

Interagency Committee on the Health Effects of Non-Ionising Fields

Notes from the Meeting held on 13 February 2020 at the Ministry of Health, 133 Molesworth Street, Wellington

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), Rose Feary (Ministry for the Environment), Dave McLean (Massey University) Andrea t'Mannetje (Massey University), Isobel Stout (local government), Saerom Shin (Ministry of Health, Office of Radiation Safety).

Apologies

Andreas Markwitz (Ministry of Health, Office of Radiation Safety), Richard Jaine (Ministry of Health – Chair), Marie Gibson (DHB Public Health Units), Sally Gilbert (Ministry of Health), Sue Chetwin (Consumer NZ)

Welcome

Due to the absence of Richard Jaine and Sally Gilbert on Corona virus duties, Dave McLean took the chair, welcomed everyone to the meeting and led a round of introductions.

Finalise the agenda

The agenda was confirmed. A discussion a recent meeting with Darius Leszczynski and a National Radio item on wireless earbuds were added under "Other business".

Minutes of the previous meeting

The minutes of the meeting held on 22 August 2019 were confirmed as an accurate record of the meeting.

Matters arising

All action points have been attended to.

New Zealand Information on ELF and RF

Industry Update on Engineering and Technical Developments

Peter Berry said that the electrical distribution sector had had few EMF enquiries.

Ben Blakemore spoke to his report. There was a small typo – 5G spectrum in the 3.5 GHz band (not 2.6 GHz band) is to be auctioned.

Adam Tommy said that Dense Air, a new mobile operator, has started in New Zealand. They offer provider-neutral mobile network capacity and coverage through small cells on 2.6 GHz spectrum they own, with backhaul to the providers over existing networks.

Mathew Walker reported that Transpower receives about two EMF enquiries per week. In November 2019 Mathew and Peter Berry hosted a visitor from the Japanese EMF Information Centre (JEIC) who was interested to find out how the change to a 200 µT limit had gone in New Zealand, and how Smart Meters had been accepted. The JEIC has 6 staff and participates in the EMF Portal. They also have a rapid response group of scientists around the world to help summarise new research papers of interest. They receive about 80-120 EMF queries per month. There is an ELF meter loan service – many borrowers report that the readings were lower than they expected, and that having used the meter has alleviated concerns.

MobiKids Study

There is no new information on the MobiKids study.

InterOcc study

The InterOcc work is complete and this will be removed from the standing agenda items.

Public Health Units

There was no report from DHB public health units.

Local Government

Isobel noted that she receives the odd query if a new cellsite goes up, which almost always asks about 5G. There was a brief discussion as to why the new technology was causing such concern compared with previous generations. The ease with which material is passed around social media was raised as one possibility.

Ministry of Education

Kimbal McHugo said that Education is about to start replacing all wireless infrastructure in schools with WiFi 6 equipment.

Ministry for the Environment

Rose Feary said that there were no significant updates, but MfE are keeping an eye on the NESTF. There have been some queries on 5G. A discussion document on the Renewable Electricity NPS has been released.

Simon Cooke-Willis requested than if and when the NESTF is reviewed, consideration be given to including laser data links in the scope. These are sometimes used as an alternative to an RF link, and the class of laser they use is such that it could be hazardous if viewed through binoculars.

Energy Safety Service/Worksafe

There have been no queries received.

Ministry of Health

The correspondence on 5G has decreased a little so far this year. The Ministry has signed an MoU with ARPANSA for the exchange of information and cooperation in NIR protection. It allows for sharing guidelines and standards and undertaking cooperative research and development.

Radio Spectrum Management

There were no items to raise at the Committee.

Update on Standards

Martin Gledhill spoke to his paper on the IEEE/ICES revised exposure Standard, and mentioned that IEEE/ICES is also working on an updated exposure assessment Standard.

ICNIRP has submitted its revised RF guidelines for publication, but there is no word on when they may be published.

The Australian Communications and Media Authority, which regulates exposures from personal devices such as mobile phones, has proposed the temporary use of IEC TR 63170:2018 – *Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz* as the test method for devices operating at frequencies >6 GHz until the corresponding IEC Standard is finalised.

Australian Information on ELF and RF

The report from ARPANSA was tabled at the meeting, and taken as read. There was a typographic error in the item on EME funding: the amount available is \$9 million, not \$49 million. The committee also noted Ken Karapidis' appointment to ICNIRP, and the appointment of Rodney Croft of the University of Wollongong as ICNIRP chair.

International Information on ELF and RF

International Reports (ELF)

John Dockerty spoke to the abstracts that he had circulated. They cover the period since February 2019, when he last attended a meeting.

- Martinez – a second look at the US Moscow embassy microwave study (first reported on by Lilienfeld in 1978).
- Carpenter – Claims that source of funding influences the results reported for ELF field epidemiology studies, and that there is strong evidence for effects on adult cancers. However, the paper does not present evidence to support the assertions, and goes beyond the facts.
- Swanson et al – Non-significant decline in risk over time in ELF field-childhood leukemia studies. There are suggestions of higher risks in studies looking at higher exposures and with better exposure assessment.
- Migault et al – Overall the data are not suggestive of a risk between ELF field exposure and prematurity or being small for gestational age.
- Crespi et al – Findings suggest that magnetic fields are not a sole explanation for the association between distance from a power line and leukemia risk in children, and some other factor associated with power lines may be responsible.
- Gervasi et al – There was a weak, non-significant association between living within 50 m of transmission lines and risk of Alzheimer's and Parkinson's diseases. Latency may be an issue.
- Talibov et al – This study pooled data from several previous studies on childhood leukemia, including John Dockerty's. A comprehensive job-exposure matrix was used to assess parental occupational ELF field exposures but there was no association with childhood leukemia.
- Sorahan – Individual exposures were not assessed, and overall there was evidence for the "healthy worker" effect. People in the study were involved in a wide variety of work, which explains the diverse outcomes found.
- Peters et al – ELF fields and electric shocks were both associated with risk of ALS. There was no dose-response for ALS. Dave McLean noted that he is involved with a similar study that finds risks associated with electric shocks but not ELF fields. Previous studies, however, have found risks associated with ELF fields.
- Bodewein et al – Studies on intermediate field (IF) exposures are very heterogeneous, and for most endpoints are insufficient for drawing conclusions. Future studies should take a more systematic approach.

International Reports (RF)

Martin Gledhill spoke to the abstracts which he circulated to the meeting. The discussion included comments that:

- Vienne-Jumeau et al – review primarily based on published meta-analyses, and notes the low quality of some work and problems defining exposure/dose.
- Brzozek et al – proposal to improve dosimetry in cellphone studies.
- Luo et al – This is a re-analysis of data already analysed by the authors in a paper which found no association between cellphone use and thyroid cancer. There did not appear to be any a priori hypothesis, and the statistical methods used look as though they would throw up many chance correlations. The authors note that replication is needed to confirm

any findings, and further evaluation is needed. Dave McLean noted that there is a genetic component in many diseases.

- Liu et al – Associations between mobile phone use and depressive symptoms appears to be linked to screen time and sleep disturbance rather than RF exposure.
- Miller et al – Call for a re-evaluation of RF by IARC, and systematic reviews by WHO of non-cancer outcomes. Both of these are in hand.
- Elwood et al – This was a response to the Pockett viewpoint published at the end of 2018. A subsequent letter to the NZMJ editor and response by Prof Elwood, discussing the NTP rat and mouse study, have also been published.
- Mireku et al – A further study linking night time use of devices and poor sleep, which again suggested the device use was the factor of interest.
- Brzozek et al – More sophisticated analysis of data on the effect of mobile phone use on cognitive function resulted in weaker associations for those outcomes where associations had been found.
- Pall – Claims to find that various microwave exposures cause diverse neuropsychiatric effects, mediated by actions of microwaves on voltage-gated calcium channels in cells. Cites a previous paper by the same author as the basis for the proposed mechanism but this only had one reference on the effects of microwaves. Previous papers on interaction mechanisms have discounted the ability of RF/microwaves at the levels being discussed by Pall to have any effects. No explanation of how the studies cited were selected and no assessment of study quality.
- Scmiedchen et al – Finds that many studies on IEI-EMF (EHS) have methodological limitations that could have given rise to false positives or negatives. The studies with good methodology indicate that effects unlikely.
- Houston et al – Finds damage in mouse sperm after exposure to moderately high levels and suggest this could be a sensitive tool for evaluating effects of exposure.
- Nakatani-Enomoto et al – Exposure to 4G-type signal produced enhanced EEG waves in some frequency bands, but they could be explained by subject's drowsiness. No harmful effects detected.
- Velghe et al – Found that exposure surveys where participants were personal exposimeter give reproducible results. Highest mean total exposure was found in Brussels, but highest mobile downlink exposures were found in Antwerp.
- Migault et al – Describe another job-exposure matrix based on INTEROCC covering frequencies from 100 kHz to >10 MHz.
- Vijaylaxmi et al – Analysed publications on genetic damage from RF and found that only 9% acknowledged funding by industry (vs 53% by government sources and 26% not mentioning funding source). Industry-funded studies scored better in a quality evaluation.
- Vanbergen et al – No clear evidence as to whether RF fields pose a threat to insect pollinators – there is only one good study available, and that one reports both positive and negative effects.
- Narayanan et al – Appear to suggest that little research has been done, which is far from the case, and conclusions at odds with those of health and scientific review groups.
- Yu et al – Suggest that exposure to 4G signals affects male fertility, but very poor dosimetry.
- Panagopoulos et al – Suggests that exposure to 3G signals is genotoxic but very poor dosimetry.
- Broom – Found behavioural effects on mice – effects at moderate exposure were the opposite of those at high exposure.
- Simko et al – Reviewed in vivo and in vitro studies on effects of RF between 6-100 GHz. While many effects reported there were no consistent relationships between effects and power density, exposure duration or frequency. Study quality needs to be improved.
- Smith-Roe et al – This paper describes part of the NTP study. Assessed DNA damage and found increases in some organs for some modulations in either rats or mice. Vijaylaxmi et al questioned the methods, statistics and conclusion that RF is associated with DNA Damage. Smith-Roe et al defended the methods and transparency of data handling.

- Perov et al – Found that low RF exposure stimulated adrenal gland activity, which could be indicative of a stress response.
- Bosquillon de Jenlis et al – Hypothesised that RF + noise would lead to significant effects on sleep in rats, but found that only RF exposure caused changes in sleep parameters – the addition of noise made no difference.
- Kim et al – When exposed to high levels of RF, mobile rats showed no temperature increase but non-mobile anaesthetised rats had large body temperature increases.
- Furman et al – High intensity pulsed microwaves had no effect on physical, physiological or behavioural status of mice.
- Habash et al – Concluded that more epidemiological research is needed to clarify currently inconclusive data on effects of ELF fields.
- Tognola et al – Identified residential characteristics associated with high ELF field exposure in France.
- Paakkonen et al – found low ELF fields in petrol, hybrid and electric cars. Found that all levels were low, and levels in electric vehicles were (just) the lowest. Martin Gledhill commented that other studies have found higher levels in all types of cars. Magnetic fields in petrol vehicles come from magnetised steel in tyres, fans etc.
- Lai – Discusses cellular free radicals associated with ELF and static fields and the types of effects they might have. Notes that there is no credible hypothesis or mechanism that could explain any effects of fields on free radicals.
- Brech et al – Found increase in DNA damage in cells exposed to high levels of IF-EMF.

Other business

Meeting with Darius Leszczynski

An invitation to a meeting with Dr Darius Leszczynski had been circulated to the committee in November. This was attended by Dave McLean, Rose Feary and George Slim (who provides policy advice to the Prime Minister's Chief Science Advisor (PMCSA)).

Dave considered that Dr Leszczynski was familiar with the literature but had a different understanding of its implications than himself, and was selective in his choice of literature. Dr Leszczynski was on the 2011 IARC panel that assessed RF, and there was some discussion about this. Dave considers that IARC is highly credible, and for that reason was disconcerted when he heard a radio interview with the PMCSA in which she noted that she:

"believes people also get confused, because radiofrequency radiation is classified as a "possible" human carcinogen. Out of five levels, that puts radiofrequency radiation in the same category as pickles and dry cleaning.... "Possibly carcinogenic means we can't rule it out, but it is a very low risk".

This indicates a misunderstanding of IARC's work, which classifies agents according to the quality and reliability of the evidence, and not the magnitude of any risk that may or may not be present. The meeting considered that the Ministry of Health should write to the PMCSA to express the Ministry's confidence in the IARC evaluation process, and ensure that she fully understands the IARC classification scheme.

Dave also asked whether there would be benefit in widening representation on the Interagency Committee.

Item on National radio about wireless earbuds

There was an item on National Radio recently where Jim Mora interviewed Joel Moskowitz, who has suggested that high SARs from wireless earbuds could cause health effects, and Ken Karapidis of ARPANSA who maintained that exposures are low and we are protected by current safety standards. Martin Gledhill noted that Apple Airpods are Bluetooth 3 devices, which mean that they can transmit at up to 100 mW power, but also use power control to reduce that to what is needed to maintain a wireless connection. The SAR at full power is 0.46 W/kg.

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.

Next meeting

The next Committee meeting is proposed for Thursday 13 August 2020, in the afternoon.

Martin Gledhill
Acting Secretary

18 February 2019

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