Science and Politics of Base Station Electromagnetic Field Risks

IEEE COMCAS2021

INTERNATIONAL CONFERENCE ON MICROWAVES, COMMUNICATIONS, ANTENNAS, BIOMEDICAL ENGINEERING & ELECTRONIC SYSTEMS

1-3 November 2021

David Intercontinental Hotel

Tel Aviv, Israel

Dr. Haim Mazar (Madjar)/ ITU intersector coordinator on RF-EMF (ATDI, Israel)
h.mazar@atdi-group.com
Pr. David J. Ball/ Centre for Decision Analysis & Risk Management, School of Science & Technology, Middlesex University, London
david@davidjball.com

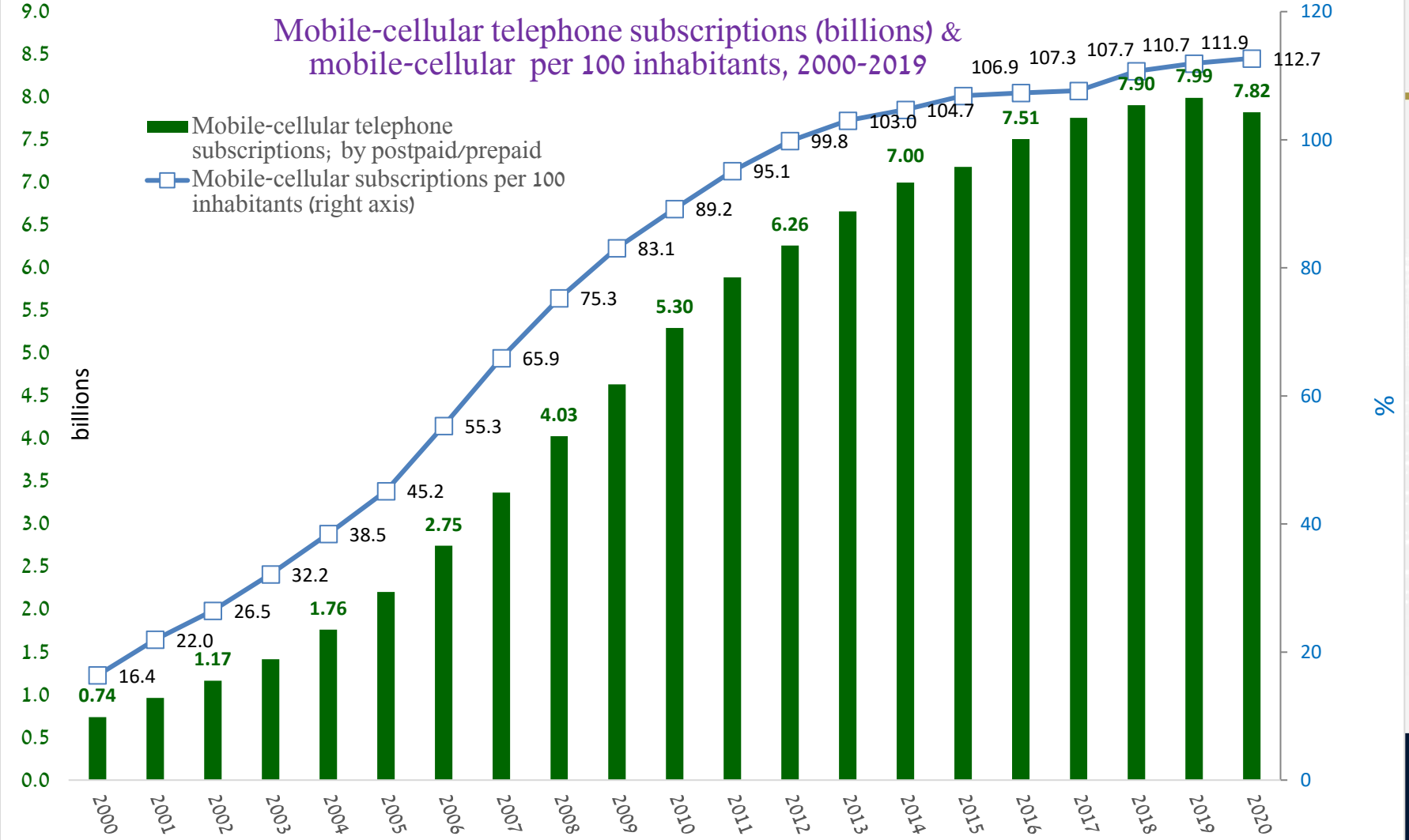
Cite the IEEE paper: H. Mazar Madjar and D. J. Ball, "Science and Politics of Base Station Electromagnetic Field Risks," 2021 IEEE International Conference on Microwaves, Antennas, Communications and Electronic Systems (COMCAS), 2021, pp. 216-218, doi: 10.1109/COMCAS52219.2021.9629038
https://ieeexplore.ieee.org/document/9629038 and
https://mazar.atwebpages.com/Downloads/IEEE_COMCAS21BallMazarScience_politics_EMFbasestationRisks.pdf

Science-based

1. Current science-based approach to ensuring public safety from RF-EMF base stations
2. Potential misframing of the debate as a purely scientific issue
3. Leading to inappropriate risk communication exercises
4. Thus, disenfranchising other potentially legitimate siting concerns and hence politicization

Health related Recommendations

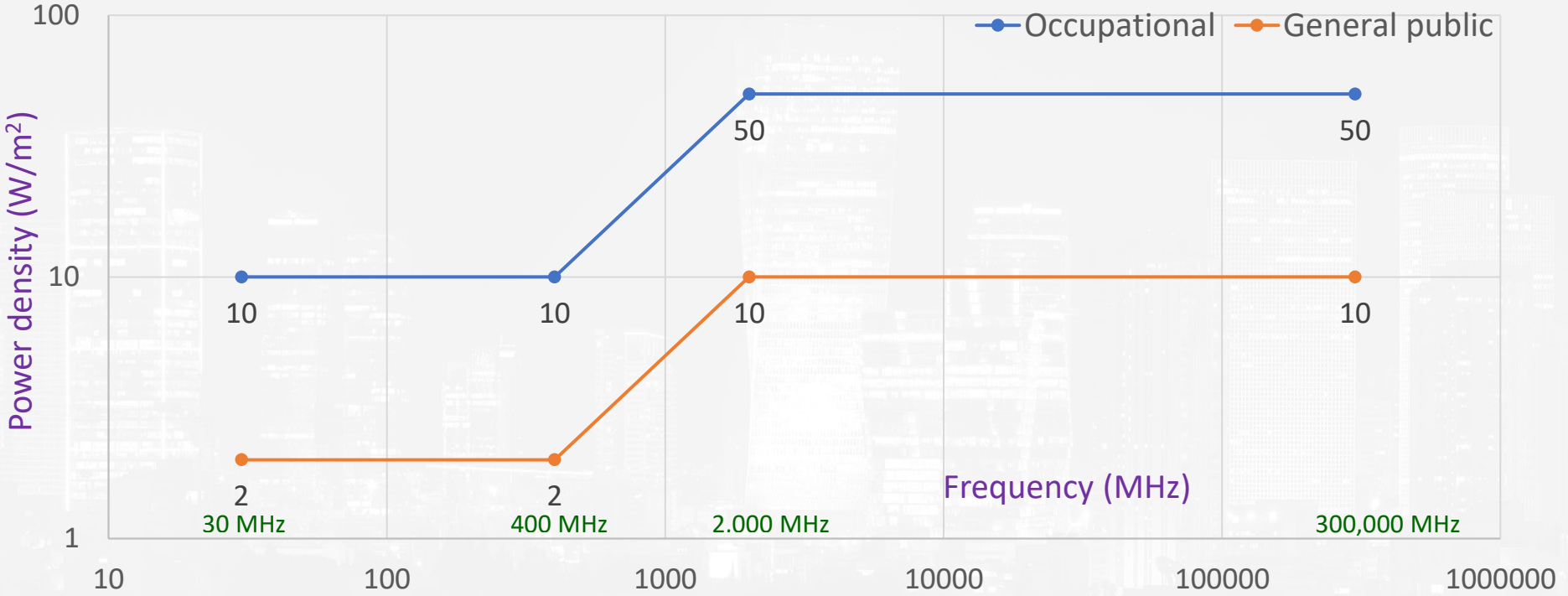
1. Primary health recommendation remains unchanged: to follow the guidelines set by the science-based ICNIRP and IEEE expert groups, & to limit the power-density exposure level for general-public, according to ICNIRP 2020 Guidelines and IEEE 95.1 2019 standard:
   1) in the range 400–2000 MHz: **$f_{MHz}/200$ (W/m^2)**
   2) above 2,000 MHz: **10 (W/m^2)**
2. The ICNIRP and IEEE limits are largely harmonized, and the power-density limits for whole-body exposure to continuous fields are identical above 30 MHz


Mobile-cellular telephone subscriptions (billions) & mobile-cellular per 100 inhabitants, 2000-2019
Mobile-cellular telephone subscriptions; by postpaid/prepaid
Mobile-cellular subscriptions per 100 inhabitants (right axis)
billions
%
0.74
1.17
1.76
2.75
4.03
5.30
6.26
7.00
7.51
7.90
7.99
7.82
16.4
22.0
26.5
32.2
38.5
45.2
55.3
65.9
75.3
83.1
89.2
95.1
99.8
103.0
104.7
106.9
107.3
107.7
110.7
111.9
112.7
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

WHO on RF-EMF Health

1. World Health Organisation (WHO) Q&A on 5G mobile networks and health says that 'provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated' click
2. WHO states that '5G mobile networks do not spread COVID-19. Viruses cannot travel on radio waves/mobile networks. COVID-19 is spreading in many countries that do not have 5G mobile networks

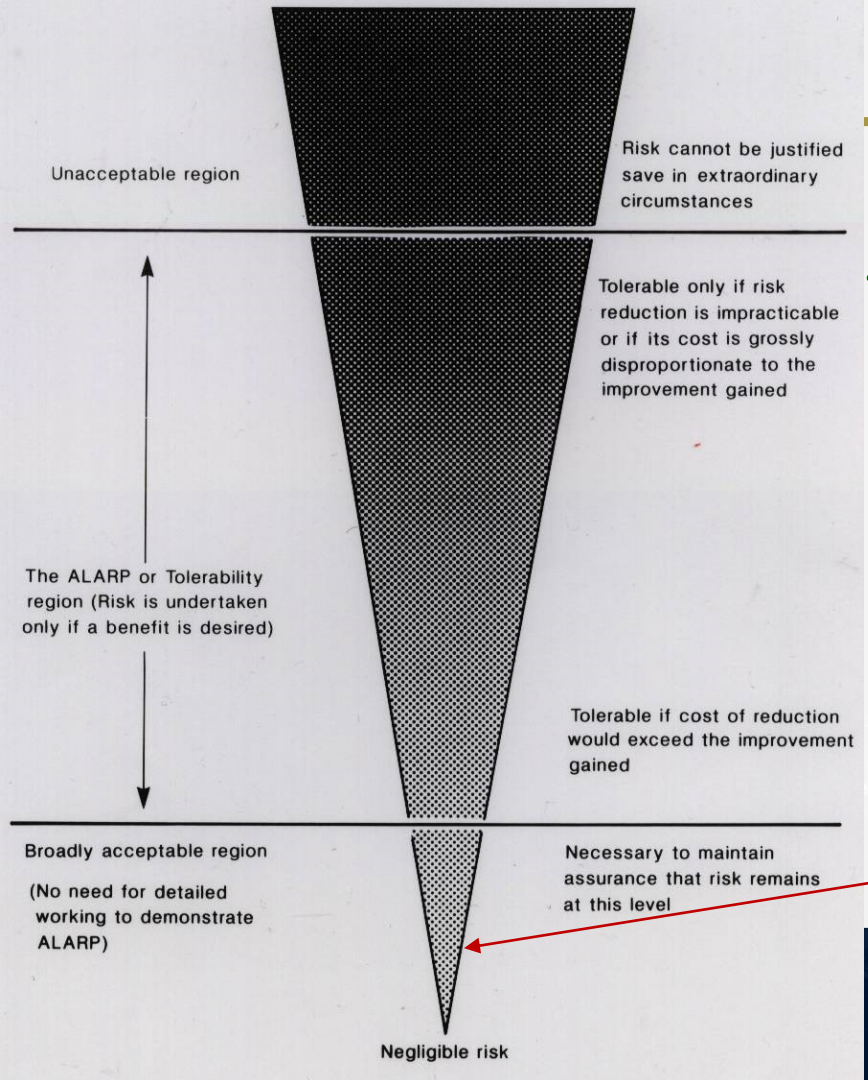
ICNIRP (2020) Table 5, general-public vs occupational **power-density** 30 MHz–300 GHz



Band	Footnotes identifying RF bands for 5G pursuant to the Itu RR (2020 Edition)		
	Region 1	Region 2	Region 3
450-470 MHz		5.286AA	
470–698 MHz	-	5.295, 5.308A	5.296A
694/698–960 MHz	5.317A	5.317A	5.313A, 5.317A
1 427–1 518 MHz	5.341A, 5.346	5.341B	5.341C, 5.346A
1 710–2 025 MHz		5.384A, 5.388	
2 110–2 200 MHz		5.388	
2 300–2 400 MHz		5.384A	
2 500–2 690 MHz		5.384A	
3 300–3 400 MHz	5.429B	5.429D	5.429F
3 400–3 600 MHz	5.430A	5.431B	5.432A, 5.432B, 5.433A
3 600–3 700 MHz	-	5.434	-
4 800–4 990 MHz	5.441B	5.441A, 5.441B	5.441B
24.25–27.5 GHz *		5.532AB	
37–43.5 GHz*		5.550B	
45.5–47 GHz*	5.553A	5.553A	5.553A
47.2–48.2 GHz*	5.553B	5.553B	5.553B
66–71 GHz*		5.559AA	

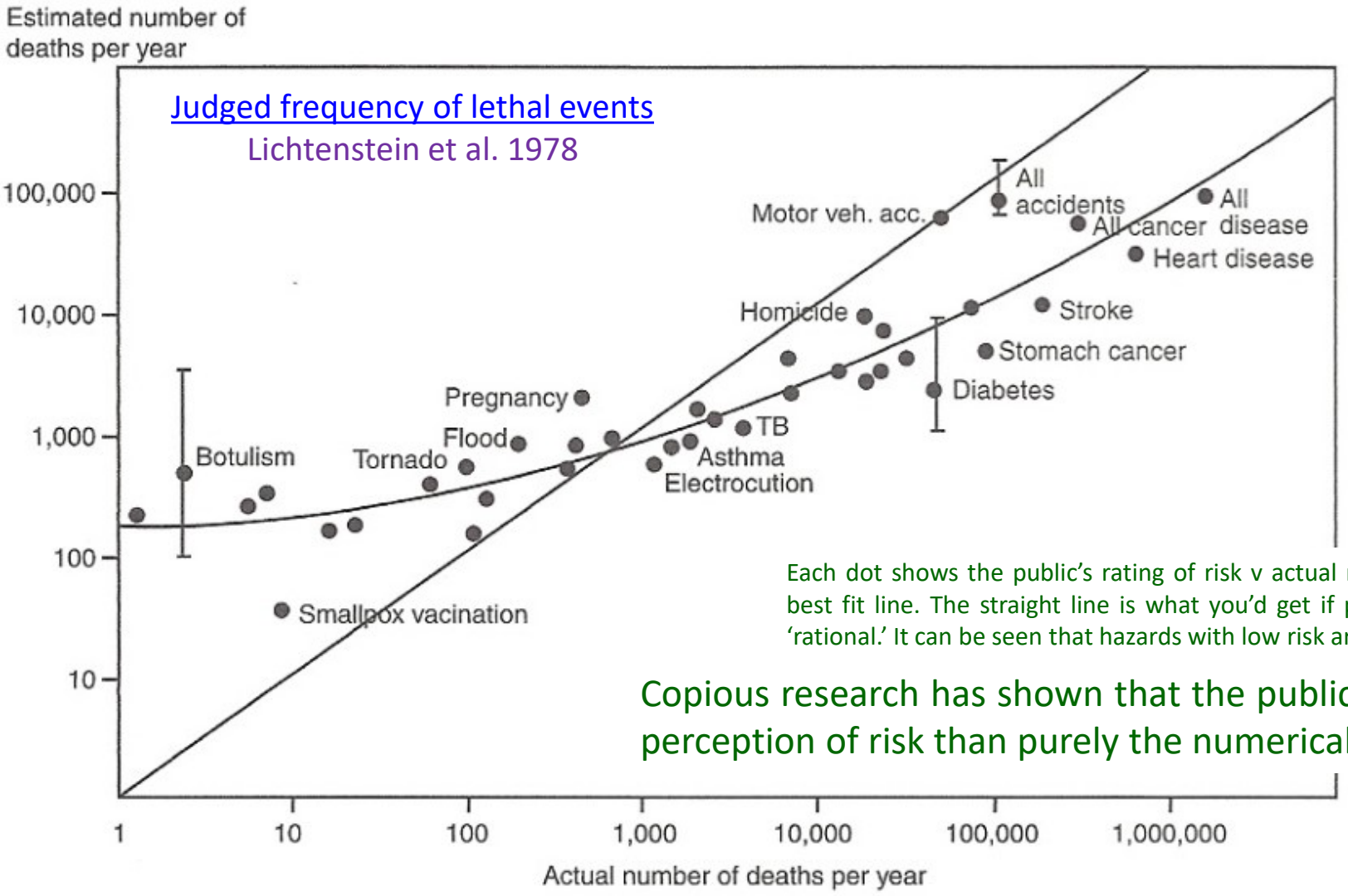
* revised at WRC-19

Tolerability of risk from nuclear power stations, UK HSE, 1992, Fig. 3



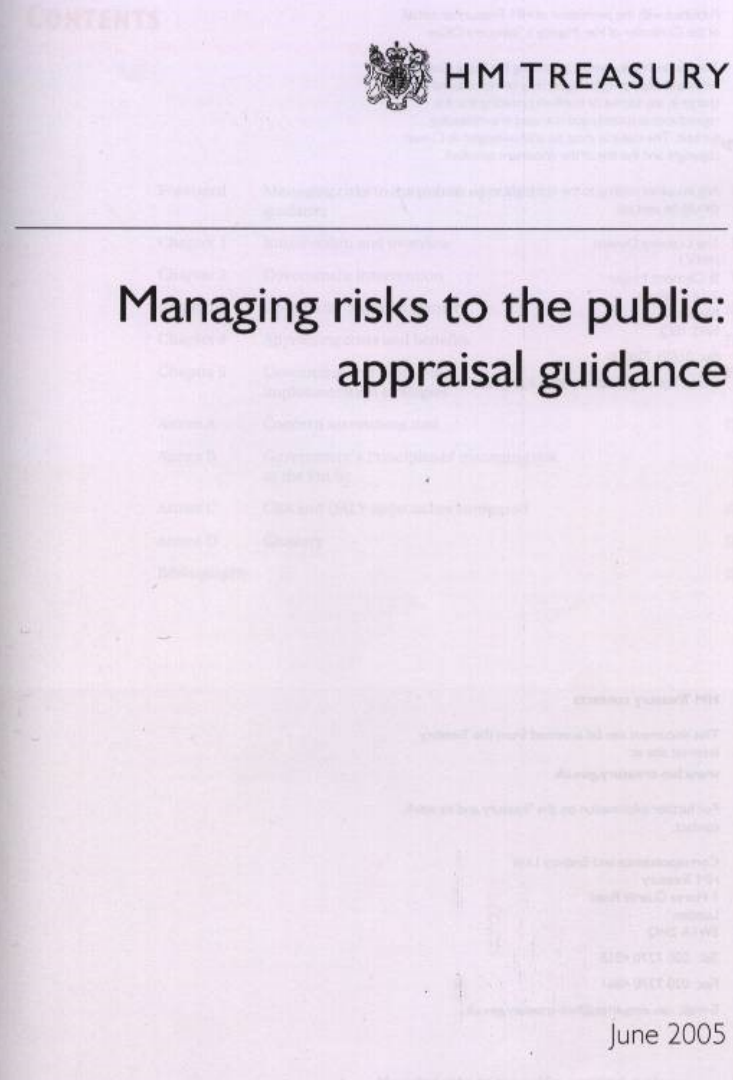
This tolerability of risk framework is used internationally. 5G base station risk, according to known research, lies well inside in the 'broadly acceptable' region.

5G base station risk



Each dot shows the public's rating of risk v actual risk. The curve is the best fit line. The straight line is what you'd get if public were so-called 'rational.' It can be seen that hazards with low risk are over-rated.

Copious research has shown that the public has a 'richer' perception of risk than purely the numerical value.

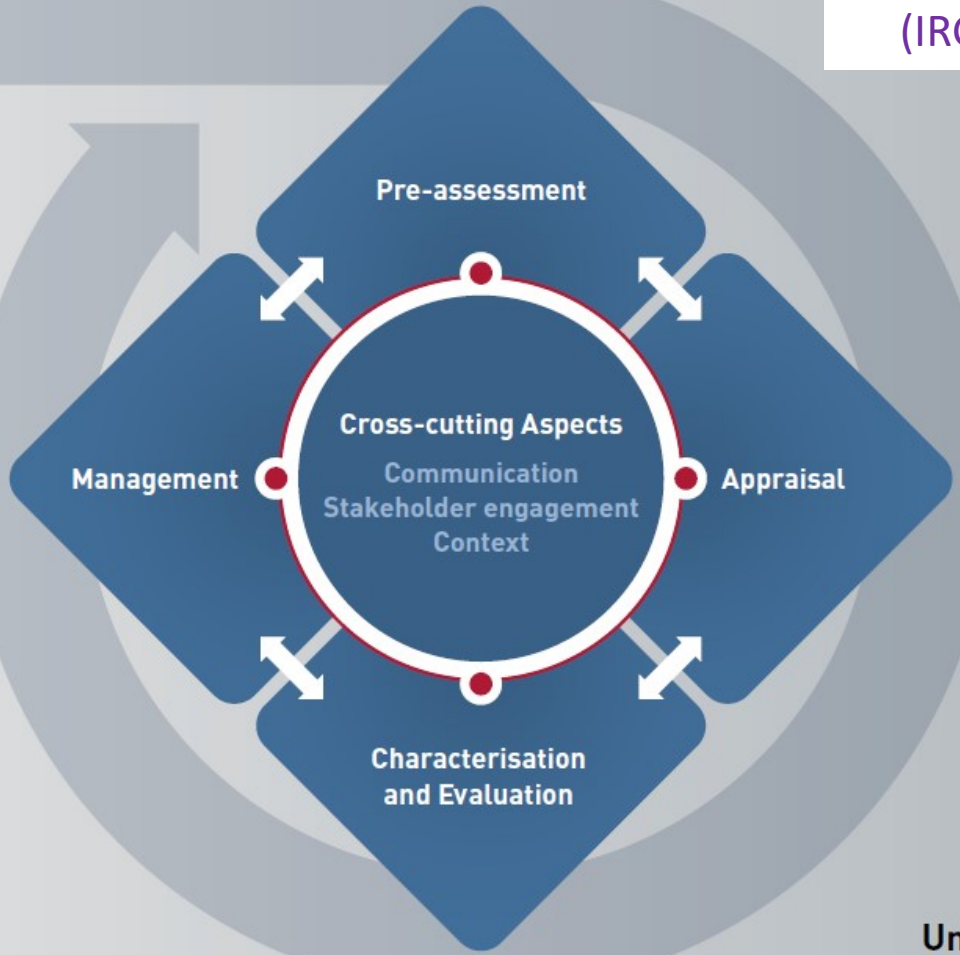


Managing risks to the public: appraisal guidance

This leads to thoughts of compromise …

1. This UK guidance seeks to incorporate public perceptions into risk decisions under the guise of 'concern assessment.'
2. It weights actual risk with psychological factors
3. Notably, the resulting control measures are mainly shaped around better communication, not greater risk control

International Risk Governance Council's (IRGC) risk governance framework



However, recent research supports the idea that the public perception of risk from base stations may not be the main issue. It suggests that something could be wrong at the *pre-assessment* stage.

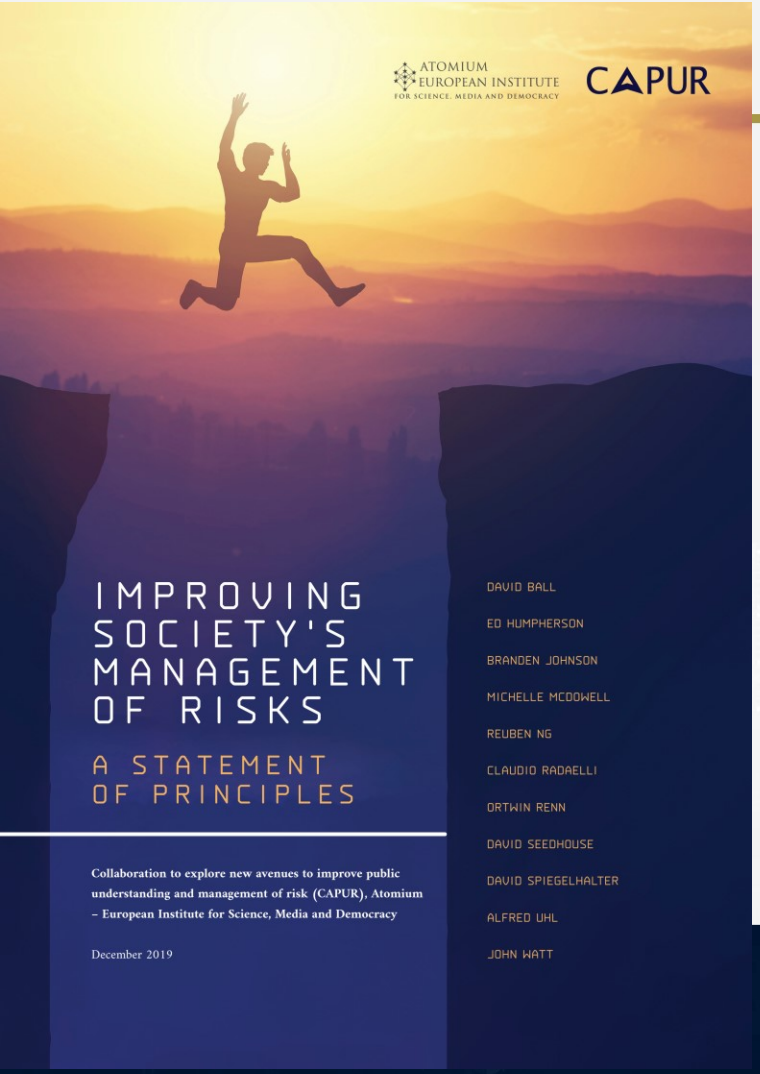
Thus, is the public's real concern not about health, or not just about health?

https://en.wikipedia.org/wiki/Cell_site#/media/File:Cell-Tower.jpg

Engaging with Risks- citizens, science and policy in mobile phone mast siting controversies; Maastricht University; Hermans, M.

1. Academics have tended to frame the base station issue as a risk perception issue. This is now questioned
2. There are other factors such as lack of opportunities to participate in siting plans, landscape 'pollution,' devaluation of property …
3. The net effect is to transfer what are really local policy issues to the scientific arena

In this way the siting issue is mis framed and leads to political games around what really matters



Principles of Risk Management Ball et al. 2019

1. Risk decision making involves more than numbers
2. Risk communication (two way) should be integral
3. Participative approaches have potential to legitimise decisions

ITU, Geneva 10 Oct. 18

ITU workshop on modern policies, guidelines, regulations and assessments of human exposure to RF-EMF

See workshop presentations at
https://www.itu.int/en/ITU-D/Study-Groups/2018-2021/Pages/meetings/session-Q7-2-oct18.aspx