

My comments relate to the potential future use of the frequency range 100-200 GHz and begin with a paragraph from the International EMF Scientist Appeal, sent to the United Nations, the World Health Organisation and all UN member states, including the UK:

*"Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damage, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life."*

Last year IARC announced that it would be reviewing its 2011 classification in light of recent significant research findings (the crucial animal studies missing during the 2011 assessment) which means we can expect non-ionising radiation to be elevated to a Group 2A Probable Carcinogen or (more likely given the findings) a Group 1 Human Carcinogen within the next four years.

Given this impending classification, why is it considered safe to make use of spectrum bands in the frequency range 100-200GHz? Why have no risk assessments been carried out for such millimetre wave frequencies? Why has declassified information on the biological effects of millimetre waves not been taken into consideration?

Regardless of the toxin, 'safe' exposure limits always come down as knowledge of harm and exposure expands: sometimes to 'no known threshold of safety' as recognised for certain environmental contaminants and carcinogens such as radiations. Safety guidelines established in 1998 by ICNIRP for RF-EMR, however, remain unchanged despite a 2020 'update' and despite the fact that 5G technology is designed to make use of increasingly high frequency wavelengths and new and untested digital technologies (Massive MIMO etc).

ICNIRP guidelines continue to refer only to thermal effects on living systems and disregard the many thousands of papers in the scientific literature that document adverse biological effects at exposure levels tens of thousands of times lower than the guidelines.

There is currently:

- A gross imbalance between research on developing the technology and on anticipating and reducing potential harm to people and environments;
- A failure to ensure independent research into health and environmental effects that can help combat 'manufactured doubt';
- A failure of scientists to acknowledge what they do not know; to properly understand and embrace knowledge from other disciplines and to acknowledge the limitations of 'controlled models' in predicting real exposures;
- A failure of scientists and policymakers to appreciate complex and variable realities, multi-causality and the likelihood of inconsistent scientific results;

- A failure by policymakers to understand the difference between the high strength of evidence needed to establish robust scientific knowledge and the case-specific appropriate strength of action needed to justify timely preventative action;
- A failure to act on early and late warnings of impending harms;
- A failure to manage the 'latency lacuna' whereby evidence of chronic harm necessarily comes years or decades after much technical change in the exposure conditions which generated the harm: this is a particularly severe challenge for the fast moving telecoms industry;
- A failure to involve the public in helping to choose their technological futures and to avoid 'toxic trespass';
- A failure to provide adequate insurance systems, so that the costs of harm to people and environments are paid by victims, taxpayers and nature – not by the polluter (*Late Lessons from Early Warnings*, EEA, 2001, 2013).

The public is receiving unqualified and unsound safety advice regarding exposure to EMR in general and 5G in particular and the present trajectory is both unethical and unsustainable. Given the growing numbers of people reporting adverse health effects from EMR exposure it is clear that technological expertise should now be focussing on the development of safe communications technology rather than on further expansion of existing systems and spectrum bands. Please address this area as a matter of priority.