The National Toxicology Program animal study

The findings of the NTP animal study contributes to the wider research on radiofrequency (RF) and health. The findings are not applicable to people using mobile phones because the study exposed animals to RF differently and further research is recommended in this area. Based on this current information, we believe the current safety limits for mobiles phones remain acceptable for protecting the public's health.

The United States Department of Health and Human Services National Toxicology Program (NTP) recently completed a series of studies, which investigated whether exposure to RF radiation causes any health effects, including cancer, in rats and mice. The final reports from the rat and mouse studies as well as a press release and a fact sheet are available from the NTP website.

The studies exposed rats and mice to RF at the same frequencies used by the 2G and 3G mobile phone networks. The animals were exposed to varying RF levels up to 10 watts per kilogram (W/kg) for up to 9 hours at a time. Australian mobile phone exposure level limits are set at 2 W/kg, however most mobile phones have lower exposure levels.

The NTP reported that there was varying evidence that exposure to high RF levels was associated with tumours of the heart, brain and adrenal glands of male rats. There was no clear evidence of any tumours in female rats, and male and female mice. The NTP also noted that these results cannot be directly applied to humans for two main reasons:

- The RF levels and durations of exposure in this study were greater than what people receive from mobile phones.
- The rats and mice were exposed to RF across their whole bodies, which is different from the more localized exposure that humans receive from mobile phones.

ARPANSA supports the completion of the NTP study, which has a number of strengths including using a large number of animals exposed across their lifetime. A close analysis of the NTP study shows a number of limitations, which further question the relevance of the findings to human health:

- The rats exposed to RF lived longer than the control rats (not exposed to RF). This can bias the results since the incidence of cancer is likely to increase in rats that live longer.
- The reported effects occurred in rats but not in mice. There is no plausible explanation why the reported effects occurred in one species but not the other.
- The reported effects occurred in male rats but not in females. There is also no plausible explanation why the reported effects occurred in males but not in females.
- There was no clear dose-response found i.e. there was no clear relationship showing the incidence of cancer changed with the varying RF levels that the rats were exposed.
- It is possible that the reported effects occurred due to chance. This is because the study conducted a number of different tests and statistically there was no indication that the increases in cancer incidence was more than what would be expected by chance alone. This is often called the multiple comparisons or multiple testing problem.

These points are not resolvable within the current study results due to the study design. The absence of findings in mice or female rats leaves significant doubt about the study outcome and its relevance to humans at lower exposure levels.

A detailed analysis of the NTP study has been published by the International Commission on Non-Ionizing Radiation (ICNIRP), which is the peak international organisation in providing science-based advice on limiting exposure to non-ionizing radiation. ICNIRP concluded that the NTP study does not provide a consistent, reliable and generalizable body of evidence that can be used as a basis for revising current human exposure guidelines to RF.

No single study considered in isolation will provide a meaningful answer to the question of whether RF from mobile phones and other everyday sources can cause or contribute to adverse health effects in people. Animal studies can often be expected to provide information regarding potential health outcomes, but because of the differences between species the data may not be extendable or applicable to providing information on risk to humans. ARPANSA welcomes new research in this area and recently published a research agenda, which provides specific research recommendations on RF and health. The ARPANSA research agenda specifically recommends further animal studies investigating mobile phones and cancer.

The ARPANSA RF Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields is designed to protect people of all ages and health status against all known adverse health effects from exposure to RF EME. It is based on scientific research that shows the levels at which harmful effects occur in people, and it sets safety limits based on international guidelines that are considered best practice, well below these harmful levels. Based on the finding of this NTP study, we believe the current safety limits for mobiles phones remain acceptable for protecting the public's health.

We also publish information about mobile phones and health. A large number of studies have been performed to investigate whether mobile phones pose a potential risk to human health. It is the assessment of ARPANSA and other national and international health authorities, including the World Health Organization, that there is no established scientific evidence that the use of mobile phones causes any health effects. However, the possibility of harm cannot be completely ruled out. For those concerned about health effects, ARPANSA provides advice on how to minimise exposure.

ARPANSA will continue to assess new research, including the rollout of new and emerging technologies, including the rollout of the 5th generation of mobile communications, in order to provide the Australian public with independent scientific information and advice.