

ICNIRP (the International Commission on Non-Ionising Radiation Protection)

ICNIRP was formed in 1992. In 1998 ICNIRP published its thermal (heating and shock) guidelines. These have been widely criticized for rejecting evidence of adverse health effects at sub-thermal or biological and cancer levels. Many scientists now feel that, unless ICNIRP adopts appropriate biological guidelines, it should be disbanded or its membership should be replaced by those who accept biological evidence. Such scientists could be drawn from the authors of the BioInitiative Report in 2007 or the International Commission for Electromagnetic Safety (ICEMS) or the many medical doctors who have petitioned governments to set new standards, along with the many other concerned scientists around the world who argue that to protect the human race it is essential to have biological and cancer safety guidelines.

Weaknesses in ICNIRP's rationale for its 1998 guidelines

1. A supposed absence of “consistency” and “established effects”.

A typical phrase in ICNIRP's justification for rejecting the thousands of studies showing sub-thermal adverse effects is that there is “no consistent evidence of adverse ... effects” (p.498).

Thus, if a few studies, perhaps sponsored by industry show no effects, these negative findings are held by ICNIRP to outweigh all the positive findings by independent scientists. Another word based on similar reasoning is “established”. Thus ICNIRP states that “Restrictions on the effects of exposure are based on established health effects” (p.508), although it is not often made clear how studies would provide the “established” effects necessary for instituting biological guidelines compared with heating safety levels, despite the fact that many scientists would accept that many sub-heating effects are now very well “established”..

2. A supposed absence of mechanism.

Where a possible mechanism has not been fully elucidated, ICNIRP feels competent to reject epidemiological results it otherwise accepts. Thus the link between power lines and childhood leukaemia was published in 1979 and almost all scientists now accept its validity. Even ICNIRP in 1998 accepted its validity from epidemiological evidence - “The fact that results for leukemia based on proximity of homes to power lines are relatively consistent ...” (p.499) - but then rejected the

implications of the overwhelming epidemiological evidence on the grounds that “experimental research” and “laboratory studies”, presumably into possible mechanisms, did not provide a sufficiently strong support: “It is the view of the ICNIRP that the results from the epidemiological research on EMF field exposure and cancer, including childhood leukemia, are not strong enough in the absence of support from experimental research to form a scientific basis for setting exposure guidelines” (p.499) and “In the absence of support from laboratory studies, the epidemiological data are insufficient to allow an exposure guideline to be established” (p.503).

This is an extraordinary approach to public health. In many other areas of risk, such as the link between smoking and lung cancer, the failure to identify an exact mechanism has not prevented governments from restricting smoking. IARC was able to classify power line frequencies as possibly carcinogenic without establishing a mechanism.

3. A supposed absence of “clear” or “conclusive” or “convincing” evidence

Other phrases used by ICNIRP to reject adverse reactions include a lack of “clear” or “conclusive” or “convincing” evidence, although it is unclear what these words actually mean. Thus “However, there is no clear evidence that these biological interactions of low frequency fields lead to adverse health effects” (p.501) seems both to admit “biological interactions” but also simultaneously to assume that they have positive health effects because no harmful effects have yet been perceived.

Again, while listing studies which appear to show links between leukaemia and radio or TV stations, ICNIRP blandly asserts that “recent studies of populations living near EMF transmitters have suggested a local increase in leukemia incidence (Hocking et al. 1996; Dolk et al. 1997a, b), but the results are inconclusive” (p.504).

Even as regards microwave radiation, where there have been numerous reports of adverse effects at sub-heating levels since the 1950s, ICNIRP evades facing the issue by stating: “Although there are deficiencies in the epidemiological work, such as poor exposure assessment, the studies have

yielded no convincing evidence that typical exposure levels lead to adverse reproductive outcomes or an increased cancer risk in exposed individuals” (p.507).

Many other scientists have argued that the evidence is sufficiently “clear” or “conclusive” or “convincing” and that ICNIRP’s rejection of the evidence on subjective grounds lacks scientific objectivity.

4. Assumptions about medical effects of EMR
Some of ICNIRP’s attempts to dismiss studies finding links with cancer appear to make assumptions which are unwarranted, given the existing level of medical research, such as: “An elevated cancer risk among exposed individuals was observed, but the type of cancer of which this was true varied from study to study” (p.500). Again: “If there is truly a link between occupational exposure to magnetic fields and cancer, greater consistency and stronger associations would be expected of these recent studies based on more sophisticated exposure data” (p.500). It is not explained why electro-magnetic radiation operating

at a quantum level and at sub-thermal exposures has to affect the human body in ways so far observed which are less varied and more consistent with expectations from conventional medicine.

5. Assumptions based on a priori beliefs

Where studies have revealed new and unexpected findings on how EMFs are biologically active, ICNIRP appears to think that the effects may not exist or are unimportant, based on a belief that such a finding “challenges the traditional concept” or is too “complicated”. Thus “Interpretation of several observed biological effects of AM electromagnetic fields is further complicated by the apparent existence of ‘windows’ of response in both the power density and frequency domains. There are no accepted models that adequately explain this phenomenon, which challenges the traditional concept of a monotonic relationship between the field intensity and the severity of the resulting biological effects” (p.507). As often, the ICNIRP attitude is to ignore such findings, however complex, rather than seek to understand and evaluate them: “Overall, the literature on athermal effects of AM electromagnetic fields is so complex,

the validity of reported effects so poorly established, and the relevance of the effects to human health is so uncertain, that it is impossible to use this body of information as a basis for setting limits on human exposure to these fields” (p.507).

To dismiss all the hundreds of studies on adverse sub-thermal effects simply because the science is complex and subtle and also challenges existing assumptions appears inadequate for a committee claiming expertise in this area.

6. Assertion that more confirmation is needed
It is sometimes unclear how many studies are needed to confirm an observation and for what reason. Six studies, for instance, by more than four scientists are listed in support of the statement that “Studies on mammary cancer development in rodents treated with a chemical initiator have suggested a cancer-promoting effect of exposure to power-frequency magnetic fields in the range 0.01–30 mT” (p.502). The next sentence explains the hypothesis that EMR leads to the “suppression of pineal melatonin and a resulting elevation in steroid hormone levels and breast cancer risk”,

supported by two studies by the same scientist. The paragraph then continues: “However, replication efforts by independent laboratories are needed before conclusions can be drawn regarding the implications of these findings for a promoting effect of ELF magnetic fields on mammary tumors.”

Another example is “An association between Alzheimer’s disease and occupational exposure to magnetic fields has recently been suggested (Sobel and Davanipour 1996). However, this effect has not been confirmed” (p.500). Here a recent study (Huss et al., 2008), with dose-dependent findings based on a population survey of 4.7 million people, has appeared to confirm this suggestion of 12 years before. It could be argued, however, that ICNIRP should have acted on the basis of precaution in 1998 without awaiting an ill-defined “confirmation” and thus saved much suffering.

7. Supposed single interpretation of data

It is odd that ICNIRP in 1998 did not admit even then to a considerable degree of uncertainty and the need for differing interpretations, since many of the leading involved scientists had long believed that

there were sub-thermal adverse effects from EMR. It was therefore misleading to draw conclusions from the vast amount of data claiming that there was only one possible interpretation: “it can only be concluded that there is currently no convincing evidence for carcinogenic effects of these fields and that these data cannot be used as a basis for developing exposure guidelines” (p.503). Here, in addition, the unsupported use of the word “convincing” begs the argument, since other scientists were convinced on less evidence long before 1998 and some in the 1970s.

8. Susceptible sub-groups of the general public
There is problem over the definition of “the general public”. In contrast to “occupational exposure” it means anyone who is not employed in the electricity or transmitting industry. Nevertheless there are likely to be sub-groups of the general population who are especially susceptible to EMR for genetic or epigenetic reasons. This factor is admitted by the ICNIRP statement: “By contrast [with occupationally exposed adults], the general public comprises individuals of all ages and of varying health status, and may include particularly susceptible groups or

individuals” (p.509). Now that epigenetic factors, in the form of a variant gene which does not promote DNA repair but which is carried by 4-20% of the population, has been linked with incidences of childhood leukaemia in a dose-response relationship in proximity to power lines (Yang 2008), it appears that, to protect such sub-groups, general action will be needed which will affect all the general population. Guidelines therefore need to be set to cater for the very low exposure levels at which these sub-groups are susceptible. One major sub-group is that of children, whose nervous systems are still developing and whose bodies will proportionately and cumulatively absorb more radio and microwave frequency radiation than adults.

9. Failure to provide protection

Even where ICNIRP admits that a sub-thermal effect is well established, it can still refuse to implement any form of protection. Thus ICNIRP admits that “microwave hearing” has been studied with papers published since 1961, and the 1998 ICNIRP review states “Repeated or prolonged exposure to microwave auditory effects may be stressful and potentially harmful” (p.506), but there

is no suggestion of protecting the general public.

[Read ICNIRP's rationale of its 1998 guidelines here...](#)

Uncertainties over ICNIRP's membership and aims

1. Inadequate evaluation, protection and independence

ICNIRP claims that it is “an independent group of experts established to evaluate the

state of knowledge about the effects of NIR on human health and well being, and, where appropriate, to provide scientifically based advice on non-ionizing radiation protection including the provision of guidelines on limiting exposure” (p.540). All these three claims – independence, evaluation and protection - have been much disputed in recent years:

- Inadequate evaluation - Although ICNIRP claims sufficient expertise to evaluate appropriately all the scientific evidence on the health dangers of non-ionising radiation, its traditional preponderance of physicists has suggested otherwise. The fact 14 leading international scientists studied the same evidence but deduced entirely different results in the form of the BioInitiative Report of 2007, suggests

that either ICNIRP or the BioInitiative scientists are inadequately skilled in their evaluation. Moreover other organizations, such as the Russian NCNIRP have agreed with the BioInitiative scientists and not ICNIRP. The sheer weight of evidence, where even the WHO admits that 80% of studies in some areas show sub-heating adverse health effects, suggests that ICNIRP as currently constituted lacks the necessary medical and biological expertise to assess the relevant data.

- Inadequate protection - Although ICNIRP's title includes the word 'Protection', it does not appear to operate as a committee protecting the health of the general public. Such a "protection" committee would act decisively on evidence

suggesting even a 10-30% likelihood of a health risk from environmental pollution like electro-magnetic radiation. To demand 95% scientific certainty may suit a research committee, but not one committed to safeguarding public health where caution in the face of growing evidence of harm is essential.

- Inadequate independence - Although ICNIRP claims its members “are not affiliated with commercial or industrial enterprises” (p.540), many observers regard ICNIRP as simply a front for the demands of the telecoms and TV industries. There is, for instance, serious disquiet about the way ICNIRP members are selected. Dr Louis Slesin wrote in June 2007:

"It should be noted that ICNIRP is not a transparent organization. It has never disclosed the sources of its funding nor the procedures for the selection of its members. ICNIRP was established by Mike Repacholi, who has long had financial ties to both the telecom and electric utility industries. "

2. Out-dated statements and infrequent reviews

Some of ICNIRP's statements claiming no biological effects are now generally regarded as out-dated. Thus, for pulsed electro-magnetic radiation, the assertion that "Epidemiological studies on exposed

workers and the general public have provided limited information and failed to demonstrate any health effects” (p.508) has been disproved by studies over the last seven years showing ill health in dose-dependent levels around mobile phone transmitter masts, in addition to those on radar, TV and radio transmitters.

By setting the timing of the first interim review of the 1998 guidelines at eleven years later, in 2009, and then in 2013, it appears that ICNIRP is directly responsible for much human suffering, even assuming that biological and cancer safety limit guidelines are introduced then. Equally, ICNIRP also appears responsible for significant ecological damage from environmental EMR pollution.

3. The power of the telecommunication

and TV industry

Before ICNIRP began, in 1985 Becker and Selden, two leading researchers on sub-thermal effects, wrote: “Our survival depends on the ability of upright scientists and other people of goodwill to break the military-industrial death grip on our policy-making institutions.” (Becker, RO, and Selden, G, *The Body Electric: Electromagnetism and the Foundation of Life*, (New YorkL Harper) 1985, p.329.)

For many people the problem with ICNIRP is the way it appears to respond to the wishes of the military, TV operators and mobile phone industries, and governments who rely on them for tax revenues and for checking locations of citizens by tracking

mobile phones. Most scientists and doctors assume that ICNIRP should respond to the health needs of the general population, instead of apparently supporting guidelines which seem to maximize immediate profit and tax revenue.

It is unlikely to be ignorance of the science which holds back ICNIRP from issuing sub-thermal or biological guidelines. In 1992 the German Radiation Protection Commission stated that adverse sub-thermal effects had been published since 1977: "Specific effects which are not related to heating have been described in the scientific literature for approximately 15 years. If a high frequency radiation is amplitude modulated with another frequency, field effects can occur, which do not exist under un-modulated radiation. These manifest mostly as changes in the

permeability of the cell membranes."

Federal Gazette no. 43, Publications of the Federal Radiation Protection Commission, Germany, 03 March 1992, 24, p.6.

http://www.hese-project.org/hese-uk/en/nie mr/health.php?content_type=R&list=frequency

In August 1995, before ICNIRP's denial of sub-thermal dangers in 1998, Professor Ross Adey, chairman for the U.S. National Council for Radiation Protection and Measurement's (NCRP) committee evaluating the standards for power-line frequency electromagnetic fields, wrote:

"The laboratory evidence for athermal effects of both ELF and RF/Microwave fields now constitutes a major body of scientific literature in peer-reviewed journals. It is my personal view that to

continue to ignore this work in the course of standard setting is irresponsible to the point of it being a public scandal."

Dr. John Goldsmith (author of 'Epidemiological Evidence of Radiofrequency Radiation (Microwave) Effects on Military, Broadcasting and Occupational Studies', 1995) wrote:

"There are strong political and economic reasons for wanting there to be no health effect of RF/MW (radiofrequency/microwave) exposure, just as there are strong public health reasons for more accurately portraying the risks. Those of us who intend to speak for public health must be ready for opposition that is nominally but not truly, scientific."

Quoted in Elettromagnetics Forum, 1997, 1 (2), no. 7:

http://www.emfacts.com/forum/issue2/mag_6.html

At first the main opposition to sub-thermal or biological safety limits came from the western governments and their military forces. Once the health risks were identified in the 1940s and 1950s from radar, it became increasingly expensive to provide sufficient buffer zones around airports and power lines. Only Russia, China and other countries following the implications of their medical research adopted biological limits. In the early 1990s, when the first links between mobile phones and brain tumours appeared, the industry, supported by some governments, lobbied for health issues to be banned from planning permission for transmitter masts. At the same time Motorola established a research team, which was accused of trying to find only

positive evidence about phones, and ICNIRP was established. The industry had learnt from the problems faced by tobacco companies and wanted to maximize their profits for as long as possible before legal claims could be upheld.

[Read ICNIRP's statement, "General approach to protection against non-ionising radiation" here...](#)