5G hysteria is coming ...

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https://www.abc.net.au/radionational/programs/greatmomentsinscience/dr-karl-5g-hysteria-cancer-radiation/11164020#transcript

Transcript

Hide

Dr Karl: G'day, it's Dr Karl here.

Now like it or not, the 5G telephone network is coming. And it offers blisteringly fast download speeds - up to 1 gigabyte per second!

That's almost as astonishing as the negative publicity around 5G telephone networks!

It claims that vast numbers of people have already died from various cancers given to them by the evil 5G radiation, which has apparently also killed vast swathes of forest across the world.

Kruszelnicki makes these assertions yet, with the cancer claim, is knowingly willfully conflating concerns about existing mobile technology and legitimate concern about future radiation exposure from 5G. He provides no substantiation or evidence that anyone has claimed that 5G has already caused cancer.

Similarly, research has shown damage to trees by existing mobile technology. I am unaware of any claims made that “5Ghas apparently also killed vast swathes of forest across the world.”

https://www.ncbi.nlm.nih.gov/pubmed/27552133

Radiofrequency radiation injures trees around mobile phone base stations.

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Abstract

In the last two decades, the deployment of phone masts around the world has taken place and, for many years, there has been a discussion in the scientific community about the possible environmental impact from mobile phone base stations. Trees have several advantages over animals as experimental subjects and the aim of this study was to verify whether there is a connection between unusual (generally unilateral) tree damage and radiofrequency exposure. To achieve this, a detailed long-term (2006-2015) field monitoring study was performed in the cities of Bamberg and Hallstadt (Germany). During monitoring, observations and photographic recordings of unusual or unexplainable tree damage were taken, alongside the measurement of electromagnetic radiation. In 2015 measurements of RF-EMF (Radiofrequency Electromagnetic Fields) were carried out. A polygon spanning both cities was chosen as the study site, where 144 measurements of the radiofrequency of electromagnetic fields were taken at a height of 1.5m in streets and parks at different locations. By interpolation of the 144 measurement points, we were able to compile an electromagnetic map of the power flux density in Bamberg and Hallstadt. We selected 60 damaged trees, in addition to 30 randomly selected trees and 30 trees in low radiation areas (n=120) in this polygon. The measurements of all trees revealed significant differences between the damaged side facing a phone mast and the opposite side, as well as differences between the exposed side of damaged trees and all other groups of trees in both sides. Thus, we found that side differences in measured values of power flux density corresponded to side differences in damage. The 30 selected trees in low radiation areas (no visual contact to any phone mast and power flux density under 50μW/m^2) showed no damage. Statistical analysis demonstrated that electromagnetic radiation from mobile phone masts is harmful for trees. These results are consistent with the fact that damage afflicted on trees by mobile phone towers usually start on one side, extending to the whole tree over time.

That's amazingly fast-acting even for evil radiation, considering that by April 2019, the 5G phone networks had been deployed for only a few months in a handful of cities in South Korea, China and the USA.

Now all mobile phones -- including 5G - use high frequency radio waves. That's a type of electromagnetic wave.

So let me start with the electromagnetic spectrum.

The bit that we're most familiar with is the visible light spectrum, which covers all the colours of the rainbow from red to violet. It's just a tiny part of the spectrum, sitting around the middle.

We measure the frequency of electromagnetic waves in "cycles per second", which is usually abbreviated to "hertz" (Hz).

Down the bottom end of the spectrum we have the extremely low frequency band, or ELF. It runs from 3 to 30 Hz, or cycles per second.

So in each second, these electromagnetic waves go up and down between 3 and 30 times.

You can send information only each time the wave goes up and down. So the ELF band can send data only very slowly. But the ELF waves will penetrate the ground beneath our feet, and even the oceans. So ELF frequencies were used to communicate with submarines, while they were underwater.

Heading up the spectrum, we run into the Ultra Low Frequency band, which runs from 300 to 3,000 Hz. Because the frequency is higher, you can send more information in each second, but the waves don't penetrate as well. But they will still penetrate the ground, so they're used in underground mines.

Then as we get into the higher frequencies, we come across the million Hz (or megahertz) band (which is used for AM radio) and 100 million Hz band (or 100 megahertz, which is used for FM radio and TV).

Once again, we have the same deal -- as the frequency gets higher, we can send more information in each second, but the signal is more easily blocked by solid stuff like the concrete in buildings.

Our current 4G mobile phone networks run at frequencies between 700 MHz and a few thousand megahertz (which is the same as a few gigahertz.)

Now the new 5G network uses two main bands -- one under 6 GHz (that's six billion cycles per second), while the other one is above 24 GHz.

So that's higher frequency than 4G, but it's still lower than visible light which sits around 600,000 GHz.

So now it's time to re-emphasise two points.

First, as the frequency gets higher, we get more cycles per second, so we can transmit more data. So it's just plain old physics that lets the 5G network transmit data to our phones at 1 Gb a second.

This is a misleading statement as it implies that the only way to transmit more data is to increase the transmission frequency.
In fact, 4G technology evolution continues to deliver more data throughput, from 10Mbps for UE Category 1 to 3000Mbps for UE Category 8 (LTE-A), a 30,000% increase in download speeds with the same frequencies.
See for example:
https://www.cablefree.net/wireless-technology/cablefree-4g-lte-advanced-carrier-aggregation

Second, as a frequency gets higher, the ability of the radio signal to pass through stuff gets less. Once again, plain old physics tells us that the 5G radio signal will be more easily blocked by the concrete in buildings than our current 3G or 4G phones.

So what about the big cancer scare?

Well that goes back to the fact that some electromagnetic radiation is able to damage atoms. To be more specific, the damage is that the atom gets some of its electrons knocked off. An atom that has lost electrons like that is called an "ion", so this radiation is called "ionising radiation". Ionising radiation is well known to cause cancer.

In the electromagnetic spectrum, there's a very special barrier at the colour violet. It's the barrier between "ionising radiation" and "non-ionising radiation", which means it's the barrier between cancer and non-cancer.

Violet light will not damage atoms. But any radiation with a higher frequency can cause cancer.

This is a highly misleading statement. Kruszelnicki is implying multiple incorrect hypotheses:

1. That ionisation is the only cancer-causing effect of ionising radiation. From https://molecular-cancer.biomedcentral.com/articles/10.1186/s12943-016-0577-4 :
   "Radiotherapy causes DNA damage directly by ionization or indirectly via the generation of reactive oxygen species (ROS), thereby destroying cancer cells."
2. That ionisation is required to induce cancer. IARC's list of 'known carcinogens' shows 91% of known carcinogenic agents are not ionising agents:
   https://en.wikipedia.org/wiki/List_of_IARC_Group_1_carcinogens
3. That non-ionising radiation cannot cause cancer. This is the subject of great scientific debate. In 2011, IARC classified non-ionising radiation as a Class 2B carcinogen 'POSSIBLY CARCINOGENIC TO HUMANS'. Indeed, some 35 bodies of evidence provided by Dr Martin Pall (University of Washington), in an open letter to ARPANSA cited ""Cancer including initiation, promotion and progression, further including tumor progression, tissue invasion and metastasis) (35 reviews)."
   https://stopsmartmetersau.files.wordpress.com/2019/03/prof-pall-response-to-arpansa-letter-4-march-2019.pdf
4. Kruszelnicki does not address the multitude of other potential health risks associated with non-ionising radiation from cell phone infrastructure, including Oxidative stress and free radical damage (19 review studies), Calcium channel stimulation (15 review studies), DNA damage (21 review studies), Apoptosis (13 review studies),

Inflammation, Glucose metabolism disruption, Endocrine effects (12 review studies) and Heat-shock protein formation

Ultraviolet light is the weakest ionising radiation. It has a slightly higher frequency than violet light -- at around 30,000,000 GHz - and it does have enough energy to knock the electrons out of atoms. After all, we know that ultraviolet light can cause skin cancers, which is why we put on sunblock.

Kruszelnicki implies here that the sole mechanism whereby ultraviolet light causes cancer is ionisation, whereas other mechanisms exist including oxidative stress.

As we keep going through the spectrum to higher and higher frequencies we reach X-rays and finally gamma rays. These types of ionising radiation carry more energy, and if they land on human flesh, they can cause cancer. We know that both x-rays and gamma rays can cause cancer.

As noted previously, it is well established that radiotherapy using X-rays may be effective also via non-ionising mechanisms. This statement once again leads the audience to believe that the only mechanism involved when considering electromagnetic radiation is that of ionisation vs non-ionisation. This is incorrect and highly misleading.

But let's go back, away from cancer land, to that tiny part near the middle of the electromagnetic spectrum which is the visible light band.

As we travel in the other direction, from violet light to red and beyond, the frequencies get lower. This is all non-ionising radiation. It does not carry enough energy to damage atoms -- so it cannot cause cancer.

As shown previously, the assertion “so it cannot cause cancer” is strongly debated and contradicted by much scientific evidence. Due to the development of understanding about the cancer-causing risks of non-ionising radiation,

IARC applied the classification of 2B “Possible carcinogen”. To state “cannot cause cancer” is refuted.

Visible light, AM and FM radio, TV, microwaves, mobile phones and power lines cannot cause cancer -- the frequency and energy is just too low to damage atoms.

We have run many hundreds of studies over the last half century, and we have never been able to prove that any of these non-ionising radiations cause cancer.

This is utterly misleading because it is intended to ‘prove’ that non-ionising radiation has been proven safe. This assertion is not supported by the body of scientific evidence. ORSAA has collated and categorised over 2000 scientific research papers and a meta-analysis shows over half the papers show biological effects, 20% an uncertain effect and only 29% show no effect.

https://www.orsaa.org/uploads/6/7/7/9/67791943/aocrp5_2018_ppt_7.pdf

But hang on you say, wasn't there an oft-quoted study in 2018 that showed mobile phone radiation caused cancer in both rats and mice?

Actually no, it showed that mobile phone radiation increased their life expectancy -- but I'll talk more about that next time ...

5G hysteria is coming: part 2

Tuesday 11 June 2019 11:15AM
https://www.abc.net.au/radionational/programs/greatmomentsinscience/5g-hysteria-cancer-dr-karl-part-2/11186930#transcript

Last time, I talked about the upcoming evolution of the mobile phone network. The plan is to move from the current 3G and 4G networks, to the much faster 5G network.

And it's been accompanied by equally fast cancer scare publicity.

But as I said last time, while ionising radiation (such as ultraviolet and X-Rays) can cause cancer, non-ionising radiation (which is the type of radiation put out by mobile phones and microwaves) does not.

Despite hundreds of studies over the last fifty years, we have never proven that non-ionising radiation -- like mobile phones use - causes cancer. Or, as the US National Cancer Institute says "No consistent evidence for an association between any source of non-ionizing [radiation] and cancer has been found."

https://stopsmartmetersau.files.wordpress.com/2019/03/prof-pall-response-to-arpansa-letter-4-march-2019.pdf
Dr Martin Pall, Professor Emeritus, Washington State University states
“Cancer including initiation, promotion and progression, further including tumor Progression, tissue invasion and metastasis) (35 reviews).”

For details, see:
https://stopsmartmetersau.files.wordpress.com/2019/03/response-to-icnirp-draft-guidelines.pdf

Also:
“Meta-analyses of the Hardell group and Interphone studies show an increased risk for glioma and acoustic neuroma. Supportive evidence comes also from anatomical localisation of the tumor to the most exposed area of the brain, cumulative exposure in hours and latency time that all add to the biological relevance of an increased risk. In addition risk calculations based on estimated absorbed dose give strength to the findings. (Hardell, 2012 – Section 11)”
https://bioinitiative.org/conclusions/

But what about the two major studies relating to non-ionising radiation and cancer, that were released by the National Institutes of Health in the USA? The ones that are mentioned every time cancer and mobile phones comes up.

Since he hasn’t mentioned the names of the studies, I presume he means the NTP Cell Phone study which released partial findings in 2016 and final findings in 2018.
See https://www.biorxiv.org/content/10.1101/055699v1.full
And https://ntp.niehs.nih.gov/results/areas/cellphones/index.html

“... These studies found low incidences of malignant gliomas in the brain and schwannomas in the heart of male rats exposed to RFR of the two types [Code Division Multiple Access (CDMA) and Global System for Mobile Communications (GSM)] currently used in U.S. wireless networks. Potentially preneoplastic lesions were also observed in the brain and heart of male rats exposed to RFR.
[...]
Lastly, the tumors in the brain and heart observed at low incidence in male rats exposed to GSM- and CDMA-modulated cell phone RFR in this study are of a type similar to tumors observed in some epidemiology studies of cell phone use. These findings appear to support the International Agency for Research on Cancer (IARC) conclusions regarding the possible carcinogenic potential of RFR.”

One of the studies exposed rats to the electromagnetic radiation put out by mobile phones running at the relatively low frequency of 900 MHz. Some 180 male and female rats were exposed to this radiation over their whole body, not just their heads. Now the radiation levels were much higher than a human would get from their mobile phone. And the rats were exposed for nine hours a day, seven days a week for two continuous years.

Surprisingly, the male rats that were exposed to the radiation actually lived longer than the non-exposed rats. However, they did have more cancers of the heart and brain -- but weirdly, only for the male rats.
This is a highly biased interpretation of the findings and runs contrary to the conclusions of the study.
Other effects noted in the study include ““in the male group exposed to CDMA with 6 W/kg, a higher rate of natural death was observed (46%).” as well as other effects including lower birth weights. Kruszelnicki omits mention of these findings.

The other study exposed 180 male and female mice to another frequency used by mobile phones - 1900 MHz.

Again they were exposed to very high levels of radiation, for approximately nine hours each day, seven days per week, for two continuous years. And again, the male mice that were exposed to radiation lived longer than the control mice that were not exposed.
And - the male mice that were irradiated had higher levels of cancers -- this time in the skin and lungs. But in this study, the female mice that were exposed to radiation didn't get off scot free. They had higher levels of malignant lymphomas.

Wait a minute -- that sounds like evidence that non-ionising radiation can cause cancer, right?

Well, when you look at the actual statistics, the numbers of rats with cancer were all very low -- all in the single digits. This is a very small sample size. And that's a big problem.
Once again, Kruszelnicki is willfully misrepresenting the intention of the study. From the fact sheet that accompanies the findings:
“NTP conducted toxicology studies in rats and mice to help clarify potential health hazards, including cancer risk, from exposure to RFR used in 2G and 3G cell phones. 2G and 3G networks were standard when the studies were designed and are still used for phone calls and texting.
The $30 million NTP studies took more than 10 years to complete and are the most comprehensive assessment, to date, of health effects in animals exposed to RFR. The results will help guide other studies of newer technologies.“
The study was never intended to ‘prove’ that cell phones cause cancer but rather to establish direction for further studies based on findings.

Nonetheless, the study factsheet states:
“What did the studies find?
NTP studies found that exposure to high levels of RFR, like that used in 2G and 3G cell phones, was associated with:

• Clear evidence of tumors in the hearts of male rats. The tumors were malignant schwannomas.
• Some evidence of tumors in the brains of male rats. The tumors were malignant gliomas.
• Some evidence of tumors in the adrenal glands of male rats. The tumors were pheochromocytomas.
For female rats, and male and female mice, it was unclear, also known as equivocal, whether cancers observed in the studies were associated with exposure to RFR."

Kruszelnicki provides his own interpretation of the results which is at odds with the stated findings and conclusions of the study.

According to the neurologist, Dr Steven Novella, "The fact that the data was negative in female rats, in male and female mice, and for most tumour types is important. It limits the applicability of the results, and suggests they may be just random noise or due to some confounding factor."

So the results are still fuzzy -- we need a bigger sample size.

Once again, this is a mis-stating of the goals and of the findings of the study.

And on average the radiation-exposed mice did live longer.

This is mentioned in the study fact-sheet thus:
"Were there any surprise findings?
NTP found longer lifespans among the exposed male rats. This may be explained by an observed decrease in chronic kidney problems that are often the cause of death in older rats."

That Kruszelnicki focuses attention on this 'surprising finding' on page 3 of 4 of the findings, instead of the headline finding of "Clear evidence of tumors in the hearts of male rats"

However, this study is usually misquoted as showing that the radiation from mobile phones causes cancer in humans AND reduces our life expectancy.

Indeed the study did not show mobile phone radiation causes cancer in humans, but it did show evidence of oncogenic activity caused by mobile phone radiation in an animal model which lends weight to concerns about oncogenic activity in humans.

But where is this fake news about mobile phones and 5G coming from?

Surprisingly, according to the New York Times, a major source of disinformation about the 5G network has been the Russian TV network, simply called RT.

RT stands for Russia Today, and is available worldwide.

RT claims that the 5G network is linked in humans to "brain cancer, infertility, autism, heart tumours and Alzheimer's disease". There is zero scientific proof of this -- especially considering that the 5G network has been running only in a very few locations, and only since the beginning of 2019.

The RT network consistently runs segments with titles such as "a 'Dangerous Experiment on Humanity' ", "5G Apocalypse", "Could 5G Put More Kids At Risk For Cancer?", "5G Tech is 'Crime under International Law.' ", , and " 'Totally Insane': Telecom Industry Ignores 5G dangers".

And where does RT get its data from? Certainly, not from Hard Science.

The Guardian reporter, Tim Dowling wrote about RT that, "Fringe opinion takes centre stage. Reporting is routinely bolstered by testimony from experts you have never heard of, representing institutions you have never heard of."

And here's a big surprise. While the official overseas Russian TV network claims there are massive health risks from the 5G network, the president of Russia, Vladimir Putin is a very big promoter of the 5G network.

President Putin said, "We need to look forward. The challenge for the upcoming years is to organise universal access to high-speed Internet, to start operation the fifth-generation communication systems."

Kruszelnicki is suggesting that Russia is driving an anti-5G movement in Australia. This is journalistic hyperbole intended to discredit anyone with concerns about the health impact of wireless radiation and 5G.
I note in a recent hearing of the US Senate Commerce, Science and Transportation Committee Hearing on the future of 5G wireless technology, replying to a question from Senator Dick Blumenthal whether the telecommunications industry was funding any independent research into the health effects of 5G, the reply was “To my knowledge there are no active studies being backed by industry today.”
I direct you to this short clip from the proceedings:
https://www.youtube.com/watch?v=ekNC0J3xx1w

Shifting to the folk who specialise in anti-technology, anti-sunscreen and anti-vaccine beliefs, you find they also push this anti-5G agenda - but with a twist. They will sell

you machines that will generate a supposedly "good" electromagnetic radiation that will protect you from the supposedly "bad" electromagnetic radiation -- with prices ranging from $299-$999. And if this is not your bag of tea, they recommend "... Spirulina, Wheat Grass, vitamin C and similar supplements (which) are consumable forms of sunlight, which will always improve our health and raise our vibrations."

Yet more journalistic hyperbole intended to disparage anyone that voices concerns about the health effects of either existing wireless technology or the roll-out of 5G as ‘snake oil salesmen’.

Just what frequency they raise our vibrations to is not clear.

Let's just hope it's in the non-ionising range.