ICNIRP Guidelines: Unscientific and Not Protective

A. Minority-viewpoint ICNIRP:[1]

- a single-viewpoint cartel adopting a minority, unscientific and unprotective viewpoint;
- based on Schwan's invalidated 1953 claim of only short-term and heating effects;
- a private self-appointed group formed in 1992 by the International Radiation Protection Association (IRPA) with aims including 'to facilitate the exploitation of radiation and nuclear energy for the benefit of mankind';
- endorsed since 2007 by the World Health Organization; but the WHO is legally subservient on all radiation matters to the International Atomic Energy Authority;
- effectively a 'front' promoting the wireless and radiation industries;
- its SAR heating limit derives from 1970s animal studies before pulsed mobile phones;
- a minority viewpoint, rejecting the 80% of studies showing non-thermal harm.

B. Mainstream and majority scientific viewpoint:

- accepts proven long-term non-thermal effects of radio-frequency radiation (RFR) and electromagnetic fields (EMFs), along with short-term and heating effects;
- accepts proven long-term non-thermal symptoms including cancers, cardiovascular harm, electrosensitivity, infertility, and neurological harm;
- is based on all the mainstream scientific evidence from the international leading experts since the 1930s and before;
- endorsed by the European Parliament, 522 to 16 votes, and WHO's IARC, 29 to 2;
- supported by the majority of expert scientists (International EMF Scientist, EMF Call);
- adopts guidelines which are scientific and protective of humans and wildlife;
- a majority viewpoint backed by some 80% of studies showing non-thermal harm.

Table 1

Chronology of Radio Frequency Guidelines

Metric	***Back-ground (safe) levels***	***Majority mainstream guidelines***			***Minority 'industry' guidelines***		
		Long-term and short-term			*Short-term only*		
		Non-thermal and heating			*Heating only*		
		Peak			*Averaged over time*		
	Level	*Date*		*Level*	*Date*		*Level*
Power density (for heating) µW/m²	0.000001	1935	USSR	100,000	1953	US: Schwan	100,000,000
		1961	Poland	100,000	1974	US: ANSI	10,000,000
		1972	Poland	1,000	1998	ICNIRP	9,200,000
		2010	Seletun	170	2018	ICNIRP draft	40,000,000
		2012	Bioinitiative	6 adults 3 children			
Other metrics							
Electric field* V/m	0.00002	2018	IGNIR	0.006-0.2	1998	ICNIRP	61.0
(for heating) SAR W/kg	0.00002	2010	Seletun	0.0003	1981	IRPA, WHO	0.08 (6 min. av.)

*Electric field is for both non-thermal and heating effects. Power density (mainly) and SAR are for heating only.

Table 2

Acceptance of adverse EMF biological effects

EMF adverse effects		***Majority mainstream***		***Minority 'industry'***	
		e.g. Bioinitiative, EUROPAEM, IGNIR, Seletun, many others		*e.g. ICNIRP*	
Basis for acceptance:		*Scientific evidence*		*Arbitrary hypothesis*	
DURATION					
1959	Cumulative	*1959*	√		*x*
1932	Delayed symptoms	*1988*	√		*x*
1756	Long-term	*1935*	√		*x*
1890	Short-term	*1935*	√	*1953*	√
FREQUENCY, NOT POWER ABSORBED					
1961	Effects can depend purely on frequency not power absorption	*2016*	√		*x*
GEOMAGNETIC					
1860s	Geomagnetic, sferic, solar effects	*1960*	√		*x*
LINEAR AND NON-LINEAR					
1889	Linear dose-response	*1935*	√	*1953*	√
1959	Non-linear, windows	*1977*	√		*x*
MECHANISMS					
1994	*DNA changes*	*2001*	√		*x*
2008	*Genetic variants - ELF*	*2008*	√		*x*
2014	*Genetic variants - RF*	*2014*	√		*x*
1975	*Magnetite*	*1975*	√		*x*
1981	*Melatonin reduced*	*1981*	√		*x*
1994	*Oxidative stress*	*2007*	√		*x*
1974	*Voltage-Gated Calcium Channels*	*2013*	√		*x*
PEAK AND PULSED, NOT AVERAGED					
1959	Peak denotes harm, not average	*1972*	√		*x*
1959	Pulsed more harmful than continuous or averaged	*1959*	√		*x*
ORIENTATION and POLARISATION					
1974	Orientation relative to RF waves	*1974*	√		*x*
2015	Polarisation of man-made RF	*2015*	√		*x*
SYMPTOMS					
1979	Cancer (2B) – ELF	*2001*	√		*x*
1953	Cancer (2B) – RF	*2011*	√		*x*
2016	Cancer evidence sufficient for 1-RF	*2018*	√		*x*
1960	Cardiovascular adverse effects	*1966*	√		*x*
1932	Electrosensitivity – RF	*1966*	√		*x*
1952	Electrosensitivity – ELF	*1966*	√		*x*
1975	Infertility	*2012*	√		*x*
1948	Neurological adverse effects	*2016*	√		*x*
1889	Tinnitus	*1961*	√		*x*
TEMPERATURE					
1890	Heating	*1935*	√	*1953*	√
1896	Non-thermal adverse effects	*1935*	√		*x*
VOLTAGE, NOT POWER ABSORBED					
1961	Voltage determines adverse effects, not heat/power absorbed	*2016*	√		*x*

On unscientific short-term heating-only guidelines, back in 1972 (ICNIRP still clings to similar guidelines): *'Skepticism is not a sufficient basis for setting standards.'* [2]

C. ICNIRP's 2018 draft guidelines: (i) higher levels to accommodate 5G

To allow 5G, the 1998 ICNIRP short-term heating guidelines will have to be relaxed.

- 5G requires beams of greater power and intensity compared with 2G, 3G and 4G.
- 5G will exceed even the ICNIRP's current short-term heating-only guidelines, already shown to be unscientific and not protective of human health and wildlife.

Radar, ICNIRP and 5G

The established biological effects of radar exposure are relevant to 5G.

- Radar depends on **pulsed beams** like 5G.
- Radar is often at **millimetre wave-lengths**, like those proposed for 5G.
- In addition to cancers and infertility, radar workers in the 1940-50s suffered eye damage such as **cataracts**. These are essentially **non-thermal**, although coincidentally accompanied temperature rises as a stress response (see Table 4).
- The ICNIRP's draft guidelines are still based on Schwan's 1953 **heating mistake**.
- Some **people are sensitive** to airport radar and aircraft ground-seeking radar.
- **Insects** can be seen on film reacting to radar beams from radar 14 miles away.[3]
- The **cost** of buying additional land for radar safety near airports was apparently one reason why the US adopted Schwan's flawed heating hypothesis in 1953.

ICNIRP 2018 draft guidelines' 5G raised limits

The draft ICNIRP 40 W/m^2 [40,000,000 μW/m^2] is **four times higher** than any short-term heating guideline since 1974, and close to Scwhan's 100,000,000 μW/m^2 of 1953.
In comparison:

(a) Long-term non-thermal guidelines include:

- Bioinitiative: 3 μW/m^2 (children), 6 μW/m^2 (adults)
- IGNIR (>4hr): <1 μW/m^2 (children and pregnant women), 10 μW/m^2 (night time), 100 μW/m^2 (daytime)

(b) The safe natural background level is about 0.000001 μW/m^2.

Other concerns not addressed by ICNIRP's draft for 5G:

- preventing people **looking into a 5G beam** from a mast, IoT or mobile handset;
- preventing **numerous 5G beams focussing** on one spot or person;
- **protecting young children** from 5G beams; they have thinner skin that adults;
- **preventing 5G handsets transmitting** when part of the body is too close.

ICNIRP not protective of wildlife, especially the loss of 70-80% of insects

ICNIRP guidelines are not environmentally protective, e.g. animals, insects and plants.

Contravenes the Nuremberg code: experiment without consent or knowledge

The chair of the ICNIRP, Van Rongen, stated about 5G in 2019:[4]

> *"It* [5G] *is not set up as a public health experiment but of course you can consider it as such. It will be necessary to gain more information about the exposure and any health problems that might come from an effect of that exposure."*

Changes suggest inaccuracies and unreliability

If changes to the old 1998 ICNIRP guidelines are necessary, it suggests that the 1998 guidelines were not fully reliable, even for short-term heating-only effects.

C. ICNIRP's 2018 draft guidelines: (ii) unscientific and not protective

To allow 5G within even its short-term heating-only guidelines, ICNIRP's draft guidelines will need to provide for greater power and intensity of exposures in three ways.

Table 3. *The old 1998 ICNIRP values are in red and the 2018 draft ones in black.*[5]

Basic restrictions and differences with 1998 values

Parameter	Freq. range	ΔT	Spatial	Aver. time	Health effect level	RF	Occup.	RF	General public
Core ΔT	100 kHz-300 GHz	1°C	WBA	30 min 6 min	4 W/kg	10	0.4 W/kg	50	0.08 W/kg
Local ΔT (Head & Torso)	100 kHz-6 GHz	2°C	10 g	6 min	20 W/kg	2	10 W/kg	10	2 W/kg
Local ΔT (Limbs)	100 kHz-6 GHz	5°C	10 g	6 min	40 W/kg	2	20 W/kg	10	4 W/kg
Local ΔT (Head, Torso, Limbs)	>6-300 GHz 30-300 GHz 10-300 GHz	5°C	4 cm^2 1 cm^2 20 cm^2	6 min 6 min $68/f^{1.05}$	200 W/m^2 400 W/m^2	2	100 W/m^2 200 W/m^2 50 W/m^2	10	20 W/m^2 40 W/m^2 10 W/m^2
Pain (contact current)	100 kHz-110 MHz *(**guidance** level* *reference level)*	--	--	10 sec	20/10 mA (adult/child)	1	20 mA 40 mA	1	20/10 mA (ad./child) 20 mA

(a) **Heating:** the three main changes all reflect ICNIRP's **invalid heating-only claim**.

- Protective guidelines do not use just ICNIRP's heating-only metrics (μW/m^2, W/kg).[6]
- They should use appropriate non-thermal metrics, such as V/m, cellular responses,[7] DNA breaks,[8] [Ca2+]i, or NO,[9] and recognise the many variables.[10]

(b) **Averaging:** ICNIRP's are based on averaging, hiding actual peak values (see § D).

(a) **Absorption averaging:**

Increasing the power density (microWatts per square metre) values:

from *(i)* ***incident****, the amount of energy hitting the body,*
- *10,000,000 μW/m^2, for 10 – 300 GHz*

to (ii) **supposed absorbed power**, the energy supposedly absorbed by the body, excluding any energy supposedly reflected
- 20,000,000 μW/m^2, for <6 – 300 GHz
- 40,000,000 μW/m^2, for 30 – 300 GHz

(b) **Incident area averaging:**

Reducing the area over which power density is measured and averaged:

from *(i)* ***small***
- *20 cm^2, for 10 – 300 GHz*

to (ii) **very small**
- 4 cm^2, for <6 – 300 GHz
- 1 cm^2, for 30 – 300 GHz

(c) **Duration averaging:**

Extending the time over which core body temperature is measured:

from *(i)* ***very short***
- *6 minutes, for 100 kHz – 300 GHz*

to (ii) **short**
- 30 minutes, for 100 kHz – 300 GHz

D. ICNIRP's unscientific averaging

(a) Absorption averaging is unscientific for non-thermal and non-linear effects

- **Absorption** relates to ICNIRP's invalidated short-term heating hypothesis.
- Absorption **averaging** is unscientific for non-thermal and non-linear effects.
- It has been known since 1936 that **non-thermal RF effects are basic**. Temperature rise reflects an organism's reaction to a non-thermal stimulus.[11]
- Non-thermal effects have also been known since 1958 to be **cumulative** and related to **peak power**, effects masked by averages and absorption.[12]

(b) Area averaging is unscientific for non-thermal and non-linear effects

- The attempt to reduce the body to a very small area in comparison with the size of the whole body and its constituent organs is unscientific.
- The failure to distinguish between, say, small children and adults, is unscientific. For instance, for higher frequencies, the invalid assumption that adverse effects relate only to surface heating still fails to allow for young children having thinner skin, thinner skull bones and smaller heads than adults, and children having their internal organs and nervous systems relatively closer to the body's surface.
- Since non-thermal effects are transmitted internally by the body's own signalling systems and tissues, it is unscientific to assume that this is irrelevant when whole-body illumination can be as harmful as irradiation of a small section, especially since adverse effects of exogenous RF energy are cumulative.

(c) Duration averaging is unscientific for non-thermal and non-linear effects

- Schwan devised his limit for his heating hypothesis of 1953 based on **continuous** exposures, not pulsed.[13] Continuous exposures do not need duration averaging.
- However, all wireless communications are now **pulsed**. Averaging the duration of pulsed exposures is unscientific for non-thermal effects which are non-linear.
- Duration averaging **hides** adverse health outcomes, as for cataracts (Table 4).

Table 4

Effects of averaging:
experiment on cataracts in rabbits' eyes at 2.45 GHz

	Group A - Continuous	***Group B - Pulsed***
Power density: Continuous *Power density: Average*	800,000 µW/m^2 continuous	800,000 µW/m^2 pulsed
Continuous radiation *Pulsed radiation*	800,000 µW/m^2 continuous	4,000,000 µW/m^2 pulsed at 20%
Temperature rise	4º C	4º C
Duration	60 minutes	60 minutes
Outcome (cataract)	No cataracts	All developed cataracts

- Both groups A and B experienced the **same heating power**, at 800,000 µW/m^2.
- **All** group B developed cataracts after a **single** exposure with pulsed radiation.[14]
- Group A took **ten days** for cataracts at the same, but continuous, heating power.

- *Human short-term heating threshold (1953):* 100,000,000 µW/m^2
- *ICNIRP draft short-term heating threshold 4cm (2018):* 20,000,000 µW/m^2
- *Human short-term heating threshold (1974):* 10,000,000 µW/m^2
- *Cataracts in rabbits' eyes (1958):* 800,000 µW/m^2
- *Human long-term safety threshold (2012):* 6 µW/m^2
- *Safe background level:* 0.00001 µW/m^2

Further information on ICNIRPs' unscientific and unprotective guidelines:

- "Factual proof of the dangers of wireless radiation, including 5G, against the 'unscientific' claims of lobbyists following ICNIRP, AGNIR and COMARE" (2019)
- "Majority-viewpoint and minority-viewpoint guidelines, and non-thermal effects" (2020)
- Selected Studies on ES and EHS (2018)
- "Serious flaws in the WHO's and ICNIRP's claims on 5G and RF wireless radiation" (2019)

References for ICNIRP's minority, unscientific and conflicted position:

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- Claire Edwards: "BBC Fake News on 5G Decoded: Health Impacts Denied Despite Overwhelming Scientific Evidence" (Global Research, August 25 2019)
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- Simon Hodges: "How ICNIRP, AGNIR, PHE and a 30 year old political decision created and then covered up a global public health scandal" (Community Operating System, September 12 2019)
- Antoinette Janssen: "ICNIRP guidelines are fraudulent" (Mutterland, July 30 2019)
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- Margi Murphy: "Mobile safety standards relaxed ahead of 5G networks" (*Daily Telegraph*, March 9 2019)

Ecological harm from RFR:

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- Halgamuge MN: "Review: Weak RF exposure from mobile phone radiation on plants" (*Elect Biol Med.,*2017).
- Thielens A et al.: "Radio-Frequency EMF Exposure of Western Honey Bees" (*Sci Rep.,* 2020).

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[1] Private group Internat. Commission on Non-Ionizing Radiation Protection, effectively a wireless industry 'front'.
[2] Bowers R et al.: "Technology Assessment and Microwave Diodes" (*Scientific American.* (1972).
[3] Dr John Ott, Dancing Aphids - Radar Excitation (from *Exploring the Spectrum*, 1960, video, 1 min.)
[4] Margi Murphy: "Mobile safety standards relaxed ahead of 5G networks" (Daily Telegraph, March 9 2019).
[5] D. Leszczynski: "New ICNIRP Guidelines, nothing really new, just the same stonewalling" (BRHP,Jan.23 2020).
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