



5G: knowns, unknowns, known-unknowns, and myths

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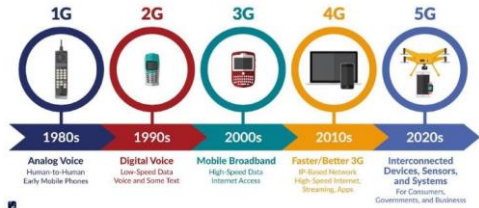
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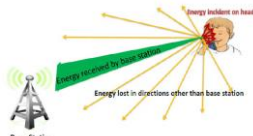
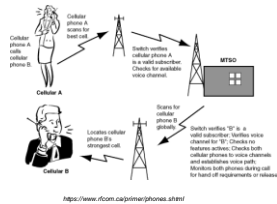
Evolution of mobile communication technology



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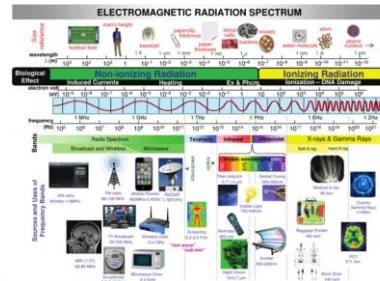
Background: mobile phone technology



Joni M. Mikulovic, Sept 24, 2017

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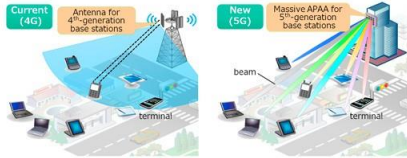


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Fifth-generation technology standard for broadband cellular networks (5G)

- New technologies and protocols for 4G frequencies
- Massive MIMO (Multiple Input Multiple Output)



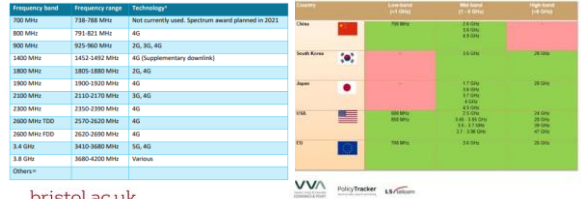
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<https://www.telecomtv.com/content/5g/softbank-deploying-100-massive-mimo-base-stations-in-pre-5g-move-13944/>

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Additional development in 5G

- Use of higher frequencies (millimeter Waves [30 GHz+])



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Additional development in 5G

Small Cells

- miniature radio access point or base station with low RF power output, footprint and range
- Enhance cellular network coverage and capacity in areas with high demand
- Enable line-of-sight communication for higher frequencies (industry, logistics, transport, defense)

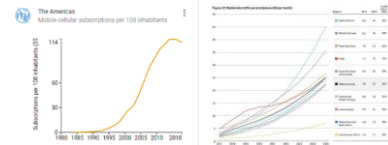


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Why do we want 5G?

- Obviously, some companies and people will make a lot of money
- But also, there are clear improvements in performance and new possibilities
 - Ability to handle more data
 - Higher data transfer
 - Low latency

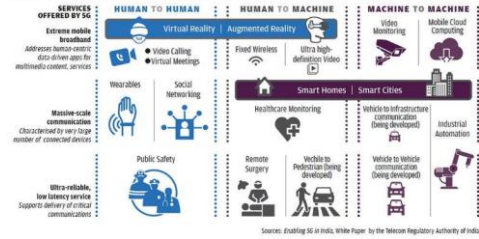


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Brace for 5th Generation

Telecom networks are set for a massive overhaul, which will make interaction with machines more immediate and real



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<https://www.downtoearth.org.in/news/science-technology/5g-a-dangerous-generation-63802>

Concern: Human Exposure

- The claim is made that RF exposure of everyone will increase, and we will permanently live in a "cloud of high levels of electrosmog"

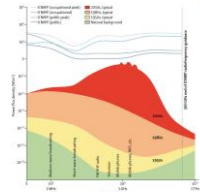
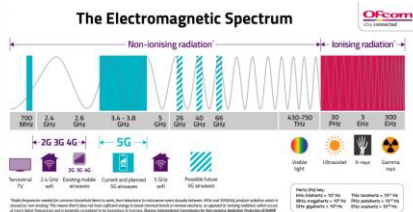


Figure: Total maximum body exposure to radiofrequency electromagnetic radiation from mobile and cordless phones (in comparison with International Commission on Non-Ionizing Radiation Protection safety guidelines)

Bardaro and Carpenter, The Lancet Planetary Health 2018; 2(12): E512-E514

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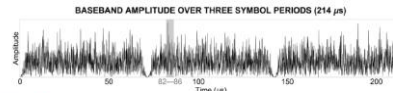
Human exposure (5G)



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Human exposure (5G)

- 5G NR offers a wider range of choices in parameters (channel bandwidth, channel frequency, symbol rate/subcarrier spacing) than 4G LTE.
- However, the waveforms of 4G LTE and 5G NR are typically similar
- Modulation differences unlikely to have any biological relevance
- But the greater range of accessible frequencies suggests further health research, particularly in mm-wave band.



Foster et al. Waveforms of 4G and 5G Radiofrequency Signals: Are Differences Relevant to Biology or Health? Health Physics, November 20, 2024

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For reference: ICNIRP 2020

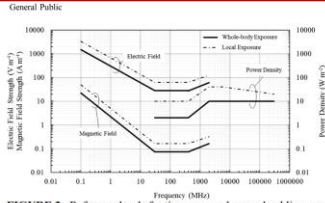
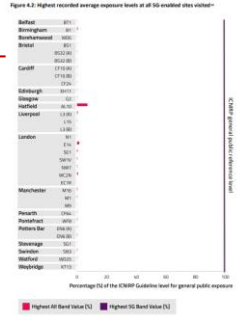


FIGURE 2. Reference levels for time averaged general public exposures of 26 min, to electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values; see Tables 5 and 6 for full specifications).

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5G Exposure: United Kingdom

- https://www.ofcom.org.uk/_data/assets/pdf_file/0021/214644/emf-test-summary-010321.pdf



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5G exposure: France

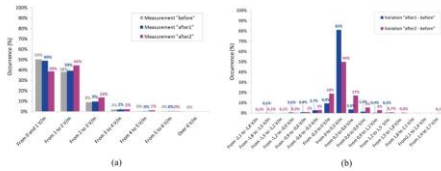


Figure 3. (a) Distribution of overall exposure levels before and after 5G roll out on 3500 MHz band; (b) distribution of differences between overall exposure levels before and after 5G roll out on 3500 MHz band.

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<https://comptes-rendus.academie-sciences.fr/physique/item/10.5802/crphys.183.pdf>

5G Measurement data conducted in different countries (non-exhaustive)

Switzerland: contribution from 5G to the total environmental RF-EMF exposure (3.5GHz band) <10% maximum exposure levels from 5G base stations 150-200 times below ICNIRP limits (Varti et al. *Applied Sciences* 2021;11:3592)

South Korea: 5G (3.4-3.8 GHz) contributes about 15% to total telecommunications emissions (Selmaoui et al. *Electromagn* 2021;42(3):467-474)

Italy: 5G exposure is overall very limited for most of measurement locations (typically lower than 15% (<https://ieeexplore.ieee.org/document/3541374>))

Romania: >90% of the measurements <0.2% ICNIRP limits and 99% below 2%. (3MHz - 18 GHz band) (<https://ieeexplore.ieee.org/abstract/document/9527794>)

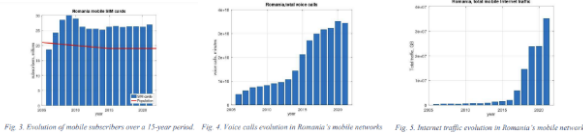
Germany: First results with provoked data traffic revealed exposures below 0.25% ICNIRP reference levels. (<https://ieeexplore.ieee.org/abstract/document/9411088>)

Overview (up to 2021) for those interested: Ramirez-Vazquez et al. *Measurement studies of personal exposure to radiofrequency electromagnetic fields: A systematic review. Environ Res* 2023;218:114979



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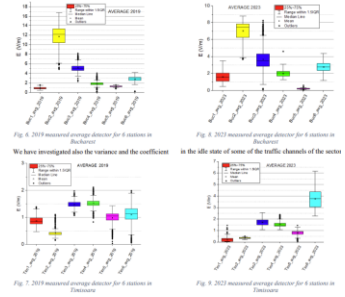
Romania



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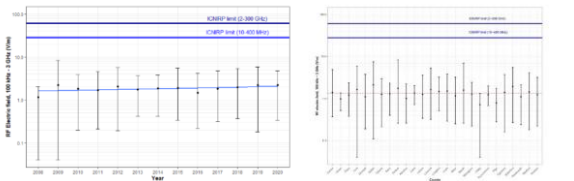
<https://ieeexplore.ieee.org/abstract/document/10615901>

Romania



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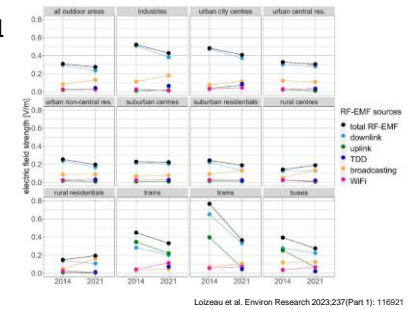
Trend data (Ireland) and international comparison



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<https://www.epa.ie/environment-and-you/radiation/identif-emf-monitoring-programme/#d.en.84545>

Switzerland



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Loizeau et al. Environ Research 2023;237(Part 1): 116921

Exercise 1a

- You live in the house by the red arrow and only access to 2G.
- A new 4G/5G mobile antenna is to be built.
- There are 1-6 locations available, which condition either the blue, green or orange antenna model.
- Which configuration do you choose

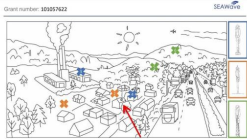


Figure 3: Picture used in the siting task.

From Horizon Europe SEAIWave project (Grant number: 101057622)
 Deliverable: WP10 – D10.1 – D35 / Qualitative exposure perception studies
https://seaiwave-project.eu/seaiwave-project.eu/fp/user/D35_WP10.pdf

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Grant number: 101057622

SEAIWave

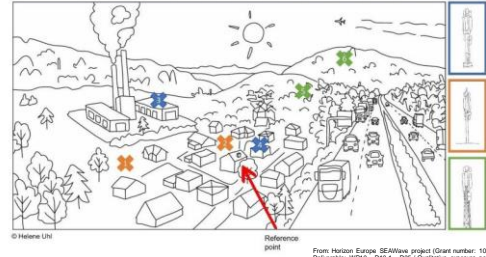


Figure 5: Picture used in the siting task.

From Horizon Europe SEAIWave project (Grant number: 101057622)
 Deliverable: WP10 – D10.1 – D35 / Qualitative exposure perception studies
https://seaiwave-project.eu/seaiwave-project.eu/fp/user/D35_WP10.pdf

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Exercise 1b

- Now I would like to give you some more information about cell phones and base stations.
 - The farther away a base station is, the worse your reception
 - Cell phones and base stations interact with each other.
 - Cell phones, like base stations, are transmitters and receivers at the same time.
 - Since the cell phone is generally much closer to you than the base station, users are generally exposed to higher radiation levels from the personal device than from the base station.
 - The farther away a base station is, the stronger the cell phone has to transmit to reach the station.

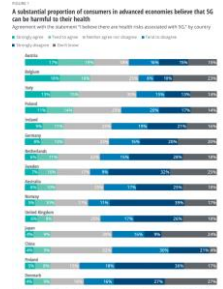


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https://seaiwave-project.eu/seaiwave-project.eu/fp/user/D35_WP10.pdf

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5G and health effects



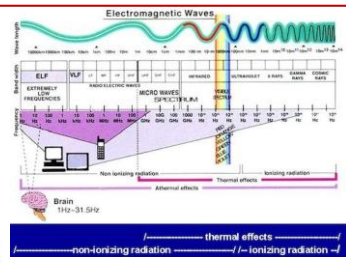
<https://www2.deloitte.com/us/en/insights/industry/technology/health-care-and-telecom-providers/2022/5g-radiation-dangers-health-concerns.html>

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Concern: Health effects

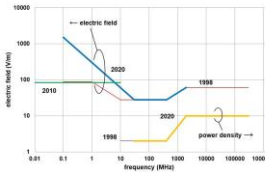


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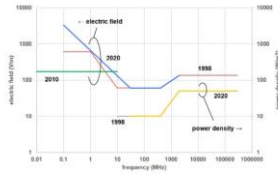
Marin Blank, *ELF and health risk: a scientific perspective*. Commonwealth CMA, San Francisco, 2010.

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Whole body average reference levels for the general public for the ICNIRP (1998), ICNIRP (2010) and ICNIRP (2020) guidelines



Whole body average reference levels for workers for the ICNIRP (1998), ICNIRP (2010) and ICNIRP (2020) guidelines, for the 100 kHz to 300 GHz frequency range.

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<https://www.icnirp.org/evvidifferences.html>



Adverse Health Effects of Wireless Radiation on Humans

Metabolic Disturbance	Reactive Oxygen Species Generation	Genotoxicity and Carcinogenicity	Immunotoxicity and Inflammation	Apoptosis and Necrosis
Discomfort Symptoms	Sensory Disorders	Sleep Disorders	Congenital Abnormalities	Precancerous Conditions
CANCER	NEURODEGENERATION	INFERTILITY	NEUROBEHAVIORAL	CARDIOVASCULAR

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<https://www.safemr.com/2017/08/5g-wireless-technology-is-5g-harmful-to.html>

WHO assessment of health effects of exposure to radiofrequency electromagnetic fields: systematic reviews

- <https://www.sciencedirect.com/special-issue/109J1SL7CXT>
 - Commissioned systematic reviews
 - Protocols published prior to start of each review
 - Results now (almost) all published
 - Best overviews that take into account study quality
- Note: a few complaint letters published by activist groups. I will not discuss these here, but you can be found following the link above*

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Cancer

Kerlipis et al. The effect of exposure to radiofrequency fields on cancer risk in the general and working population: A systematic review of human observational studies – Part I. Most researched outcomes. *Environment International* 2024; 108963



- WHO-IARC classified RFR as 'possibly carcinogenic to humans' (Group 2B) in 2011
- New WHO Review:
 - 63 aetiological articles, published between 1994 and 2022, with participants from 22 countries
 - RF-EMF exposure from mobile phones (ever/regular vs no/non-regular):
 - Glioma: RR = 1.01 (95% CI = 0.89–1.13)
 - Meningioma: RR = 0.92 (0.85–1.02)
 - acoustic neuromas: RR = 1.03 (0.85–1.24)
 - pituitary tumours: RR = 0.91 (0.81–1.05)
 - salivary gland tumours: RR = 0.91 (0.79–1.05)
 - paediatric brain tumours: RR = 1.06 (0.74–1.51)
- No observable with increasing time since start use of mobile phones, cumulative call time, or cumulative number of calls.
- Moderate certainty evidence that it likely does not increase the risk of glioma, meningioma, acoustic neuroma, pituitary tumours, and salivary gland tumours in adults, or of paediatric brain tumours.
- Little evidence of associations with cordless phones or fixed-site transmitters:

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Cancer

Choi et al. Int J Environ Res Public Health 2020; 17(22): 10.3390/ijerph17218079



Factor	All			Hardell et al.'s Studies			INTERPHONE-Related Studies			Other Groups			
	No.	OR (95% CI)	I ²	No.	OR (95% CI)	I ²	No.	OR (95% CI)	I ²	No.	OR (95% CI)	I ²	
Time since first use of latency (years)	<5	2.07 (0.56 to 7.99)	50.0	10	1.05 (0.52 to 1.70)	0.0	8	0.78 (0.64 to 0.96)	36.2	8	1.10 (0.92 to 1.32)	14.6	
	5-9	2.3	1.01 (0.56 to 1.81)	51.0	10	1.20 (0.88 to 1.63)	44.4	8	0.80 (0.70 to 0.92)	13.7	5	1.19 (0.99 to 1.40)	0.0
	≥10	1.8	1.29 (0.94 to 1.85)	87.8	5	1.62 (1.03 to 2.57)*	39.9	8	0.99 (0.79 to 1.24)	25.3	5	1.57 (0.72 to 3.42)	93.3
Cumulative or lifetime use (years)	<5	1.1	0.81 (0.74 to 0.90)	0.0	n.a.	n.a.	9	0.77 (0.69 to 0.86)	0.0	8	0.99 (0.88 to 1.11)	0.0	
	5-9	14	0.89 (0.78 to 1.02)	23.9	n.a.	n.a.	9	0.83 (0.73 to 0.96)	0.0	5	1.04 (0.78 to 1.40)	54.4	
	≥10	9	1.04 (0.68 to 1.59)	36.9	n.a.	n.a.	5	0.92 (0.54 to 1.59)	0.0	5	1.15 (0.61 to 2.18)	77.1	
Cumulative call time (hours)	<500	26	0.99 (0.90 to 1.09)	0.0	9	1.08 (0.94 to 1.23)	9.2	9	0.78 (0.66 to 0.93)	0.0	8	1.01 (0.89 to 1.24)	0.0
	500-1000	7	1.14 (0.61 to 2.13)	69.9	1	1.00 (0.49 to 2.06)	2.2	1.07 (0.77 to 1.49)	0.0	4	1.21 (0.79 to 1.86)	69.9	
	≥1000	8	1.40 (1.12 to 2.92)*	74.5	2	3.05 (1.69 to 7.01)*	10	1.25 (0.96 to 1.62)	23.7	2	1.71 (0.66 to 4.48)	81.8	
Cumulative number of calls	1000-7000	3	1.07 (0.87 to 1.32)	0.0	n.a.	n.a.	2	0.70 (0.38 to 1.29)	0.0	5	1.13 (0.94 to 1.36)	0.0	
	7000-10000	5	1.00 (0.69 to 1.45)	0.0	n.a.	n.a.	n.a.	n.a.	3	1.00 (0.69 to 1.45)	0.0		
	≥10000	10	1.14 (0.78 to 1.62)	96.6	n.a.	n.a.	5	0.85 (0.56 to 1.28)	55.1	3	1.48 (0.58 to 3.76)	96.0	

No., number of studies; n.a., not available. * indicates that cellular phone use statistically significantly increases the risk of tumor.

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Cancer

Kavalioti et al. The effect of exposure to radiofrequency fields on cancer risk in the general and working population: A systematic review of human observational studies – Part II: Less researched outcomes. Environment International 2020; 109274



- Less researched cancer outcomes
- 26 articles, which were published between 1988 and 2019, with participants from 10 countries.
- Not associated with an increased risk of:
 - Leukaemia RR = 0.99 (0.91–1.07)
 - non-Hodgkin's lymphoma RR = 0.99 (0.92–1.06)
 - thyroid cancer RR = 1.05 (0.88–1.26)
- Long-term (10 + years) mobile phone use also not associated with:
 - Leukaemia RR = 1.03 (0.85–1.24)
 - non-Hodgkin lymphoma RR = 0.99 (0.86–1.15)
 - thyroid cancer (too few studies for pooling)
- Occupational RF-EMF exposure not associated with:
 - lymphohematopoietic system tumours RR = 1.03 (0.87–1.28)
 - oral cavity/pharynx cancer RR = 0.68 (0.42–1.11)
- Low certainty of evidence that It does not increase the risk of leukaemia, non-Hodgkin's lymphoma or thyroid cancer.

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Cancer in laboratory animals



- Mevissen et al.
- Protocol published
- Final meta-analysis not published yet.

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Cognitive performance

Pajuhel et al. The effect of exposure to radiofrequency electromagnetic fields on cognitive performance in human experimental studies: Systematic review and meta-analysis. Environment International 2020; 109599



- Human experimental studies
- Included 76 studies with 3,846 participants from 19 countries (1989-2021)
- None of the meta-analyses observed a statistically significant effect of RF-EMF exposure compared to sham on cognitive performance.
 - Focused attention, vigilance, selective attention, divided attention, simple reaction time, choice reaction time, working memory, visual and auditory perception, verbal expression, motor skills, reasoning, mathematical procedures
- Overall, high to low certainty of evidence that short-term RF-EMF exposure does not reduce cognitive performance in human experimental studies.

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Cognitive performance



Burke et al. The effects of radiofrequency exposure on cognition: A systematic review and meta-analysis of human observational studies. *Environment International* 2024; 198779

- Observational studies
- 5 studies from 4 cohorts with 2808 adults and 1831 children across 3 countries (2006-2017).
- Only few studies provided very low to low certainty evidence of little to no association between RF-EMF exposure and learning and memory, executive function and complex attention.
- None of the studies among children reported on global cognitive function or other domains of cognition.
- Only one study reported a lack of an effect for all domains in elderly persons (very low certainty evidence).

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Female reproduction



Johnson et al. The effects of radiofrequency exposure on adverse female reproductive outcomes: A systematic review of human observational studies with dose-response meta-analysis. *Environment International* 2024; 198818

- 18 studies in this review; 8 general public studies and 10 occupational studies
- Evidence very uncertain about the effects of RF-EMF from mobile phone exposure on:
 - > preterm birth risk RR = 1.14 (0.97-1.34)
 - > LBW RR = 1.14 (0.99-1.30)
 - > SGA RR = 1.13 (1.02-1.24)
- Evidence is very uncertain about the effects of RF-EMF amongst female physiotherapists using shortwave diathermy on
 - > miscarriage OR = 1.02 (0.94-1.1)
 - > congenital malformations OR = 1.4 (0.85-2.32)
 - > miscarriage RR = 1.06 (0.96-1.16)
 - > pre-term births RR = 1.19 (0.32-4.37)
 - > low birth weight RR 2.90 (0.69-12.23)
- Overall, the body of evidence is very uncertain about the effect of RF-EMF exposure on female reproductive outcomes.

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Pregnancy and birth outcomes



Carroll et al. Effects of Radiofrequency Electromagnetic Field (RF-EMF) exposure on pregnancy and birth outcomes: A systematic review of experimental studies on non-human mammals. *Environment International* 2022; 198178

- Non-human animals
- 88 papers
- *in utero* RF-EMF exposure does not have a detrimental effect on fecundity
- Probably no effect on offspring brain weight
- Probably no decrease in female offspring fertility
- Likely affects offspring health at birth (based on mammal litter size and fetal weight).
- Possible delayed effects of *in utero* exposure
- Conclusion:
 - > RF-EMF may have detrimental impact on neurobehavioural functions, varying in magnitude for different endpoints
 - > but very uncertain

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Male fertility



Kerry et al. The effects of radiofrequency exposure on male fertility: A systematic review of human observational studies with dose-response meta-analysis. *Environment International* 2024; 198877

- Human studies
- 9 studies in this review (7 general public and 2 occupational studies)
- Very uncertain surrounding the effects of RF-EMF on:
 - > sperm concentration MD (mean difference) per hour of daily phone use 1.6 10⁶/mL (-1.7 : 4.9)
 - > sperm morphology MD (-0.21 : 0.51) percentage points of deviation of normal forms per hour
 - > sperm progressive motility MD -0.46 (-1.04, 0.13) pp/hr
 - > total sperm count MD -0.44 10⁶/ejaculate (-2.59 : 1.7) per hour
- No or little effect of carrying a mobile phone in the front pocket on sperm concentration, total count, morphology, progressive motility or on time to pregnancy.
- Little or no effect of computer or other electric device use on sperm concentration, total motility or total count.

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Male fertility



Cordelli et al. Effects of radiofrequency electromagnetic field (RF-EMF) exposure on male fertility: A systematic review of experimental studies on non-human mammals and human sperm *in vitro*. Environment International 2024; 192629

- Non-human animals and human sperm *in vitro*
- 117 papers on animal studies and 10 papers on human sperm exposed *in vitro*
- Only few studies rated as "low concern"
- Associations between RF-EMF exposure and decrease of pregnancy rate and sperm count, to which moderate and low certainty were attributed, are not negligible
- No consistent relationship between the exposure levels and the observed effects.
- Most studies evaluated RF-EMF exposure levels higher than human population exposure and the limits set in international guidelines.

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Self-reported symptoms



Bosch-Capblanch et al. The effects of radiofrequency electromagnetic fields exposure on human self-reported symptoms: A systematic review of human experimental studies. Environment International 2024; 198812

- 41 studies mostly from Europe, with a total of 2,874 participants.
- Head exposure
 - Headaches *standard mean difference (SMD) 0.08 (-0.07 : 0.22)*
 - Sleeping disturbances *SMD -0.01 (-0.22 : 0.20)*
 - Composite symptoms *SMD 0.13 (-0.51 : 0.76)*
- Whole-body exposure similar findings and effect sizes
- For IEL-EMF (electrohypersensitive) individuals
 - *Could not perceive the EMF exposure status better than chance*
 - *Could not determine EMF conditions better than the general population.*
- Conclusion:
 - *Acute RF-EMF below regulatory limits does not cause symptoms*
 - *Corresponding claims in the everyday life are related to perceived and not to real EMF exposure status.*

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Tinnitus, migraine and non-specific symptoms



Rizzi et al. The effects of radiofrequency electromagnetic fields exposure on tinnitus, migraine and non-specific symptoms in the general and working population. A systematic review and meta-analysis on human observational studies. Environment International 2024; 192338

- General and working populations
- 13 papers from 8 cohort and 1 case-control studies (486,558 participants) exclusively from Europe
- Tinnitus (n=3), migraine (n=1), [headaches](#) (n=6), sleep disturbances (n=5), and composite symptom scores (n=5).
- Only one study addressed occupational exposure.
- Conclusions
 - *RF-EMF exposure below guideline values does not cause symptoms, but the evidence is very uncertain*
 - *There is no indication that RF-EMF below guideline values causes symptoms*
 - *However, inherent limitations of the research results in substantial uncertainty*

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Oxidative stress



Meyer et al. The effects of radiofrequency electromagnetic field exposure on biomarkers of oxidative stress *in vivo* and *in vitro*: A systematic review of experimental studies. Environment International 2024; 192946

- 45 *in vivo* and 11 *in vitro* studies were included in the systematic review
- 12,353 publications excluded because they did not meet the criteria defined in the published protocol
- 6 human *in vitro* samples and 50 animal samples, including rodents and rabbits
- Evidence on the relation between the exposure to RF-EMF and biomarkers of oxidative stress was of very low certainty (high RoB level and high heterogeneity).
- Conclusions:
 - *There may be no or an inconsistent effect of RF-EMF on biomarkers of oxidative stress in the brain, liver, blood, plasma and serum, and in the female reproductive system in animal experiments*
 - *There may be an increase in biomarkers of oxidative stress in testes, serum and thymus of rodents*
 - *Evidence is of very low certainty.*

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Take-home / Recap



3-4-5G (<6GHz)

- o **Cancer risk:** Increasingly unlikely RFR is an important factor
- o **Reproduction and Fertility:** associations plausibly result from study weaknesses or other exposures
- o **Cognition and behaviour:** Weak evidence no associations. Indications of effects possibly attributed to excessive use instead
- o **Oxidative stress:** Inconsistent effect of RF-EMF on biomarkers of oxidative stress

5G

- o Mm-waves (28GHz+) unlikely to exacerbate effects in humans
- o Remain **gaps in research** in human populations for 3 GHz+
- o **Attention:** cancers of skin and eye, and possibilities of local heating (in particular testicular tissue)
- o Mm-Waves mainly of interest for industrial, logistics, transport and defense applications

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5G Conspiracy Theories



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5G conspiracy theories

- Have been circulating since the 1990s, and have long historical roots.
 - Doctors first talked of "radiophobia" as early as 1903.
 - Following on from fears about power lines and microwaves in the 1970s
 - opponents of 2G technology in the 1990s suggested that radiation from mobile phones could cause cancer, and that this information was being covered up
- 5G responsible for the unexplained deaths of birds and trees
 - <https://www.reuters.com/article/factcheck-birds-5g-hotUSL1N2OS1FK>, <https://fuffact.org/online/dead-birds-india-were-not-killed-5g/>, <https://fuffact.org/online/birds-5g-netherlands/>
- 5G coronavirus conspiracy theories particularly challenging because they bring together people from very different parts of the political spectrum:
 - The far-right as part of a technological assault by big government on the freedom of individuals.
 - Anti-vaxxer community, who are often allied with those distrustful of Big Pharma.

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<https://theconversation.com/four-experts-investigate-how-the-5g-coronavirus-conspiracy-theory-began-139137>

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5G-COVID 19 conspiracy theories

- Theory by now well-known to most people
- In a UK poll, 21% agreed, to varying extents, that coronavirus is caused by 5G and is transmitted through radiowaves.
- The coronavirus 5G conspiracy theory comes in several different strains:
 - pandemic began in Wuhan as this was where the 5G technology was trialled (incorrect, already rolled out in other locations)
 - Coronavirus crisis was deliberately created to keep people at home while 5G engineers install the technology everywhere.
 - 5G radiation weakens people's immune systems, making them more vulnerable to infection by COVID-19
 - ...or, 5G directly transmits the virus.

This is a reworking of long running conspiracy fears about mind control experiments, subliminal messaging and supposed secret US military weapons projects



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5G conspiracy theories

Concerns have been expressed concerning that 5G might be in fact be a **hi-tech weapon** whose use represents an 'existential threat to humanity'.

Non Lethal Microwave Weapons	
Frequency	Illness Caused
4.5 Hz	Paranoia
6.6 Hz	Depression/suicide
8 Hz	Animals fall asleep
11 Hz	Manic behaviour/anger
25 Hz	Blindness: if aimed at the head, heart attack if aimed at the chest

Other frequencies may induce hysteria, trauma, lust, murder and cancer.
Boris Trossat, physicist and former British naval officer and electronic warfare scientist



5G can be used as a military weapon... Remember the people falling death to the streets in China? Because they died of covid19? Acute death doesn't happen with a virus. We can't trust any technocrat with this kind of technology, ever. Period. #STOP5G

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5G conspiracy theories ... the New World Order

One increasingly popular idea is that the pandemic is part of a plan by global elites like Bill Gates or George Soros – in league with Big Pharma – to institute mandatory worldwide vaccinations that would include tracking chips, which would then be activated by 5G radiowaves.



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<https://theconversation.com/four-experts-investigate-how-the-5g-coronavirus-conspiracy-theory-began-139137>

The total deaths, expected to be created by #5G, is 28x the total of WWII. Source: Hidden Dangers 5G, by Jerry Flynn
What #USA's #Biden, #Musk and #Bezos are creating, goes far beyond the war crimes Putin creates in Ukraine.

Jerry Flynn, a retired Canadian Armed Forces specialist in wireless, radio, electronic warfare, and signals intelligence. Author of the book: Hidden Dangers 5G: How governments, factories and electric power utilities suppress the facts about the known hazards of electromagnetic field (EMF) radiation.

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5G CELL TOWER, DR. MARTIN PALL, DR. MARTIN PALL, BY: RF SAKKATHOL MF, SMART PHONE, SMART METER, SMART METERS WIFI

MARTIN PALL PREDICTS END OF HUMANITY IN 5-7 YEARS

© 2016 DR. P. TIT. #ECCENTRICS

Pro. Dr. Martin Pall - Hyper Electro Sensitivity

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Final Conspiracy Theory

" Never look at the screen of your mobile phone for too long, because your will get square eyes.....seriously!"

Sophie de Vocht, aged 5 (May 2, 2022)

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Links of interest

- *5G Health Fears: An Epidemiological Approach*, Cambridge Wireless Journal Nov 2019, <https://fileseed.com/dlton/fmt5dc3490bc798f19>
- Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) Report https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_r_041.pdf
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 102. Non-ionizing Radiation, Part 2. Radiofrequency Electromagnetic Fields. <https://pubs.nci.nih.gov/publications/monographs/download/343846467486a2a20119d134813e487018d6.pdf>
- ICNIRP Guidelines (100 KHz to 300 GHz); <https://www.icnirp.org/publications/publications/ICNIRP%202020.pdf>

Art: <https://debalemindcontrol.webador.cz.uk/truth-tellers-aliens-4f-see-here/confirming-truth-the-isis-david-dees-amazing-art>

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