

Interagency Committee on the Health Effects of Non-Ionising Fields

Draft Notes from the Zoom Meeting held on 18 February 2021

Present

Peter Berry (Electricity Engineer's Assoc.), Veerendra Bhim (Energy Safety Group, WorkSafe NZ), Ben Blakemore (Telecommunication Carriers Forum), Simon Cooke-Willis (Telecommunication Carriers Forum), Martin Gledhill (Ministry of Health – Acting Secretary), John Dockerty (University of Otago), Kimbal McHugo (Ministry of Education), Adam Tommy (Kordia), Matthew Walker (Transpower New Zealand Ltd), Andrea t'Mannetje (Massey University), Theresa van Rooyen (Radio Spectrum Management), Pippa Player (ministry of Business, Innovation and Employment), Ken Karipidis (ARPANSA), Sarah Loughran (ARPANSA), Dave McLean (Massey University), Sally Giles (Ministry of Health).

Apologies

Richard Jaime (Ministry of Health – Chair), Marie Gibson (DHB Public Health Units), John Duffy (Consumer NZ), Isobel Stout (local government), Elaine Gyde (Ministry for the Environment), Sally Gilbert (Ministry of Health).

As well as presenting his apologies and announcing his resignation, Jon Duffy noted that there was no-one in Consumer NZ able to replace him, but he offered to suggest replacements.

Welcome

Due to the absence of Richard Jaime, Dave McLean took the chair, welcomed everyone to the meeting and led a round of introductions.

Finalise the agenda

The agenda was confirmed. An item to discuss a replacement for Jon Duffy was added to Other Business.

Minutes of the previous meeting

The minutes of the meeting held on 13 August 2020 were confirmed as an accurate record of the meeting.

Matters arising

There were no action points from the previous meeting.

New Zealand Information on ELF and RF

Local government

Isobel Stout sent a report that there had been no local government issues.

Ministry of Education

The programme to replace all wireless equipment in schools is now back on after delays due to Covid-19. Resilience for internet connections is also being installed, with 4G connections as a backup for fibre.

Ministry of Health

The volume of correspondence on 5G (Ministerials and OIAs) has been lower than last year.

Energy Safety Service/Worksafe

There have been no queries received.

Update on Standards

Adam Tommy noted the revised ICNIRP Guidelines and that they had been incorporated into the ARPANSA RPS S-1 RF Standard. ICNIRP has a long-term project to review its ELF guidelines.

The joint Standards Australia/Standards New Zealand TE-007 committee that develops EMF exposure assessment Standards has proposed the direct text adoption of several relevant IEC Standards.

Health Canada has updated the limits in the Canadian Safety Code 6 (SC-6) RF exposure Standard dealing with brief and/or pulsed exposures at frequencies greater than 6 GHz. The approach takes a modification of that proposed in ICNIRP 2020.

The IEEE is reviewing limits at frequencies less than 10 MHz in its C95.1 Standard.

Ministry for Business, Innovation and Employment

MBIE is looking at RMA reform but waiting for guidance from MfE.

Industry Update on Engineering and Technical Developments

Peter Berry reported that he has not heard of any significant EMF issues from the electricity distribution industry.

Matthew Walker said that Transpower is receiving a low level of EMF enquiries, about one per week. He referred to the recent Climate Change Commission report, and a Transpower report on the electrification of the economy, both of which foresee a move towards increased use of electricity and the consequent need to upgrade the grid.

Ben Blakemore reported that public concerns on RF and 5G seem to have decreased since last year.

Simon Cooke-Willis noted that Spark and Vodafone are rolling out 5G sites and promoting 5G phones. Internet of Things use over platforms such as LoRaWAN is increasing in applications such as agriculture where data volumes are low and using cellular data services would not be cost-effective.

The next generation of WiFi using IEEE 802.11ax protocols is being introduced. It is frequently referred to as "WiFi 6", which risks confusion with "6G". It has the same transmit power restrictions, and uses the same frequencies, as current generations of WiFi. In some jurisdictions, a 6 GHz band is also becoming available. WiFi 6 is more efficient than previous generations at serving multiple users, and can transfer data at rates up to 10 Gbps.

In the light of the arson attacks on cellsites last year, Vodafone has commissioned some short videos to show on social media that explain what 5G is really about.

The FAQs that accompany the ICNIRP 2020 guidelines are recommended reading for any radio engineer.

Australian Information on ELF and RF

Ken Karipidis and Sarah Loughran spoke to their report. Ken Karipidis has jointly authored a paper with Andrew Wood (Swinburne University of Technology) on calcium movement in and out of cells. Andrew Wood's contribution was funded by the Ministry of Health. The paper concludes that RF fields do not have any effect on calcium movement. ARPANSA has paid for the paper to be open access.

ARPANSA has contributed A\$350,000 towards the WHO EMF project to help fund systematic reviews of the RF research.

RPS S-1 has been reviewed and accepted by the Australian Radiation Health Committee and will be published on Thursday 25 February.

Sarah Loughran has been engaged as Director of ARPANSA's EME Programme. This programme has now started, and activities will include exposure surveys in the home and workplace, looking at the cumulative exposures from different sources and how these change over time. The calibration facility will be upgraded with a new anechoic chamber. The programme will also fund research carried out by ARPANSA and other organisations. In response to a question Sarah said that ARPANSA will not be adding capability to measure SAR from handsets, as this requires specialised, expensive equipment and is already undertaken by others.

International Information on ELF and RF

International Reports (ELF)

John Dockerty gave an overview of the recent papers that he had selected:

- Chen – Dave McLean was a co-author of this paper and gave an overview of the work undertaken, and the conclusions that motor neurone disease was associated with occupational exposure to electric shocks but not ELF magnetic fields. Potential for exposure was assessed using established job-exposure matrices which. While generally suitable for this purpose, they do have limitations. The findings appear to be biologically plausible as electric shocks are a high energy event, whereas ELF magnetic field exposures are not.
- Jalilian – In contrast to the findings of the Chen paper, Jalilian's systematic review and meta-analysis came to opposite conclusions: ELF magnetic fields are associated with amyotrophic lateral sclerosis (ALS, the most common form of motor neurone disease) but electric shocks are not. The overall conclusion from the papers is that more data is needed.
- Nunez-Enriquez – A well conducted study, in an area with higher exposures than most, but few exposed cases.
- Ingle – No effects of ELF fields on fertility were found.
- Huang – The meta-analysis found an association between magnetic fields and dementia, but the data were imprecise.
- Brascher – Provides evidence that people will experience a nocebo effect if told that they could experience adverse effects. Sarah Loughran commented that there had been similar findings in a study at Wollongong.
- Harakawa – 10 kV/m electric fields appeared to suppress a stress response in mice.

International Reports (RF)

- Health Council of the Netherlands review of 5G and Health – Concludes that there is no reason not to deploy 5G at 3.5 GHz frequencies, but recommends that 26 GHz are not used until there has been further research. The review is based on the WHO 2014 draft RF EHC document, supplemented by the Swedish yearly reviews and the Health Council's own search for more recent papers. The conclusion on the 26 GHz band is surprising, as is the decision to consider only research in the frequency range 20 GHz – 40 GHz to draw conclusions about health effects in this band. Some papers that did carry out research in this frequency range were not included in the review.
- National Academy of Sciences investigation of symptoms experienced by US embassy personnel in Havana and Guangzhou – This concluded that directed, pulsed RF energy appeared to be the most likely cause of the symptoms experienced. However, this conclusion is based on speculation as to whether such exposures actually cause some of the symptoms (eg vestibular disorders) rather than a firm evidence base, and recent reviews discount the possibility of RF fields causing many of the reported symptoms.
- BERENIS review of EMFs and oxidative stress – this is a summary of a longer review to be published on a Swiss government website. It notes the poor quality of some of the research but concludes that there may be effects. Ken Karipidis commented that the authors appear to rely on the numbers of studies finding effects when drawing conclusions, rather than

taking account of study quality. One of the systematic reviews commissioned by the WHO considers oxidative stress.

- Roosli – concludes that epidemiology studies do not suggest increased brain or salivary gland tumor risk with mobile phone use but there is uncertainty about long latency periods [more than 15 years].
- Choi – In contrast to the Roosli conclusions, the Choi review and meta-analysis found evidence linking mobile phone use to increased tumour risk. Differences between the Choi and Roosli approaches included the fact that Roosli considered ancillary data, such as registry studies, to provide a check on the plausibility of some of the epidemiology findings, and Choi considered the Interphone study to be of poor quality (despite the extensive validation studies).
- Carlberg – Looked at time trends for thyroid cancers and concluded that they could be consistent with RF from mobile phones being a causative factor.
- Chen – Found that mobile phone use might result in a decreased risk of meningioma.
- Dos Santos – The studies considered did not provide a lot of evidence, but overall indicated no genotoxic effects on the oral epithelium associated with cellphone use. Further studies are needed to evaluate other potential cytotoxic effects.
- Cabre-Riera – Found that higher exposure to RF is related to lower non-verbal intelligence, but cautioned that the nature of the study meant that this could be a chance finding or reverse causality. The exposure measure, in terms of accumulated dose (mJ/kg/day) is different to that normally used for exposure assessment (specific absorption rate in J/kg/sec)
- Karadeniz – Highlights the poor general knowledge amongst the public about causes of cancer.
- Shih – The meta-analysis found that some sources of exposure were associated with increased risk of breast cancer but others were not. Overall they concluded that RF exposures did give an increased risk. Dosimetry is likely to be poor.
- Kacprzyk – A systematic review and meta-analysis found that cellphone use is not associated with tinnitus.
- Elwood – An overview article concluding that RF fields do not cause a specific syndrome of ill health. Many of the symptoms reported are common in the population and similar to those reported with other perceived environmental hazards.
- Wallace – Heart rate variability does not seem to be caused by exposure to GSM signals.
- Koh – Looked at the factors associated with risk perception of 5G networks in Korea.
- Martin – Found that measured exposures to RF fields from cellsites are not associated with non-specific symptoms or insomnia.
- Frank – An opinion piece recommending a moratorium on 5G roll-out pending more research. The opinion is based on a limited review of the research, and un-nuanced view of the precautionary principle.
- Redmayne – Proposes a new model of Electrosensitivity, that needs testing experimentally.
- Eggert – Found that effects of RF exposure on sleep did not appear to be age-dependent in men, and did not indicate any adverse health effects.
- Lopez – Although exposure to WiFi overnight appeared to improve performance in one cognitive task, others were not affected and this could be a random finding.
- Lee – Found variations in exposures to the head from mobile phones depended on the year the measurement was made and the network the phone connected to. Mobile phone output power was normally far below the maximum possible.
- Wust – Found that the effects of heating cells with RF were significantly different from heating them to the same temperature in a water bath.
- Leszczynski – A catalogue of studies of mmWave exposures on the skin, that concludes that more studies are needed to ensure safety. Ken Karipidis commented that ARPANSA has prepared two papers reviewing studies of exposures to mmWaves at levels below the ICNIRP limits, and they have been accepted for publication.
- Lee – Long term exposure to mice resulted in cognitive enhancement at middle age.

- Wood – Reviewed the research on effects of RF on calcium flow in and out of cells (as discussed previously by Ken Karipidis).
- Selmaoui – Reviewed research on the effects of RF exposures on melatonin and cortisol and found conflicting results.
- Delen – Found effects of RF exposure on rat brains that could be mitigated by melatonin injections.
- Romeo – A proposed systematic review of in vitro studies of genotoxicity of RF fields, that supplements the WHO systematic reviews being undertaken.
- Suri – Found no association between ELF magnetic field exposures in power plants and reproductive hormone levels.
- Binboga – Reported evidence for effects of 28 μT ELF fields on heart rate parameters.
- Zhang – Exposed rats over 24 weeks to ELF magnetic fields up to 500 μT and found no effects on blood properties, fibrosis or oxidative stress in the liver or kidney.
- Bouisset – Found that exposure to ELF magnetic fields and AC currents did not affect postural control.

Martin Gledhill spoke to his report on the GLORE meetings. He highlighted the comprehensive review by Health Canada of mmWave health effects research (to date not published), which supported ICNIRP's basis for setting limits but suggested that a slightly different approach was needed for specifying basic restrictions and reference levels for brief and/or pulsed exposures.

He also mentioned the Telstra videos about 5G that have circulated on social media, that take a humorous approach to countering some of the myths that have arisen. They have generally been well-received.

Other business

Replacement for Consumer NZ representative

The Committee agreed that a replacement for a Consumer NZ (who represent the public interest on the committee) representative should be found, and that Jon Duffy should be contacted to obtain his suggestions for such a person.

The discussion turned to whether there should be wider representation on the committee. Martin Gledhill noted that the committee was established as a technical advisory committee for the Ministry and other government agencies, and that members are appointed based on their expertise. Dave McLean considered that wider representation could do no harm. Kimbal McHugo said the main purpose of the committee is to determine whether the science has changed to the extent that a review of Health and government policy is needed. Simon Cooke-Willis said a consumer viewpoint is important to ask questions that consumers might have, such as "Is this product safe" or "Is it covered by standards?".

Action: Sally Gilbert to approach Jon Duffy to discuss options for Consumer NZ to continue to provide representation on the Committee.

RF exposure standards in New Zealand

Adam Tommy noted that the Committee had discussed the ICNIRP 2000 guidelines at its previous meeting, and that ARPANSA had incorporated ICNIRP's approach into its new RPS S-1 Standard, and asked whether New Zealand should also consider updating its guidance. Ken Karipidis noted that some small but important changes had been made to the ICNIRP guidelines in RPS S-1. It was noted that the age of NZS 2772.1 was often raised as an objection to its validity.

The meeting decided to recommend that, in the light of ICNIRP's 2020 guidelines and recommendation that countries (like New Zealand) whose exposure standards are based on ICNIRP 1998 update to the new 2020 guidelines, the Ministry of Health update its own recommendations on limits for exposures to RF fields to be based on ICNIRP 2020, like RPS S-1.

Action: The Ministry of Health should consider updating its advice on limits for exposures to RF fields to be based on ICNIRP 2020, like RPS S-1.

Risk communication

The approach to dispelling myths about 5G used in the Telstra videos was raised, noting that it was a fresh approach and appeared to have been successful. Ben Blakemore raised a question about research suggesting that symptoms attributed to RF fields might, in fact, be a nocebo effect, and asked whether that meant the committee should include someone with expertise in that area. Sarah Loughran suggested that risk communication is best directed at people who are undecided, but maybe the approach to how this is done by government agencies needs to be reviewed. Martin Gledhill commented that the problem exists in other areas, such as anti-vaccination and theories on the origins of Covid-19 (and indeed, whether Covid-19 is real) so any change in approach to risk communication could be quite general. He referred back to some comments in his notes on the GLORE meeting, that there was a risk of humour undermining strong messaging, but also noting that the government of Victoria had used humour in its Covid-19 messaging.

The committee decided to ask the Ministry of Health about the options used by the Ministry (and perhaps other government agencies) for risk communication.

Action: The Ministry of Health should respond to the Committee about the options used by the Ministry (and perhaps other government agencies) for risk communication.

Conclusions

The Committee noted the reports received and advised that there was nothing in the research considered at the meeting that would lead the Committee to consider that any change in current policy was required.

Retirement

Dave McLean announced that he is retiring and that this would be his last meeting with the Committee. The Committee gave a vote of thanks for his many informed contributions over the years.

Next meeting

The next Committee meeting is proposed for Thursday 2nd September 2021. As part of the Ministry's approach to sustainability, participation over Zoom will be offered.

Martin Gledhill
Acting Secretary

19 February 2021