819/EHS-Evidence-for-a-Novel-Neurological-Condition?secret_password=vTXRv77GmQV49VuP0GJO)

### ABSTRACT

*Objective:* We sought direct evidence that acute exposure to environmental-strength electromagnetic fields (EMFs) could induce somatic reactions (EMF hypersensitivity). *Methods:* The subject, a female physician self-diagnosed with EMF hypersensitivity, was exposed to an average (over the head) 60-Hz electric field of 300 V/m (comparable with typical environmental-strength EMFs) during controlled provocation and behavioral studies. *Results:* In a double-blinded EMF provocation procedure specifically designed to minimize unintentional sensory cues, the subject developed temporal pain, headache, muscle twitching, and skipped heartbeats within 100 s after initiation of EMF exposure ( $p < .05$ ). The symptoms were caused primarily by field transitions (off-on, on-off) rather than the presence of the field, as assessed by comparing the frequency and severity of the effects of pulsed and continuous fields in relation to sham exposure. The subject had no conscious perception of the field as judged by her inability to report its presence more often than in the sham control. *Discussion:* The subject demonstrated statistically reliable somatic reactions in response to exposure to subliminal EMFs under conditions that reasonably excluded a causative role for psychological processes. *Conclusion:* EMF hypersensitivity can occur as a *bona fide* environmentally inducible neurological syndrome.

**KEYWORDS:** electromagnetic fields, evoked potentials, hypersensitivity, provocation study, sensory transduction, sleep study

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297. Professor Henshaw likened EHS to an allergy as in a peanut allergy or hayfever. The resource for EHS sufferers is [www.ES-UK.info](http://www.ES-UK.info) which contains guidance, reports, studies etc to be helpful to such sufferers.
298. Michael Bevington has written a my paper on numbers involved in ES and EHS, which also has some material on aspects of the condition:
- <https://www.ommegaonline.org/article-details/The-Prevalence-of-People-With-Restricted-Access-to-Work-in-Man-Made-Electromagnetic-Environments/2402>
299. Michael Bevington is a trustee of ES-UK, a charity dedicated to providing information to those with EHS. He articulated EHS as:

“Electromagnetic Hypersensitivity is categorised as a multisymptomatic ‘el-allergy’ in the Nordic classification of 2000 (R.68.8). Its symptoms are ‘certainly real’ and it can be a ‘disabling condition’ (W.H.O., 2005). It was first recorded in the mid 20th-century as an occupational illness, but it has now



spread into the general population through environmental exposure from increasing levels of electro-magnetic fields and radiation.”

<https://www.scribd.com/document/462608652/EHS-Bevington-2013>

300. His views are expressed further below:

If you read my article on the prevalence of people with ES/EHS unable to work, you'll see I try to grapple with these numbers.

eg the Essex study sponsored by the UK government and industry through the MTHR reckoned 4.0% of the UK population was ES/EHS ie 2,68 million of the current 67 million UK population, with 1.8% severely affected ie 1.2 million:

see Table 1 under Eltiti 2007.

For various reasons, as I explained in my article, I have reduced these percentages to 3.6% and 1.2% respectively.

You can also see under 'Discussion' my attempt to find how many people with any health condition are in contact with an appropriate charity:

Another approach for assessing the relationship between the two types of surveys, of the general population (Table 1) and of people with IEI-EMF/EHS (Table 2), where the referents are often accessed via self-help groups, is to estimate the number of people with an environmental health condition typically in contact with specialised national self-help groups. Allergy UK in 2017 had 11,383 contacts through its helpline, webchat and by email out of 21 million people with an allergy, at 0.054% (The British Allergy Foundation, 2017). Asthma UK in 2017 had 93,000 downloads of online Action Plans out of 5.4 million people with asthma, at 1.7% (Asthma UK, 2017). Applying these proportions of 0.054% - 1.7% to Electrosensitivity, UK's distribution of 710 printed newsletters in September 2018 (Electrosensitivity UK, 2018) would produce a national prevalence of 0.062% - 1.94%, meaning that the general population with restricted work, based on 67% of people with IEI-EMF/EHS, would be 0.042 - 1.3%, with a midpoint of 0.67%.

I've just watched an interview with Dr Magda Havas where she goes for a higher percentage of people with ES/EHS:

<https://www.youtube.com/watch?v=BY9wNMFzJc&feature=youtu.be>

Because there cannot be a single diagnostic test for ES/EHS, because it is a multi-systemic condition, it is probably impossible to give an accurate percentage, except through self-diagnosis of functional impairment, which is attendant with numerous problems as regards aetiology.

301. The SCENIHR report 2015 rejects EHS:

[https://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_041.pdf](https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf)

“Symptoms that are attributed by some people to various RF EMF exposure can sometimes cause serious impairments to a person’s quality of life. However, research conducted since the previous SCENIHR Opinion adds weight to the conclusion that RF EMF exposure is not causally linked to these symptoms. This applies to the general public, children and adolescents, and to people with idiopathic environmental intolerance attributed to electromagnetic fields (IEI-EMF). Recent meta-analyses of observational and provocation data support this conclusion. For symptoms triggered by short-term exposure to RF fields (measured in minutes to hours), the consistent results from multiple double-blind experiments give a strong overall weight of evidence that such effects are not caused by RF exposure. For symptoms associated with longer-term exposures (measured in days to months), the evidence from observational studies is broadly consistent and weighs against a causal effect. However, it has gaps, most notably in terms of the objective monitoring of exposure. Human studies on neurological diseases and symptoms show no clear effect, but the evidence is limited.”

302. At least four terms have been used for ES in addition to allergy, syndrome and condition:
- sensitivity,
  - intolerance,
  - sickness or disease (as in Radio Wave or Microwave Sickness from 1932), and
  - reception (as in magnetoreception - this was originally to be called magnetosensitivity, I think)
303. There is a range of sensitivity to all environmental exposures. Some people are more sensitive at detecting temperature change or light change or vibration sense for example, than others. This is a normal finding which should be expected with regards to EMFs has been demonstrated with geomagnetic / sferics prodromes with a substantial literature base. Also it has been demonstrated more specifically with provocation type studies analysing conscious sense thresholds.
304. RFR is known to be harmful not simply to humans, but also to plants, trees, pollinators and animals.
305. The harm of RFR to humans has been known since the 1970s as shown by the Naval Research document listing 2,000 studies from Russia and Eastern Europe showing harm to humans and animals and the NASA 1981 report – see **Schedule 24**.
306. Despite that, ICNIRP does recognise that some people may be sensitive to RFR and in their guidelines, they do state that governments should consider guidelines to address such persons. This suggestion is ignored by our government and Public Health England who both proclaim that there is no harm to humans below ICNIRP’s guidelines (more further below).
307. In the UK, people who suffer from electrohypersensitivity (“EHS”) are largely ignored. GPs are not taught about EHS symptoms in medical school so do not recognise the

symptoms when they are presented with them. Hospitals do not recognise the symptoms either.

308. Exposure to radiofrequency radiation is a recognised diagnosis in the UK albeit many GPs are unfamiliar with that diagnosis.
309. In the UK, many people presenting with symptoms of EHS are told that their symptoms have nothing to do with RFR, they are psychosomatic or have psychological anxieties. Many become refugees in their own homes trying to work out for themselves what is wrong with their health. Some eventually work out that their condition relates to wireless devices and have some degree of improvement when they eliminate RFR from their home environment and shield their homes from external RFR. But they are excluded from public spaces and cannot participate in public life. They are disabled and discriminated against in every way, for some such as Phillip Watts, suffering pain which is like 'torture' (as he puts it in his own words) because of the effects on him biologically of RFR from external influences.
310. Employers are ignorant of the symptoms despite the Electromagnetic Radiation regulations and health and safety at work obligations to their employees. I have been contacted by an engineer at Openreach whose job was to connect the cables carrying the radiofrequency signals for wireless equipment and who developed cuts and burns on his body which he showed to his employer who ignored his plight. He mentioned that he showed his employer his medical notes which included a reference to him suffering from radiation effects but these were dismissed by his employer and he was eventually forced out of his employment.
311. The World Health Organisation says that electromagnetic frequency exposures below the limits recommended in the ICNIRP guidelines do not appear to have any known consequence on health. Our government and Public Health England ("PHE") take that view as do many governments around the world. This is demonstrably wrong.
312. Hospitals in the UK use ICD10 to generate reimbursement codes, along with OPCS codes. ICD10 W90 refers to exposure to non-ionising radiation and then you have subcategories on where the exposure occurred. So, there is a category to use provided the clinician makes the link between NI radiation exposure and the symptoms. There is a growing group of GPs who are recognising the symptoms of EHS.

## 14. Let's now look at some other legal aspects

### *Human rights*

313. The Danish Institute for Public Health and the Council for Health-Safe Telecommunications has prepared a legal document related to the broad harm from 5G as well as other wireless technologies. They state:

"The legal opinion is based on the rules of law in the European Convention on Human Rights, the UN Convention on the Rights of the Child, the EU directive on the conservation of natural habitats and of wild fauna and flora, the EU

directive on the conservation of wild birds, on the precautionary principle as well as on the Bern- and Bonn- conventions on the protection of animals and plants.”

314. LEGAL OPINION – on whether it would be in contravention of human rights and environmental law to establish the 5G-system in Denmark - FINAL DANISH VERSION TRANSLATED INTO ENGLISH by Christian F. Jensen attorney-at-law (L)

<https://mdsafetech.files.wordpress.com/2019/07/5g-danish-legal-opinion-jensen-2019.pdf>

*Other laws and potential breaches of laws*

315. Time has not allowed me to review all potential laws which may be contravened by a roll out of 5 G, but a few below come to mind.
- (a) Negligence – your company has a duty of care to the public in the tort of negligence to ensure that your products do not cause harm. They do cause harm. You have been told of this harm in this document and the email accompanying it. It is harm which is reasonably foreseeable and for which your company will be liable in damages to members of the public who suffer harm, including myself and my family.
  - (b) Common Assault - since it is proven that RF causes ES symptoms, then to deploy RF without consent is assault.
316. While it is not a breach of the law as such, it should be noted here that insurance companies will not insure against harm caused by EMR.

## 15. Breach of various international conventions

317. PACE believes that “5G, together with previous generations of wireless technology, is an experiment on humanity that constitutes cruel, inhuman and degrading treatment under General Assembly resolution 39/46 of 10 December 1984. [24]”
318. PACE also states that “The deployment of 5G violates over 15 international agreements, treaties and recommendations, including article 7 of the International Covenant on Civil and Political Rights, which derives from the Nuremberg Code of 1947. [25] It also violates the Declaration of Helsinki of 1964 and its several revisions, as well as other international guidelines that have been translated into national laws in various countries. [26]”
319. Counsel is invited to consider whether we should include beaches of international agreements as part of our case.
320. Other international agreements identified by PACE which is being breached are below (References #25 & #26 – Human and environmental rights violations are the norm).

**World Medical Association Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects** – Originally adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and subsequently complemented until the 64th WMA General Assembly, Fortaleza, Brazil, October 2013.

<https://pdf-it.dev.acw.website/please-and-thank-you?url=https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/&pdfName=wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects>

**The Belmont Report** - National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, Department of Health, Education and Welfare (DHEW) - Bethesda, Maryland, September 30th 1978.

[https://videocast.nih.gov/pdf/ohrp\\_belmont\\_report.pdf](https://videocast.nih.gov/pdf/ohrp_belmont_report.pdf)

**Standards and operational guidance for ethics review of health-related research with human participants of the WHO (2011).**

[https://apps.who.int/iris/bitstream/handle/10665/44783/9789241502948\\_eng.pdf;jsessionid=84A8770C0A05F4493339B34D2EF0BA27?sequence=180](https://apps.who.int/iris/bitstream/handle/10665/44783/9789241502948_eng.pdf;jsessionid=84A8770C0A05F4493339B34D2EF0BA27?sequence=180)

**International Ethical Guidelines for Health-related Research Involving Humans -Prepared by the Council for International Organizations of Medical Sciences (CIOMS) in collaboration with the World Health Organization (WHO)** – Geneva, Switzerland, 2016.

<https://cioms.ch/wp-content/uploads/2017/01/WEB-CIOMS-EthicalGuidelines.pdf>

**Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine** – Council of Europe, European Treaty Series-No. 164, Oviedo, April 4th 1997.

<https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=090000168007cf98>

321. Additional international agreements, treaties, guidelines and recommendations being violated:

1. **The Universal Declaration of Human Rights (1948).** “Everyone has the right to life, liberty and security of person” (art. 3). “No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment” (art. 5).

[https://www.ohchr.org/EN/UDHR/Documents/UDHR\\_Translations/eng.pdf](https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf)

2. **European Convention for the Protection of Human Rights and Fundamental Freedoms** of November 4th 1950. Everyone's right to life shall be protected by law (art 2.1). No one shall be subjected to torture or to inhuman or degrading treatment or punishment (art. 3).

[https://www.cvce.eu/obj/convention\\_for\\_the\\_protection\\_of\\_human\\_rights\\_and\\_fundamental\\_freedom\\_rome\\_4\\_november\\_1950-en-32a749bd-2ce0-4d3a-b26a-973e4b176e4f.html](https://www.cvce.eu/obj/convention_for_the_protection_of_human_rights_and_fundamental_freedom_rome_4_november_1950-en-32a749bd-2ce0-4d3a-b26a-973e4b176e4f.html)

3. **European Social Charter** of October 18th 1961.

Part I The Contracting Parties accept as the aim of their policy, to be pursued by all appropriate means, both national and international in character, the attainment of conditions in which the following rights and principles may be effectively realized:

3. All workers have the right to safe and healthy working conditions.

7. Children and young persons have the right to a special protection against the physical and moral hazards.

8. Employed women, in case of maternity, and other employed women as appropriate, have the right to a special protection in their work.

11. Everyone has the right to benefit from any measures enabling him to enjoy the highest possible standard of health attainable.

Article 7 – The right of children and young persons to protection. With a view to ensuring the effective exercise of the right of children and young persons to protection, the Contracting Parties undertake:

10. to ensure special protection against physical and moral dangers to which children and young persons are exposed, and particularly against those resulting directly or indirectly from their work.

Article 11 – The right to protection of health

With a view to ensuring the effective exercise of the right to protection of health, the Contracting Parties undertake, either directly or in co operation with public or private organizations, to take appropriate measures designed inter alia:

1. to remove as far as possible the causes of ill health;

2. to provide advisory and educational facilities for the promotion of health and the encouragement of individual responsibility in matters of health;

3. to prevent as far as possible epidemic, endemic and other diseases.

[https://www.cvce.eu/content/publication/2003/3/7/e71c737f-4afb-41e3-9426-43bbf1cd0f00/publishable\\_en.pdf](https://www.cvce.eu/content/publication/2003/3/7/e71c737f-4afb-41e3-9426-43bbf1cd0f00/publishable_en.pdf) 82

4. The right to the highest attainable standard of physical and mental health as set out in article 12 of the **International Covenant on Economic, Social and Cultural Rights**.

Article 12 provides as follows:

1. The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.
2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for:
  - (a) The provision for the reduction of the still birth-rate and of infant mortality and for the healthy development of the child;
  - (b) The improvement of all aspects of environmental and industrial hygiene;
  - (c) The prevention, treatment and control of epidemic, endemic, occupational and other diseases;
  - (d) The creation of conditions which would assure to all medical service and medical attention in the event of sickness.  
<https://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>
5. **The United Nations Global Strategy for Women's, Children's and Adolescents' Health (2016-2030)** [...] has as objectives and targets to "transform", by expanding enabling environments; to "survive", by reducing maternal and newborn mortality; and to "thrive" by ensuring health and well-being and reducing pollution-related deaths and illnesses.  
  
<https://www.who.int/life-course/partners/global-strategy/globalstrategyreport2016-2030-lowres.pdf> 83
6. **Convention on the Rights of Persons with Disabilities (CRPD, 2006).**

Preamble:

- (a) Recalling the principles proclaimed in the Charter of the United Nations which recognize the inherent dignity and worth and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world,
- (b) Recognizing that the United Nations, in the Universal Declaration of Human Rights and in the International Covenants on Human Rights, has proclaimed and agreed that everyone is entitled to all the rights and freedoms set forth therein, without distinction of any kind,
- (c) Reaffirming the universality, indivisibility, interdependence and interrelatedness of all human rights and fundamental freedoms and the need for persons with disabilities to be guaranteed their full enjoyment without discrimination,
- (d) Recalling the International Covenant on Economic, Social and Cultural Rights, the International Covenant on Civil and Political Rights, the International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Elimination of All Forms of Discrimination against Women, the Convention against Torture and Other Cruel, Inhuman or Degrading

Treatment or Punishment, the Convention on the Rights of the Child, and the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families,

- (e) Recognizing that disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others, etc. <http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf> 84

**7. The Standard Rules on the Equalization of Opportunities for Persons with Disabilities (1993).**

Fundamental concepts in disability policy (Page 6).

- 17. The term "disability" summarizes a great number of different functional limitations occurring in any population in any country of the world. People may be disabled by physical, intellectual or sensory impairment, medical conditions or mental illness. Such impairments, conditions or illnesses maybe permanent or transitory in nature.
- 18. The term "handicap" means the loss or limitation of opportunities to take part in the life of the community on an equal level with others. It describes the encounter between the person with a disability and the environment. The purpose of this term is to emphasize the focus on the short comings in the environment and in many organized activities in society,for example, information, communication and education, which prevent persons with disabilities from participating on equal terms.
- 19. The use of the two terms "disability" and "handicap", as defined in paragraphs 17 and 18 above, should be seen in the light of modern disability history. During the 1970s there was a strong reaction among representatives of organizations of persons with disabilities and professionals in the field of disability against the terminology of the time. The terms "disability" and"handicap" were often used in an unclear and confusing way, which gave poor guidance for policy-making and for political action. The terminology reflected a medical and diagnostic approach, which ignored the imperfections and deficiencies of the surrounding society.
- 22. The term "prevention" means action aimed at preventing the occurrence of physical, intellectual, psychiatric or sensory impairments (primary prevention) or at preventing impairments from causing a permanent functional limitation or disability (secondary prevention). Prevention may include many different types of action, such as primary health care, prenatal and postnatal care, education in nutrition, immunization campaigns against communicable diseases, measures to control endemic diseases, safety regulations , programs for the prevention of accidents in different environments, including adaptation of workplaces to prevent occupational disabilities and diseases, and prevention of disability resulting from pollution of the environment or armed conflict. ... And just about every rule stated thereafter are violated. <http://www.un.org/disabilities/documents/gadocs/standardrules.pdf> 85



8. **The United Nations Convention on the Rights of the Child (1989)**. States shall “undertake to ensure the child such protection and care as is necessary for his or her well-being” (art. 3), States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services (art. 24.1).

States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures (art. 24.2):

- (c) To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution;

<https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>

9. **Resolution 72 – Measurement concerns related to human exposure to electromagnetic fields of the International Telecommunications Union (2012)**. It stated that “There is a need to inform the public of the potential effects of exposure to electromagnetic fields (EMFs)” and invited Member States “to adopt suitable measures in order to ensure compliance with relevant international recommendations to protect health against the adverse effect of EMF”.

[https://www.itu.int/dms\\_pub/itu-t/opb/res/T-RES-T.72-2012-PDF-E.pdf](https://www.itu.int/dms_pub/itu-t/opb/res/T-RES-T.72-2012-PDF-E.pdf) 86

10. **The Mid-term review of the European Environment and Health Action Plan 2004- 2010 (2008)**: “The European Parliament notes that the limits on exposure to electromagnetic fields which have been set for the general public are obsolete, ... obviously take no account of developments in information and communication technologies, of the recommendations issued by the European Environment Agency or of the stricter emission standards adopted, for example, by Belgium, Italy and Austria, and do not address the issue of vulnerable groups, such as pregnant women, newborn babies and children.”

<https://publications.europa.eu/en/publication-detail/-/publication/2d11e9cb-4797-44bea423-a2d9ad94b09a/language-en>

11. **Resolution 1815 (Council of Europe, 2011)**. The potential dangers of electromagnetic fields and their effect on the environment: “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.”

Also worth noting, Part 4: While electrical and electromagnetic fields in certain frequency bands have wholly beneficial effects which are applied in medicine, other non-ionising frequencies, whether from extremely low frequencies, power lines or certain high frequency waves used in the fields of radar, telecommunications and mobile telephony, appear to have more or less potentially harmful, non-thermal,

biological effects on plants, insects and animals as well as the human body, even when exposed to levels that are below the official threshold values.

<http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994>

12. **The Declaration of the United Nations Conference on the Human Environment (1972):** “The discharge of toxic substances... in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems” (principle 6).

<http://www.un-documents.net/unchedec.htm> 87

13. **The World Charter for Nature (1982):** “Activities which are likely to cause irreversible damage to nature shall be avoided... [W]here potential adverse effects are not fully understood, the activities should not proceed” (art. 11).

<http://www.un.org/documents/ga/res/37/a37r007.htm>

14. **The Rio Declaration on Environment and Development (1992):**

PRINCIPLE 1: Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

PRINCIPLE 2: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

PRINCIPLE 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

PRINCIPLE 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

[http://www.unesco.org/education/pdf/RIO\\_E.PDF](http://www.unesco.org/education/pdf/RIO_E.PDF)

15. **The United Nations World Summit on Sustainable Development (2002):** “There is an urgent need to... create more effective national and regional policy responses to environmental threats to human health” (para. 54(k)).

<https://sustainabledevelopment.un.org/milestones/wssd> 88

16. **Revised African Convention on the Conservation of Nature and Natural Resources (2017):** “The Parties shall... take all appropriate measures to prevent, mitigate and eliminate to the maximum extent possible, detrimental effects on the environment, in particular from radioactive, toxic, and other hazardous substances and wastes” (art. 13).

[https://au.int/sites/default/files/treaties/7782-treaty-0029\\_-\\_revised\\_african\\_convention\\_on\\_the\\_conservation\\_of\\_nature\\_and\\_natural\\_resources\\_e.pdf](https://au.int/sites/default/files/treaties/7782-treaty-0029_-_revised_african_convention_on_the_conservation_of_nature_and_natural_resources_e.pdf)

17. **The Outer Space Treaty (1967)** Which requires that the use of outer space be conducted “so as to avoid [its] harmful contamination and also adverse changes in the environment of the Earth”(art. IX).

[http://www.unoosa.org/pdf/gares/ARES\\_21\\_2222E.pdf](http://www.unoosa.org/pdf/gares/ARES_21_2222E.pdf)

18. **The United Nations Guidelines for The Long-Term Sustainability of Outer Space Activities (2018)**: Address, to the extent practicable, risks to people, property, public health and the environment associated with the launch, in-orbit operation and re-entry of space objects (Guideline A.2,2 c).

[http://www.unoosa.org/res/oosadoc/data/documents/2018/aac\\_1052018crp/aac\\_1052018crp\\_20\\_0\\_html/AC105\\_2018\\_CRP20E.pdf](http://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf)

## 16. Other issues that arise

322. Resolution 1815 Council of Europe states that children should not be exposed to Wifi. ICNIRP seems to have ignored that.

323. Deprivation of property by Electronic Communications Code is wrong and would need to be stopped as part of the remedies sought. Do see the correspondence at Schedule 17 on what is happening on this as mobile operators upgrade their antenna and drive down the price of leasing property by 95%.

324. A paper on the precautionary principle is below:

<https://www.scribd.com/document/462831211/European-Commission-Adopts-Communication-on-Precautionary-Principle-2000>

325. There are serious conflicts of interests at PHE and ICNIRP. There is a judgement in Turin (Torino) in Italy which gives excoriating criticism of the conflicts in ICNIRP. The judge refused to consider that the ICNIRP guidelines were safe. Do see the English summary version of the judgement below.

[https://www.scribd.com/document/462832150/Turin-Verdict-ICNIRP-Judgment-SUMMARY-of-the-Turin-Court-of-Appeal-9042019-en-Min?secret\\_password=XwnaTTvgctXveiLn90NW](https://www.scribd.com/document/462832150/Turin-Verdict-ICNIRP-Judgment-SUMMARY-of-the-Turin-Court-of-Appeal-9042019-en-Min?secret_password=XwnaTTvgctXveiLn90NW)

326. LED street lights which gives off RFR may have a cancer risk.

<https://www.telegraph.co.uk/science/2018/04/26/new-led-streetlights-may-double-cancer-risk-new-research-warns/>

<https://www.france24.com/en/20190515-led-light-can-damage-eyes-health-authority-warns>

<https://www.navigantresearch.com/news-and-views/when-5g-meets-smart-street-lighting>

<https://www.environmentalleader.com/2017/10/maine-city-incorporates-wifi-street-lights/>

327. There is a question over whether the Aarhus Convention on the Environment has been implemented properly into environmental legislation in the UK if there are no adequate remedies against the UK government for pollution from RFR. We have written to DEFRA about this but got nowhere.

<https://www.unece.org/env/pp/introduction.html>

328. There is support from some MPs but they are probably a handful. There was a Parliamentary debate last summer on some of these issues:

<https://hansard.parliament.uk/Commons/2019-06-25/debates/7D18471E-627A-41C4-B338-11F278CEA9B7/ElectromagneticFieldsHealthEffects>

329. Dr David Drew, at that time Shadow Secretary of State and MP for Stroud (Labour), was particularly vocal as to the risk of harm from EMR and called for the provisions of one or more 'white zones' in the UK to assist those who are EHS. Unfortunately, he lost the seat in December 2019.

330. His colleague Tonia Annunziata MP, who represents a Welsh constituency also spoke on similar lines but more briefly and has retained her seat.

331. Glastonbury Town Council has banned 5G. The Executive summary of their report is below:

[https://www.scribd.com/document/462838964/Glastonbury-Executive-Summary-FinalReportandRecommendationsfromGlastonburys5GAdvisoryCommitteeExecutiveSummary?secret\\_password=fBHvbYjpyLhNAuQ5SU0M](https://www.scribd.com/document/462838964/Glastonbury-Executive-Summary-FinalReportandRecommendationsfromGlastonburys5GAdvisoryCommitteeExecutiveSummary?secret_password=fBHvbYjpyLhNAuQ5SU0M)

We can send the full report if you wish.

332. Australia Mobile Telecoms Association made some submissions at an Australian Parliamentary enquiry which may be of interest:

[https://www.scribd.com/document/462842365/Sub335-Australia-Mobile-Telecoms-Association?secret\\_password=w82rHO0VsDnAkKluBqPH](https://www.scribd.com/document/462842365/Sub335-Australia-Mobile-Telecoms-Association?secret_password=w82rHO0VsDnAkKluBqPH)

## 17. Industry tropes

333. It may be helpful to look at potential defences which the government may propose.

334. Defence 1 – Power density (and so heat generation) is more important than frequency. This is what Arthur Firstenberg had to say about this:

“It is not the power level that does the harm. It is the degree of coherence, type and depth of modulation, wavelength, number of frequencies, number of signals, bandwidth, shape of the waves, pulse height, pulse width, rise and fall time, and other properties of the radiation.

The unimportance of power levels for effects other than heat has been shown many times. In Salford's studies<sup>1</sup> the lowest power levels caused the most leakage in the blood-brain barrier. Blackman,<sup>2</sup> Bawin,<sup>3</sup> Dutta,<sup>4</sup> Schwartz,<sup>5</sup> and Kunjilwar,<sup>6</sup> all in different laboratories, found that calcium efflux from neural and cardiac cells occurred at specific frequencies and exposure levels and did not increase with power. In Dutta's study a 3,000-fold decrease in power caused a 4-fold *increase* in calcium efflux. Sadchikova<sup>7,8</sup> and her Soviet colleagues found that workers exposed to the lowest power levels suffered more often from radio wave sickness. Belyaev<sup>9</sup> found that genetic effects occurred at specific frequencies and the magnitude of the effect did not change with power level over 16 orders of magnitude.

My conclusion from the NTP studies is that RF radiation causes a lot of both malignant and benign tumors at every exposure level. The assumption that there is a dose response, i.e. higher power levels cause more cancer, is proven wrong.

The assumption that wireless technology can be made safe by reducing the power is proven wrong.

335. Prof Henshaw considers that frequencies at low power has sufficient quantum energy to cause cell damage.
336. Defence 2 – the evidence must be looked at together. Seema Kennedy, Parliamentary Under Secretary of DHSC speaking at HoC debate stated:

<https://hansard.parliament.uk/Commons/2019-06-25/debates/7D18471E-627A-41C4-B338-11F278CEA9B7/ElectromagneticFieldsHealthEffects>

“A challenge in understanding the evidence is that some studies report effects, while others do not. Sophisticated analyses are needed to draw studies together, considering their strengths and weaknesses and working out what they mean collectively, which is the role of expert groups. Simply counting or listing studies that have found effects is not an adequate way of assessing where the overall evidence lies.”

337. This is a popular one with the phrase below being used in multiple responses:
- “conclusions must be reached on the basis of the “entire scientific literature and not merely a selection of studies based on methodological adequacy and chance””
338. Dr Shirin Joseph in her submission to the UK Parliament on a 5G enquiry compared that statement to a study which shows that there is a black swan. Many replicating studies may not show a black swan exists but that does not mean that there is no black swan.
339. Prof Henshaw's response to this is below:

**Re: ‘conclusions must be reached on the basis of the “entire scientific literature and not merely a selection of studies based on methodological adequacy and chance” ‘**

The issue is simple, both the WHO, SCENIHR and especially the AGNIR have used this to employ subjective and prejudicial criticism of findings that are in fact statistically significant.

The Sarah Starkey 2016 paper (*Inaccurate official assessment of radiofrequency safety by the Advisory Group on Non-ionising Radiation*) deals nicely with the AGNIR. Now let me tell you a story about IARC 2002. Please refer to my ppt slides attached and O'Carroll & Henshaw 2018 (*Aggregating Disparate Epidemiological Evidence: Comparing Two Seminal EMF Reviews*).

Two seminal reviews (IARC, 2002; CDHS, 2002) of possible health effects from power frequency EMFs reached partly different conclusions from similar epidemiological evidence.

IARC 2002 concluded that only childhood leukaemia was associated with power frequency EMF exposure and “no other cancer”. CDHS 2002 (known also as the California Report) concluded that in addition to childhood leukaemia, certain other cancers were associated with power frequency EMF exposure, especially adult leukaemia and adult brain tumours – see slides.

On publication, I was phoned by a journalist who asked: “How is it that two Official reports published within two months of each other come to very different conclusions?”. I replied: “Quite simple, one of them is wrong”, to which the journalist asked: “which one?”. I then replied: “IARC 2002”. The journalist was aghast, how could I possibly criticise this IARC report?

The reality is even more interesting when you read IARC 2002. There you will see tables listing the findings of 33 & 35 independent adult leukemia & brain tumour findings respectively. It is very clear that most studies yield statistically significant positive findings of an EMF association.

So, the findings are there to see in the body of the IARC 2002 report and they are essentially the same as the findings in CDHS 2002 – after all, the two reports did essentially examine the same studies. So what was going on with the IARC 2002 Report?

A whistle blower [I have the name], present at all of the IARC 2002 Committee deliberations, has explained: I paraphrase:

Study 1 (e.g. of adult leukaemia): Chairman: “Well yes, I know they found a positive result, but you can't really believe it can you, given the way they did the study?”

Study 2 (i.e. the next of adult leukaemia): Chairman: “Well yes, I know they found a positive result, but the authors are not really experts in this field, so we can discount this one”.

And so on, for both adult leukaemia and adult brain tumours.....

This was the Chairman's prejudice plain and simple. I call it Scientific Fraud.

Please see detailed analysis in O'Carroll & Henshaw 2008 attached and our abstract conclusion: "*IARC shows no evidence of considering the aggregation of results other than subjectively. It considered individual studies but this led to a tendency to fragment and dismiss evidence that is intrinsically highly significant. We make recommendations for future reviews.*"

Actually, it is worse than that. Of you look at the slides, you will see (#6 & 7) that the p-value for significance matches that for the Nobel Prize winning discovery of the Higgs Boson (99.99999% certainty)!

So, let's look again at:

"conclusions [1] must be reached on the basis of the "entire scientific literature [2] and not merely a selection of studies based on methodological adequacy [3] and chance [4]".

[1]. Agreed, but they need to be the right conclusions

[2]. But they never look at anything like the entire literature – see Starkey and my comments about the related science - earlier email.

[3]. This has been use subjectively and prejudicially to obfuscate and prevaricate – (words just for you Jessica!)

[4]. The probability of a chance finding is given by the p-value. Now this too has been used to obfuscate and prevaricate: "This result could just be chance"!

In addition to the above there are the errors and omissions in the SCENIHR 2015 Report highlighted by Martin Pall.

340. Defence 3 - Overall, those expert groups have not found any clear evidence of adverse health effects occurring if the International Commission on Non-Ionizing Radiation Protection exposure guidelines are followed. The ICNIRP exposure restrictions have been incorporated into a 1999 European Council recommendation on limiting public exposures to electromagnetic fields. The United Kingdom and Public Health England support that recommendation.

## 18. Conclusion

341. I have so much more that I can tell you. But for the moment I will leave my submissions at this point.
342. If you accept the submissions in this document, I would suggest to you that we are all being used as guinea pigs in a giant experiment. Nuremberg Code which I have set out in **Schedule 15** prohibits experiments on humans without their consent.

<http://broughttolife.sciencemuseum.org.uk/broughttolife/techniques/nurembergcode>

343. The Nuremberg Code was introduced in August 1947, after the *Nuremberg trials*. In these trials, Nazi doctors were convicted of the crimes committed during *human*

experiments on concentration camp prisoners. It attempted to give clear rules about what was legal and what was not when conducting human experiments.

344. The code consists of ten points. The first and most important is that anyone participating in an experiment must give informed consent. This means nobody can be forced to participate in human experiments. All participants must understand the potential risks.
345. The code also gives rules for running the experiments. For example, participants can leave the experiment if they want. Doctors must stop the experiment if they realise it can harm the patient. Also, no experiment can be made where the risks outweigh the benefits that can be had from it.
346. There is a lot of opposition to 5G around the world including a lot in the US, Australia, Switzerland and other countries. Brussels has suspended the roll out of 5G.
347. The vast majority of the population have no idea of what is coming at them and when it is too late, it will be too late to do anything about it because the hardware will be embedded into the landscape and into our lives.
348. We and our children will be sick, with the burden being borne **not** by the mobile phone service companies who propagate the radiation, but by the taxpayers through the NHS.
349. At what price should humanity's advancement be permitted? Who is to be our protector in this unequal fight?
350. Other references which may be of assistance are set out in **Schedule 16**.
351. The mobile services industry is an industry, supported by the government, which survives, and profits, from selling wireless air time and products which connect to a wireless infrastructure put together by many companies which causes diseases that lead to a staggering number of illnesses per year, some leading to death, an immeasurable amount of human suffering and economic loss, and a profound burden on our national health care system.
352. The government, PHE and their antecedents have known many of these facts for at least 80 years or more.
353. Despite that knowledge, they have consistently, repeatedly, and with enormous skill and sophistication, denied these facts to the public and to the public health community.
354. Our government is blinded by the touted benefits of public surveillance, questionable economic progress and tax revenues.
355. Turning off these two 5G transmitters as requested will go a small way towards preventing the suffering of your residents.



20.8.20