

## Ontario Physician and Scientists Predict

### Rising Healthcare Costs after

### 5G Roll Out.

Media Briefing, Queen's Park  
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1 PM.

#### TRANSCRIPT:

**Dr. Riina Bray MD:** Dr. Bray is trained as a chemical engineer and doctor of medicine with Masters degrees in addictions, toxicology and public health. She is Assistant Professor in the Department of Family and Community Medicine with cross appointment to the Dalla Lana School of Public Health, at the University of Toronto, and she is the Medical Director of the Provincial Environmental Health Clinic at Women's College Hospital.

**Magda Havas PhD:** Dr. Havas is Professor Emeritus at Trent University in Peterborough, Canada. She is internationally recognized for her research on the biological effects of electromagnetic pollution and on the beneficial effects of electrotherapies. She is co-author of *Public Health SOS: The Shadow Side of the Wireless Revolution*; she has more than 190 publications and has given invited lectures in 30 countries. Dr. Havas works with people who are electrically hypersensitive. Her latest research links microwave radiation from wireless phones to heart irregularities including arrhythmia and tachycardia.

**Dr. Anthony Miller MD:** Dr. Miller is Professor Emeritus at the Dalla Lana School of Public Health at the University of Toronto. He has acted as adviser to the International Agency for Research on Cancer, from whom he has also received a Medal of Honour. He has worked in senior positions for the National Cancer Institute of Canada and his appointments and honors date are numerous and date back to the 1960s. Dr. Miller is considered a globally recognized authority on cancer in his field.

**Meg Sears PhD:** Dr. Sears holds a PhD in biochemical engineering. She is associated with The Ottawa Hospital Research Institute. She has also been a scientific advisor to the Canadian Human Rights Commission, the National Research Council and other governmental bodies. She is currently Chair of Prevent Cancer Now, a national organization identifying substitutes to carcinogenic substances and agents in our daily lives.

**Frank Clegg, Moderator:** Frank Clegg is CEO of Canadians For Safe Technology (C4ST), a Canadian organization that advises all levels of government about safer uses of modern technology. He spent his career in information technology including a period at IBM, and 14 years as President of Microsoft Canada.

INTRODUCTION:

**FRANK CLEGG:**

My name is Frank Clegg and I am the CEO of Canadians for Safe Technology. I've worked in internet technology my whole career including 14 years as President of Microsoft Canada.

For the past five years I have volunteered with C4ST working with all levels of government to create healthier communities across Canada. We do this by bringing them the latest science about the health effects of microwave radiation from wireless devices.

When I started in this business, almost no one outside the military was exposed to microwave radiation. Today almost everyone is affected, and from the moment of conception onwards.

I'm here to introduce you to an expert panel including a doctor and scientists who have a warning about the coming health conditions that are predicted to rise if we blindly accept the next generation 5G technology.

We are joining scientific researchers in 41 other countries including the United States and the UK, who are warning that 5G is going to pose a massive public health risk. It's not been made clear to the public that 5G won't just be another number and a letter on your cell phone. It requires an entirely new infrastructure of thousands of small cellular antennas to be erected throughout the cities where it's going to be installed.

All of our speakers today have delivered expert testimony to the Parliamentary Health Committee in Ottawa on the subject of wireless radiation and human health; but so far, the only public discourse on 5G has been whether we should let a Chinese Company install it or not. Today we are here to change the conversation to the predictable and probable health risks that 5G wireless is likely to bring.

I'll begin by introducing Dr. Riina Bray. Dr. Bray is trained as a chemical engineer and doctor of medicine with Masters degrees in addictions, toxicology and public health. She is Assistant Professor in the Department of Family and Community Medicine with cross appointment to the Dalla Lana School of Public Health, at the University of Toronto. She is the Medical Director of the Provincial Environmental Health Clinic at Women's College Hospital.

**DR. RIINA BRAY:** Over the past 15 years at our Provincial Environmental Health Clinic, we have been assessing an increasing number of vulnerable patients who have been referred from across Ontario (including Toronto, Hamilton, London, Windsor, Ottawa, Sudbury, Thunder Bay and Timmins), who suffer from the adverse effects brought on by electromagnetic exposures, most commonly to non-ionizing radiofrequency radiation. These sources include cell phones, Wi-Fi, an increasing number of wireless radiation-emitting consumer devices, and cellular communication towers.

More and more doctors are becoming aware of this condition as demonstrated by the rise in the number of referrals. The most prevalent symptoms include headache, fatigue, decreased ability

to concentrate, tinnitus, irritability and insomnia. Impacts on the heart and nervous system are also of concern. Because of these symptoms, some have been forced to quit their jobs, or have had to take time off work, or experienced reduced productivity. At the environmental health clinic we help them to identify the cause of their symptoms and educate them in order to minimize exposures and recover more readily.

We see people from all walks of life including teachers, students, government workers and business people. We are concerned that the upcoming introduction of 5G will significantly increase the proximity and extent of exposure to microwave radiation of Ontarians. We predict that the number of people who develop the symptoms I just mentioned will rise in the places where 5G is first installed.

**FRANK CLEGG:** Tomorrow, on May 31<sup>st</sup>, Women's College Hospital in Toronto will host a full day symposium for healthcare providers across Ontario to discuss the science behind the health effects of wireless radiation, and to show healthcare providers how to identify and manage the increasing number of people suffering from it.

It's important to explain today what 5G means to people who aren't yet sensitive to microwave radiation, or maybe aren't aware that they're sensitive. Many more people have symptoms that they don't know to attribute to wireless radiation exposure.

I'd like to introduce Magda Havas to explain the elevated risk factors associated with 5G. Dr. Havas is Professor Emeritus at Trent University. In the early days of her career she informed all levels of government about acid rain, before the politicians understood how dangerous it was. Her more recent work has linked the microwaves from cell phones and Wifi to heart irregularities including tachycardia. Dr. Havas is internationally recognized for her research in this field. She has written almost 200 publications and has lectured at universities and medical conferences in 30 countries. Most recently she has been researching the public health implications of 5G.

**DR. MAGDA HAVAS:** 5G—5th generation technology and the Internet of Things—promises faster download speeds and the ability to have such conveniences as driverless cars and a host of applications most of us haven't even dreamed of. The Toronto-Montreal corridor will be one of the early test sites in Canada and millions of people are going to be exposed to a new type of radiation called “millimetre waves” that are an integral part of the 5G technology. This will bring with it an additional layer of microwave exposure.

There will be thousands of new antennas installed. Small cell antennas could be placed as close as every 3rd hydro pole, and local planning authorities and people who live in these areas will have no say regarding their deployment.

What the telecom industry has not mentioned in all the advertising about 5G, is that these new frequencies have never been tested for their long-term biological and health effects. mmWaves

are currently used in airport scanners and by the U.S. military for crowd control – called the Active Denial System.

At high intensities these waves cause intense heat and pain since sweat glands on the surface of our skin act like mini antennas. At lower intensities scientists are predicting damage to eyes; loss of insect populations, which are already declining; antibiotic resistance in bacteria; and physiological effects on the nervous system and the immune system. Living in a city like Toronto could be very different for a lot of people.

When I was younger and researching acid rain in Canada's far north, there was zero microwave exposure because there is no natural generation of it on earth. If we calculate the increase today, it's well over a hundred or a thousand times more.

It's one-quintillion times more than humans naturally experience. It is rare even in science to use the number: One Quintillion.

5G transmitters will radiate 24-hours a day and so close to homes, it will be difficult IF NOT IMPOSSIBLE to avoid constant exposure. And this is in addition to what we are already exposed to with cell phones, tablets, Wi-Fi, video games, smart meters and an increasing number of smart appliances in our homes.

Deployment of 5G is particularly disturbing to those who have already developed a sensitivity to electromagnetic pollution. In addition to the hundreds of patients being assessed at Dr. Bray's Environmental Health Clinic in Toronto, as much as 3% of the Canadian population – that's over 1 million people – are believed to be sensitive, and this number is likely to increase with increasing exposure.

The major symptoms include insomnia, chronic fatigue, chronic pain, mood disorders, poor short-term memory, difficulty concentrating, depression and heart palpitations that can be misinterpreted as anxiety. Symptoms also include skin problems, dizziness, nose bleeds, elevated blood sugar, and—in extreme cases—loss of consciousness. Microwave frequencies are also shown in scientific studies to contribute to cancers and to damage sperm.

Scientists and medical doctors, across the US and in the UK, are requesting delayed deployment until testing can be conducted on the long-term biological effects of 5G technology.

The scientific debate about the health effects of microwave radiation is over. Microwave radiation, at levels to which we are currently exposed, adversely affects human health. Of that there is no longer any doubt.

The current debate is, “can we afford the health care costs that are likely to follow the roll out of 5-G?”

Provincial governments pay for health care. The federal government has failed to protect us from the rising levels of microwaves, and now they're downloading the financial fall-out onto the provinces.

I would encourage provincial ministers to request—at the very least—that the federal government adopt a precautionary approach to 5G until we better understand the consequences of this technology. We need to know the true cost of 5G before we can assess its potential benefit.

**FRANK CLEGG:** The list of symptoms that Dr. Havas and Dr. Bray described are all reported and documented. If you're wondering how this could have happened, it was predicted years ago, by the cell phone companies.

On the C4ST website you can find links to the warnings published by the manufacturers of the cell phones in all of your pockets right now. All of them advise you not to touch it while using it, and some specifically say not to carry it in a breast pocket, or near the abdomen of a pregnant woman, or a teenager. Unfortunately those warnings are so small, or buried inside the settings of your phone, that most people never see them.

We can't pretend that the convenience of having this technology is without cost, especially when the manufacturers of every cell phone are already admitting the danger in fine print.

The 5G world that Dr. Havas just described, one with enough constant radiation to run a city full of driverless cars, can actually be considered trespassing and a theft of our right to a healthy life.

When we wonder if something is harmful, we look to the authorities that to determine that things are safe for us. In 2011 the World Health Organization, through the International Agency for Research on Cancer, classified radiofrequency radiation—the blanket name for the type signal employed by cell phones, cell towers, and wifi—to be a Class 2B Carcinogen.

That means there is enough firm and reliable scientific evidence to state that wireless radiation may give you cancer. One of the scientists involved in reviewing that classification was Anthony Miller who is Professor Emeritus at the University of Toronto. In the past he has worked as a National Health Scientist for the Canadian Government and has been awarded the medal of honour by the International Agency for Research on Cancer.

Dr. Miller is here today to bring you up to date on what scientists in his field are discovering about wireless radiation.

**DR. ANTHONY MILLER:** I was associated with the International Agency for Research on Cancer that recommended the World Health Organization list all radio frequency radiation, including cell phones and Wifi, as a possible carcinogen. The Classification was officially designated as number 2-B – that is a list of possible carcinogens that also includes lead and DDT. That was back in 2011.

A lot has changed since then. New science has emerged, both human and animal, and many scientists now believe that radiofrequency radiation should be categorized as a Class 1 Human Carcinogen. That means many scientists studying this closely now place this radiation in the same category as cigarette smoking, asbestos exposure, and X-Rays. That also means that all of

the people watching this today can consider that their cell phones and their exposure to wifi is increasing the risk of cancer in their bodies. That also means that when 5G is rolled out we can expect to see an increase across Ontario in all of these conditions.

**FRANK CLEGG:** We are witnessing, at an unprecedented pace of change, the rise of wireless technology in our lives. We're also starting to witness a rise in a broad range of illnesses and conditions that could all be related to wireless technology.

Prevent Cancer Now is a national organization that educates Canadians about reducing our exposure to the things we know can cause cancer. The group is made up of doctors, scientists and others who identify the potential contributors to cancer, and to identify alternatives that may be safer. They have advised all levels of government across the country about these kinds of issues.

The Chair of Prevent cancer Now—Meg Sears—is our next speaker. Dr. Sears holds a PhD in biochemical engineering. She is associated with The Ottawa Hospital Research Institute. She has also been a scientific advisor to the Canadian Human Rights Commission, the National Research Council and other governmental bodies. She's here today to speak about identifying a safer approach to communications technology.

**DR. MEG SEARS:** Some of my colleagues in the United States and abroad are describing 5G as a giant human experiment. After all, we have no evidence up front that this novel technology is safe, theory points in the opposite direction, and the bottom line is: we just don't know.

I disagree that 5G rollout with millimeter wave radiation is a "modern scientific experiment." If this was indeed a proper scientific experiment then we would have first of all a justifiable hypothesis of "no adverse effect"; second, we would have ethical approval; third, informed consent from all participants; and fourth, a portion of the population would not be exposed, to act as a control - Where can we find that in 2019? We would also conduct an interim analysis to halt the experiment at the first sign of adverse effects; and finally, analyses and results would be reported publicly, for discussion and implementation of logical next steps.

None of this is in place.

At the same time, increases in use of personal wireless devices is concurrent with a rise in brain tumors that are associated with cell phones. The most aggressive type of brain tumor is increasing in young Americans, and has outpaced leukemia and testicular cancer. Male infertility is also on the rise, while we learn that sperm and testes are harmed by cell phones in pockets and lap-tops on laps.

Wireless radiation affects prenatal development in animals and in humans, just as we are witnessing rapidly increasing diagnoses of developmental disorders such as on the autism spectrum. Children are much more vulnerable, but we allow widespread use of WiFi and wireless devices in their schools, even in junior kindergarten. Wireless radiation can affect many

organs, but we do not have adequate data to connect these health effects with environmental exposures. Without data, science just can't keep up.

The bottom line is that it takes decades for a new substance or technology to cause enough harm that it is finally proven dangerous and eventually is curtailed. It is so much wiser to make less toxic choices, to use less hazardous practices.

Our recommendation is to invest in fibre optic cables, through communities and within buildings across Canada. Fibre is already rolling out as a “backbone” of communications through major Canadian centres, but is not extending to fingers and toes. It is patchy in the outskirts, and lacking through rural Canada. Communications via fibre is rapid, secure, reliable and harmless compared with wireless radiation. What's more, signals through wire or fibre require much less energy. Powering 5G technology is projected to be a major contributor to greenhouse gases, at a time when the national imperative is to reduce these gases, to blunt climate chaos.

We have enough evidence that this unprecedented technology has potential for unprecedented impacts on human and environmental health. 5G will not be an ethical scientific experiment. If it was an experiment, our hypothesis would be that it will most likely cause a significant stress on public and environmental health in Ontario. We can do this better and more safely, with largely fibre-based technologies

**FRANK CLEGG:** As you can see this is a public health warning that we take very seriously. Ontario doctors are already counting the sick and injured from exposure to wireless devices.

Despite all this current science, clinical observations, and evidence, Public Health Ontario has not updated its approach to wireless radiation in nine years. This is the terrain on which 5G is coming. The public is getting sick, and the government is not up to date with the science.

I'm not aware of any attempt by my or related industries to establish the safety of upcoming or even current wireless products. We just ask if they meet federal safety guidelines, which I now understand are forty years out of date. I concur with Dr. Sears that we can do better. There are scientists in 42 countries including Canada warning about 5G. The doctor and scientists here are not alone.

Some municipal jurisdictions in Belgium and Italy have placed a moratorium on 5G. This week the global insurance underwriter Swiss Re published its annual forecast and highlighted 5G as an upcoming insurable health globally in the next three years.

This health crisis is avoidable, because there are alternatives to wireless that is fast, secure, reliable and much safer. Many advocates recommend a four-step path to a safer future.

- 1) A first recommendation is that, to the fullest extent possible, faster internet communications be built with fibre optic wiring into and throughout buildings.
- 2) It is also recommended that if wireless 5G is built in our neighbourhoods, that the appropriate government ministries commit to early detection of any health effects. This

can be done by monitoring and reporting through public health agencies, given special consideration to children, who are the most vulnerable.

- 3) It is also strongly advised that the Ministry of Health begin discussions with doctors who are already assessing and treating illnesses related to wireless exposure. Plans should be developed to educate family physicians across the province so they can identify the condition and help their patients.
- 4) A fourth and final recommendation is that the Ontario Ministry of Health and the Ontario Ministry of the Environment manage independent safety testing on wireless 5G before it is allowed to be installed in Toronto or anywhere else in the province.

If Toronto is to be an “early adopter” of 5G, then Toronto will also be the location where illnesses first begins to rise. It would be fiscally responsible for the Province to consider that all companies applying to install 5G infrastructure also be obliged to pay for any measurable increase in the cost of health care in Ontario, especially if they can’t first guarantee its safety.

Since the Province has to pay for health care, it has a right to demand this technology be properly tested for safety. It also has an obligation to protect the people between Toronto and Quebec.

We are joining the hundreds of scientists and doctors from dozens of countries who say there is enough evidence to predict a rise in illness and a rise in health care costs if we allow 5G to be rolled out without question.

A copy of today’s proceedings along with scientific citations is being sent to the office of the Premier, and the Ministers of Health, Finance, and Environment.

Finally, in anticipation of the medical symposium tomorrow at Women’s College Hospital, some of patients have attended today to provide a window into how they live with with the effects of microwave radiation. They are the proverbial ‘Canaries in the Coal Mine’ - the more sensitive among us whose symptoms emerged during the first round of cell towers and wifi.

David Fancy is Professor in the Department of Drama at Brock University in St. Catharines Ontario.

Melissa Chalmers is a commercial airline pilot who has been off work for several years after being injured by microwave radiation from cell towers behind her home.

They have come here today in case anyone wants to speak directly to someone who is living with the long-term effects of electromagnetic injury. They also will be at the symposium tomorrow and members of the media are welcome to attend. It is at Women’s College Hospital, just across the street at 76 Grenville. It begins at 8 am and runs all day.

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For the benefit of medical practitioners, the event will live-streamed via the OTN (The Ontario Tele-medicine Network) at OTN.CA so they can learn more about how to identify EMF susceptible individuals and manage their care properly.

I thank the doctor and scientists who came to speak to us all today. And thank you for coming and listening. If you have any questions please direct them through me to the speakers.

### Selected Bibliography:

#### **Riina Bray**

1. Canadian Medical Association Journal, “Federal Wi-Fi panel criticized for undisclosed conflict,” *CMAJ*, 185(11) Aug. 2013, pages E515 –E516
2. Canadian Medical Association Journal, “Federal Wi-Fi safety report is deeply flawed, say experts.” *CMAJ*, 186(9) June 2014, Page E300
3. Genius, Stephen J. and Christopher T. Lipp, "Electromagnetic hypersensitivity: Fact or fiction?" *Science of the Total Environment*, STOTEN-13064: Nov. 2011, No. Of Pages 10
4. House of Commons Canada, “Standing Committee on Health, Evidence,” Number 058, 2<sup>nd</sup> Session, 41<sup>st</sup> parliament, April 2015, <http://www.ourcommons.ca/DocumentViewer/en/41-2/HESA/meeting-58/evidence>
5. McCarty, David E., et al., "Electromagnetic Hypersensitivity: Evidence for a Novel Neurological Syndrome," *Informa HealthCare, International Journal of Neuroscience*, 2011
6. Pall, Martin L., "How to Approach the Challenge of Minimizing Non-Thermal Health Effects of Microwave Radiation from Electrical Devices," *International Journal of Innovative Research in Engineering and Management* Oct. 2015 Vol. 2, Issue 5
7. Parliamentary Assembly Council of Europe, “The potential dangers of electromagnetic fields and their effect on the environment,” Resolution 1815, 2011, <http://www.cellphonetaskforce.org/wp-content/uploads/2011/12/EDOC12608-draft.pdf>
8. Royal Academy of Medicine, Brussels, Belgium, “2015, Brussels International Scientific Declaration on Electromagnetic Hypersensitivity and Multiple Chemical Sensitivity”, [http://www.ehs-mcs.org/fichiers/1441982143\\_Statement\\_EN\\_DEFINITIF.pdf](http://www.ehs-mcs.org/fichiers/1441982143_Statement_EN_DEFINITIF.pdf)

9. Lobb, Ben, Chair, *Radiofrequency Electromagnetic Radiation and the Health of Canadians: Report of the Standing Committee on Health*, June 2015, 41st Parliament, Second Session, online at: <https://www.ourcommons.ca/DocumentViewer/en/41-2/HESA/report-13/>
10. EUROPAEM Guideline 2015 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses. Belyaev I. Dean A. Eger H. Hubmann G. Jandrisovits R. et al. *Rev Environ Health* 2015; 30(4):337-371. 1. Cindy L. Russell. 2018.

#### **Dr. Madga Havas**

11. 5 G wireless telecommunications expansion: Public health and environmental implications. *Environmental Research* 165 (2018) 484–495. <https://www.sciencedirect.com/science/article/pii/S0013935118300161>
12. Tom Wheeler interview video: <https://www.youtube.com/watch?v=22QlpiXR6DY>
13. IEEE Spectrum: Everything you want to know about 5G. [https://www.youtube.com/watch?v=GEx\\_d0SjvS0](https://www.youtube.com/watch?v=GEx_d0SjvS0)
14. Havas, M. 2018. Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention, Citation: *J Sci Discov*(2019); 3(1):jsd18020; DOI:10.24262/jsd.3.1.18020 <http://www.e-discoverypublication.com/wp-content/uploads/2019/03/JSD18020-final.pdf>
15. Havas, M. 2017. When theory and observation collide: Can non-ionizing radiation cause cancer? *Environmental Pollution*, Volume 221, February 2017, Pages 501-505 <https://www.sciencedirect.com/science/article/pii/S0269749116309526>

#### **Dr. Anthony Miller:**

16. Falcioni, L., Bua, L., Tibaldi, E., et al. (2018). Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission. *Environmental Research*;17(1):50. doi: 10.1186/s12940-018-0394-x. PMID: 2984372
17. Gittleman, H.R., Ostrom Q.T., Rouse, C.D. et al. (2015). Trends in central nervous system tumor incidence relative to other common cancers in adults, adolescents, and children in the United States, 2000 to 2010. *Cancer*;121(1):102-112. doi: 10.1002/cncr.29015.
18. Hardell, L. and Carlberg, M. (2009). Mobile phone and cordless phone use and the risk for glioma - Analysis of pooled case-control studies in Sweden, 1997-2003 and 2007-*Pathophysiology*; 22: 1-13.

19. National Toxicology Program (2018a). NTP Technical Report on the Toxicology and Carcinogenesis Studies in Hsd:Sprague-Dawley SD Rats Exposed to Whole-Body Radio Frequency Radiation at a Frequency (900 MHz) and Modulations (GSM and CDMA) Used by Cell Phones. NTP TR 595.  
[https://ntp.niehs.nih.gov/ntp/about\\_ntp/trpanel/2018/march/tr595peerdraft.pdf](https://ntp.niehs.nih.gov/ntp/about_ntp/trpanel/2018/march/tr595peerdraft.pdf) (accessed 25 August 2018).
20. Philips, A., Henshaw, D.L., Lamburn, G., O'Carroll, M.J. (2018). Brain tumours: rise in Glioblastoma Multiforme incidence in England 1995–2015 suggests an adverse environmental or lifestyle factor. *Journal of Public Health and Environment*:7910754. doi: 10.1155/2018/7910754.

### Dr. Meg Sears

21. Zhou et al, A new type of power energy for accelerating chemical reactions: the nature of a microwave-driving force for accelerating chemical reactions, *Sci Rep.* 6 (2016) 25149. doi:10.1038/srep25149
22. P. Lidström et al. Microwave assisted organic synthesis—a review, *Tetrahedron.* 57 (2001) 9225–9283. doi:10.1016/S0040-4020(01)00906-1
23. Ahirwar et al. “Microwave Non-Thermal Effect Reduces ELISA Timing to Less than 5 Minutes” *RSC Adv.* 6, no. 25 (February 18, 2016): 20850–57. <https://doi.org/10.1039/C5RA27261K>
24. de la Hoz et al. “Microwaves in Organic Synthesis. Thermal and Non-Thermal Microwave Effects.” *Chemical Society Reviews* 34, no. 2 (February 2005): 164–78. <https://doi.org/10.1039/b411438h>
25. Pall. 2015 "Microwave frequency electromagnetic fields (EMF's) produce widespread neuropsychiatric effects including depression," *J Chem Neuroanatomy* 75
26. Blank & Goodman. 2012. Electromagnetic fields and health: DNA-based dosimetry, *Electromagnetic Biology and Medicine*, 31:4, 243-249, DOI: 10.3109/15368378.2011.624662
27. Temporal trends in sperm count: a systematic review and meta-regression analysis *Hum Reprod Update*. Published online July 25, 2017.1-14 doi:10.1093/humupd/dmx022
28. Adams, Jessica A., Tamara S. Galloway, Debapriya Mondal, Sandro C. Esteves, and Fiona Mathews. “Effect of Mobile Telephones on Sperm Quality: A Systematic Review and Meta-Analysis.” *Environment International* 70 (September 2014): 106–12. <https://doi.org/10.1016/j.envint.2014.04.015>
29. La Vignera, Sandro, Rosita A. Condorelli, Enzo Vicari, Rosario D'Agata, and Aldo E. Calogero. “Effects of the Exposure to Mobile Phones on Male Reproduction: A Review of the Literature.” *Journal of Andrology* 33, no. 3 (May 6, 2012): 350–56. <https://doi.org/10.2164/jandrol.111.014373>
30. Pall, Martin L. “Wi-Fi Is an Important Threat to Human Health.” *Environmental Research* 164 (July 1, 2018): 405–16. <https://doi.org/10.1016/j.envres.2018.01.035>
31. De Luca, Chiara, Jeffrey Chung Sheun Thai, Desanka Raskovic, Eleonora Cesareo, Daniela Caccamo, Arseny Trukhanov, and Liudmila Korkina. “Metabolic and Genetic Screening of Electromagnetic Hypersensitive Subjects as a Feasible Tool for Diagnostics

and Intervention.” Mediators of Inflammation 2014 (2014). <https://doi.org/10.1155/2014/924184>.

32. Belyaev, Igor, Amy Dean, Horst Eger, Gerhard Hubmann, Reinhold Jandrisovits, Markus Kern, Michael Kundi, et al. “EUROPAEM EMF Guideline 2016 for the Prevention, Diagnosis and Treatment of EMF-Related Health Problems and Illnesses.” Reviews on Environmental Health 31, no. 3 (2016): 363–397. <https://doi.org/10.1515/reveh-2016-0011>.

### **Frank Clegg**

33. Schoechle, T. “~~Re~~Re-Inventing Wires: The Future of Landlines and Networks.” National Institute for Science, Law & Public Policy, Washington, DC, USA, May 2018. <http://electromagnetichealth.org/wp-content/uploads/2018/05/Wires.pdf>.