

EMR and Health

Report on electromagnetic radiation, health and well-being

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'Havana Syndrome'

A government investigation provides support for a link between the Havana Syndrome and electromagnetic radiation.



In 2016 US embassy staff in Havana, Cuba, began reporting unusual symptoms — pain, ringing in the ears, dizziness headaches and cognitive problems. Medical investigations failed to find a cause and many of the staff were withdrawn from the embassy.

The baffling condition became known as the 'Havana Syndrome' and cases were subsequently reported by US embassy staff in Paris, Geneva, Berlin and Bogotá (Colombia). Ultimately around 200 people connected with US administrators reported similar symptoms in 12 countries.

To investigate the problem, the US Intelligence Community—the Director of National Intelligence and Deputy Director of the CIA—established an expert panel to investigate potential causes of what they called 'Anomalous Health Incidents' (AHIs). The panel reviewed classified documents on scientific, medical and intelligence topics and heard from affected individuals.

On 1 February this year, the panel's report was released.^{1, 2}

It says, 'Pulsed electromagnetic energy, particularly in the radiofrequency range,

plausibly explains the core characteristics of reported AHIs, although information gaps exist. There are several plausible pathways involving various forms of pulsed electromagnetic energy, each with its own requirements, limitations, and unknowns. For all the pathways, sources exist that could generate the required stimulus, are concealable, and have moderate power requirements. Using nonstandard antennas and techniques, the signals could be propagated with low loss through air for tens to hundreds of meters, and with some loss, through most building materials. Stimulation and disruption of these biological systems has been credibly demonstrated in cells and tissues, and persons accidentally exposed to radiofrequency signals described sensations similar to the core characteristics. However, there is a dearth of systematic research on the effects of the relevant electromagnetic signals on humans.'

The report also found that ultrasound could plausibly explain some symptoms but could only be used in close-access situations. Some other environmental exposures were ruled out.

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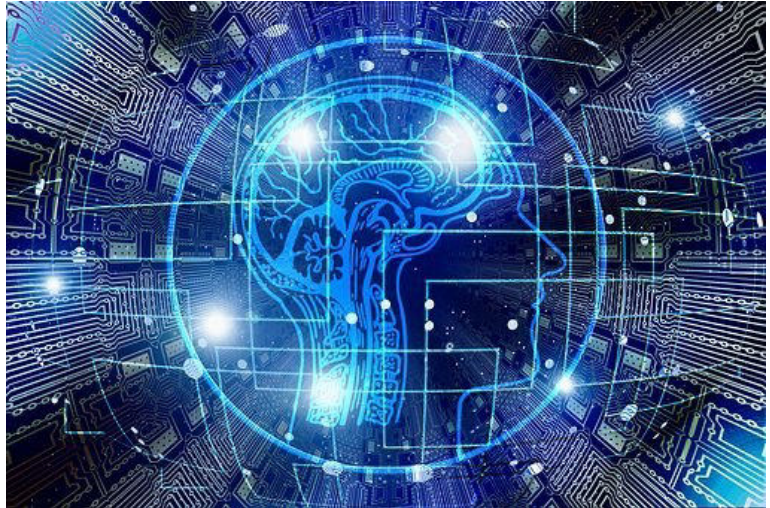
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Digital ID

Would you like a future where somebody or something else made decisions about the use of your personal data?

This is the future envisaged for us by the World Economic Forum, an international lobbying agency founded by Klaus Schwab. Its new report called 'Advancing Digital Agency: The Power of Data Intermediaries', was published in February.¹

It asks, 'What if you could outsource the decision-making fatigue to a trustworthy third party? What if you could pre-consent to your preferences so that you did not need to continuously opt-in? What if technology allowed you to outsource your decision-making even further – to a digitally automated agent, potentially using artificial intelligence (AI), which could actively make those decisions for you?'



The report says that 'The technology ecosystem is ultimately powered by the collection, sharing and processing of data, often personal in nature.' It describes the use of 'intermediaries' to manage the sharing and distribution of a person's data. An intermediary could be a government agency, or it could be some sort of artificial intelligence whose job is to decide how and where to share your data. According to the report, an intermediary like this can 'enable greater sharing of that data between private corporations and organizations.'

While the report describes different types of 'intermediaries', it favours the use of artificial intelligence known as 'trusted digital agency'.

The new digital environment would include the use of 'digital identity'. 'A digital ID is the electronic equivalent of an individual's identity card. It is a way to provide verified personally identifying information of an individual for a software to read and process', the report says. It would contain information that could be used for:

- financial services (open bank accounts; perform financial transactions)
- food
- health care (monitor health devices/wearables)
- travel (book trips; enter jurisdictions)
- telecommunications (monitor devices)
- e-government services (vote, collect benefits, pay taxes)
- social platforms (login to social media)
- e-commerce (shop, business transactions)
- confirming personal identity
- viewing history (financial; medical; behaviours)
- drawing inferences (eg suitability for a loan).

'What if technology allowed you to outsource your decision-making even further – to a digitally automated agent, potentially using artificial intelligence (AI), which could actively make those decisions for you?'

According to the report, a form of digital identity already exists – vaccine passports. 'Such vaccine passports are used when travelling between jurisdictions and at a local level, such as when entering dining establishments or other places where proof of vaccination status is necessary.'

Digital Identification could also be used for sharing a person's genetic information, according to Dr Jennifer King, a

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Privacy and Data Policy Fellow at the Stanford Institute for Human-Centered Artificial Intelligence and one of the co-authors of the paper. She explains that, if people don't want to provide data about their DNA to multiple agents, they could provide it to a data intermediary 'that allowed these companies access to your genomic data without giving up your rights to actual data.'²

Is allowing an external intermediary to control the use of your data a brilliant technological innovation or a dance highway to a dystopian future? While extolling the advantages of the technology, the WEF report admits, 'In worst case scenarios, digital agents could lead to the non-transparent use of data, including in ways that harm the data subject.'

Time will tell.

1. 'Advancing Digital Agency: The Power of Data Intermediaries', Insight Report, February 2022; https://www3.weforum.org/docs/WEF_Advancing_towards_Digital_Agency_2022.pdf
2. <https://hai.stanford.edu/news/advancing-case-data-intermediaries>

Magnetic fields and cancer

Magnetic fields—the fields generated by powerlines, wiring, electrical appliances and equipment—are known to affect the body and may contribute to cancer, says Professor Massimo Maffei from the Department of Science at the University of Turin, Italy.

In a review published in the International Journal of Molecular Sciences, he considered evidence that magnetic fields contribute to breast cancer, brain tumours and leukemia.

Breast cancer is the most common cancer in women aged 65 and older and claims the most lives. Maffei says that 'the excessive exposure to MFs [magnetic fields] increases the risk of female breast cancer.' One theory to account for this is that magnetic fields reduce levels of melatonin, a potent free radical scavenger. Another possibility is that exposure 'correlates with increased proliferative activity of the mammary epithelium'. Maffei says that 'there is a growing body of evidence that the use of electric bedding devices may increase breast cancer risk.'

Brain tumours are on the rise in many countries and have been linked to living close to high voltage powerlines. One study found an increased rate of brain tumours in children who were exposed to magnetic fields of 3 or 4 milliGauss (mG).

Leukemia, the most common cancer in children, is also linked to magnetic field exposures. 'Several meta-analyses showed a statistical association between childhood leukemia and a range of exposure 0.1—2.36 uT MF intensity' [1—23.6mG], the paper says.

Maffei points out that some magnetic field exposure comes from electrical sources inside the home, for example the fields generated by electric blankets (which may increase the risk of prostate and testicular cancers).

However, generally higher exposures occur in the workplace and the jobs with the highest exposures include 'electronics workers, cooks and kitchen workers, cashiers, bakery workers, textile machine operators, and residential and industrial sewing machine operators.' Maffei says that occupational exposure to magnetic fields has been linked to brain tumours, breast cancer in men and women and leukemia. Exposure of men has been linked to 'tumours of the liver, biliary passages, kidney, and pituitary gland'. Exposure of women has been linked to 'an increased incidence of astrocytoma HIV, for cancer

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Mobile phones and sperm

Can mobile phone radiation interfere with male reproduction?

To answer this question, scientists from Pusan National University, Korea, recently examined the research on the associations between human sperm concentration, viability, and motility and mobile phone use. They examined evidence from 18 studies involving both data from both *in vitro* (test tube) and *in vivo* (living) experiments and their results were published in November last year.

The researchers found that men's use of a mobile phone was associated with reduced sperm motility, viability, and concentration. It was particularly reduced in the group with high mo-

bile phone usage. They also found that 'the decrease was remarkable in *in vivo* studies.'

The authors concluded that, 'long-term cell phone use is a factor that must be considered as a cause of sperm quality reduction.'

'Male cell-phone users should strive to reduce mobile phone use to protect their sperm quality,' said Dr Sungjoon Kim, Assistant Professor at the School Of Medicine at Pusan National University and lead author of the study. He added that, 'additional studies will be needed to determine the effect of exposure to EMWs [electromagnetic waves] emitted from new mobile phone models in the present digital environment'.

Sungjoon Kim et al, 'Effects of mobile phone usage on sperm quality – No time-dependent relationship on usage: A systematic review and updated meta-analysis,' *Environmental Research*, Volume 202, 2021; <https://doi.org/10.1016/j.envres.2021.111784>; <https://www.sciencedirect.com/science/article/abs/pii/S0013935121010781?via%3Dihub>

Whoops!

Do satellites fall out of the sky?

Sometimes they do.

On 3 February, SpaceX launched 49 Starlink satellites into low Earth orbit—approximately 210 km above Earth. Starlink deploys satellites to provide internet services across the globe.

The following day, the satellites were impacted by a geomagnetic storm which caused changes to the atmosphere that the majority of the satellites were unable to cope with. As a result, 40 satellites reentered the Earth's atmosphere.

According to SpaceX, the facility that designs, manufactures and launches spacecraft, the deorbiting satellites do not pose any risk to other satellites and are designed to 'demise' upon re-entry. In other words, they are not expected to generate debris.

<https://www.spacex.com/updates/>

Insights on wireless radiation from a physicist

Perhaps you'd like to know more about the radiofrequency (wireless) radiation that's generally present in our homes and communities. You might be wondering:

- how do we know whether wireless radiation is harmful?
- what about 5G? Is it a risk to our health?
- could wireless radiation be more dangerous than the radiation we get from natural sources, such as the sun?
- even if it's non-ionizing?
- can it harm our bodies, even though it doesn't heat them? (Australian and international standards are based on preventing the heating effects of radiation.)
- do these standards protect us?
- what can we do to protect ourselves and our families?

The answers to these and other questions have been kindly provided by Dr Leendert Vriens, a retired physicist and expert in radiofrequency (wireless) radiation from the Netherlands. In an interview with Lyn McLean, he provides important insights about this radiation, how it affects our bodies and what we can do to protect ourselves.

Dr Vriens provides a summary of the evidence showing that wireless radiation is linked with cancer, oxidative stress (and related health problems), fertility, leakage of the blood-brain-barrier and cognitive performance and that current standards don't protect us. Here are some fascinating glimpses.

- Dr Vriens says that the short-term health effects of wireless radiation include:
 - neurological effects, like fatigue, headaches, dizziness, memory and concentration problems, insomnia and anxiety.
 - cardiac effects, such as heart arrhythmias and high blood pressure
 - eye problems, such as pressure in the eyes, deteriorating vision and cataracts.
 - ear problems, such as ringing and low-frequency noise.
 - and a range of other effects, such as skin problems (allergic reactions, burning), digestive problems and nosebleeds.
- The long-term health effects include fatigue, pains, high blood pressure, hearing disturbing noise and digestive problems. Other long-term effects include cancer, neurological diseases, genetic effects such as male sterility, miscarriage and birth defects.'
- Why do our bodies react to wireless radiation? Dr Vriens says that 'Almost all reactions in our body and all reactions with external material entering our body are determined by electromagnetic forces. That is because molecules, atoms and ions are composed of positively charged nuclei and negatively charged electrons. The wireless communication also introduces electromagnetic forces in our body.'
- Dr Vriens says that 'The photons of ionizing radiation, such as X-rays, indeed have enough energy to cause ionization and breaking of molecular bonds in our body. This can be harmful for our health.' He explains that when a group of soldiers stand on a bridge, the bridge remains intact. However, when the soldiers march across a bridge in time with each other, the vibration they generate can (and has) collapsed a bridge. And so it is with photons. One photon alone doesn't cause harm; but many photons acting coherently (in a wave) can.
- On the question of whether international standards protect us, Dr Vriens says that 'Heating has almost never been a criterion for determining whether a biological effect is harmful or beneficial to our health.' He refers to many agents that have harmful effects on our bodies – tobacco, DDT, asbestos, glyphosate – without heating them.
- He says some countries - Italy, Belgium, Poland, Switzerland, Bulgaria, Russia, China and some other countries – have radiation limits that are factors of 10 to 100 lower than those of the ICNIRP [the International Commission of Non-ionizing Radiation Protection] on which Australia's standard is based.

In his interview, Dr Vriens addresses these and other important issues that help us better understand wireless radiation and make informed decisions about our exposure. You can see the podcast with Dr. Vriens [here](#) and download his paper [here](#).



Dementia

What factors are involved in the cognitive impairment that occurs in dementia?

To answer this question, researchers reviewed 185 studies and took into account 44 separate environmental factors. They found that electromagnetic fields may, with other factors, contribute to dementia. But more frequent social contact and more greenness protected against it.

Zhao, Y et al, 'Environmental factors and risks of cognitive impairment and dementia: A systematic review and meta-analysis', Ageing Res Rev, 72;101504, Dec 21, <https://www.sciencedirect.com/science/article/pii/S1568163721002518>



5G Aviation risk

Concerns about 5G interference with vital flight equipment has threatened a crisis in the US aviation industry.

On 17 January, CEOs of major US airlines—including American Airlines, Delta Air, UPS, FedEx Express—wrote a joint letter to US administrators requesting their intervention to avoid massive disruptions to flights and consequent interference with commerce when the 5G network was turned on two days later.

In their letter, the CEOs referred to the fact that the C band (3.7—3.98 GHz) 5G signals would interfere with vital navigational equipment on aircraft, including altimeters which measure distance above ground and provide information to other navigational systems. This could affect a large percentage of their fleets. The consequences, they warned, could be enormous. As well as cancelled flights, passengers could be stranded, freight grounded, commerce disrupted and medical supplies held up.

The letter urged authorities to establish a two-mile, 5G tower-free around airport runways.

AT&T and Verizon airways agreed not to turn on 5G antennas near airports initially until a permanent solution could be found. <https://www.dailymail.co.uk/news/article-10417587/British-Airways-latest-carrier-scrambling-change-transatlantic-flights-amid-5G-rollout.html>

Everything old is new again

A new research group is about to start. Or rather—it's an amalgamation of two existing groups—the Bioelectromagnetics Society and the European BioElectromagnetics Association. Both societies currently publish the Bioelectromagnetics Journal which reports the biological effects of electromagnetic radiation.

The new organisation, called BioEM will have its headquarters in Switzerland. <https://microwavenews.com/news-center/end-bems-merger-or-heist>



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WLAN risks

Exposure to WLAN (wireless local area networks, including WiFi) radiation can have harmful effects on the nervous system, according to a study by Dr Lebrecht von Klitzing from the Institute of Environmental and Medical physics in Germany, published in February.

Dr von Klitzing tested a number of patients who were both exposed and not exposed to radiation from a WLAN router. He used an electrocardiogram (ECG) to test heart function and an electromyogram (EMG) to test the function of muscles and nerves.

He found effects on both the heart and nervous systems of subjects. In one patient, exposure showed 'a threatening cardiovascular problem. In several patients, the EMG readings showed an artificial 10-Hz signal in nervous system.

Dr von Klitzing concluded that WLAN exposure does affect the body at levels below international (ICNIRP) guidelines, indicating that these guidelines are not sufficiently protective. He also observed that effects on the nervous system differed from patient to patient. 'There is no uniform effect on biosystem by WLAN-exposure,' he wrote.

Von Klitzing, L, 'Healthy disorders by SLAN-exposure', Journal of Clinical Images and Medical Case Reports, Vol 3, 7 Feb, 2022, <http://www.jcimcr.org/pdfs/JCIMCR-v3-1639.pdf>

EHS case study

Scientists from Europe have reported on symptoms developed by a healthy office worker when she moved to a workstation with higher exposures.

Lennart Hardell and Tarmo Koppel describe the situation as follows: 'A 55 year old previously healthy female office worker changed her work place in April 2018. She had worked in the same building for almost 10 years but at another location. After 3 months job in another place she returned to this building, but this time to another office at the 6th floor close to base stations on the roof. In the surrounding 4G was installed a couple of years before her return. She had full time work in the office. At the previous working place she had no health problems.'

According to the researchers, 'she experienced continuous heavy headache during the week, pain in the chest, shortness of breath, cough, fatigue, dizziness, uncontrolled movements of the body, low blood pressure (e.g. 86/57 mmHg), palpitations with rapid heart rate (e.g. 140–145) including fainting at one occasion. She had sensations of 'fever' in the head but not in the body. All these symptoms initially started at work and were aggravated over time including nose bleeding at the work place. She noticed loss of hair on the head and on eyebrows.'

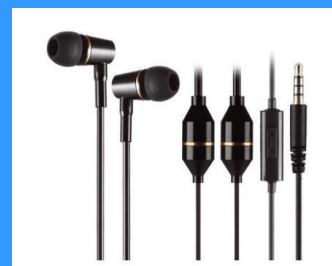
Most of her symptoms disappeared after she took two weeks' sick leave from work.

Hardell, Lennart and Koppel, Tarmo. "Electromagnetic hypersensitivity close to mobile phone base stations – a case study in Stockholm, Sweden" *Reviews on Environmental Health*, vol, no, 2022. <https://doi.org/10.1515/reveh-2021-0169>

Mobile phone protection



Wavewall mobile phone cases protect the head, body and the phone



Airtube headsets—no wire to conduct radiation into the head

'she experienced continuous heavy headache during the week, pain in the chest, shortness of breath, cough, fatigue, dizziness, uncontrolled movements of the body, low blood pressure ... palpitations with rapid heart rate'

(Continued from page 3)

of the corpus uteri and multiple myeloma' and for men and women there is some evidence of increased risks of 'non-Hodgkin lymphoma, acoustic neuroma, and thyroid cancer.'

According to Maffei, occupational 'MF exposure limits are more than a thousand times higher than the magnitudes that are associated with the cancer risks that are observed in epidemiological studies, leaving millions of workers exposed to MF in this large gray area where the public health consequences are unclear.'

Magnetic fields may not just cause cancers directly, but they may contribute to it in other ways. Maffei says that 'MFs exert their effect on both human and animal (rat and mice, mainly) cells when used at high intensity and for a long time. The common response is the production of ROS [reactive oxygen species], which trigger a cascade of other cellular responses which might be the direct consequence of MF exposure.'

Maffei, M.E. Magnetic Fields and Cancer: Epidemiology, Cellular Biology, and Theranostics. *Int. J. Mol. Sci.* **2022**, *23*, 1339. <https://doi.org/10.3390/ijms23031339>; <https://www.mdpi.com/1422-0067/23/3/1339/htm>

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The symptoms are similar to those experienced by US embassy staff in Moscow in the 1990s, as a result of which it was found that Soviets had beamed microwave radiation at the US embassy for several decades.³

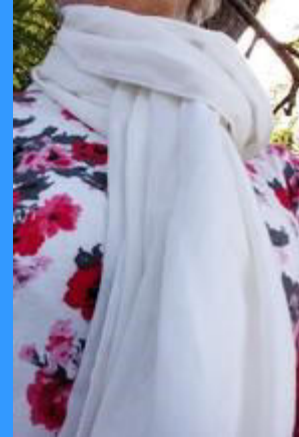
The 2022 panel investigating symptoms made recommendations and advised that it would continue to support affected workers.

1. https://www.dni.gov/files/ODNI/documents/assessments/2022_02_01_AHI_Executive_Summary_FINAL_Redacted.pdf
2. <https://www.dni.gov/index.php/newsroom/reports-publications/reports-publications-2022/item/2273-complementary-efforts-on-anomalous-health-incidents>
3. Goldsmith, John. (1995). Epidemiologic Evidence of Radiofrequency Radiation (Microwave) Effects on Health in Military, Broadcasting, and Occupational Studies <https://www.tandfonline.com/doi/abs/10.1179/oeh.1995.1.1.47> . International journal of occupational and environmental health. 1. 47-57. 10.1179/oeh.1995.1.1.47. and <https://afsa.org/havana-syndrome-there-was-moscow-signal>

Protect the body
from wireless
radiation



Shielding singlets for
kids; head protection;
shielded scarves



'occupational 'MF exposure limits are more than a thousand times higher than the magnitudes that are associated with the cancer risks ...in epidemiological studies'