

Don't hang up yet: the latest study linking mobile phones to cancer has big problems

May 30 2016, by Rodney Croft, University Of Wollongong



Credit: AI-generated image ([disclaimer](#))

You may have seen the headlines over the weekend, reporting on a new study that's supposedly found a link between [mobile phones and cancer](#). But all is not quite as it seems. And much of the alarm raised by the study is misplaced.

First, a bit of background. The study was set up by the US National Toxicology Program ([NTP](#)) in response to concerns about the potential health effects of radiofrequency (RF) emissions from mobile telecommunications devices. It was set to determine whether chronic RF exposure caused cancer in mice and rats.

This was a large, well-funded study, and as such has been eagerly awaited by RF health scientists and [policy makers](#) alike. The issue of whether RF emissions can cause cancer has been hotly debated, and the evidence to date has been unable to settle the matter conclusively.

The [report](#) concludes that:

[...] the observed hyperplastic lesions and glial cell neoplasms [cancer] of the heart and brain [in rats] were likely caused by the RF.

In short, it found radiation similar to that generated by mobile phones appeared to cause cancer in some rats.

Uncertainties

But it's difficult to interpret the report in the proper light because it was released without normal scientific evaluation. The authors argued that they did this because of both strong media interest and the importance of the results to human health.

This argument would suggest that they had shown something sufficiently unambiguous to clarify this important issue. The problem is, the results of this report are far from unambiguous.

Even given that science can never be 100% certain of its conclusions, there is still reason for me to believe that the report's conclusions have overstepped the mark.

First, in terms of the generalisability to public health, it is important to note that the study did not use exposure levels relevant to mobile phones.

It used whole body average specific absorption rates (SARs) of 1.5 watts per kilogram of body mass, three watts per kilogram and six watts per kilogram. But the [maximum allowable SAR](#) for the general public is 0.08 W/kg.

This does not make the results of the report meaningless, as even at six watts per kilogram, this would be a novel finding. But science has already found that very high RF levels can cause tissue damage. Even if they're true, the conclusions would not require an urgent public health communication.

Second – and perhaps more importantly – there are a number of counter-intuitive results and missing details that require clarification before the conclusions can be accepted. These oddities were highlighted by internal reviewers listed in the report, but their concerns have yet to be fully addressed.

For example, the control animals – those that weren't exposed to high levels of RF emission – died earlier than the RF exposed animals. We also expect control rats to develop *some* tumours over their lifetime, and the control rats in this study had *none*.

This raises questions about the adequacy of the controls. The issue was raised by reviewers, with one noting that if the RF group was compared to a normal [control group](#) (by adding just *one* tumour to the control group) that the finding would no longer be statistically significant.

Further, information about how the statistics accounted for the early death rate is missing. If tumours in the RF groups developed after the controls had already died, then this would skew results and so needs to

be carefully dealt with.

Also missing is crucial information about randomisation, which a reviewer noted can lead to differences in survival rates.

Similarly, other important information is not provided – such as results from the equivalent analyses in mice – making it very difficult to know if the findings merely represent chance.

Off the hook

Given these issues, it is clear that greater detail and scientific review is required to know whether the results are important to science and the public. This goes against the claim by the report's authors that urgent publicity for the study is warranted.

The NTP study will need to be fully evaluated once further details requested by internal reviewers become available. And it will need to be considered within the context of the RF bioeffect literature more generally.

At present, though, and particularly given the uncertainties regarding its results, the NTP report does not provide reason to move from current scientific consensus that *mobile phone-like exposure does not impact health*.

I agree with two of the report's reviewers, who state that "additional experiments are needed to assess if the incidence of brain gliomas in male rats exposed to GSM- or CDMA- modulated RFR is significantly higher than the control group or not", and "I am unable to accept the authors' conclusions."

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