



Safe Technology: Schools, Towns, and
Vulnerable Populations



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International Commission on the Biological
Effects of Electromagnetic Radiation

Environmental Health Trust

1

1



Your Presenter's Brief Bio

Dr. Chamberlin is the Past-Chair and Professor Emeritus in the Department of Electrical and Computer Engineering at the University of New Hampshire. In his more than forty years in academia, he has performed research for over twenty-five sponsors, including the National Science Foundation. He has received two Fulbright awards, including the prestigious Fulbright Distinguished Chair. He has also served as an Associate Editor for the Institute for Electrical & Electronics Engineers (IEEE), and he regularly performs reviews for them and other technical and scientific publications.

Dr. Chamberlin served on the New Hampshire State Commission that was convened through legislation to explore the impacts of wireless radiation. Since serving on the commission, he has been active in carrying out the recommendations of the commission by working with legislators and community groups around the world. Dr. Chamberlin is a founding member of the International Commission on the Biological Effects of Electromagnetic Fields and is the past President of the Environmental Health Trust. He has engaged in speaking tours in China and Europe where he presented the findings of the New Hampshire Commission to groups that included the Royal Society of Medicine in London.

2

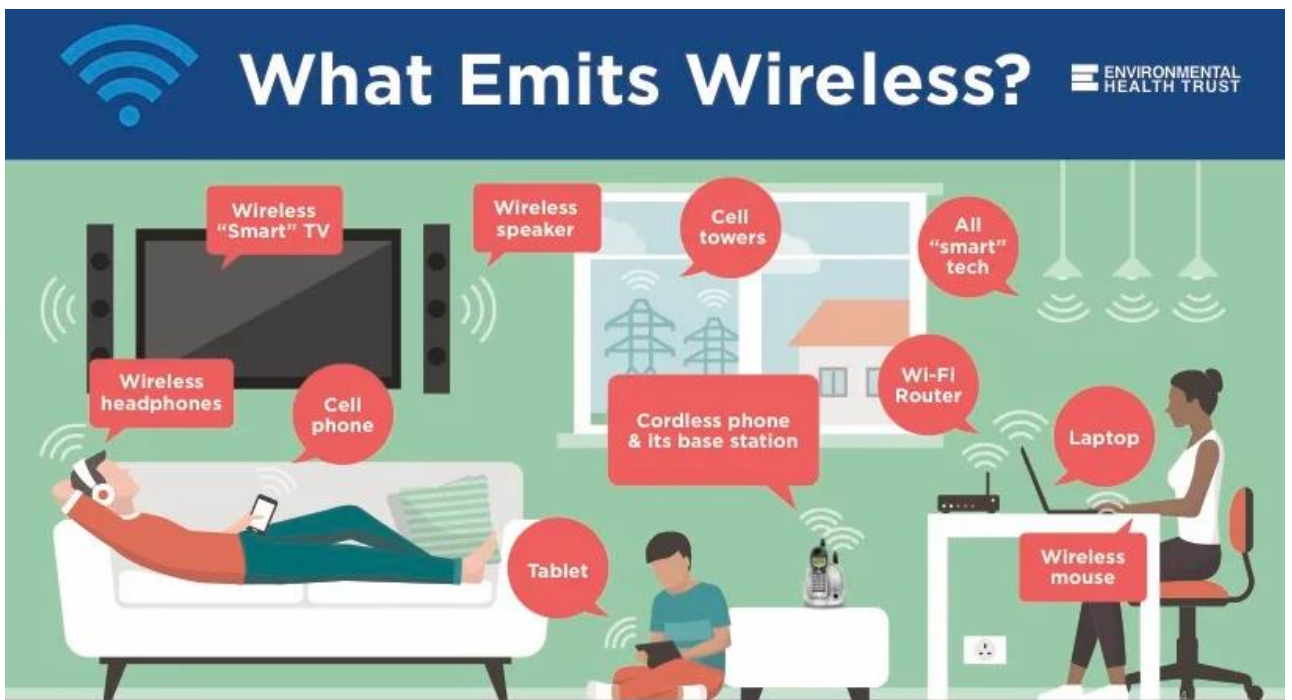
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Covered in this Presentation

- Answer the question about the harms of wireless radiation
 - The New Hampshire Commission on the Health and Environmental Impacts of Wireless Radiation
- How wireless radiation guidelines were set
- The role of government regulatory bodies in protecting us
- What you can do
- Q&A

3

3



4

NH Commission on the Health and Environmental Impacts of 5G and Wireless Technology

- The Commission was convened through [bipartisan legislation](#) that was passed by both houses of the legislature and signed by the Governor
- The 13 Commission members had backgrounds that included medicine, physics, toxicology, electromagnetics, epidemiology, biostatistics, occupational health, public health policy, business, and law

5

5

Some of the Questions Posed to the Commission

- Why does the insurance industry recognize wireless radiation as a risk, but will not insure for damages caused by it?
- Why have the many hundreds of peer-reviewed studies showing harm from wireless radiation been ignored by the FCC?
- Why are FCC guidelines based solely on thermal effects, when non-thermal effects have been well documented?
- Why did the World Health Organization classify wireless radiation as a possible carcinogen, and why is that fact being ignored by the FCC?

6

6

Sources of Information for the Findings of the Commission

- Peer-reviewed and Commission-vetted, publications
- Regulatory agencies (FCC, FDA, EPA)
 - They were invited to meet with the commission, but they did not, nor did they provide sufficient answers to our questions.
- Outside experts: all presenters except one provided clear evidence that wireless radiation poses a threat to human health and the environment
 - The presenter who did not acknowledge those risks was the presenter from the telecommunications industry; he was also the only person paid to present

7

7

Outcome of Peer-Reviewed Literature Review

- We identified hundreds of top-tier publications that showed harm from low-level wireless radiation exposure.
- The vast majority of peer-reviewed publications showed effects from exposure ([Henry Lai 2020](#)).
 - 240 out of 261 (91%) of studies showed free radical (oxidative damage) effects resulting from low-level RFR exposure
 - Oxidative stress can lead to chronic inflammation, which can lead to a host of diseases as shown on the next slide

8

8

Oxidative Effects, Primary Mechanism for Wireless Radiation Harm

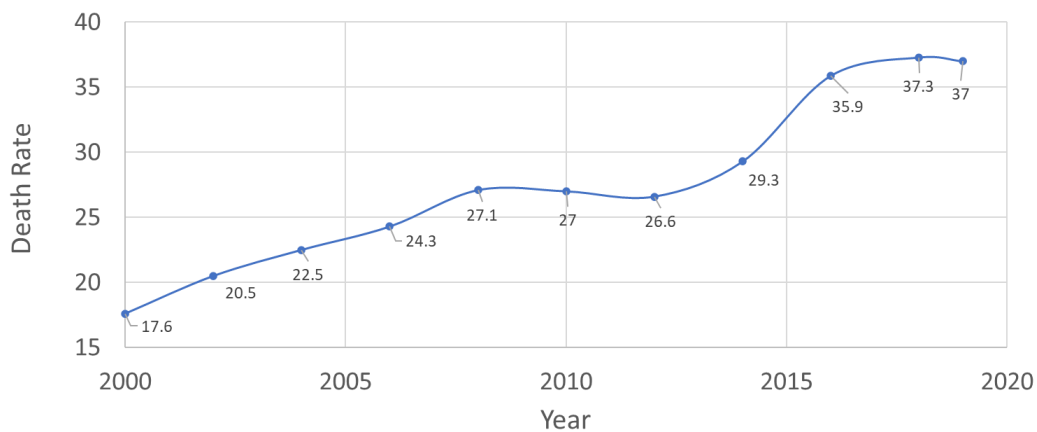
As noted on the previous slide, the primary mechanism by which exposure causes harm are oxidative changes, which can lead to an increase in free radicals. Those free radicals can lead to chronic inflammation and many of harmful outcomes including:

- **Reproduction (sperm damage and infertility)**
- **Neurodegenerative disease (Alzheimer's)**
- **Cancer**
- **Cardiovascular disease**
- **Diabetes**
- **Chromosome damage**
- **Neuronal DNA damage**
- **Neuropsychiatric effects**

9

9

U.S. Alzheimer's Death Rate (per 100,000 people)

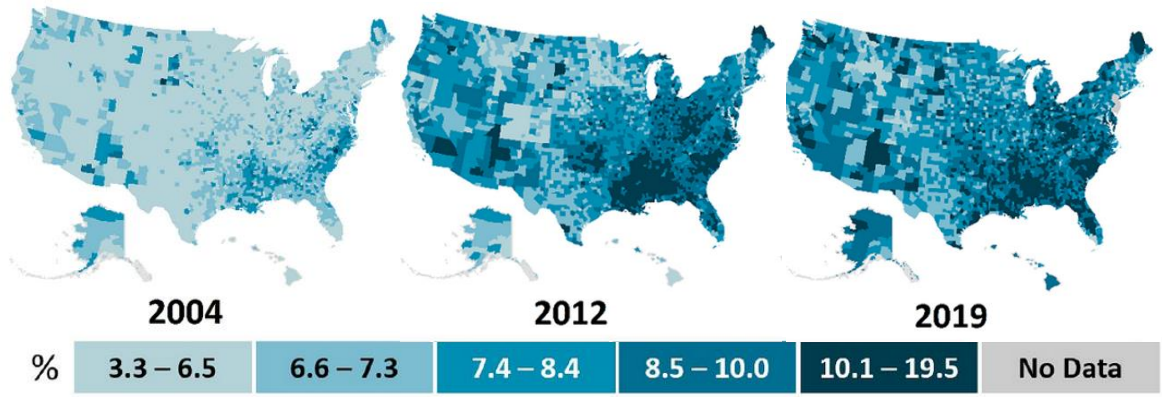


<https://www.alz.org/media/Documents/alzheimers-facts-and-figures.pdf>

10

10

Age-adjusted prevalence of diagnosed diabetes among adults aged 20 years or older, United States, 2004, 2012, and 2019

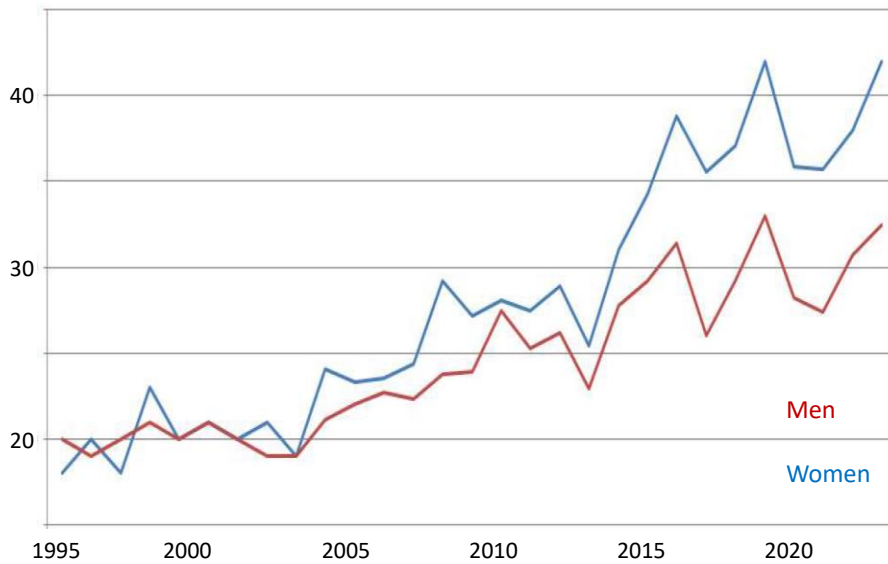


Data sources: US Diabetes Surveillance System; Behavioral Risk Factor Surveillance System.

<https://www.cdc.gov/diabetes/data/statistics-report/diagnosed-diabetes.html>

11

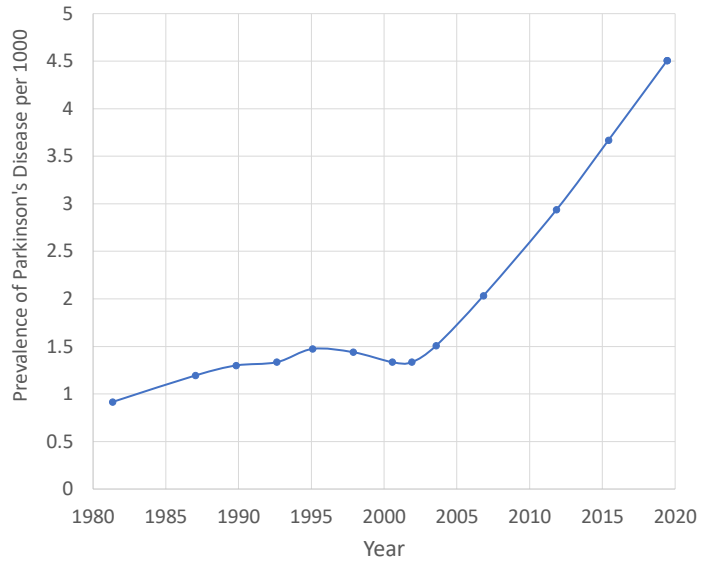
Danish Cancer Registry Report on New Central Nervous System and Brain Tumors per 100,000 People [\(reference\)](#)



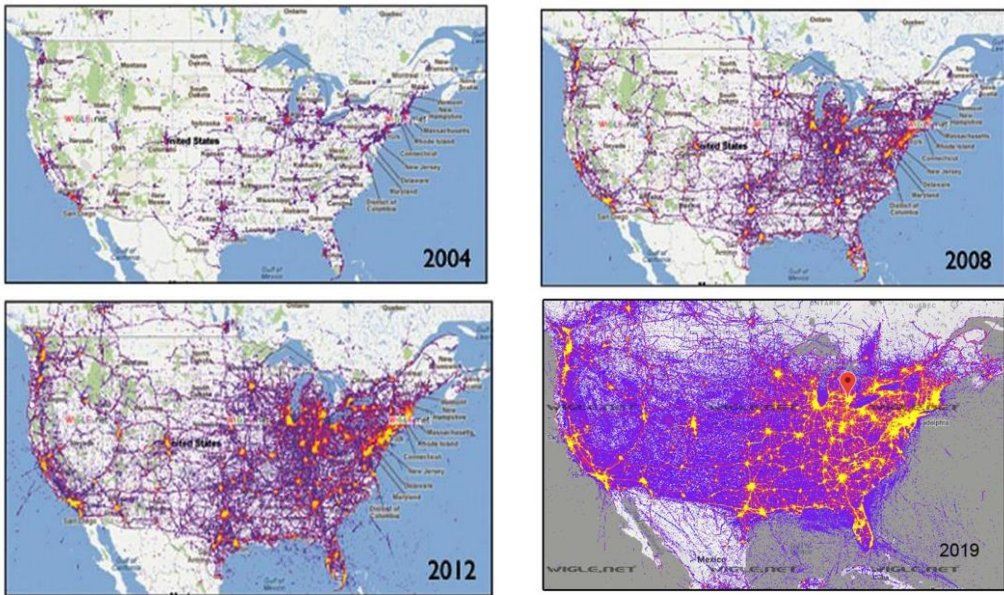
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12

Worldwide temporal trend in the all-age prevalence of Parkinson's disease ([The Lancet](#))



Network Density History in the United States ([WiGLE.net](#))

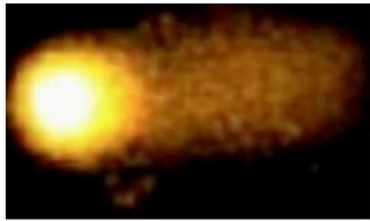


Wireless Radiation Effect on DNA

An important European review of the science, called The [Reflex Report](#), prepared by 12 scientific institutes in 7 countries, confirmed long-term genetic damage in the blood and brains of users of mobile phones and other sources of electromagnetic fields.



Control



Ionising gamma irradiation
0.5Gy (equivalent to 1,600
chest x-rays)



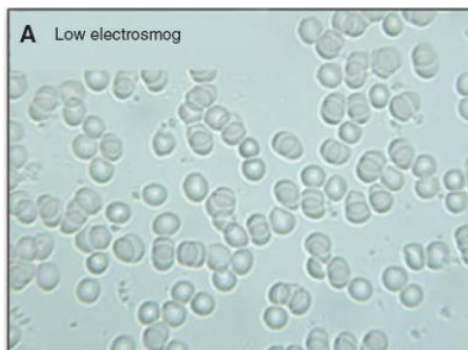
Non-ionising RF-EMF exposure
24 hours mobile phone exposure
1,800 MHz at SAR = 1.3W/kg

Comet Assays, aka single-cell gel electrophoresis, of DNA: control and after exposures

15

Wireless Radiation Exposure and the Formation of Rouleaux in the Blood

- Rouleaux is the clumping of red blood cells, and is a **pathological condition** generally associated with some Cancers, Chronic Infections, Connective Tissue Disorders, Inflammatory States, etc.
 - The association between rouleaux and wireless radiation was first documented by Drs. Rubik and [Havas](#) who used an *in vitro* [blood analysis](#)
 - These studies did not get much traction because they were *in vitro* studies
 - Earlier this year, Dr. Robert Brown, a Senior Radiologist, [used ultrasound to correlate rouleaux formation with wireless radiation exposure](#).

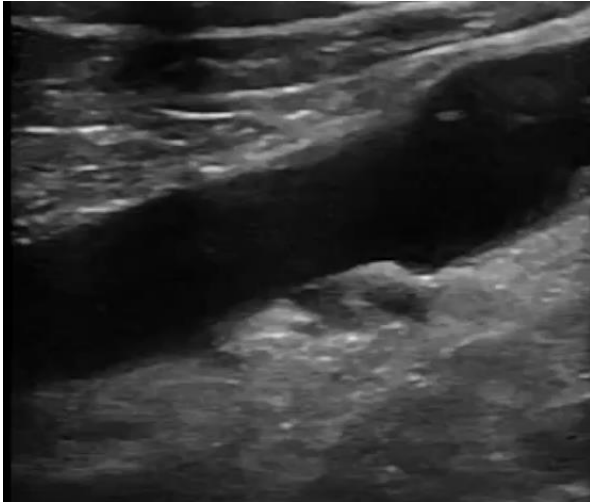


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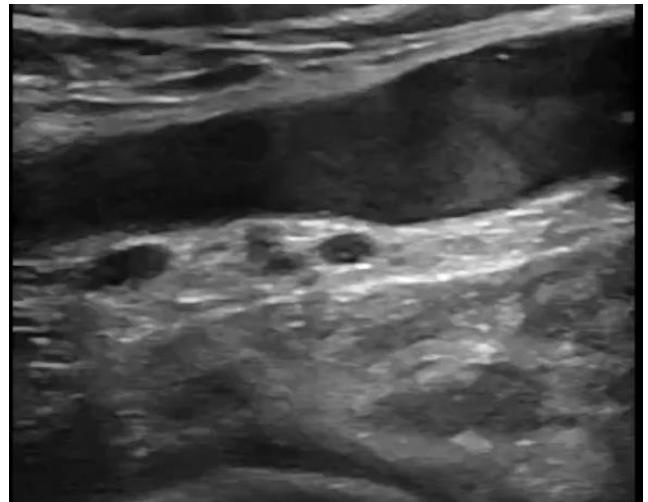
16

Popliteal Vein Before and After Exposure to Cellphone Radiation

Before Exposure (no rouleaux evident)



After Exposure (rouleaux evident as hazy region in vein)



17

17

Many Physicians Worldwide Recognize the Harms of Wireless Radiation



[2020 Consensus Statement](#) of UK and International Medical and Scientific Experts and Practitioners on Health Effects of Non-Ionizing Radiation (NIR)
(Signed by groups representing over **3,500 medical doctors**)

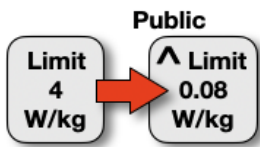
Public Health Crisis:

1. RFR has been proven to damage biological systems at intensities below FCC/ICNIRP guidelines.
2. Public exposure to RFR is already harmful and will rise with the deployment of 5G.
3. Exposure is unavoidable, contravening the Human Rights Act for those who do not consent.
4. Multiple international governmental health advisory groups are biased by conflicts of interest.

18

18

How the Current FCC Wireless Radiation Exposure Guidelines Were Set

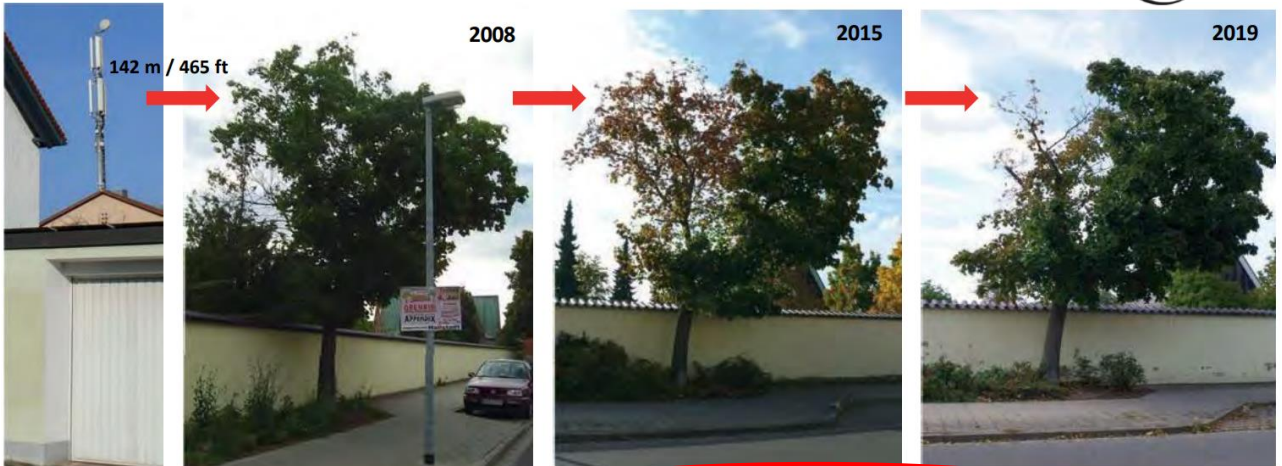


- Current limits were set in the 1980s and were based on short-term (around an hour) behavioral studies on 8 rats and 5 monkeys
- The assumption made in setting these limits is that, if wireless radiation is not strong enough to warm tissues, it will not cause harm
- The animals were exposed to increasing levels of radiation until they could no longer perform their task. That level was then designated as the threshold dose
- An arbitrary “safety factor” of 50 was then applied to that number to come up with a radiation threshold for the general public

19

19

Example of Long-Term, Very-Low Exposure



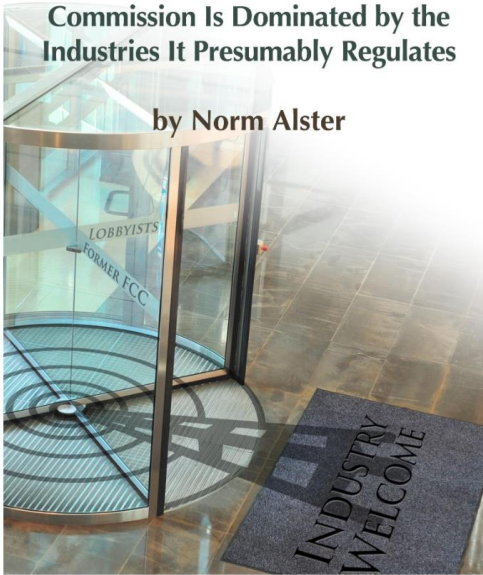
Left side of tree: 3380 $\mu\text{W}/\text{m}^2$ (0.03% of FCC limit)
 Right side of tree: 500 $\mu\text{W}/\text{m}^2$ (0.005% of FCC limit)

No. 14 from Group 1 (Table 4), Norway Maple Tree (*Acer platanoides*), Hallstadt, Königshofstraße/Friedhof (2008–2019)₀

20

Captured Agency:

How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates



by Norm Alster

www.ethics.harvard.edu

What Role Do Regulatory Agencies Play?

“Industry controls the FCC through a soup-to-nuts stranglehold that extends from its well-placed campaign spending in Congress through its control of the FCC’s Congressional oversight committees to its persistent agency lobbying.”

https://ethics.harvard.edu/files/center-for-ethics/files/capturedagency_alster.pdf

21

21

Harvard Report Shows Wireless Industry Using a Playbook Similar to the One Used by Big Tobacco

- To ensure its access on Capitol Hill, the wireless industry spends tens of millions of dollars in campaign contributions [according to the Center for Responsive Politics](#), and over \$100 million on [lobbying in recent years](#).
- The playbook’s key insight is that an industry doesn’t have to win the scientific argument about safety; it only has to keep the argument going.
 - As recently as 1998, even as evidence of tobacco toxicity grew overwhelming, cigarette maker Phillip Morris was writing newspaper advertorials insisting there was no proof smoking caused cancer: [page 20 of Harvard Report](#)

22

22



23

What You Can Do
 (Craft Ordinances and Policies to Minimize Exposures)

- Ordinances (town, city, county)
 - Mandate cell tower setbacks from [schools](#), hospitals, and neighborhoods
 - There are many [good examples](#) of effective ordinances
- Policies (schools)
 - Acknowledge that wireless radiation is harmful
 - Propose realistic steps that a school can take to reduce exposures
 - Implement wired connections when feasible
 - Locate wireless access points away from students, particularly electrically-sensitive students
 - Adjust the power of existing wireless access points so that they provide coverage only for the intended area
 - Replace wireless access points with lower radiation devices when they need replacing

24

Conclusions Reached by the New Hampshire Commission

[Final Report](#) submitted in November 2020.

- Wireless radiation poses a significant threat to human health and the environment
- Electromagnetic Radiation Syndrome (EMR-S) is an illness caused by wireless radiation
- This is not solely a scientific issue, it is a political/economic issue

25

25

Appendix

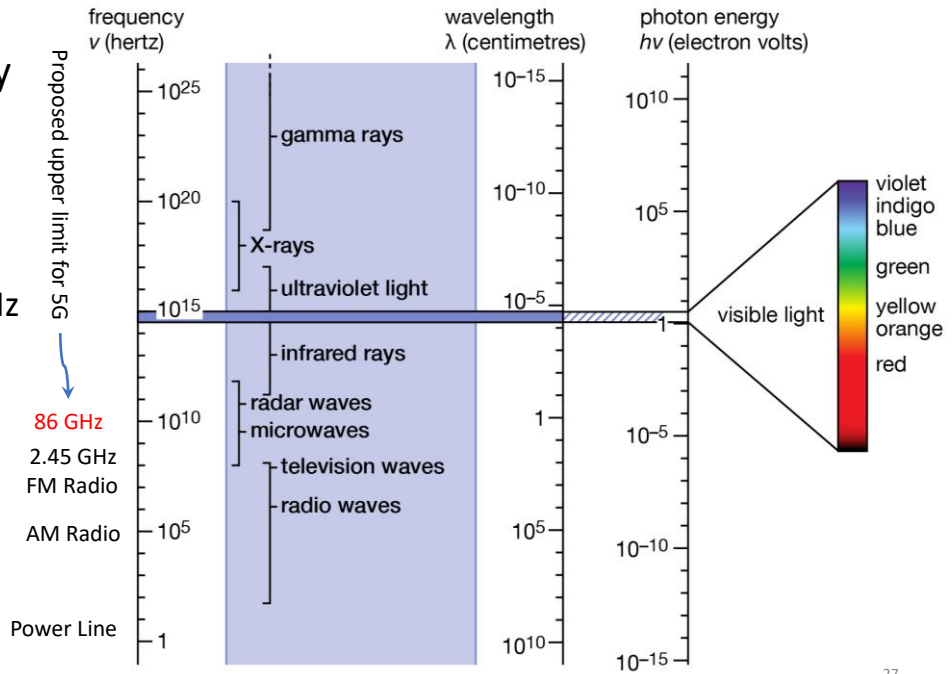
The slides that follow are slides that have been used in earlier presentations, and they are made available in this appendix because they contain information that is relevant but could not be shown in this presentation because of time constraints.

26

26

The Frequency Spectrum

Most wireless radiation occurs between 300 MHz and 6 GHz, although higher frequencies are being considered



© Encyclopædia Britannica, I

27

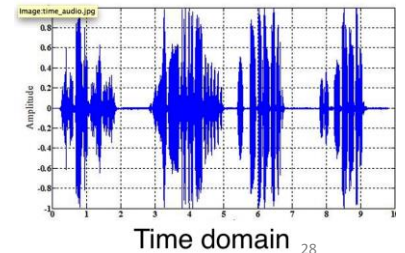
Characteristics of Wireless Signals



- *What is meant by “wireless” radiation?*

High-frequency devices that transmit digital information fall into this category. These devices include: cellphones, cell towers, Bluetooth, baby monitors, smart meters, cordless phones, Wi-Fi (wireless routers) and IoT devices

Wireless (digital) signals send information in bursts (packets). Each spike (burst) in the plot below represents a time interval when a packet of information is being sent. An expanded view of four packet intervals would look something like the plot on the right:



28



Notes:

1 Hz = 1 cycle/second
 1 MHz = 1,000,000 Hz
 1 GHz = 1,000,000,000 Hz
 1 mWatt = 0.001 Watt

- *What are the differences between signals from different wireless devices?*

They are all transmitted in high frequency bands (300 MHz to 6 GHz) but frequency varies from device to device

- 5G will extend the upper frequency to around 86 GHz

Different device types use different protocols to transmit digital information

- Generally, devices of the same type (such as cellphone and cell tower) use the same protocol when communicating. Because of this, cellphones and cell towers radiate the same types of signals, although at different powers and different periods of time.

Different device types transmit at different power levels

- Bluetooth & Wi-Fi (up to 100 mWatts)
- Smart Meter (≤ 1 Watt)
- Cellphone (600 mWatts – 3 Watts)
- Cell Tower (typically 10 Watts, but can go as high as 50 Watts)

Radiation from all these devices can harm health

29

29

Electromagnetic-Sensitivity Is recognized by the ADA

By the Center for Electrosmog Prevention, 2019

- The following ADA Accommodations Request Packet may be used by ES (electrosensitivity) sufferers to apply for reasonable accommodations to help avoid RF radiation from “small cells” and wifi *in public government areas*, related to accessibility or any other [Title II](#) application. “[Title II of the Americans with Disabilities Act](#) applies to State and Local Governments.



30

What Is Known About the Placement of Cell Towers on Buildings?



31

31

What happened when cell towers were turned on?

Within a week of installation many firefighters developed unusual symptoms of headaches, fatigue, insomnia, memory loss, confusion, nausea and weakness. After a time, firefighters in stations with adjacent cell towers were found to have forgotten CPR or became lost responding to a fire in a city they grew up in.

[Physicians for Safe Technology](#)

32

32

Article Title:
Radiation from
wireless technology
affects the blood,
the heart, and the
autonomic nervous
system

Firefighters' Symptoms Consistent With Laboratory Findings

Quote from article: "Provocation studies presented in this article demonstrate that the response to electrosmog is physiologic and not psychosomatic. Those who experience prolonged and severe EHS may develop psychologic problems as a consequence of their inability to work, their limited ability to travel in our highly technologic environment, and the social stigma that their symptoms are imagined rather than real."

Havas, Magda, *Reviews on Environmental Health*, vol. 28, no. 2-3, 2013, pp. 75-84. <https://doi.org/10.1515/reveh-2013-0004>

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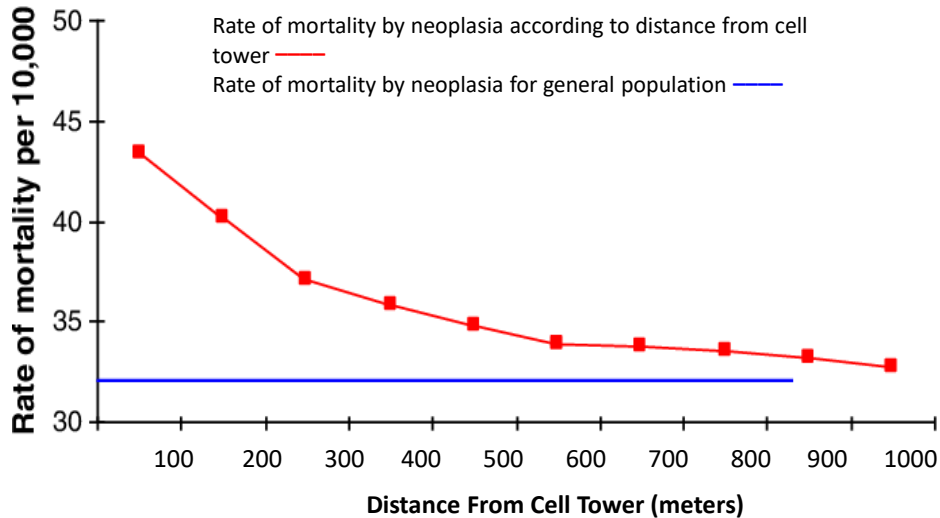
Death Rates from Cancer versus Distance People Live from Cell Tower Transmitter

- Peer-reviewed article: [Mortality by neoplasia \[cancer\] and cellular telephone base stations in the Belo Horizonte municipality, Minas Gerais State, Brazil](#)
 - Explored the relationship between cancer mortality rates and the distance people lived from a cell tower
 - Study investigated a large number of cancer deaths (7,191) and a large number of cell towers (856)
 - Performed during a time when few people had personal electronic devices (1996-2006)
 - Results of study revealed the effects of living near a cell tower
 - The maximum exposure level measured during the study was 407.8 mW/m² which is less than 5% of the ICNIRP/FCC guidelines

34

34

Key Finding from the Article Referenced on Previous Slide



35

35

Outcomes for People Living Near Cell Towers



- Meta study of **38** previous studies: [Evidence for a health risk by RF on humans living around mobile phone base stations: from radiofrequency sickness to cancer](#)
 - 73.6% of studies showed effects of radiofrequency sickness
 - 76.9% of studies showed increased cancer rates
 - 75% of studies showed changes in biochemical parameters
 - Studies also showed negative impacts on animals and trees.
 - A distance of 500 meters from a cell tower appears to be a “reasonable” cutoff distance for adverse health effects.

36

36

Human Exposure Exposure Limits For RF From Cell Towers and Wireless Networks

Environmental Limit as Applied to Homes and Schools

ehtrust.org

