The 5G microwave technology 3.5 GHz – what do we know today about health risks? First 5G case studies and the 5G Appeal

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Environment & Cancer
Research Foundation

Universitetssjukhuset Örebro
ÖREBRO LÄNS LANDSTING

ÖREBRO UNIVERSITY

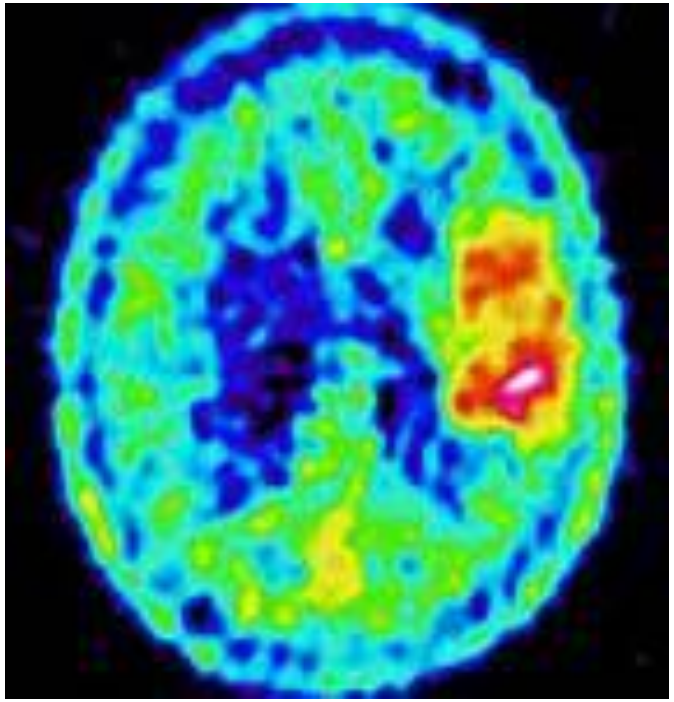
Stockholm, Sweden October 2023

Radiofrequency (RF) radiation

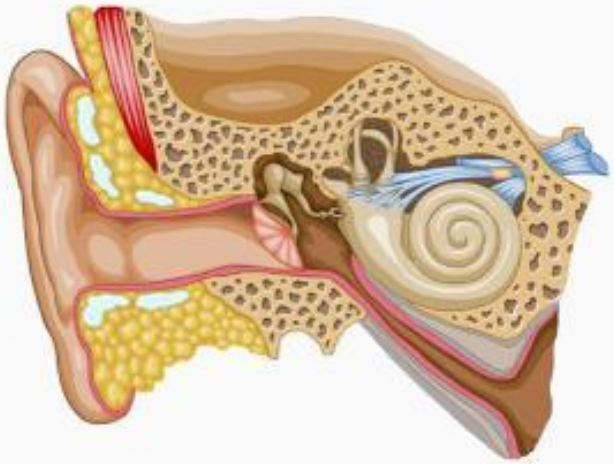
In May 2011 IARC evaluated RF radiation in the frequency range 30 kHz–300 GHz to be a possible human carcinogen, Group 2B

New evaluation is not scheduled yet. Based on new studies RF radiation should be classified as human carcinogen, Group 1

GLIOMA	Ipsilateral		
	Cases/controls Numbers of exposed	Odds Ratio	95 % Confidence Interval
Interphone 2010			
Cumulative use ≥1,640 h	100/62	1.96	1.22 – 3.16
Coureau et al 2014			
Cumulative use ≥896 h	9/7	2.11	0.73 – 6.08
Hardell, Carlberg 2015			
Cumulative use ≥1,640 h	138/133	3.11	2.18 – 4.44
Meta-analysis			
Cumulative use ≥1,640 h*	247/202	2.54	1.83 – 3.52



Acoustic neuroma	Ipsilateral		
	Cases/controls Numbers of exposed	OddsRatio	95 % Confidence Interval
Interphone 2010			
Cumulative use ≥1,640 h	47/46	2.33	1.23 – 4.40
Hardell et al 2013			
Cumulative use ≥1,640 h	19/133	3.18	1.65 – 6.12
Meta-analysis			
Cumulative use ≥1,640 h	66/179	2.71	1.72 – 4.28



Pathology findings – Brain

Hyperplastic Brain Lesions in Male Rats

	Control		GSM Modulation			CDMA Modulation		
	0 W/kg		1.5 W/kg	3.0 W/kg	6.0 W/kg	1.5 W/kg	3.0 W/kg	6.0 W/kg
Number examined	90		90	90	90	90	90	90
Malignant glioma‡	0*		3 (3.3%)	3 (3.3%)	2 (2.2%)	0	0	3 (3.3%)
Glial cell hyperplasia	0		2 (2.2%)	3 (3.3%)	1 (1.1%)	2 (2.2%)	0	2 (2.2%)

‡ Historical control incidence in NTP studies: 11/550 (2.0%), range 0-8%

* Significant SAR-dependent trend for CDMA exposures by poly-6 ($p < 0.05$)

Pathology findings – Schwannomas

Schwannomas Observed in Male Rats

	Control	GSM Modulation			CDMA Modulation		
	0 W/kg	1.5 W/kg	3.0 W/kg	6.0 W/kg	1.5 W/kg	3.0 W/kg	6.0 W/kg
Number examined	90	90	90	90	90	90	90
Heart‡	0*	2 (2.2%)	1 (1.1%)	5 (5.5%)	2 (2.2%)	3 (3.3%)	6** (6.6%)
Other sites	3 (3.3%)	1 (1.1%)	4 (4.4%)	2 (2.2%)	2 (2.2%)	1 (1.1%)	2 (2.2%)
All sites (total)	3 (3.3%)	3 (3.3%)	5 (5.5%)	7 (7.7%)	4 (4.4%)	4 (4.4%)	7 (7.7%)

‡ Historical control incidence in NTP studies: 9/699 (1.3%), range 0-6%

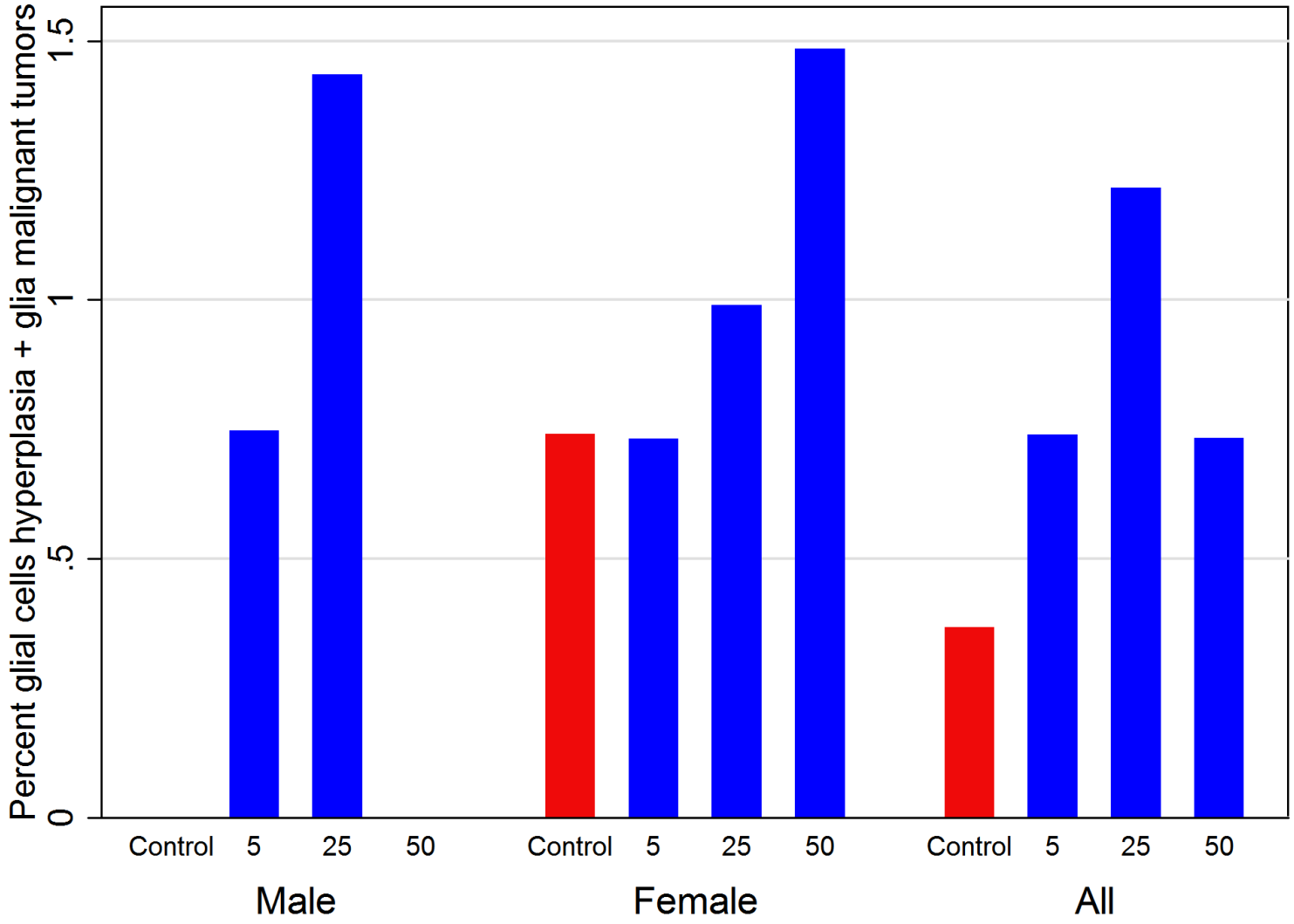
* Significant SAR-dependent trend for GSM and CDMA exposures by poly-3 ($p < 0.05$)

** Significant different than controls poly-3 ($p < 0.05$)

Ramazzini Institute Italy Rat Study

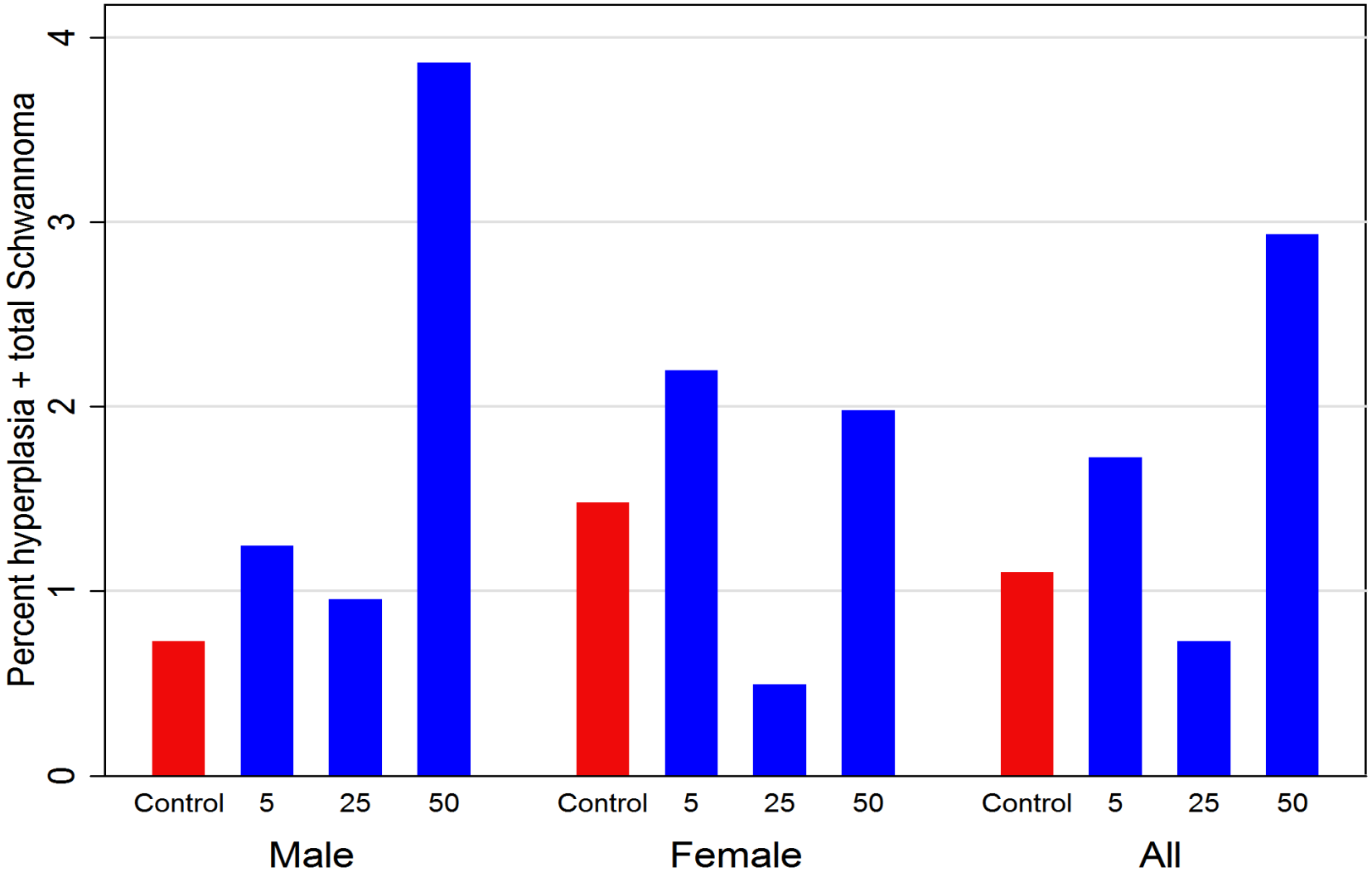
Note: No male control overall and no male rat in the 50 V/m group with glial cell proliferation or glioma

Glia cell proliferation, glioma (V/m)



Ramazzini Institute Italy Rat Study

Schwann cell proliferation + Schwannoma ('acusticus neurinoma') V/m



ICNIRP

ICNIRP is registered in Germany and located in Munich at the same address as the German Federal Office for Radiation Protection

Started in 1992 as an “independent commission”.

Continues the previous work by the International Non-Ionizing Radiation Committee (INIRC) of the International Radiation Protection Association (IRPA).

According to ICNIRP’s statues, the commission shall submit its recommendations for comment by the IRPA prior to publication.

ICNIRP maintains the same attitude to health effects from RF-radiation as the Institute of Electrical and Electronics Engineers (IEEE) and its standards setting committee, the International Committee on Electromagnetic Safety (ICES).

ICES is dominated by industry and military representatives.

ICES within IEEE also sets limits for RF exposure which are in line with the ICNIRP opinion that there are only immediate thermal effects and no effects below those that cause immediate effects due to increased temperature.

This perception was established in the 1950's and a decade later used when the first thermal based standard for radiofrequency radiation was set in the USA in 1966

Guidelines by different organizations for radiofrequency radiation in $\mu W/m^2$

Year	Power Density Limit ($\mu W/m^2$)	Name	Description
1996	10,000,000 5,800,000	FCC	USA: 5,800,000 $\mu W/m^2$ averaged over a 30-minute period (869 MHz), previously recommended in 1986 by NCRP; 10,000,000 $\mu W/m^2$ for PCS frequencies (1.85-1.99 GHz)
1998	10,000,000 9,000,000 4,500,000	ICNIRP	10,000,000 $\mu W/m^2$ for 2–300 GHz 9,000,000 $\mu W/m^2$ for 1800 MHz and 4,500,000 $\mu W/m^2$ for 900 MHz. averaged over 6 min.
2001	1,000	Salzburg Resolution	
2001	100	EU Parliament STOA 2001	
2002	1	New Salzburg Precautionary Exposure Limit Indoor	maximum indoor exposure recommendation for GSM base stations proposed by the Public Health Office of the Government of Salzburg
2009	See 1998	ICNIRP	Confirmation of ICNIRP 1998

2012	**3-6**	**Bioinitiative 2012 Recommendation**	
2016	0,1-100	Europa EM EMF Guidelines	For frequencies in the range of frequencies between GSM 900 to WiFi 5,6 GHz depending on sensitivity, night time or daytime exposure.
2020	400 MHz: 10,000,000 800 MHz: 18,200,000 1,800 MHz: 36,500,000 2,000 MHz: 40,000,000 6 GHz: 40,000,000 60 GHz: 26,600,000 300 GHz: 20,000,000	ICNIRP 2020	General public

Regarding animal studies yielding a promoting effect from RF radiation ICNIRP states that "*interpretation of these results and their applicability to human health [is] difficult, and, therefore, there is a need for further research to better understand these results".*

The NTP studies and Ramazzini Institute results are disregarded stating that "*no consistency was seen across these two studies"* and "*within the context of other animal and human carcinogenicity research…, their findings do not provide evidence that radiofrequency EMFs are carcinogenic".*


Pressbyrån
RESOLUTION
AVICII
EXPERIENCE

Sergel Plaza, October 2023

Narda 550 (RMS; root mean square results)

V/m

Min	Mean	Max
3.32	12.75	**35.22**

MikroW/m²

Min	Mean	Max
2 9237	431 200	**3 290 314**


Spår 11-19 Track 11-19
Vi vet att
1 av 10 vill göra
hållbara val.
BRA
För att du ska ha det bra
Jernhusen

Stockholm Central Station, October 2023

Downstairs (Narda-550 Broadband; RMS results)

V/m

Min	Mean	Max
0	5	**37.03**

MikroW/m²

Min	Mean	Max
0	66 313	**3 637 191**


50
50
TULLHUS
Skeppsbron
25-23
KLAUS NOMI
operan.se
WINGS
CRAFT BEER

Stockholm Skeppsbron, Old City, October 2023

(Narda-550 Broadband; RMS; root mean square results)

V/m

Min	Mean	Max
1.7	8.5	**24.5**

MikroW/m²

Min	Mean	Max
7 398	189 397	**1 585 683**

Stockholm Drottninggatan, October 2023

(Narda-550 Broadband; RMS; root mean square)

V/m

Min	Mean	Max
10.1	25.5	**44.6**

MikroW/m²

Min	Mean	Max
268 445	1 728 862	**5 271 555**

Four articles on 5G and the Microwave syndrome

Hardell L, Nilsson M.
Case Report: The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation
Ann Case Rep: 2023; 8: 1112. www.doi.org/10.29011/2574-7754.101112

Nilsson M, Hardell L. Development of the Microwave Syndrome in Two Men Shortly after Installation of 5G on the Roof above their Office. Ann Clin Case Rep. 2023; 8: 2378

Hardell L, Nilsson M. Case Report: A 52-Year Healthy Woman Developed Severe Microwave Syndrome Shortly After Installation of a 5G Base Station Close to Her Apartment. Ann Clin Med Case Rep. 2023; V10(16): 1-10

Nilsson M, Hardell L. 5G Radiofrequency Radiation Caused the Microwave Syndrome in a Family Living Close to the Base Stations. Journal of Cancer Science and Clinical Therapeutics 2023; 7: 127-134.

Clinical symptoms, nervous system, grades 0-10. 0 = no symptoms, 1 = mild symptoms, 10 = unbearable pain and/or discomfort. Previously healthy woman 62 years, and healthy man 63 years (within parentheses).

Hardell L, Nilsson M.
Case Report: The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation. Ann Case Rep: 2023; 8: 1112.

Symptom	Before 5G, November 2021	With 5G, November 2021	After 5G, office, January 2022	After 5G, house countryside March 2022
Headache	0 (0)	6 (6)	1 (0)	0 (0)
Tinnitus	2 (2)	6 (6)	3 (2)	1 (3)
Dizziness	2 (0)	10 (0)	3 (0)	1 (0)
Balance disorder	0 (0)	7 (0)	2 (0)	1 (0)
Concentration/Attention deficiency	1 (0)	8 (0)	1 (0)	1 (0)
Loss of immediate memory	0 (0)	7 (0)	2 (0)	1 (0)
Fatigue	2 (0)	8 (7)	2 (0)	0 (0)
Insomnia	0 (0)	10 (5)	0 (0)	0 (0)
Depression tendency	0 (0)	6 (3)	0 (0)	0 (0)
Emotivity	0 (0)	7 (3)	1 (0)	0 (0)
Irritability	0 (0)	8 (0)	2 (0)	0 (0)

Clinical symptoms, heart, lung, vascular, grades 0-10. 0 = no symptoms, 1 = mild symptoms, 10 = unbearable pain and/or discomfort. Previously healthy woman 62 years, and healthy man 63 years (within parentheses).

Hardell L, Nilsson M. Case Report: The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation. Ann Case Rep: 2023; 8: 1112.

Symptom	Before 5G, November 2021	With 5G, November 2021	After 5G, office, January 2022	After 5G, house countryside March 2022
Transitory cardiovascular abnormalities, heart rate variability	1 (0)	5 (0)	1 (0)	0 (0)
Lungs; dyspnoea, cough,	2 (0)	7 (0)	2 (0)	0 (0)
Nose bleeding	0 (1)	0 (5)	0 (1)	0 (0)
Blood pressure variability (high, low)	0 (1)	5 (5)	0 (1)	0 (0)

Clinical symptoms, skin, grades 0-10. 0 = no symptoms, 1 = mild symptoms, 10 = unbearable pain and/or discomfort. Previously healthy woman 62 years, and healthy man 63 years (within parentheses).

Hardell L, Nilsson M. Case Report: The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation. Ann Case Rep: 2023; 8: 1112.

Symptom	Before 5G, November 2021	With 5G, November 2021	After 5G, office, January 2022	After 5G, house countryside March 2022
Global body dysthermia	0 (0)	7 (0)	1 (0)	0 (0)
Skin, face, arms, legs	0 (2)	0 (5)	0 (4)	0 (1)
Skin, burning, lancinating skin on hands and arms	0 (0)	8 (0)	0 (0)	0 (0)

Levels of maximum (peak) microwave radiation in apartment before 5G, with 5G, in office space without 5G, and present home on countryside. Measured average levels over 2-5 min in brackets. NA= Not available (Safe and Sound PRO II)

Hardell L, Nilsson M. Case Report: The Microwave Syndrome after Installation of 5G Emphasizes the Need for Protection from Radiofrequency Radiation. Ann Case Rep: 2023; 8: 1112

	Apartment with 4G/3G before 5G Nov 4, 2021	Apartment after 5G deployment March 18, 2022	Office space where the couple moved to February 4, 2022	New home Countryside April 8, 2022
Bedroom	9 000 (NA)	>2 500 000 (9 000-50 000)	3 500 (20-105)	33 (2-6)
Living room	2 000 (NA)	183 000 (500-5 200)	NA	300 (2-6)

Hardell L, Nilsson M. Case Report: A 52-Year Healthy Woman Developed Severe Microwave Syndrome Shortly After Installation of a 5G Base Station Close to Her Apartment. Ann Clin Med Case Rep. 2023; V10(16): 1-10

Hardell L, Nilsson M. Case Report: A 52-Year Healthy Woman Developed Severe Microwave Syndrome Shortly After Installation of a 5G Base Station Close to Her Apartment. Ann Clin Med Case Rep. 2023; V10(16): 1-10

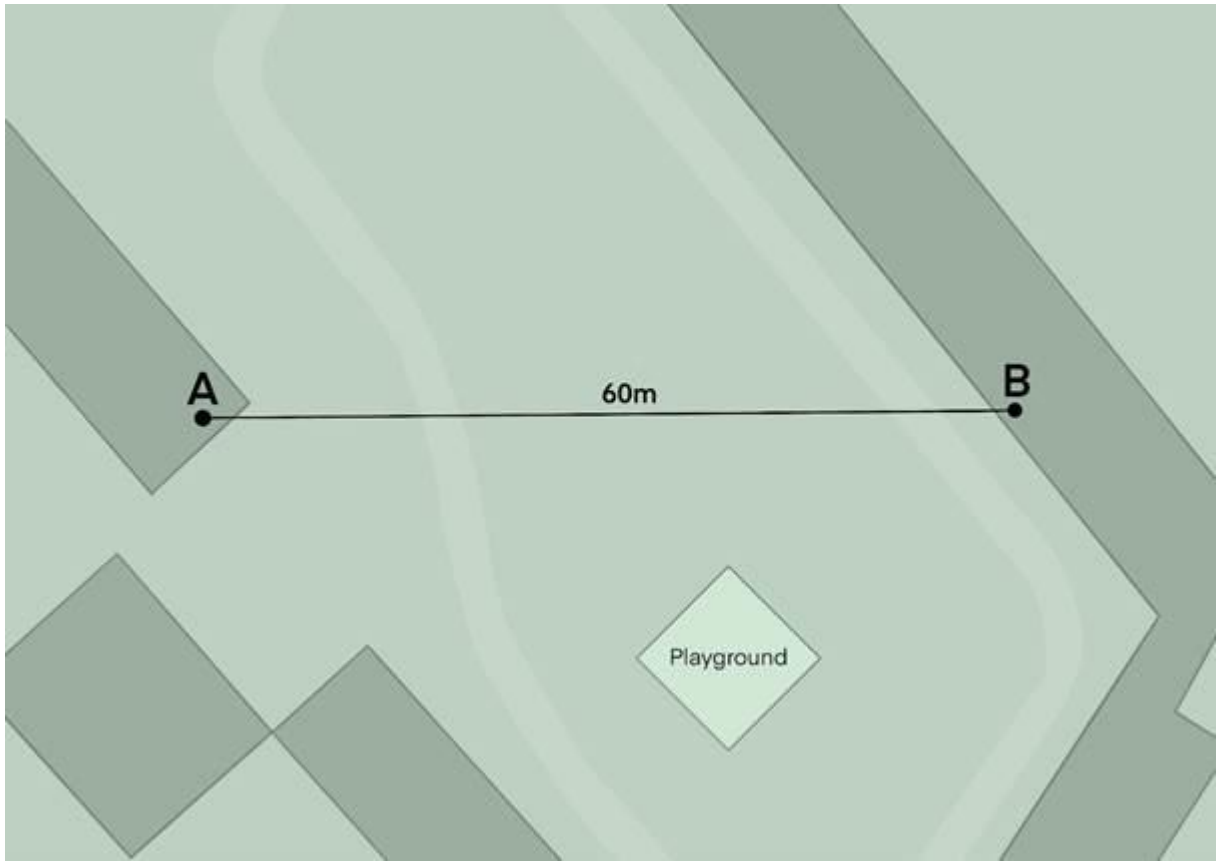


Table II. Measuremt of RF radiation in an appartment on January 13, 2021.	
Max (peak) value is given for every measurement during 1 minute each.	
Ten measures were made at each place and the results show the range of levels in µW/m2 (Safe and Sound Pro II)	
Place	Max (peak)
Kitchen table	156-1 420
Bedroom pillow	120-616
Hall	2 860-9 390
Living room window	17 500-758 000
Living room sofa	36 800-222 000
Bathroom bath	65 400-150 000
Bathroom sink	8 610-28 900
Balcony (>max)	>2 500 000
	within 10-15 sec
	each time

Professor Veikko Launis at Åbo University in Finland

(https://www.laakariliitto.fi/lakaretik/lakaretikens-filosofiska-grunder/lakar-och-vardetikens-grundprinciper/).

Respect for life: This is the basis for all activities that concern all living creatures.

Human dignity: The moral value for all people should be the same. Human rights should be equal to all persons.

Self-determination: The right for self-determination is an essential part of moral.

Medical care: The society is obliged to take care of the disabled.

Justice: All persons should be ensured equal possibility for adequate care.

Benefit: The result of an action is the benchmark for the moral value. The expected benefit should be as large as possible in relation to the inconvenience.

Launched on September 13, 2017. By October 12, 2023 there are 434 signatories.