**Brief (4 pages with the remainder being appendices)**

**to Innovation and Economic Development Committee.**

**City of Winnipeg, City Hall**

**Monday February 10th, 2020 9:30 am**

By Margaret Friesen on behalf of 5G Winnipeg Awareness

**Item 2: Winnipeg Antenna Systems Policy - 5G Network**

Good morning Councillors - Thank you for the opportunity to present on this important topic of 5G technologies and associated so-called “small cell” antenna infrastructure.

My name is Margaret Friesen. I am representing “5G Winnipeg Awareness” who are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives.

I presented about the concerns surrounding 5G antennas to the Property Development, Heritage and Downtown Development committee on January 6th, 2020 (see Appendix A).

It is not just Winnipeggers who are concerned about 5G roll out. People worldwide are voicing opposition because the standards in their countries, are not protective of human health.

On January 25th, 2020 protests were held across Canada and around the world.

* FOR CANADA, at least 14 events in 8 provinces. See - EMR Health Alliance BC: https://emrabc.ca/?p=16197
* WORLDWIDE:
	+ EMR Radiation Safety (Joel Moskowitz, Ph.D., Public Health, University of California, Berkeley)- <https://www.saferemr.com/2020/01/5g-global-protest-1-25-2020.html>
	+ Stop 5G International reported 270 Stop 5G events in 38 countries- https://stop5ginternational.org/wp-content/uploads/2020/02/Press-Release-Feb-2020.pdf

The next information event in Winnipeg called **5G Wireless Forum - Opportunities and Threats: Health, Environment and Rights** will be held on Saturday afternoon , May 2nd, 2020. It will be a public meeting open to the public and you are invited.

**HEALTH CONCERNS:**

**There is no scientific evidence to support any claim of safety for long term 5G exposures.**

**Health Canada’s Safety Code 6 guidelines are obsolete because they are based on the now disproven assumption that only heating from radiofrequency radiation exposure causes adverse health effects.**

**See Appendix A.**

Health Canada’s claim that its Safety Code 6 guidelines (adopted as its standard by Innovation, Science and Economic Development which regulates cell antenna emissions) are among the most stringent in the world is simply not true.



Dr. Anthony Miller (MD, FRCP, FRCP (C), FFPH, FACE) is a specialist in internal medicine and Professor Emeritus of the Dalla Lana School of Public Health, University of Toronto. He is among a group of concerned medical experts and individuals that there are health risks of radio frequency radiation. This comes from all these mobile devices and the myriad towers we already have, and he says the health risks at present are being ignored and that these risks and concerns will only be increased with 5G.[[1]](#footnote-1)

**Dr. Miller’s publications are listed in Appendix A and detail the scientific evidence that supports a Class 1 *known* carcinogen classification by the World Health Organization’s International Agency for Research on Cancer (Dr. Miller has served as an advisor to the WHO-IARC)**

Dr. Miller was recently interviewed by CBC Radio Canada  **5G-In the rush to the internet of things, is human health at risk?** (posted Tuesday, February 4, 2020 12:26).

 https://www.rcinet.ca/en/2020/02/04/5g-in-the-rush-to-the-internet-of-things-is-human-health-at-risk/

**Dr. Miller has also recently (February 4, 2020) written his concerns about 5G to the Penticton City council and others (Appendix B.)** Dr. Miller outlines the evidence for health concerns and also makes this statement about liability:

**LIABILITY CONCERNS - Extract from Dr. Miller’s letter: *“Possible liability concerns: Those who support the introduction of 5G should recognize that no insurance agency (including Lloyds of London) will cover them against liability from ill health effects caused by radiofrequency radiation.”***

**What the City of Winnipeg can do:**

**1. Conduct public consultations on the installation of small cell antennas in residential areas.** This option is open according to the “Winnipeg Systems Antenna Systems Policy” and the federal department whose minister has the ultimate say in cell antenna installations (Industry, innovation, Economic Development) CPC20-03. CPC-2-0-03 — “Radiocommunication and Broadcasting Antenna Systems” <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08777.html>

It is our understanding that as it is now, there will be no public consultations, no notifications nor any signage for the installation of small cellular radiofrequency emitting antennas in neighbourhoods or elsewhere.

2. The City of Winnipeg can amend its policy to include the requirement of having public consultations for the installation of cellular antennas of “non-tower structures” within City limits.

3. The City can issue a letter of non-concurrence. The city’s policy states:

**2.2 Role of the City**

The ultimate role of the City is to issue a statement of concurrence or non-concurrence to the Proponent and to Industry Canada. The statement considers the land use compatibility of the Antenna System, the responses of the affected residents and the Proponent’s adherence to this Policy. The City also guides and facilitates the siting process by:

 **Communicating** to Proponents the particular amenities, sensitivities, planning priorities and other relevant characteristics of the area;

 **Developing the design guidelines** for Antenna Systems contained in Section 6 of this Policy; and

 **Establishing** a community consultation process, where warranted.

By working with Proponents throughout the siting process, beginning with preliminary notification and the site investigation meeting, the City seeks to facilitate Antenna System installations that are sensitive to the needs of the local community.

I am here today to inform you that we, the “affected” residents of Winnipeg, wish to be consulted and that a community consultation process is warranted. We, the residents who will be irradiated by what the scientific evidence is telling us is likely a known carcinogen (as well as having many other adverseeffects) are the biggest stakeholders in this process, with our health at stake, and are being left out of this whole process.

**QUESTIONS:**

* **-Do you agree that we, the residents of Winnipeg have a “right to know” and be fully informed about the installations of 5G antennas close to our homes and schools?**
* **-Will you, as our representatives, do what is necessary to hold full public consultation hearings before the 5G rollout begins?**

**Furthermore:**

**We, the residents of Winnipeg, do not consent to having radiofrequency radiation emitting antennas installed close to our homes. We urge the City of Winnipeg to do everything within its jurisdiction\* to prevent the development and installations in residential areas of cell antennas of the 4G/5G network until it is deemed safe for the general public\*\*.**

**\* Including writing a letter of non-concurrence to the federal department of Innovation, Science and Economic Development.**

**\*\* By a panel of medical doctors and scientists recommended by the Environmental Health Clinic at Women’s College Hospital in Toronto, Ontario, Canada.**

**Respectfully submitted.**

**Margaret Friesen M.Sc.**

**Spokesperson, 5G Awareness Winnipeg**

**5g.winnipeg.awareness@gmail.com**

**Website: https://5gwinnipegawareness.ca/**

**Face Book: https://www.facebook.com/5GWinnipegAwareness/?modal=admin\_todo\_tour**

**-------------------------**

**APPENDIX A. 5G Awareness Winnipeg brief to the Property Development, Heritage and Downtown Development Committee on January 6th, 2020.**

**Brief to Property Development, Heritage, Downtown Development Committee. City of Winnipeg, City Hall.**

**Monday January 6th, 2020 9:30 am**

By Margaret Friesen on behalf of 5G Winnipeg Awareness

**Item 22: Review of the Winnipeg Antenna Systems Policy - 5G Network**

Good morning Councillors - Thank you for the opportunity to present on this important topic of 5G technologies and associated so-called “small cell” antenna infrastructure.

My name is Margaret Friesen. Today I am representing a newly formed group named “5G Winnipeg Awareness.” We are residents from all parts of the City of Winnipeg who are deeply concerned about the pervasive expansion of radiofrequency emitting antennas installed close to where people spend much of their lives. My background: Master of Science in Entomology/Toxicology and a Bachelor of Science (Honours) degree in Zoology. Most of my 30+ years career in the federal government and University of Manitoba was in original research projects including ecosystem toxicology and DNA population genetics of marine mammals. I have published in peer-reviewed literature, including most recently a paper on radiofrequency radiation and smart and healthy buildings[[2]](#footnote-2). I presented to City committees in 2015 about the proposed *Winnipeg Antenna Systems Policy (*passed) 27 May 2015: Winnipeg.ca/ppd/planning/AntennaSystemsPolicy/pdfs/WinnipegAntennaSystemsPolicy.pdf

****5G uses newer frequencies – different wave sizes and with higher energy than existing 1G, 2G, 3G and 4G. It will be in addition to the other frequencies already in use AND because the newer wave size cannot as easily penetrate objects (e.g. tree leaves and water droplets), these small cells would be located close to our homes – possibly every 2 to 3 homes in residential areas (see picture from Mission BC). Also, network coverage signal areas are designed to overlap, therefore many, if not all, residences will be swamped by the emissions from more than one nearby small cell. We will be exposed, whether we want to be or not, to radiation emitted from so-called “small cell” antennas installed close to our homes.

Based on what is happening in other parts of Canada, there could be more than one antenna on each lamp pole or hydro pole installation. The actual 5G technology is not yet widely rolled out (there are pilot projects) but antennas emitting the 4G and other frequencies are already being installed close to homes – frequencies where the science has shown potential harm such as cancers and DNA damage. 5G rollouts plan to require more towers and more antennas on existing towers. Based on information from European countries, such installations increase radiofrequency emissions levels.

**1. There is an urgent need to delay 5G and 4G antenna installations in residential areas**

Health concerns alone are enough to put the brakes on the rollout of 5G and the 4G antenna installations but there are also serious privacy and cyber-security issues.

**2. The fundamental problem: *Safety Code 6 (2015), Health Canada’s guidelines for safe human exposure* are not protective of human health**

Safety Code 6 (2015) for the frequencies used for common telecommunications, relies only on the adverse effects of the heating of tissue for its guidelines [which had been adopted as its standards by Innovation, Science and Economic Development (ISED)]. This has been shown in many studies to be a false assumption. There are many hundreds of studies showing adverse effects at levels that do not cause heating.

* During the last revision of Safety Code 6 (2015) more than 100 international scientists and Canadian medical doctors wrote to the Minister of Health stating that Safety Code 6 limits were not protective enough.
* The so-called independent review by an expert panel of Safety Code 6 that recommended only minor changes seem to be a rubber-stamp exercise. Some of the controversy was described in several articles in the *Canadian Medical Association Journal*[[3]](#footnote-3).
* More recently, the EMF (electromagnetic field) Scientists and MDs Appeal <https://www.emfscientist.org/> (as of August 25th, 2019 signed by 250 specialists from 42 nations) asks for more protective standards.

**Speeding analogy:**

*Modified from Powerwatch https://www.powerwatch.org.uk/science/intguidance.asp*

|  |  |  |
| --- | --- | --- |
| **1800 MHz Public Exposure Guidelines** | Intensity (mW/m2) | Speed Analogy in km/hour |
| Safety Code 6 | 10,000 | 4,800 |
| Belgium, parts of Italy | 100 | 480 |
| Austrian Sustainable Building Council | 1 | 50 |
| EUROPAEM\* (MDs) | 0.1 | 15 |
| Natural (all frequencies) | 0.001 | < 1 |
| Cosmic background | 0.00000001 | < 1 |

\* Belyaev, et al. (2016). EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses. Reviews on Environmental Health, 31(3). https://doi.org/10.1515/reveh-2016-0011

* Health Canada has a number of links that go to the World Health Organization (WHO) website.

There are at least 2 bodies that have studied health effects of radiofrequency radiation:

1. International EMF Project. Most of the information on this site is not very recent. This project has put a call out for systematic reviews of the health literature on radiofrequency radiation (RFR). This came after much controversy after an earlier review was heavily criticized for bias and conflict of interest. It is heavily influenced by industry friendly scientists.

2. International Agency for Research on Cancer (IARC). In 2011, IARC classified RFR, which would include 5G, as a *possible* carcinogen. RFR is on the list to be re-evaluated based on more recent evidence showing harm. Many scientists, independent of industry influence, consider the scientific evidence to warrant a *known* carcinogen classification, along with asbestos and cigarette smoking.

* Evidence for radiofrequency radiation as a *known* carcinogen. Canadian MD and cancer epidemiologist Dr. Anthony B. Miller published that there is now enough evidence for the upgrading of radiofrequency radiation as a *known* human carcinogen (same category as asbestos and cigarette smoking). In 2011, radiofrequency radiation was classified as a *possible* human carcinogen by the World Health Organization’s International Agency for Research on Cancer (IARC). An Advisory Group of 29 scientists from 18 countries met at IARC on 25–27 March 2019 to recommend priorities for the IARC Monographs Programme during 2020–2024.[[4]](#footnote-4)
* **There is no scientific evidence to support any claim of safety for long term 5G exposures.**
* Strong evidence of cancer, DNA damage and sperm damage from 2G, 3G and 4G frequencies (Appendix 1).
* Public health issue is described by Cindy Russel MD. (Appendix 1, Russell 2018).
* Electrosensitivity (EHS) – Article by Magda Havas PhD (see Appendix 1). Press release: *Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out* (see below).
* We plan to write to the Chief Provincial Public Health Officer (Dr. Brent Roussin) with this and other information.
* *Winnipeg Free Press* article: “Winnipeg should be cautious about 5G antennas”

https://www.winnipegfreepress.com/opinion/analysis/winnipeg-should-be-cautious-about-5g-antennas-564489772.html

* *Common Ground* article: “Better health safety guidelines imperative before exposing public to 5G”

https://commonground.ca/better-health-safety-guidelines-imperative-before-exposing-public-to-5g/

* Property Development, Heritage and Downtown Development (PDHDD) Committee passed a motion – May 27th. City staff working on a report. MB Hydro in discussions with providers.

**3. City of Winnipeg and small cell antennas close to homes and schools, etc.**

* Federation of Canadian Municipalities – Press Release June 16, 2019: *Statement by FCM on Supreme Court of Canada decision on telecommunications*

<https://fcm.ca/en/news-media/news-release/statement-fcm-supreme-court-canada-decision-telecommunications>.

* Some municipalities have said no: a citizen who attended the Maple Ridge BC council meeting emailed to Margaret, “Maple Ridge in 2018 had been approached by TELUS and they [Council] said we need to think about it, need evidence its safe. No small cell antennas were installed.”
* Installation of at least 2 cell towers in Winnipeg halted after letters of non-concurrence were written by Councillors for those Wards. Another was halted after the City Councillor followed up on residents’ complaints and found that the area was not zoned for a tower.
* Sutton, Quebec unanimously passed a resolution in December 2019: TO REQUEST the federal government, following the precautionary principle, to decree a moratorium on the deployment of the 5G cellular network, until the various studies reach a consensus on the absence of risk and impact of 5G cell technology on health and the environment. TO TRANSMIT a copy of this resolution to the Minister of Health, the Minister of Innovation, Science and Economic Development, and the federal member for Brome-Missisquoi.
* [Original wording in French: “DE DEMANDER au gouvernement fédéral, en suivant le principe de précaution, qu’il décrète un moratoire sur le déploiement du réseau cellulaire 5G, et ce, jusqu’à ce que les diverses études dégagent un consensus quant à l'absence de risque et d'impact de la technologie cellulaire 5G sur la santé et l'environnement.”]
* The Bloc Quebecois in October 2019: *"in favor of a moratorium on the establishment of the 5G network ... that scientific studies be entrusted to an independent and autonomous commission ... respecting the precautionary principle."*
* The Green Party of Canada in its 2019 platform stated: *“A green government will strike a parliamentary committee to examine the implications of introducing 5G technologies…”*
* Highly controversial in parts of the USA. New Hampshire, USA has …

**4. If small cells may be installed in homes and near schools, need “fulsome” public consultation held by the City of Winnipeg.** Currently can be exempted. In Winnipeg, “*if these antenna installations would be on new towers, public consultation would be required. But most, if not all, 5G antennas, will be exempt from consultation. The Winnipeg Antenna Systems Policy allows the exemption of “antennas on buildings, water towers, lamp posts, etc. … provided the height above ground of the non-tower structure … is not increased by more than 25%.”* This loophole is possible because of the federal Innovation, Science and Economic Development’s policy CPC-2-0-03.

**5. Alternatives must be investigated with full public consultations:**

1. Copper and ethernet (widely used now) to and through the premises – one non-wireless alternative (slower transmission speeds than fiber optics).
2. Fiber optics to and through the premises (FTTP) – Community-owned wired fiber-to-the-premises
* Community Broadband – Municipal Broadband - Canadian success stories https://community-broadband.ca/
* Site from BC: *Connected Communities. Wired Networks for Crossing the Digital Divide:* <https://connected-communities.ca/>
* Wired Smart Cities: <https://connected-communities.ca/wired-smart-cities>
* In Manitoba:
	+ St. Frances Xavier (in progress)
	+ Maybe Thompson and Hamiota

**6. Our Requests:**

**1) Put a “pause” on future plans for rollout of 5G and the 4G small antennas that pave the way for 5G.**

**2) Help us get answers to questions to clarify the situation, for example:**

1. On Sept. 4th, 2019, Margaret asked in an email to the Mayor’s office: “Can you tell me if the City of Winnipeg is legally obligated to accept 5G technology or other radiofrequency emitting installations on its facilities or utilities such as lamp posts, by Manitoba Hydro or telecommunications providers?” As of today, there has been no response. Any suggestions on how to get an answer to this?
2. Have any legal commitments been made? If so, what are they?
3. Manitoba Hydro owns the lamp posts on Winnipeg’s streets. Who has say on what they are used for?
4. Can new poles for small cell placement be erected without Council consent?
5. Public Rights of Way agreements, what access do the telecommunications companies have?
6. What are the relevant “Joint Pole” agreements?
7. Need full scale public consultations (not by the telecommunications providers) if small cell are installed close to homes, daycares and schools. How can the City of Winnipeg do this?
8. Have alternatives such as fiber-optic networks been fully investigated? For health and cyber-security aspects?

**3) Provide us with guidance in preparing a report to send to the City of Winnipeg – to whom?**

 Some questions (still in draft form):

1. Cost/benefit analysis: Is there a cost/benefit analysis? If so, is it available to the public?
2. Legal aspects/Liability/ Insurance. London, Ontario has required $5 million insurance. Insurance policy? What are the monetary factors? Has the subject of compensation been considered? Require proof of liability insurance against harmful effects of RFR on health from all telecommunications companies deploying wireless technologies.
3. Pedestrian safety

Who is measuring (pedestrians may be exposed to a high levels of RF radiation)

1. Monitoring exposure levels/tracking health effects
2. ISED (formerly Industry Canada) requires that each wireless system owner comply with Safety Code 6. In the case of a structure with cells from more than one provider, (a multiparty structure for 5G) who is calculating the cumulative exposure of having all these antennas active at the same time? Each company files for their system....do the site owners compile the cumulative exposure report?
3. Will Manitoba Public Health start monitoring and reporting on the exposure to, and related health effects, of RF radiation.

**4) Assist in increasing awareness of Electromagnetic hypersensitivity (EHS),** also commonly called electrosensitivity and electrohypersensitivity. Surveys conducted in Sweden, Taiwan, the United Kingdom and the U.S. (California) have found that approximately **3 to 13.3% of the population** reported symptoms (Eltiti et al., 2007) (Johansson, 2006) (Levallois, Neutra, Lee, & Hristova, 2002) (Tseng M, Lin, & Cheng, 2011). It is likely that Canada would be within this range because the same wireless technologies (e.g. cell phones, computers, wireless routers, etc.) are commonly used in all of these countries.

In Canada, the Canadian Human Rights Commission has a policy with EHS classified under environmental sensitivities (Canadian Human Rights Commission, 2007) (Sears, 2007) – a health condition that is a consequence of the environment. It must be accommodated under the *Canadian Human Rights Act*. EHS is recognized as a disability in the United States under the *Americans with Disabilities Act*.[[5]](#footnote-5) Sweden recognizes EHS as a functional impairment (Johansson, 2010). Legal cases for compensation and disability pensions have been successful in Australia,[[6]](#footnote-6) France,[[7]](#footnote-7) Spain[[8]](#footnote-8) and U.S.[[9]](#footnote-9)

Symptoms often reported include headaches, concentration difficulties, sleep problems, dizziness, depression, fatigue, skin rashes, tinnitus and flu-like symptoms (Genuis & Lipp, 2012) (Johansson, Hilliges, Björnhagen, & Hall, 1994). Adverse reactions to emissions from wireless equipment range from mild and readily reversible to severe, when individuals must greatly reduce their exposures to sources of electromagnetic radiation (Carpenter, 2015) (Hedendahl, Carlberg, & Hardell, 2015) (Sears, 2007).

Provocation studies have been uneven in their findings. The need for changing the approach is discussed by Dr. Darius Leszczynski, Adjunct Professor of Biochemistry, University of Helsinki, Finland.[[10]](#footnote-10) Dr. Magda Havas, recently retired from Trent University, Ontario has reviewed the topic in a paper titled “*Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention*” (Havas, 2019).

On May 31st, 2019, Women’s College Hospital (in Toronto) hosted a symposium, approved for various medical credits for physicians: *“Impacts of Wireless Technology on Health: a symposium for Ontario’s medical community*.*”* This covered a wide range of topics as described in their media release:

Extract from Press Release of May 30, 2019:[[11]](#footnote-11)

***“Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out***

*Doctors treating patients from over-exposure to wireless radiation will join scientists at Queen's Park today to recommend the Ontario Government take steps to protect public health before the roll-out of 5G – the next generation of cell phone technology.*

*"My clinic is already assessing patients from across Ontario who are sensitive to microwave radiation from their wireless devices including cell phones, Wi-Fi, and an increasing number of smart appliances," said Dr. Riina Bray, Medical Director of the Environmental Health Clinic at Women's College Hospital in Toronto. "We expect 5G to add to this burden."*

*Scientists from 42 countries are now warning their governments about the emerging health problems associated wireless radiation. The initial 5G infrastructure is planned to begin in the Toronto to Montreal corridor. Daily human exposure to microwave radiation is already more than a trillion times higher than it was before cell phones.*

*Dr. Anthony Miller, Professor Emeritus with the University of Toronto, and adviser to the International Agency for Research on Cancer says, "Many scientists worldwide now believe that radiofrequency radiation should be elevated to a Class One human carcinogen, on the same list as Cigarettes, X-Rays, and Asbestos."*

*The doctors will advise the Province that increased health care costs can be avoided, if the government takes precautions to protect the public from exposure to 5G technology.”*

International Classification of Diseases (ICD) now has codes for health effects caused by non-ionizing radiation. This was a request from Electromagnetic Hypersensitivity (EHS) Resolution adopted in Belgium in 2015. Doctors can now use this code to characterize health effects associated with radiofrequency radiation and other types of non-ionizing radiation.   <https://icd.codes/icd10cm/W90>

It is not only people who are adversely affected. Environmental implications and aspects of public health related to 5G have been recently reviewed by Cindy Russell MD (11, Russell, 2018). This review includes studies showing wildlife, including birds and pollinators, are affected by ambient levels of radiofrequency radiation.

**7. Possible Actions by the City of Winnipeg:**

1. As our elected officials, you have a responsibility to make the city as healthy and safe as possible for its residents.

2. Please invest the time to learn about 5G and other technologies. How can we get the benefits as safely as possible?

3. It is our understanding that municipal governments can say “no” to the placement of antennas on public property, although this can be overruled by the federal minister of ISED (IC).

4. What is the City’s, and your, liability should a definitive link be made to harm from radiofrequency such as that emitted from City-approved antennas in the future?

5. Some municipalities have requested[[12]](#footnote-12):

a) Annual renewal of contracts for small cell antenna installations.

b) Ability to have small cell antennas removed with no legal penalty to the City should a link between harm to human health and radiofrequency be made.

c) Regular monitoring of exposure to radiofrequency emissions before installation and after the antennas are activated, and thereafter at regular intervals.

d) Establishment of a health registry for reporting adverse biological and health effects associated with 5G antennas. Establishment of a process that investigates each complaint/report in a timely manner.

e) Request to the appropriate public health authorities to contact the physicians at the Environmental Health Clinic, Women’s College Hospital, Toronto for detailed information on their concerns about increased health care costs and appropriate care for persons reporting adverse effects from exposure to radiofrequency radiation from these antennas and other sources.

f) If the city cannot put a “pause” on 5G, then it should hold “fulsome” public consultations.

**8. References cited above:**

1. Canadian Human Rights Commission. (2007). **Policy on Environmental Sensitivities. Reviewed 2014.** *Canadian Human Rights Commission*. Retrieved from https://www.chrc-ccdp.gc.ca/sites/default/files/policy\_sensitivity\_0.pdf

2. Carpenter, D. O. (2015). **The microwave syndrome or electro-hypersensitivity: historical background**. *Reviews on Environmental Health*, *30*(4), 217–222. https://doi.org/10.1515/reveh-2015-0016

3. Eltiti, S., Wallace, D., Zougkou, K., Russo, R., Joseph, S., Rasor, P., & Fox, E. (2007). **Development and evaluation of the electromagnetic hypersensitivity questionnaire**. *Bioelectromagnetics*, *28*(2), 137–151. https://doi.org/10.1002/bem.20279

4. Genuis, S. J., & Lipp, C. T. (2012). **Electromagnetic hypersensitivity: fact or fiction?** *The Science of the Total Environment*, *414*, 103–112. https://doi.org/10.1016/j.scitotenv.2011.11.008

5. Havas, M. (2019). **Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention**. *J. Sci. Discov.*, *3*(1), 20. https://doi.org/jsd18020

6. Hedendahl, L., Carlberg, M., & Hardell, L. (2015). **Electromagnetic hypersensitivity-an increasing challenge to the medical profession**. *Reviews on Environmental Health*, *30*(4), 209–215. https://doi.org/10.1515/reveh-2015-0012

7. Johansson. (2006). **Electrohypersensitivity: State-of-the-Art of a Functional Impairment**. *Electromagnetic Biology and Medicine*, *25*(4), 245–258. https://doi.org/10.1080/15368370601044150

8. Johansson, O., Hilliges, M., Björnhagen, V., & Hall, K. (1994). **Skin changes in patients claiming to suffer from “screen dermatitis”: a two-case open-field provocation study**. *Experimental Dermatology*, *3*(5), 234–238.

9. Johansson, Olle. (2010). **Aspects of studies on the functional impairment electrohypersensitivity**. *IOP Conference Series: Earth and Environmental Science*, *10*(1), 012005. https://doi.org/10.1088/1755-1315/10/1/012005

10. Levallois, P., Neutra, R., Lee, G., & Hristova, L. (2002). **Study of self-reported hypersensitivity to electromagnetic fields in California.** *Environmental Health Perspectives*, *110*(Suppl 4), 619–623.

11. Russell, C. L. (2018). **5 G wireless telecommunications expansion: Public health and environmental implications**. *Environmental Research*, *165*, 484–495. https://doi.org/10.1016/j.envres.2018.01.016

12. Sears, M. E. (2007). **The medical perspective on environmental sensitivities**. *Canadian Human Rights Commission Ottawa, Canada*, *https://www.chrc-ccdp.gc.ca/eng/content/medical-perspective-environmental-sensitivities*, 79.

13. Tseng M, M.-C., Lin, Y.-P., & Cheng, T.-J. (2011). **Prevalence and psychiatric comorbidity of self-reported electromagnetic field sensitivity in Taiwan: A population-based study**. *Journal of the Formosan Medical Association*, *110*(10), 634–641. <https://doi.org/10.1016/j.jfma.2011.08.005>

**APPENDIX 1. Wireless radiation in the radiofrequency range and adverse health effects:**

**Key peer-reviewed papers and videos**

**PAPERS IN PEER-REVIEWED JOURNALS:**

1. **CANCER** – EVIDENCE TO SUPPORT A GROUP 1 *KNOWN* HUMAN CARCINOGEN CLASSIFICATION (WORLD HEALTH ORGANIZATION, INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (WHO-IARC)
* Miller, A. B.[[13]](#footnote-13), Morgan, L. L., Udasin, I., & Davis, D. L. (2018). **Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102)**. *Environmental Research*, *167*, 673–683. <https://doi.org/10.1016/j.envres.2018.06.043>

<https://www.ncbi.nlm.nih.gov/pubmed/30196934>

* Hardell, L., & Carlberg, M. (2018). **Comments on the US National Toxicology Program technical reports on toxicology and carcinogenesis study in rats exposed to whole-body radiofrequency radiation at 900 MHz and in mice exposed to whole-body radiofrequency radiation at 1,900 MHz**. *International Journal of Oncology*. <https://doi.org/10.3892/ijo.2018.4606>

<https://www.ncbi.nlm.nih.gov/pubmed/30365129>

1. **CANADIAN BRAIN CANCER DATA** – 2X RISK OF GLIOMAS WITH >558 HOURS OF CELL PHONE USE
* Momoli, F., Siemiatycki, J., McBride, M. L., Parent, M.-É., Richardson, L., Bedard, D., … Krewski, D. (2017). **Probabilistic Multiple-Bias Modeling Applied to the Canadian Data From the Interphone Study of Mobile Phone Use and Risk of Glioma, Meningioma, Acoustic Neuroma, and Parotid Gland Tumors**. *American Journal of Epidemiology*, *186*(7), 885–893. <https://doi.org/10.1093/aje/kwx157>

<https://www.ncbi.nlm.nih.gov/pubmed/28535174>

1. **BRAIN CANCER INCIDENCE IN ENGLAND**
* Philips, Alisdair, Henshaw, Denis L., Lamburn, Graham, & O’Carroll, Michael. (2018). **Brain tumours: rise in Glioblastoma Muliforme incidence in England 1995-2015 suggests an adverse environmental or lifestyle factor**. *Journal of Environmental and Public Health*, 20.

<https://www.hindawi.com/journals/jeph/2018/7910754/>

1. **CANADIAN COLORECTAL CANCER INCIDENCE IN YOUNGER ADULTS IS “CONTINUING AND POSSIBLY ACCELERATING”**
* Brenner, D. R., Heer, E., Sutherland, R. L., Ruan, Y., Tinmouth, J., Heitman, S. J., & Hilsden, R. J. (2019). **National Trends in Colorectal Cancer Incidence Among Older and Younger Adults in Canada.** JAMA Network Open, 2(7), e198090–e198090. <https://doi.org/10.1001/jamanetworkopen.2019.8090>
1. **INCREASED ABSORPTION OF RADIOFREQUENCY ENERGY IN CHILDREN**
* Fernández, C., de Salles, A. A., Sears, M. E., Morris, R. D., & Davis, D. L. (2018). **Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality**. *Environmental Research*, *167*, 694–699. <https://doi.org/10.1016/j.envres.2018.05.013>

<https://www.sciencedirect.com/science/article/pii/S0013935118302561>

1. **PUBLIC HEALTH RISKS** (BOTH MILLER AND RUSSELL ARE MEDICAL DOCTORS)
* Miller, A. B., Sears, M. E., Morgan, L. L., Davis, D. L., Hardell, L., Oremus, M., & Soskolne, C. L. (2019). **Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices**. *Frontiers in Public Health*, *7*. <https://doi.org/10.3389/fpubh.2019.00223>

https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full

* Russell, C. L. (2018). **5 G wireless telecommunications expansion: Public health and environmental implications.** Environmental Research, 165, 484–495. <https://doi.org/10.1016/j.envres.2018.01.016>

Website: Physicians for Safe Technology - <https://mdsafetech.org/>

1. **BEHAVOURAL PROBLEMS IN CHILDREN**
* Birks, L., Guxens, M., Papadopoulou, E., Alexander, J., Ballester, F., Estarlich, M., … Vrijheid, M. (2017). **Maternal cell phone use during pregnancy and child behavioral problems in five birth cohorts**. *Environment International*, *104*, 122–131. <https://doi.org/10.1016/j.envint.2017.03.024>

<https://www.ncbi.nlm.nih.gov/pubmed/28392066>

1. **ADVERSE EFFECTS ON SPERM QUALITY** (ONE OF SEVERAL REVIEWS WITH SIMILAR CONCLUSIONS)
* Houston, B. J., Nixon, B., King, B. V., De Iuliis, G. N., & Aitken, R. J. (2016). **The effects of radiofrequency electromagnetic radiation on sperm function**. *Reproduction (Cambridge, England)*, *152*(6), R263–R276. <https://doi.org/10.1530/REP-16-0126>

<https://www.ncbi.nlm.nih.gov/pubmed/27601711>

1. **DNA DAMAGE** – OVER 30 STUDIES SHOWING DAMAGE AT UNDER SAFETY LEVEL EXPOSURES
* Panagopoulos, D. J. (2019). **Comparing DNA damage induced by mobile telephony and other types of man-made electromagnetic fields**. *Mutation Research/Reviews in Mutation Research*, *781*, 53–62. <https://doi.org/10.1016/j.mrrev.2019.03.003>

<https://www.sciencedirect.com/science/article/pii/S1383574218300991>

1. **OXIDATIVE STRESS** (CAN LEAD TO MANY HEALTH CONDITIONS INCLUDING CANCER, ALZHEIMER’S AND PARKINSON’S DISEASE)
* Yakymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016). **Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation**. *Electromagnetic Biology and Medicine*, *35*(2), 186–202. <https://doi.org/10.3109/15368378.2015.1043557>

<https://www.ncbi.nlm.nih.gov/pubmed/26151230>

1. **Electrohypersensitivity** (EHS)
	* Belyaev, I., Dean, A., Eger, H., Hubmann, G., Jandrisovits, R., Kern, M., … Thill, R. (2016). **EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses**. *Reviews on Environmental Health, 31(3)*. <https://doi.org/10.1515/reveh-2016-0011>
	* Havas, M. (2019). **Electrohypersensitivity (EHS) is an Environmentally-Induced Disability that Requires Immediate Attention**. *J. Sci. Discov., 3(1),* 20. <https://doi.org/jsd18020>
2. **CELL TOWER EXPOSURE STUDY** (DNA DAMAGE, OXIDATIVE STRESS)
* Zothansiama, null, Zosangzuali, M., Lalramdinpuii, M., & Jagetia, G. C. (2017). **Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations**. *Electromagnetic Biology and Medicine*, 1–11. <https://doi.org/10.1080/15368378.2017.1350584>

<https://www.ncbi.nlm.nih.gov/pubmed/28777669>

**VIDEOS:**

1. Less than 5 minutes: Dr. Anthony B. Miller: **Radio Frequency Radiation, Cancer and Cell Towers Statement to School District. Statement that wireless radiation should be classified as a Class 1 *known* carcinogen.**

<https://www.youtube.com/watch?v=LPs6PAG1H6c>

2. Approximately 24 minutes (2017): Dr. Anthony B. Miller: **Epidemiology of Cell Phones and Other Wireless Transmitting Devices – An Update (describes the evidence supporting an IARC Class 2A *probable* human carcinogen classification).** Expert Forum: Wireless Radiation and Human Health. Hebrew University Medical School, January 23-26, 2017

<https://ehtrust.org/science/key-scientific-lectures/2017-expert-forum-wireless-radiation-human-health/>

3. Approximately 1 hour: Devra Davis PhD, MPH. (2015) **The truth about mobile phone and wireless radiation.** Dean’s Lecture at University of Melbourne, School of Engineering

<https://ehtrust.org/science/key-scientific-lectures/dr-davis-dilvered-the-deans-lecture-at-melbourne-school-of-engineering/>

**SUPPLEMENTAL INFORMATION: A SAMPLE OF CELL TOWER STUDIES**

1. Abdel-Rassoul, G., El-Fateh, O. A., Salem, M. A., Michael, A., Farahat, F., El-Batanouny, M., & Salem, E. (2007). **Neurobehavioral effects among inhabitants around mobile phone base stations**. *Neurotoxicology*, *28*(2), 434–440. <https://doi.org/10.1016/j.neuro.2006.07.012>

2. Bortkiewicz, A., Gadzicka, E., Szyjkowska, A., Politański, P., Mamrot, P., Szymczak, W., & Zmyślony, M. (2012). **Subjective complaints of people living near mobile phone base stations in Poland**. *International Journal of Occupational Medicine and Environmental Health*, *25*(1), 31–40. <https://doi.org/10.2478/s13382-012-0007-9>

3. Eger, H., Hagen, K. U., Lucas, B., Vogel, P., & Voit, H. (2004). **[The influence of being physically near to a cell phone transmission mast on the incidence of cancer] Einfluss der räumlichen Nähe von Mobilfunksendeanlagen auf die Krebsinzidenz (in German)**. *Umvelt Medizin Gesellschaft -Verlag-Ges.*, *17*(4), 1–7.

4. Hutter, H.-P., Moshammer, H., Wallner, P., & Kundi, M. (2006). **Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations**. *Occupational and Environmental Medicine*, *63*(5), 307–313. https://doi.org/10.1136/oem.2005.020784

5. Levitt, Blake, & Lai, Henry. (2010). **Biological effects from exposure to electromagnetic radiation emitted by cell tower base stations and other antenna arrays.** *NRC Press*.

6. Santini, R., Santini, P., Danze, J. M., Le Ruz, P., & Seigne, M. (2003). **[Symptoms experienced by people in vicinity of base stations: II/ Incidences of age, duration of exposure, location of subjects in relation to the antennas and other electromagnetic factors]**. *Pathologie-Biologie*, *51*(7), 412–415.

7. Santini, Roger. (2002). **Study of The Health of People Living in The Vicinity of Mobile Phone Base Stations**. *Pathol Biol*, *50*, 369–73.

8. Wolf, R., & Wolf, D. (2004). **Increased incidence of cancer near a cell-phone transmitter station.** *International Journal of Cancer*, *1*(2). Retrieved from http://www.powerwatch.org.uk/news/20050207\_israel.pdf

9. Zothansiama, Zosangzuali, M., Lalramdinpuii, M., & Jagetia, G. C. (2017). **Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations**. *Electromagnetic Biology and Medicine*, 1–11. https://doi.org/10.1080/15368378.2017.1350584

--------------------

**APPENDIX B.**

*Dr. Anthony B. Miller*

136 Charles Street,

Port Hope, ON, L1A 1T3

Telephone 905 885 0253

Email: ab.miller@utoronto.ca

February 4, 2020

**For the urgent attention of:**

Penticton City Council Mayor John Vassilaki and Councillors

RDOS Chair Karla Kozakevich and Board of Directors

Editor of the Penticton Herald Joe Fries

Editor of the Penticton Western News

MP Richard Cannings (South Okanagan-West Kootenay)

MLA Dan Ashton (Penticton)

Linda Larson, MLA ( Boundary-Similkameen)

CC: Hans Karow (Coalition to Reduce Electropollution, CORE)

**Subject**: **Exposure of the public to Wireless 3G, 4G, 5G**

It has been brought to my attention, that last summer, in addition to already existing macro cell antennas, one cell antenna tower has been constructed on 1953 Dartmouth Road (near hospital, residential and industrial area) and antennas have also been attached to the top of the Park Place Sun Village Retirement Complex on 1147 Main Street (across the RCMP building) in Penticton.

I have also learned that antennas were previously attached to other living complexes i.e.: Charles Manor on 320 Martin Street; Apartment building on 2401 South Main Street; three cell towers only 200 m apart from each other: two Telus towers Fairview/Calgary Ave with nearest residential homes 60 m away, and one Rogers tower with an output power of 120.23 facing directly to several four stories apartment complexes 80 m away.

It is completely unacceptable that cell towers should be placed on or close to residential buildings, as this results in exposure of humans to a potentially carcinogenic form of radiation.

Radiation exposure has long been a concern for the public, policy makers and health researchers. Beginning with radar during World War II, human exposure to radio-frequency radiation (RFR) and associated technologies has grown more than 100,000-fold. In 2011, a working group of theInternational Agency for Research on Cancer (IARC) reviewed the published literature and categorized RFR as a possible (Group 2B) human carcinogen. A broad range of adverse human health effects associated with RFR have been reported since the IARC review, including brain cancer, cancers of the vestibular (hearing) nerve (Schwannomas), and sterility. In addition, two large-scale carcinogenicity studies in rodents exposed to levels of RFR that mimic lifetime human exposures have shown significantly increased rates of Schwannomas and malignant gliomas, as well as chromosomal DNA damage.

Of particular concern are the effects of RFR exposure on the developing brain in children. Compared with an adult male, a cell phone held against the head of a child exposes deeper brain structures to greater radiation doses per unit volume, and the young, thin skull’s bone marrow absorbs a roughly 10-fold higher local dose. Recent reports also suggest that men who keep cell phones in their trouser pockets have significantly lower sperm counts and significantly impaired sperm motility and morphology, including mitochondrial DNA damage, and increased risk of colon cancer.

Based on the accumulated evidence, I believe that if IARC were to re-evaluate its 2011 classification of the human carcinogenicity of RFR, it would be categorized as Group 1, i.e. carcinogenic to humans. Thus, current knowledge provides justification for governments, public health authorities, and physicians/allied health professionals to support measures to reduce all exposures to RFR to As Low As Reasonably Achievable, something we learnt was necessary for exposures to ionizing radiation (e.g. X-rays) many years ago.

The Telecom industry’s fifth generation (5G) wireless service will require the placement of many small antennae/cell towers close to all recipients of the service, because solid structures, rain and foliage block the associated millimeter wave RFR. 5G technology is being developed as it is also being deployed, with large arrays of directional, steerable antennae, operating at higher power than previous technologies. 5G is not stand-alone – it will operate and interface with other (including 3G and 4G) frequencies and modulations to enable diverse devices under continual development for the “internet of things,” driverless vehicles and more.

This novel 5G technology is being rolled out although potential chronic health or environmental impacts have not been evaluated. The range and magnitude of potential impacts of 5G technology are under-researched, although important biological outcomes have been reported with the associated millimeter wavelength exposure to RFR. These include oxidative stress and altered gene expression, effects on skin and systemic effects such as on immune function, all of which highlight the need for more research before population-wide continuous exposures occur.

An individual, if appropriately informed, can reduce her or his exposure to radiofrequency radiation from cell phones, but in the case of cell towers and small cell transmitters of 5G the exposure they receive is outside their control. With the people who manufacture these devices and those who promote small cell technology in front of homes failing to issue adequate health warnings, we are reaching a situation where homes, schools, and workplaces are being saturated with radiofrequency radiation.

Thus, to avoid an epidemic of cancer and heart damage, brain damage and infertility caused by radiofrequency radiation, we should introduce means to reduce such exposures to As Low As Reasonably Achievable, something we learnt to do many years ago for ionizing radiation (X-rays). Instead use fiber-optic connections to the home, place small cell transmitters away from residential neighborhoods and schools and strengthen the rules that are meant to protect the public.

Those who support the introduction of 5G should recognize that no insurance agency (including Lloyds of London) will cover them against liability from ill health effects caused by radiofrequency radiation.

The removal of cell towers from the top of buildings and a moratorium on the roll-out of 5G is essential.



Anthony B. Miller, MD, FRCP, CM. Professor Emeritus, Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada.

1. Source of extract: Environmental Health Trust: https://ehtrust.org/5g-a-human-health-risk-dr-miller-interviewed-on-radio-canada-international/ [↑](#footnote-ref-1)
2. Clegg et al. (2019) Building science and radiofrequency radiation: What makes smart and healthy buildings. Building and Environment. https://www.sciencedirect.com/science/article/pii/S0360132319305347 [↑](#footnote-ref-2)
3. 1) Webster, Paul Christopher. (2013). **Federal Wi-Fi panel criticized for undisclosed conflict**. *CMAJ: Canadian Medical Association Journal = Journal de l’Association Medicale Canadienne*, *185*(11), E515-516. <https://doi.org/10.1503/cmaj.109-4523>

2) Webster, P. (2013). **Chair of Wi-Fi safety panel steps down**. *CMAJ*, *185*(12), E573.

https://www.cmaj.ca/content/185/12/E573

3) Webster, Paul Christopher. (2014). **Federal Wi-Fi safety report is deeply flawed, say experts**. *CMAJ: Canadian Medical Association Journal = Journal de l’Association Medicale Canadienne*, *186*(9), E300. https://doi.org/10.1503/cmaj.109-4785

4) Webster, Paul Christopher. (2015). **Scientists decry Canada’s outdated Wi-Fi safety rules**. *Canadian Medical Association Journal*, *187*(9), 639–640. <https://doi.org/10.1503/cmaj.109-5061> [↑](#footnote-ref-3)
4. The Lancet. https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(19)30246-3/fulltext [↑](#footnote-ref-4)
5. <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-accessibility-guidelines-for-recreation-facilities/general-issues> [↑](#footnote-ref-5)
6. <https://www.news.com.au/technology/csiro-scientist-dr-david-mcdonald-wins-compensation-for-wifi-pain/news-story/0a2abc1814dca200d9e54b05f810c8f5> [↑](#footnote-ref-6)
7. [http://www.journaldelenvironnement.net/article/dans-l-essonne-l-electrosensibilite-reconnue-comme-un-handicap,45060](http://www.journaldelenvironnement.net/article/dans-l-essonne-l-electrosensibilite-reconnue-comme-un-handicap%2C45060) [↑](#footnote-ref-7)
8. <https://www.portalesmedicos.com/publicaciones/> [↑](#footnote-ref-8)
9. <https://www.prlog.org/12381499-los-angeles-unified-school-district-accommodates-teacher-who-fell-ill-after-wireless-installation.html> [↑](#footnote-ref-9)
10. The end of the road for EHS (IEI-EMF) provocation studies https://betweenrockandhardplace.files.wordpress.com/2018/02/open-letter-on-the-ehs-research-dated.pdf [↑](#footnote-ref-10)
11. Video of media briefing: http://c4st.org/ontario-doctors-warn-of-rising-health-care-costs-after-5g-roll-out/ [↑](#footnote-ref-11)
12. Modified from a presentation by Dr. Magda Havas. [↑](#footnote-ref-12)
13. Anthony B. Miller, MD, FRCP, FRCP(C), FFPH, FACE. Professor Emeritus, Dalla Lana School of Public Health, University of Toronto. A physician-epidemiologist, he was trained in internal medicine, and was a member of the scientific staff of the Tuberculosis and Chest Diseases Research Unit, UK Medical Research Council, 1962-71. He was Director of the Epidemiology Unit of the National Cancer Institute of Canada 1971-86 and Chair of the Department of Preventive Medicine and Biostatistics, University of Toronto, 1992-96. He served as a special expert in the Division of Cancer Prevention, US National Cancer Institute, 1997, Senior Epidemiologist, International Agency for Research on Cancer 1998-99, Head, Division of Epidemiology, German Cancer Research Centre, Heidelberg, 2000-03, Associate Director, Research, Dalla Lana School of Public Health, University of Toronto, 2008-10. He has been a consultant to the World Health Organization. He is Scientific Lead of the OncoSim microsimulation modelling initiative of the Canadian Partnership Against Cancer. His research encompasses cancer etiology, prevention and screening. [↑](#footnote-ref-13)