Before the
National Telecommunications Information Administration
Department of Commerce
Washington, D.C.

In the Matter of:	)	
Request for Comments on NTIA's 61	)	OMB Control Number 0660-0021
Questions to the November 2025 Edition of	)	
the U.S. Census Bureau's Current	)	
Population Survey	)	

COMMENTS OF WIRED BROADBAND, INC.

ON BEHALF OF AMERICANS INJURED AND DISABLED

FROM ELECTROMAGNETIC RADIATION

(ELECTROMAGNETIC RADIATION SYNDROME – EMR-S)

August 18, 2025

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FILING PARTIES

Wired Broadband, Inc. and the parties listed below collectively constitute the "Filing Parties," have granted permission to submit these Comments on their behalf, and join together to submit these Comments:

Children's Health Defense, childrenshealthdefense.org; **The National Call for Safe Technology**, Odette J. Wilkens, Chair & General Counsel; EMF Wellness Tucson, Lisa Smith, PhD, Tucson, AZ; Safe Tech Tucson, Tucson, AZ; Fred P. Sinclair, Jr., Alfred, NY; New Yorkers 4 Wired Tech, New York, NY; New York City Alliance for Safe Technology, New York,

NY; Rhode Island 4 Safe Tech, Sheila Resseger, M.A., Co-Founder, Cranston, RI; Susan Molloy, M.A., Snowflake, AZ; Coloradans for Safe Technology, Andrea Mercier (mother of a severely disabled child who is adversely impacted various forms of non-ionizing radiation), Colorado Springs, CO; Coloradans for Safe Technology, Nancy VanDover, DVM, OMD, Dipl Acup, disabled by EMR; Deborah Shisler, with EMR-S, CO; La Plata for Safe Technology, Ingrid Iverson, with EMR-S, CO; Virginians for Safe Technology, Jenny DeMarco, Communications Director, and Mary Bauer, retired radio frequency engineer, Fredericksburg, VA; Safe Tech International, Sara Aminoff, Union City, CA; Safe Tech International, Kate Kheel, Taneytown, MD; Safe Tech International, Patricia Burke, journalist, Millis, MA; Safe Tech Westchester, Ruth F. Moss, Westchester, NY; The Soft Lights Foundation, Mark Baker, President, Beaverton, OR; Amy Harlib, Concerned Citizen, New York, NY; Floris R. Freshman, published artist and composer, with EMR-S, Scottsdale, AZ; Virginia Farver, Fort Collins, CO; Gabriela Munoz, with EMR-S, Carmel, NY; EMF Safety Network, Sidnee Cox, Co-director, Windsor, CA; Rosemarie Russell, member of The Women's State Legislative Council of Utah, Hurricane, UT; Erin McDowell, Registered Nurse, with EMR-S Rocky River, OH, SWORT (Southwestern Ohio for Responsible Technology); Craig McDowell, veteran, Rocky River, OH; Southern EMF Radiation Solutions, Shari Champagne, with EMR-S, Houme, LA; Southwest Pennsylvania for Safe Technology, Mount Pleasant, PA, Susan Jennings, MPA, BA, Founder (son has EMR-S); Jen Goddard, Board Certified Doctor of Natural Health, Thriving Proof Holistic Health Practice, and 2025 United States of America Mrs. Maine Pageant, Brewer, ME; Loraine Uebele, FACHE, Kansas City, MO; Sean Polacik, Automation Control Systems Technician, OH; Linda M. Cifelli, retired Registered Nurse, Williamsburg, VA; Safer Cell Phone and Wi-Fi Project, Marne Glaser, Chicago, IL; Katherine Katzin, Takoma Park, MD; Jan Kiefer, Scottdale, PA; Fiber First LA, Charlene Hopey, Topanga, CA; Gene Wagenbreth, Topanga, CA; Eva Christina Andersson, E.U., Sweden; Alison McDonough, Canton, MA, with EMR-S; Longmont for Safe Technology, Doe Kelly, Co-Founder, with EMR-S, Longmont, CO; Sharon Behn, Arden, NC; Brenda Shafer, CA with EMR-S; Margaret Holt Baird, Esq, San Diego, CA with EMR-S; Arizonans for Safe Technology; Sustainability Management Consulting, Angela Casler, Chico, CA; Janet Drew, retired Registered Nurse, York, ME; Tammy Lee, with EMR-S, Lincoln, NE; Pennsylvanians for Safe Technology, Donna DeSanto Ott PT DPT MS FMCHC, Founder & President, PA; Sustainable Upton, Laurie Wodin, Co-Administrator, with EMR-S, Upton, MA; and Martine Victor, VT; Massachusetts for Safe Technology, Cecelia Doucette, Director, Ashland, MA; Marty Freyer, Mexico, MO; Jennifer Manzler, Certified Health &Wellness Coach, Cincinnati, OH, Southwestern Ohio for Responsible Technology (SWORT); Janet Taché, Hohenwald, TN; Susan Lee, Miami, FL; Susan Marlan, Asheville, NC; Kay Fitt, Palm Harbor, FL; Napa Neighborhood for Safe Technology, Amy Martenson; Global Union Against Radiation Deployment from Space (Richmond, ME); Maine Coalition to Stop Smart Meters (Richmond, ME); Friends of Merrymeeting Bay (Richmond, ME); Grace Hilbert, with EMR-S, Annandate, VA; Warren Woodward, Sedona, AZ; and MalibuForSafeTech, Lonnie Gordon, Exec. Director, Malibu, CA.

EMR means electromagnetic radiation.
EMR-S means Electromagnetic Radiation Syndrome

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1) Introduction

Wired Broadband, Inc. represents the interests of individuals from across the country who have been injured or disabled by electromagnetic radiation (EMR), and those who do not want themselves or their children to be injured or disabled by EMR. We advocate for the safe deployment of communications and utility infrastructure. At least 68 organizations, groups and individuals are joining in the filing of this submission (the "Filing Parties"). The Filing Parties, along with our partners, have a reach of at least 1,350,000 people across the country.

2) Executive Summary

As broadband connectivity has become more important in our daily lives, it becomes equally important to know how Americans connect to the internet and their preferences for the mode of connectivity. There are different modes of connectivity: wireless, copper lines, cable and fiber. Applications depend on location; e.g., wireless serves for mobility, while copper lines, cable and fiber are best for stationary (also known as "fixed") purposes, at home, work, school, medical facilities, public anchor institutions, etc.

NTIA's proposed survey questions lean heavily on mobile connectivity. The survey questions superficially ask if people are having problems with connecting to the Internet or if they lack connectivity in their area, but not specifying which mode of connectivity is providing problems or which mode they are hoping to get in their area. A neutral approach to the survey questions would give respondents the opportunity to answer more specifically regarding the mode of connectivity rather than asking leading questions in favor of one technology.

We have provided recommended modifications to the survey questions that take into consideration the different technologies, set forth in Addendum A. We have also provided proposed alternative survey questions not included, but that should be included, set forth in Addendum B. Addenda A and B are attached hereto and incorporated herein by this reference. The latter takes into consideration the millions of Americans adversely affected by wireless technology and who require wired technology to participate in society to have connectivity on an equal basis as the general public.

3) Purpose of the NTIA's Survey Questions

The Paperwork Reduction Act (PRA), cited by the NTIA as the basis for requesting these public comments, requires that federal agencies maximize the "practical utility and public

benefit from information collected,"[1] and that it be "accurate, helpful and a good fit for its proposed use,"[2] while reducing the burden on the American public in obtaining the information. The Infrastructure Investment and Jobs Act of 2021, also cited by the NTIA, advances the NTIA's role to promote broadband infrastructure development.[3] Both of these purposes require that NTIA obtain granular information on respondents' specific mode of connectivity to get an accurate survey to know what broadband infrastructure to deploy.

4) "Tech Neutral" Approach is Not Warranted

While the NTIA endeavors "to connect every American to high-speed, affordable broadband,"[4] it would not be able to achieve either unless it distinguishes between wireless and wired modes of technology. The NTIA's technology neutral approach appears to favor wireless in its questions, which will skew the answers. While wireless works well for mobility, for fixed locations wireless is grossly inferior to fiber across every metric. For fixed locations, wired connectivity is far better, especially fiber which is superior and surpasses fixed wireless across every metric: speed, reliability, capacity (no data caps as with wireless), cybersecurity, emergencies (no throttling as with wireless), energy consumption and affordability.

The issue of affordability was brought into sharp focus when industry reported that when the Affordable Connectivity Program (ACP) ended, **90%** of **wireline** subscribers **retained** their service, whereas **wireless** services **lost 80%** of their subscribers, satellite services also had losses.[5] There were 23 million recipient households participating in the ACP.[6] This shows that people value their wired service more than wireless and would give up wireless if it is not subsidized. Therefore, it is important to distinguish between the two technologies, wireless and wired, in NTIA's survey questions.

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[1] See, Public Law 104-13, §3501(2) and §3504(c)(4), https://www.govinfo.gov/content/pkg/PLAW-104publ13/html/PLAW-104publ13.htm.
[2] https://pra.digital.gov/about/.
[3] https://broadbandusa.ntia.gov/news/latest-news/ntias-role-implementing-broadband-provisions-2021-infrastructure-investment-and.
[4] https://broadbandusa.ntia.gov/news/latest-news/ntias-role-implementing-broadband-provisions-2021-infrastructure-investment-and.
[5] https://broadbandbreakfast.com/acp-fallout-wireline-retains-most-wireless-and-satellite-face-major-losses/.
[6] https://www.newamerica.org/oti/briefs/broadband-affordability-removing-a-roadblock-to-universal-service/.

While FCC Commissioner Gomez describes fiber "as a better long-term investment for building the capacity we need to compete as a global leader . . . " she rightfully describes wireless technology as "capacity limited."[7]

Former FCC Chairman Tom Wheeler, who was formerly CEO of CTIA, testified in Congress at the House Energy and Commerce Committee in March, 2021 that fiber is futureproof, with wireless only as a last resort. He spoke disappointingly that, despite approximately $40 billion of government subsidies "over the last decade," those subsidies "have failed to deliver the goal of universal access to high-speed broadband ... because it failed to insist on futureproof technology, ... and focused more on the companies being subsidized than the technology being used or the people who were supposed to be served."[8] Therefore, NTIA's emphasis on wireless to deliver "high-speed broadband" and "affordability" is unsubstantiated and without precedent. The NTIA's survey questions should be neutral in a way that also encompasses wired connectivity.

In addition, despite industry claims of "5G as a transformative technology—one that will boost the U.S.economy by over $1 trillion and create millions of jobs," a report this year by the Chief Economist of the Phoenix Center for Advanced Legal & Economic Public Policy Studies states there is "no evidence that 5G deployment has improved employment, wages, business growth, personal income, or GDP."[9]

Industry expert, Frank Clegg, Past President of Microsoft Canada, and currently CEO of Canadians for Safe Technology, hails "wired communication infrastructure, using wireless only as an adjunctive technology, [as having] vast potential to become the electronic commons essential to commerce, education, jobs, the economy, social cohesion, communications, and international competitiveness."[10] In the paper *Re-Inventing Wires: The Future of Landlines and Networks* published by the National Institute for Science, Law and Public Policy, Clegg refers to it as "a blueprint for an imperative technological renaissance, and a re-envisioning of national communications infrastructure . . .

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[7] https://www.fcc.gov/document/gomez-fcc-proceeding-broadband-deployment.
[8] https://democrats-energycommerce.house.gov/sites/evo-subsites/democrats-energycommerce.house.gov/files/documents/Witness%20Testimony_Wheeler_FC_2021.03.22.pdf.
[9] "The 5G Promise Falls Short of Reality: Examining Economic Impact Claims" — George S. Ford, PhD May 28, 2025 — https://www.phoenix-center.org/perspectives/Perspective25-03Final.pdf
[10] "Reinventing Wires: The Future of Landlines and Networks," Foreward, National Institute for Science, Law and Public Policy, https://gettingsmarteraboutthesmartgrid.org/pdf/Wires.pdf.

[presenting] indisputable technical, economic, and sustainability reasons why wired technologies portend the best and highest future."[11]

5) Why Wired Broadband Provides Superior Value

As the survey gives short shrift to wired technology, it is important to note that wired broadband is the superior solution for Internet connectivity in fixed locations (for example a home, school, or office), also known as fixed broadband. Wired broadband includes coaxial cable, copper wire, and fiber (fiber to the home or the premises known as FTTP).[12]

Mobile applications, on the other hand, such as making a phone call while driving, require wireless connectivity. Each technology should be deployed where it is **most effective**: wired for fixed applications and wireless for mobile applications. Wired and wireless technologies are not equivalent. Unfortunately, industry is trying to impose wireless for fixed applications, which will only perpetuate and worsen the digital divide.

Advantages of Fiber Networks and Services:[13]

1. Cheaper than wireless over the life of the infrastructure. Only **1% to 10%** of capital investment in a fiber network needs to be replaced every 10 years. Fiber's life span is **50-70 years**.
2. Highest speed – starting at **1000 Mbps** today (1 Gigabit, already available at 10 Gb, and upgradable to terabit speeds). **Symmetrical** download and upload speeds.
3. Lower cost – even in the most remote rural areas, in the long run wired connections are lower cost.
4. More reliable – fiber service is not degraded by line-of-sight issues or inclement weather that affects wireless.
5. Lower energy consumption – fiber consumes more than three times less energy than fixed wireless.[14]
6. Economic development – "improved access to education and health care, price stabilization."[15]

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[11] Ibid.

[12] https://www.fibre-systems.com/article/fiber-connect-2023-two-thirds-us-consumers-prefer-fibre?iframe=1.

[13]Fixed Wireless Technologies and Their Suitability for Broadband Delivery, June 2022 https://www.benton.org/publications/FixedWireless; https://www.benton.org/blog/how-fixed-wireless-technologies-compare-fiber.

[14] https://pipelinepub.com/digital-transformation-2024/reducing-energy-consumption-with-fiber-sustainability-ESG#:~:text=Fiber:%20Green%20Champion%20of%20Broadband&text=How%20does%20fiber%20consume%20less,to%202.7%20tons%20for%20DOCSIS.

[15] https://communitynets.org/content/community-network-map.

7. More secure.

Disadvantages of Fixed Wireless Networks and Services:[16]

1. Higher costs than fiber because of the ongoing need to replace wireless equipment, with **40% to 80%** of its capital investment needing to be replaced every five years.
2. Capacity constraints -- typically **asymmetrical** download and upload speeds of **100 Mbps / 20 Mbps**.
    a. Millimeter wave frequencies can support faster speeds, but only in short ranges (less than approximately 500-1500 feet from an antenna), unsuitable for rural applications because of dispersion of homes and lack of mounting structures.
3. **Not financially sustainable**: the re-investment required every five years to maintain the network makes it inherently unsustainable.
4. **Vulnerable to obstructions**, such as line-of-sight or inclement weather, making it more complex to deliver to every household.
5. **Less efficient** - wireless signals rely on radio waves which are less efficient over long distances, require frequent access points and repeaters to maintain consistent coverage, using extra signal energy just to reach end users.[17]
6. **Scalability is a critical challenge**: an increase in users requires more spectrum, which is scarce and expensive, and more antennas. Wireless is not dedicated, but shared, prone to congestion during peak or emergencies, and therefore data caps and throttling.
7. **High energy consumption**. 5G is acknowledged by industry as "power-hungry" requiring a large amount of energy consumption.[18] Energy consumption from "5G" infrastructure was "expected to increase 61x between 2020 to 2030 due to its energy demands."[19]

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[16] https://www.benton.org/blog/how-fixed-wireless-technologies-compare-fiber.
[17] https://pipelinepub.com/digital-transformation-2024/reducing-energy-consumption-with-fiber-sustainability-ESG#:~:text=Fiber:%20Green%20Champion%20of%20Broadband&text=How%20does%20fiber%20consume%20less,to%202.7%20tons%20for%20DOCSIS.
[18] 5G Heats Up Base Stations, https://semiengineering.com/5g-heats-up-base-stations/.
[19] https://ehtrust.org/report-5g-to-increase-energy-consumption-by-61-times/; see also "Reinventing Wires: The Future of Landlines and Networks," at 73, National Institute for Science, Law and Public Policy, authored by Timothy Schoechle, PhD; https://gettingsmarteraboutthesmartgrid.org/pdf/Wires.pdf.

8. **Inherently more complex**, more costly, more unstable (subject to frequent revision and "upgrades"), and more constrained in what they can deliver. [20]
9. **Poses unique security threats.** Former FCC Chairman, Tom Wheeler, has coined the term, the "5G Cyber Paradox," to denote that the increased efficiency of 5G architecture renders it inherently insecure and "more vulnerable to cyberattacks than [5G's] predecessors."[21]
    a. 5G is a distributed, software-based network with thousands of nodes and access points that a hacker can exploit; there is no choke point control as there is with the centralized, hardware-based switching network of 4G.[22]
    b. E.g., in 2018 a hacker gained access to a Nevada casino's network through its internet connected "smart" thermostat system located in a fish tank at the casino, and was able to extract information out through the thermostat and load it into the cloud.[23] This shows that 5G architecture that is supposed to facilitate the Internet of Things (IoT) poses a serious security threat.
10. **Out of step with what most Americans want** – two-thirds of Americans prefer fiber to the home (FTTP). [24] When the Affordable Connectivity Program (ACP) ended, 90% of wireline subscribers retained their service, wireless services lost 80% of their subscribers, satellite services also had losses.[25]

Economic Advantages of Fiber:

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[20] "Re-inventing Wires: The Future of Landlines and Networks," former President of Microsoft Canada, Frank Clegg," https://gettingsmarteraboutthesmartgrid.org/pdf/Wires.pdf.

[21] Why 5G Requires New Approaches to Cybersecurity, Tom Wheeler and David Simpson, Brookings Institute, Sept 3, 2019, https://www.wita.org/nextgentrade/why-5g-requires-new-approaches-to-cybersecurity/.

[22] Ibid.; see also, Why 5G Networks Are Disrupting The Cybersecurity Industry, Oct 29, 2021, https://www.forbes.com/sites/forbestechcouncil/2021/10/29/why-5g-networks-are-disrupting-the-cybersecurity-industry/?sh=5186fc041fe9.

[23] https://www.casino.org/news/hackers-stole-las-vegas-casino-high-roller-database-via-its-fish-tank/; https://www.forbes.com/sites/leemathews/2017/07/27/criminals-hacked-a-fish-tank-to-steal-data-from-a-casino/; https://www.washingtonpost.com/news/innovations/wp/2017/07/21/how-a-fish-tank-helped-hack-a-casino/.

[24] https://www.fibre-systems.com/article/fiber-connect-2023-two-thirds-us-consumers-prefer-fibre?iframe=1.

[25] https://broadbandbreakfast.com/acp-fallout-wireline-retains-most-wireless-and-satellite-face-major-losses/.

1. **FTTP has been an economic boon**, and allows communities to be self-sustaining into the future without the need for taxpayer subsidies.
2. **Chattanooga, TN's** fiber network "Gig City" has the fastest Internet in the U.S. [26]
    a. 1 Gigabit symmetrical download and upload speeds; exploring quantum speeds only made possible by fiber.[27]
    b. Economic value of its fiber network over a 10-year period from 2011 to 2020 exceeded $2.69 billion and produced 9,516 jobs, beyond expectations.[28]
    c. Booming local economic development: "over **$1.4 billion** new investments, startup funding, real estate development and payments-in-lieu of taxes."[29]
    d. "Each county resident is estimated to have benefited by about $646 per year due to the incremental value generated by the fiber optic infrastructure."[30]
    e. Fiber successes were reported as far back as 2014.[31]

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[26] Why Chattanooga Has the Fastest Internet in the US, https://tech.co/news/chattanooga-fastest-internet-usa-2018-08.

[27] How Blazing Internet Speeds Helped Chattanooga Shed its Smokestack Past, CNET.com, August 20, 2015, https://www.cnet.com/tech/services-and-software/how-blazing-internet-speeds-helped-chattanooga-shed-its-smokestack-past/; see also, "Gig City Goes Quantum" at https://thenationalcall.org/resources/.

[28] "Ten Years of Fiber Optic and Smart Grid Infrastructure in Hamilton County, Tennessee," Bento J. Lobo, Ph.D., CFA First Tennessee Bank Distinguished Professor of Finance, The University of Tennessee at Chattanooga, August 31, 2020, https://www.researchgate.net/publication/352221978_Ten_Years_of_Fiber_Optic_and_Smart_Grid_Infrastructure_in_Hamilton_County_Tennessee;
See also, *How Blazing Internet Speeds Helped Chattanooga Shed its Smokestack Past*, Cnet.com, August 20, 2015, https://www.cnet.com/tech/services-and-software/how-blazing-internet-speeds-helped-chattanooga-shed-its-smokestack-past/; *Chattanooga Mayor Pushes Back on 5G as Smart Cities Cure All*, MeriTalk, February 13, 2019, https://www.meritalkslg.com/articles/chattanooga-mayor-pushes-back-on-5g-as-smart-cities-cure-all/.
See also, for economic benefits of fiber deployment, In Kansas, Rural Chanute Built Its Own Gigabit Fiber and Wireless Network," Christopher Mitchell 10-2-21, https://ilsr.org/chanute-rural-gigabit/; and https://www.soar-ky.org/prtc/.

[29] Ibid.

[30] Ibid.

[31] "Fast Internet is Chattanooga's New Locomotive," New York Times, February 3, 2014, https://www.nytimes.com/2014/02/04/technology/fast-internet-service-speeds-business-development-in-chattanooga.html#:~:text=Steve%20Clark%2C%20a%20senior%20vice,at%20one%20gigabit%20per%20second.

3. **Chanute, KS** has "a 10 Gbps fiber-optic broadband ring"[32] which "connects schools and other community anchor institutions with Gigabit networks" [33]
    a. Gigabit network generates $600,000 per year for Chanute's Electric Utility.[34]
4. **Rural eastern Kentucky, Jackson and Owsley Counties**, with FTTP from 2014, Gigabit-capable internet has been available to every home and business.[35]
5. **Utopia Fiber in Utah** offers residences up to **10 Gbps** speeds, businesses up to **100 Gbps** speeds; multiple service providers deliver services, promoting competition to keep prices competitive.[36] Offers **fiber dedicated to the subscriber,** i.e., not shared with anyone, and proudly promotes its advantage over wireless, that **"you don't have to worry about pesky lagging or buffering during peak hours ever again!"**

6) NTIA's Proposed Survey Questions

Addendum A sets forth recommended revisions to NTIA's proposed survey questions so that they consider not just wireless, but the many different wired ways that Americans connect to the Internet. To be clear, connecting to the Internet is not synonymous with wireless. While the survey is skewed to ask questions regarding Americans' connection to wireless, there should be a more neutral approach that also includes wired connection, e.g., copper line, cable, or fiber.

If the NTIA wants to present a "tech neutral" approach, then it should mention wired connectivity (copper lines, cable and fiber) as many times as it mentions wireless, and in the same context. Addendum A provides recommendations on how the NTIA's proposed questions can be rephrased.

Since the questions focus exclusively on wireless, the resulting data set will be skewed towards wireless. Therefore, the questions should not prejudice the answers in one direction.

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[32] https://ilsr.org/chanute-rural-gigabit/.
[33] Ibid.
[34] Ibid.
[35] https://www.soar-ky.org/prtc/.
[36] https://www.utopiafiber.com/.

7) Americans Disproportionately Disconnected and Electromagnetic Radiation Syndrome

NTIA is statutorily required to promote the benefits of technological development for "***all*** users of telecommunications" and to foster "national safety and security"[37] — not solely to promote the wireless industry at the cost of public health and at the expense of disabled Americans. Survey questions should seek to assess the impact of broadband and communications policy on all Americans, including children, families, and those disabled by electromagnetic radiation, as set forth in Addenda A and B.

Americans who suffer from Electromagnetic Radiation Syndrome (EMR—Syndrome) often have difficulty accessing the Internet for work, school, telehealth, and all the other uses for which Americans rely upon Internet connectivity. Americans disabled by EMR may be either completely unable to use wireless connectivity (whether cellular, Wi-Fi, or satellite) or using such technology may exacerbate their disability or medical conditions. These Americans are disproportionately disconnected.

To meet its statutory obligations, NTIA should ask the questions set out in Addenda A and B to gather information on the impact of connectivity on Americans and their health. NTIA should also ask these questions as part of helping the White House achieve its Make America Healthy Again policy priority.

Wired broadband connectivity should be available to those with EMR-Syndrome or any American who wishes to protect their health and that of their family.

In addition, NTIA has a statutory responsibility to avoid "harmful interference as a means of increasing commercial access."[38] NTIA should recognize that interference includes not only electronic devices interfering with the functioning of other electronic devices, but also electronic devices and emissions interfering with the normal functioning of humans and human biology. (See Addendum C for information on how RF radiation interferes with human biology.) Our proposed survey questions and modifications will help assess the impacts of broadband policy and inform this NTIA statutory responsibility.

We represent the interests of many Americans across the country adversely affected from exposure to wireless radiation, as are millions of Americans. A 2019 Bevington study

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[37] 47 USC 901 (c) https://uscode.house.gov/view.xhtml?req=(title:47%20section:901%20edition:prelim)

[38] 47 USC 922(4), https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title47-section922&num=0&edition=prelim.

analyzed the prevalence of symptoms from RF radiation exposure within a given population with results showing that 30% have mild symptoms and 2% have severe symptoms or can't work.[39] Based on a U.S. population of 332.4 million people, 120 million have symptoms, 7 million have severe symptoms or can't work.[40]

The U.S. Access Board (which advises the Justice Department and other state and federal agencies under the Americans with Disabilities Act) has recognized disabilities caused by electromagnetic radiation.[41]

Electromagnetic radiation produces biological effects and while evidence of its hazards are clear and convincing,[42] the hazards are not generally publicized. Enduring these hazards is not necessary to reap the benefits of broadband connectivity.

The biological hazards of wireless technology are set forth in Addendum C, attached hereto and incorporated herein by this reference. There have been reports of chronic disease clusters and illnesses near cell towers, e.g., nausea, rashes, stroke, atrial fibrillation and a variety of cancers, have been documented near Duluth, MN (51 strokes), Pittsfield, MA (17 residents fell ill and many evacuated, one resident who remained died), Rippon, CA (4 children and 4 teachers developed cancer; one child died) and Eagle, ID (atrial fibrillations from 5G cell towers).

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[39] The Prevalence of People with Restricted Access to Work in Manmade Electromagnetic Environments," Journal of Environment and Health Science, https://mdsafetech.files.wordpress.com/2019/10/2018-prevalence-of-electromagnetic-sensitivity.pdf.

[40] https://www.commerce.gov/news/blog/2022/01/us-population-estimated-332403650-jan-1-2022#:~:text=As%20our%20nation%20prepares%20to,since%20New%20Year's%20Day%202021.

[41] U.S. Access Board – Advancing Full Access & Inclusion for All - "Indoor Environmental Quality Project," https://www.access-board.gov/research/building/indoor-environmental-quality/.

[42] See testimony submitted by Environmental Health Trust to Senate Commerce Committee, 3/27/24, regarding spectrum policy and harms from radiofrequency radiation https://ehtrust.org/wp-content/uploads/EHT-Testimony-to-Senate-Commerce-Committee-on-S3909-03272024.pdf
National Toxicology Program 2018: clear evidence of cancer (highest level of evidence) https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones#studies
Woman living near cell tower diagnosed with 51 strokes, https://www.momsacrossamerica.com/woman_living_near_cell_tower
Children and teachers diagnosed with cancer after cell tower installed near elementary school
https://www.youtube.com/watch?v=-9TMTexPb_0&t=128s

- **Near Duluth, MN**, a woman suffered 51 strokes after a nearby cell tower was "upgraded," in addition to experiencing nausea, blind spots in her vision, orientation and balance difficulties.[43]

- **Clusters of sickness near cell towers (not exhaustive).**
    - **The Board of Health of Pittsfield, MA** issued an emergency cease and desist order in April 2022 to turn off a 4G cell tower that injured 17 residents, most of whom evacuated their homes.[44] One of those who remained has since died of cancer. The order cited residents having reported "headaches, ringing in the ears, dizziness, heart palpitations, nausea, and skin rashes," and, e.g., a child who had "to sleep with a bucket next to her bed in case she needs to throw up."[45] Because the telecom carrier threatened to sue, the Board of Health was compelled to rescind the order. The residents filed suit against the city but lost on federal preemption, i.e., no legal recourse for health claims.
    - **In Rippon, CA** when a cell tower was placed near an elementary school, 4 children (ages 6-11) got cancer (brain, liver, kidney) and 4 teachers got breast cancer.[46] One of the children who contracted brain cancer (glioblastoma) when he was 10 years died in Aug 2024.[47] Since the tower was removed, it was reported that there were no more instances of cancer at the school.[48]
    - **In an Idaho town** after 5G cell towers were installed, it was reported that a cluster of residents developed atrial fibrillation (a-fib). One of those residents who had undergone surgery for a-fib is a plaintiff in a lawsuit against the telecom carrier which refuses to provide accommodation under the Americans with Disabilities Act.[49]

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[43] https://childrenshealthdefense.org/defender/marcia-haller-cell-tower-rf-radiation-sickness/.
[44] https://ehtrust.org/cease-and-desist-order-against-verizon-cell-tower-by-board-of-health-pittsfield-ma/, see below the fold for link to the Order, p.12.
[45] https://ehtrust.org/family-injured-by-cell-tower-radiation-in-pittsfield-massachusetts/.
[46] See beginning of video at https://www.youtube.com/watch?v=-9TMTexPb_0&t=128s .
[47] See the lists of treatments and surgeries that this child endured before he died, https://www.gofundme.com/f/support-the-ferrulli-family-in-memory-of-mason.
[48] See beginning of video at https://www.youtube.com/watch?v=-9TMTexPb_0&t=128s .
[49] https://childrenshealthdefense.org/press-release/chd-files-in-series-of-lawsuits-seeking-disability-accommodation-for-people-injured-by-rf-radiation-from-cell-towers/ and https://childrenshealthdefense.org/defender/henry-hank-allen-chd-verizon-lawsuit-radiofrequency-radiation-cell-towers/.

Conclusion

The NTIA has the obligation to represent the interests of all Americans, not of industry, in fulfilling its stated role to provide "high-speed broadband" and "affordability," and, under the Paperwork Reduction Act, to provide "practical utility and public benefit from information collected,"[50] and that it be "accurate, helpful and a good fit for its proposed use,"[51] The NTIA can only do so by providing technology neutral questions that encompasses different modes of technology that Americans use to connect to the Internet.

Respectfully Submitted
and on Behalf of the Filing Parties,

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[50] See, Public Law 104-13, §3501(2) and §3504(c)(4), https://www.govinfo.gov/content/pkg/PLAW-104publ13/html/PLAW-104publ13.htm.
[51] https://pra.digital.gov/about/.

ADDENDUM A

Recommended changes to NTIA's proposed survey questions

#	Category	Recommendations	NTIA Proposed Questions
1	NETCHK	Should not be asking for names of respondents – is a violation of privacy. The PRA prohibited the use of personal information. [52]	Based on your responses, it sounds like (list names where all IN* != 1) [does/do] not use the Internet. [Does/Do] [NAME/you/these people in your household] use the Internet from any location, and for any purpose? (If additional users) Who uses the Internet from any location, and for any purpose?
2	TCHINT	Next, we are interested in learning about the specific technologies households use to go online. Please focus on how your household as a whole connects to the Internet. (a) Copper line (b) Cable (c) Fiber (d) Other wired technology (e) Wi-Fi (f) Cellular (g) Satellite (h) Other (specify)	Next, we are interested in learning about the specific technologies households use to go online. Please focus on how your household as a whole connects to the Internet. [no choices provided]
3	HMINTI	How do you / anyone in this household access the Internet: (a) Using copper line from your landline (b) Using cable (c) Using fiber (d) Using a mobile data plan (e) Other	In addition to [your/your household's] mobile data plan, we are interested in whether [you/your household] also use[s] any other type of Internet service when at home.
4	HNETQL	In [your/your household's] experience over the past six months, does your [household's] Internet connection at	In [your/your household's] experience over the past six months, does your [household's]

[52] https://pra.digital.gov/about/.

		home meet [your/the household's] needs, including for speed, reliability, and, if applicable, data caps? (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No (3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No	Internet connection at home meet [your/the household's] needs, including for speed, reliability, and, if applicable, data caps? (1) Yes (2) No
5	N/A	At any point during the past six months, did [you/this household] temporarily lose a home Internet connection? (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No (3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No	No comparable question
6	HNETST	At any point during the past six months, did [you/this household] temporarily lose a home Internet connection due to difficulty paying? (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No (3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No	At any point during the past six months, did [you/this household] temporarily lose a home Internet connection due to difficulty paying? (1) Yes (2) No
7	PSCYBA	Thinking more generally about [your/this household's] use of the Internet, [have you/has any member of your household] experienced an online security breach, identity theft, or a similar crime during the past year? (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No (3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No	Thinking more generally about [your/this household's] use of the Internet, [have you/has any member of your household] experienced an online security breach, identity theft, or a similar crime during the past year?
8	EVRHOM	[Have you/Has anyone in this household] ever used the Internet from home? (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No	[Have you/Has anyone in this household] ever used the Internet from home? (1) Yes

		(3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No	(2) No
9	NOHM	What are the reasons why [you/members of your household] do not use the Internet at home? Read and select all that apply and/or enter verbatim response if other (1) Don't need it or not interested (2) Can't afford it (3) Not worth the cost (4) Can use it elsewhere (5) Not available in area (1) Want cable (a) Yes (b) No (2) Want fiber (a) Yes (b) No (3) Want DSL (a) Yes (b) No (4) Want mobile (a) Yes (b) No (5) Want other (specify)_____ (a)Yes (b)No (6) No computing device, or device inadequate or broken (7) Online privacy or cybersecurity concerns (1) Using cable (a) Yes (b) No (2) Using fiber (a) Yes (b) No (3) Using DSL (a) Yes (b) No (4) Using mobile (a) Yes (b) No (5) Other (specify)_____(a)Yes (b)No (8) Personal safety concerns (9) Household moved or is in the process of moving (10) Other:	What are the reasons why [you/members of your household] do not use the Internet at home? Read and select all that apply and/or enter verbatim response if other (1) Don't need it or not interested (2) Can't afford it (3) Not worth the cost (4) Can use it elsewhere (5) Not available in area (6) No computing device, or device inadequate or broken (7) Online privacy or cybersecurity concerns (8) Personal safety concerns (9) Household moved or is in the process of moving (10) Other: _____
10	PRINOH	What are the reasons why [you/members of your household] do not use the Internet at home? Read and select all that apply and/or enter verbatim response if other (1) Don't need it or not interested (2) Can't afford it (3) Not worth the cost (4) Can use it elsewhere (5) Not available in area (6) Want cable (a) Yes (b) No	Of the reasons you just listed for not going online at home, which [do you/does your household] consider to be the most important? Read previous responses; select best match or enter verbatim response if other (1) Don't need it or not interested (2) Can't afford it (3) Not worth the cost

		(7) Want fiber (a) Yes (b) No (8) Want DSL (a) Yes (b) No (9) Want mobile (a) Yes (b) No (10) Want other (specify)_____ (a)Yes (b)No (6) No computing device, or device inadequate or broken (7) Online privacy or cybersecurity concerns (6) Using cable (a) Yes (b) No (7) Using fiber (a) Yes (b) No (8) Using DSL (a) Yes (b) No (9) Using mobile (a) Yes (b) No (10) Other (specify)_____(a)Yes (b)No (8) Personal safety concerns (9) Household moved or is in the process of moving (10) Other:	(4) Can use it elsewhere (5) Not available in area (6) No computing device, or device inadequate or broken (7) Online privacy or cybersecurity concerns (8) Personal safety concerns (9) Household moved or is in the process of moving (10) Other: _____

#3 Respondents may not have a mobile data plan; therefore, this is a leading question. The question should be separated from the "mobile data plan" question. This is a more tech neutral question rather than leading with a mobile plan.

ADDENDUM B

Proposed Alternative Questions

Electromagnetic Exposure

- To what extent, if at all, have you been unable to go to any public spaces due to ambient electromagnetic exposure or related illness?
    - A. Very often
    - B. Often
    - C. Sometimes
    - D. Not often
    - E. Never
- To what extent, if at all, are you concerned about the health or environmental effects of electromagnetic exposure?
    - A. Very concerned
    - B. Somewhat concerned
    - C. No opinion
    - D. Mostly not concerned
    - E. Definitely not concerned
- Would you appreciate more information about how to minimize electromagnetic exposure?
    - A. Yes
    - B. No
- To what extent are you concerned about the potential downsides of social media on wireless devices, especially for youth?
    - A. Very concerned
    - B. Somewhat concerned
    - C. No opinion
    - D. Mostly not concerned
    - E. Definitely not concerned
- How satisfied are you with the download speed of your internet service?
    - A. Very satisfied
    - B. Somewhat satisfied
    - C. Neither satisfied nor dissatisfied
    - D. Somewhat dissatisfied
    - E. Very dissatisfied
- How satisfied are you with the upload speed of your internet service?
    - A. Very satisfied
    - B. Somewhat satisfied
    - C. Neither satisfied nor dissatisfied
    - D. Somewhat dissatisfied

    - E. Very dissatisfied
- Is your internet speed sufficient for your household's needs, such as streaming, gaming, or remote work?
    - A. Yes
    - B. No
- Do you use encryption or antivirus programs to protect your devices?
    - A. Yes
    - B. No
    - C. Not sure
- Have you experienced hacking or other malware intrusions on your devices?
    - A. Yes
    - B. No
    - C. Not sure
- Do you review your service providers' privacy policies and adjust privacy settings to restrict access to your data?
    - A. Yes
    - B. No
    - C. Not sure
- How do you feel about the availability of Wi-Fi on public transportation, such as subways, trains, and airplanes?
    - A. Strongly support
    - B. Somewhat support
    - C. Neither support nor oppose
    - D. Somewhat oppose
    - E. Strongly oppose

Screen Usage

- How many hours per day do you spend using electronic devices with screens (e.g., smartphones, computers, tablets, TVs) for non-work or non-educational purposes?
    - A. Less than 1 hour
    - B. 1–3 hours
    - C. 4–6 hours
    - D. 7–9 hours
    - E. 10 or more hours
- For households with children under 18: How many hours per day do children in your household spend using screens for non-educational purposes?
    - A. Less than 1 hour
    - B. 1–3 hours
    - C. 4–6 hours
    - D. 7–9 hours
    - E. 10 or more hours
    - F. No children under 18 in household

- Do you or anyone in your household feel that screen use has become difficult to control or has interfered with daily responsibilities, such as work, school, or family time?
    - A. Yes
    - B. No
    - C. Unsure
- Have you or anyone in your household taken steps to reduce screen time due to concerns about overuse or addiction (e.g., setting time limits, using app blockers, or scheduling device-free periods)?
    - A. Yes, regularly
    - B. Yes, occasionally
    - C. No
    - D. Not applicable
- How concerned are you about the potential for screen addiction or excessive screen use in your household?
    - A. Very concerned
    - B. Somewhat concerned
    - C. Not very concerned
    - D. Not at all concerned
- Do you or anyone in your household experience negative effects from screen use, such as difficulty sleeping, reduced attention span, or strained relationships?
    - A. Yes, frequently
    - B. Yes, occasionally
    - C. No
    - D. Unsure
- For parents or guardians: Do you have rules or guidelines in your household to manage children's screen time to prevent overuse?
    - A. Yes, strict rules
    - B. Yes, flexible guidelines
    - C. No rules or guidelines
    - D. Not applicable (no children in household)

Social Impacts, Behaviors and Modifications

- How often do you use the internet to connect with friends, family, or community members (e.g., through video calls, messaging, or social media)?
    - A. Daily
    - B. A few times a week
    - C. Once a week
    - D. Rarely
    - E. Never
- How has internet access affected your ability to maintain relationships with people outside your immediate household?
    - A. Significantly improved

    - B. Somewhat improved
    - C. No change
    - D. Somewhat worsened
    - E. Significantly worsened
- Do you participate in online communities or groups (e.g., forums, social media groups, or virtual clubs) to engage with others who share your interests?
    - A. Yes, regularly
    - B. Yes, occasionally
    - C. No, but I am interested
    - D. No, not interested
- Has your use of the internet for social activities (e.g., connecting with others, participating in surveys, or joining online groups) changed the amount of time you spend on in-person social activities?
    - A. Increased in-person activities
    - B. Decreased in-person activities
    - C. No change
    - D. Not applicable
- Have you made changes to reduce potential risks from wireless technology (e.g., limiting screen time, using airplane mode, choosing wired connections)?
    - A. Yes, multiple changes
    - B. Yes, one or two changes
    - C. No
    - D. Not applicable
    - D. Unsure

Presence of Cell Towers

- How concerned are you about potential health risks associated with living near cell towers?
    - A. Very concerned
    - B. Somewhat concerned
    - C. Not very concerned
    - D. Not at all concerned
    - E. Unsure
- Have you or anyone in your household experienced health symptoms (e.g., headaches, fatigue, insomnia) that you believe may be related to cell tower exposure?
    - A. Yes
    - B. No
    - C. Unsure
    - D. Not applicable (no 5G towers nearby)
- Have you avoided public spaces (e.g., parks, shopping areas) due to concerns about electromagnetic radiation from cell towers or other wireless technology?

    - A. Yes, frequently
    - B. Yes, occasionally
    - C. No
    - D. Not aware of 5G towers in public spaces
- How concerned are you about potential environmental impacts (e.g., effects on wildlife or ecosystems) from cell towers?
    - A. Very concerned
    - B. Somewhat concerned
    - C. Not very concerned
    - D. Not at all concerned
    - E. Unsure
- Would you like more information from government or health organizations about the safety of technology and ways to minimize potential electromagnetic exposure?
    - A. Yes, definitely
    - B. Yes, somewhat
    - C. No, not needed
    - D. Unsure
- How concerned are you about the potential impact of cell towers on property values in your neighborhood?
    - A. Very concerned
    - B. Somewhat concerned
    - C. Not very concerned
    - D. Not at all concerned
    - E. Not applicable (e.g., do not own property)

Devices and Connectivity

- Which devices do you most frequently connect to the internet wirelessly in your household? (Select all that apply)
    - A. Smartphone
    - B. Laptop
    - C. Smart TV
    - D. IoT devices (e.g., smart thermostats, security cameras)
    - E. Other
    - F. None
- How many wireless-enabled devices are typically connected to your home network at one time?
    - A. 0
    - B. 1–5
    - C. 6–10
    - D. 11–15
    - E. 16 or more

- Do you use wired connections for specific devices (e.g., desktop computers, gaming consoles)?
    - A. Yes, for speed
    - B. Yes, for reliability
    - C. Yes, for security
    - D. No, all devices are wireless
    - E. Not applicable (no wired option)
- Do you use "smart home" devices that rely on wireless connectivity (e.g., smart speakers, lights)?
    - A. Yes, multiple devices
    - B. Yes, one or two devices
    - C. No, but interested
    - D. No, not interested

Privacy Concerns

- How concerned are you about the collection, monetization, and/or other uses of your personal usage information by service provider through your wireless devices or networks?
    - A. Very concerned
    - B. Somewhat concerned
    - C. Not very concerned
    - D. Not at all concerned
- Do you believe wireless internet access (e.g., public Wi-Fi) poses greater privacy risks than wired connections?
    - A. Yes
    - B. No
    - C. Unsure
- Which steps do you take to protect your privacy when using wireless devices or networks? (Select all that apply)
    - A. Use a VPN
    - B. Enable two-factor authentication
    - C. Use privacy-focused apps or settings
    - D. Avoid public Wi-Fi
    - E. None
- Have you experienced a privacy breach (e.g., data leak, unauthorized access) related to wireless technology use?
    - A. Yes, significant impact
    - B. Yes, minimal impact
    - C. No
    - D. Unsure

Awareness of Dangers

- Are you aware of any health risks associated with prolonged exposure to wireless signals (e.g., Wi-Fi, cellular radiation)?
    - A. Yes, very aware
    - B. Somewhat aware
    - C. Not aware
    - D. Do not believe there are health risks
- How aware are you of cybersecurity risks (e.g., hacking, malware) when using wireless networks?
    - A. Very aware
    - B. Somewhat aware
    - C. Not aware
    - D. Not applicable (do not use wireless networks)
- Do you believe wireless devices contribute to issues like digital addiction, misinformation, or environmental impacts (e.g., e-waste)?
    - A. Yes, multiple issues
    - B. Yes, one or two issues
    - C. No
    - D. Unsure
- How dangerous do you perceive the overall use of wireless technology to be for individuals and society?
    - A. Very dangerous
    - B. Somewhat dangerous
    - C. Not very dangerous
    - D. Not dangerous at all
    - E. Unsure

Policy and Education

- Should the U.S. government implement stricter regulations on wireless technology to address privacy or health concerns (e.g., mandatory radiation labeling)?
    - A. Strongly agree
    - B. Somewhat agree
    - C. Neither agree nor disagree
    - D. Somewhat disagree
    - E. Strongly disagree
- Should schools and workplaces provide more education about the risks of wireless and wired internet access?
    - A. Yes, comprehensive education
    - B. Yes, basic education
    - C. No, not needed
    - D. Unsure

ADDENDUM C

BIOLOGICAL HAZARDS OF WIRELESS RADIATION – EXECUTIVE SUMMARY

The FCC's standards for wireless radiation were established back in 1996, and have not been reviewed, updated or verified despite significant changes in the wireless technology in use today. The FCC's standards relate solely to wireless radiation's thermal impacts on a body (e.g. how the body reacts to being heated), and do not consider other known adverse biological impacts of non-thermal levels of RF radiation (such as damage to DNA or other changes to cells). The FCC's limits were established long before the existence of 2G, 3G, 4G, or 5G technology.

Congress eliminated the EPA's funding for electromagnetic research in 1996, knee capping the EPA from studying biological impacts of RF radiation for nearly 30 years. *At the very least, the FCC's standards should be reconsidered (FCC is under federal court order to do so, but has not) given current technology*.

Wireless radiation, also referred to as radio frequency (RF) radiation, produces biological effects and evidence of its hazards are clear and convincing, yet the hazards are not generally publicized, and the hazards are unnecessary to reap the benefits of wireless technology.

- **Industry Funded Research** – The wireless industry has funded studies that show adverse biological impacts. A 1990s $28.5 million study found that RF radiation produces biological effects that are potentially hazardous to humans in ways that have nothing to do with heated tissue. A 2000 study for a major telecom carrier found RF radiation has links to cancer, neurological disorders and cognitive impairment. Insurance companies will not insure for personal injury from RF radiation, reflecting their concerns about the possible magnitude of their liability, e.g., that 5G is a high, "off the leash" risk.

- **Reports from Federal Agencies** – A 2018 $30 million US National Toxicology Program (NTP) study found "clear evidence of cancer" in lab rats from wireless radiation. In 2019, the FCC admitted that RF radiation can have non-thermal impacts on humans, but it has conducted no studies to determine what those impacts might be or what changes should be made to its RF radiation emission limits. In 2021, the DC Circuit Court of Appeals ruled in *Environmental Health Trust, et al* v. *FCC* that the FCC's lack of action was arbitrary and capricious for failing to review its emission standards in light of new science and current technology and that it should consider non-cancer health impacts of wireless radiation. So far, the FCC has failed to comply with the Court order. As early as 1971, the US Naval Medical Research Academy concluded from 2300 studies that RF radiation, including millimeter (e.g. 5G), are linked to cardiac, neurological and other disorders.

- **Independent Studies** – Several major independent studies have concluded biological effects from RF radiation, including by the World Health Organization in 2025 (finding increased risk of cancer, initial Class 2B carcinogen classification in 2011), the Ramazzini Institute in 2018 (clear evidence of cancer in lab rats, corroborating the NTP's results) and the New Hampshire Commission in 2020 (all forms of wireless radiation are harmful). The American Academy of Pediatrics warns that children are disproportionately affected by cell phone radiation. Studies concluded increased risk for ADHD, delayed motor skills, diabetes and demyelination of fetuses' brain neurons.

- **Chronic Diseases and Clusters near Cell Towers** – Illnesses near cell towers, e.g., nausea, rashes, stroke, atrial fibrillation and a variety of cancers, have been documented near Duluth, MN (51 strokes), Pittsfield, MA (17 residents fell ill and many evacuated, one resident who remained died), Ripon, CA (4 children and 4 teachers developed cancer; one child died) and Eagle, ID (atrial fibrillations from 5G cell towers).

BIOLOGICAL HAZARDS OF WIRELESS RADIATION -- SOME HIGHLIGHTS

"The evidence presented to the Board includes well over one thousand peer-reviewed scientific and medical studies which consistently find that pulsed and modulated RFR has bio-effects and can lead to short- and long-term adverse health effects in humans, either directly or by aggravating other existing medical conditions. Credible, independent peer-reviewed scientific and medical studies show profoundly deleterious effects on human health, including but not limited to: neurological and dermatological effects; increased risk of cancer and brain tumors; DNA damage; oxidative stress; immune dysfunction; cognitive processing effects; altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and damage to the blood-brain barrier."[53]
~ Board of Health, Pittsfield, MA, Emergency Cease & Desist Order to remove cell tower that was sickening 17 residents simultaneously.

What the Industry Knows About the Biological Hazards of Radiofrequency (RF) Radiation:

[53] https://ehtrust.org/cease-and-desist-order-against-verizon-cell-tower-by-board-of-health-pittsfield-ma/, see below the fold for link to the Order at 3, 2nd "Whereas" clause, paragraph #1.

1. **Industry Funded Research Finds Biological Effects**. A 1990s research program funded by the wireless industry at $28.5 million under the independent non-profit, Wireless Technology Research, LLC (WTR), found that wireless radiation (i.e., non-thermal radiation) is **biologically active producing biological effects and potentially hazardous to human health**.[54] That means the radiation does not need to heat human tissue. (Note that the FCC limits only account for thermal, not non-thermal, adverse effects.)
    a) The research was peer-reviewed with scientific oversight by both an independent Peer Review Board at the Harvard School of Public Health and a U.S. Government Interagency Working Group, chaired by the FDA, and including EPA, OSHA, NIOSH, CDC, FCC, and NIH.[55]
    b) Abruptly after these findings, the EPA was defunded from doing any further research on the biological effects of wireless radiation.[56]

2. **Industry Commissioned Study Finds Biological Effects.** A study in 2000 commissioned by a major telecom carrier found links to cancer, leukemia, neurological disorders and cognitive impairment, with special caution for children and an acknowledgement of those already disabled from the radiation.[57]

3. **Industry Patents Point to Health Risks.** Telecom and cell phone manufacturers have filed patents to reduce the level of wireless exposure tied directly to health risks such as neurological disorders and cancer.[58]

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[54] Wireless Phones and Health II: State of the Science 2002 Edition, edited by George L. Carlo; Wireless Phones and Health: Scientific Progress, edited by George L. Carlo.
[55] Ibid.
[56] Overpowered, What Science Tells Us About the Dangers of Cell Phones and Other WiFi-Age Devices, Martin Blank, PhD, 2014 at 110-112.
[57] T-Mobil Deutsche Telekom commissioned study by the Ecolog-Institute, April 2000, "Mobile Telecommunications and Health Review of the Current Scientific Research in View of Precautionary Health Protection," https://ehtrust.org/wp-content/uploads/ecolog2000.pdf.
[58] Swisscom patent, 2004 at https://www.dropbox.com/scl/fi/nwdfklq7r7j2wwsipv7ws/SwissCom-Patent-application-2003-2004-WO2004075583A1-1-1.pdf?rlkey=liuy6175hamj24lbuszpe7vux&st=5p2oy0ji&dl=0; "Manufacturers Own Patents to Cut Radiation," RCR Wireless, June 4, 2001 at https://www.dropbox.com/scl/fi/0rfwys743dgeqpifwu3ua/Manufacturer-own-patents-to-cut-radiation-RCR-Wireless-News.pdf?rlkey=e5hm46nyp9an6ugu4y005ldm3&st=xr7ocreh&dl=0.

4. **Risk Warnings of Litigation.** Industry annual reports warn their shareholders of litigation risk from potential personal injury claims from RF radiation and potential financial losses.[59]

5. **RF Radiation is a Pollutant.** The telecom industry characterizes RF radiation as a pollutant in their device protection plans and disclaim insurance liability.[60]

6. **Insurance Companies Exclude Injury Coverage for RF Radiation.** Insurance companies such as Lloyd's of London will not insure for personal injury from RF radiation because of the high risk of claims, with Swiss Re characterizing "5G" as "high," "off-the-leash" risk.[61]

7. **No 5G Pre-Market Testing.** Telecom executives during a Feb. 2019 Senate hearing confirmed no industry pre-market testing of 5G for public health or safety. Sen. Blumenthal (CT) criticized the FCC and FDA for inadequate answers on questions of public health, and concluded, "We're kind of flying blind here as far as health and safety is concerned." [62]

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[59] AT&T, Inc., 2021 Annual Report, https://investors.att.com/~/media/Files/A/ATT-IR-V2/financial-reports/annual-reports/2021/complete-2021-annual-report.pdf at 41. Verizon's 2021 U.S. SEC Form 10–K at 17, https://www.verizon.com/about/sites/default/files/2020-Annual-Report-on-Form-10-K.PDF.

[60] Exclusions of loss from electromagnetic radiation from insurance coverage:

- Verizon, Sec B "Exclusions," Subsection 16 "Pollution," https://ehtrust.org/wp-content/uploads/device-protection-brochure-nationwide.pdf;
- AT&T, Sec II "Exclusions," Subsection H. Loss from "Pollutants," Sec IX.T. Definition of "Pollutants," https://ehtrust.org/wp-content/uploads/ATT-Multi-Device-Protection-Pack-Insurance.pdf;
- Sprint, Sec II "Exclusions," Subsection H. Loss from "Pollutants," Sec IX.P. Definition of "Pollutants," https://ehtrust.org/wp-content/uploads/Sprint-Insurance-Terms-and-Conditions-Downloaded-2019.pdf.

[61] https://ehtrust.org/key-issues/electromagnetic-field-insurance-policy-exclusions/.

[62] https://ehtrust.org/health-effects-of-5g-wireless-technology-confirmed-at-us-senate-hearing-after-senator-blumenthal-questions-industry/; see also, https://mdsafetech.org/2019/02/13/no-research-on-5g-safety-senator-blumenthal-question-answered/.

8. **"Why Tech Leaders Don't Let Their Kids Use Tech."**[63] The article reports that technology executives restrict or forbid their children's use of the very technology that they are providing to the public, including "the makers of smartphones and tablets, of social media channels and game boxes." Technology "titans" such as former Apple's Steve Jobs and Bill and Melinda Gates have admitted to placing restrictions on their children's use of technology. Chris Anderson, former Wired magazine editor and CEO of 3D Robotics, said that his kids "accuse me and my wife of being fascists and overly concerned about tech, and they say that none of their friends have the same rules. That's because we have seen the dangers of technology firsthand. I've seen it in myself, I don't want to see that happen to my kids."[64]

What Federal Agencies Know About the Biological Effects of Wireless Radiation and Have Disregarded:

1. **Chronology of Federal Agencies** expressing since at least the 1990s that the FCC's wireless limits address only thermal (heating of human tissue), not non-thermal exposure of RF radiation.[65]

2. **Food and Drug Administration (FDA).** The U.S. National Toxicology Program's (NTP) 2018 report concluded **clear evidence of cancer** in lab rats from wireless radiation (similar to 2G and 3G cell phones).[66] NTP found malignant heart schwannomas and malignant brain gliomas.[67] NTP is one of the most prestigious toxicology institutions in the world. In 1999, the FDA had nominated the NTP to conduct a $30 million study of RF radiation "with a high priority," to conduct animal studies, stating that it was "not scientifically possible to guarantee that non-

[63] "Why Tech Leaders Don't Let Their Kids Use Tech," https://kidzu.co/health-wellbeing/why-tech-leaders-dont-let-their-kids-use-tech/.
[64] Ibid.
[65] https://ehtrust.org/timeline-of-development-of-safety-limits-for-wireless-radiation-in-us/.
[66] See letter of Dr. Birnbaum, former NIH and NTP Director, and hyperlinked amicus brief https://www.dropbox.com/scl/fi/nc7l00p8zxk8tj0l2a1yr/Dr.-Linda-Birnbaum-cell-tower-letter.pdf?rlkey=vq1i363i74umg9ybydrrhmn5d&st=q9l49h88&dl=0 ; see also, https://ehtrust.org/former-niehs-director-dr-linda-birnbaum-interviewed-about-cell-phone-radiation/.
[67] https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones#studies *Environmental Health Trust, et al v. FCC*, Motion for Leave to File Brief of Amicus Curiae Joseph Sandri in Support of Petitioners Urging Reversal, Aug. 5, 2020, https://ehtrust.org/wp-content/uploads/20-1025-Amicus-Brief-Joe-Sandri.pdf.

thermal levels of microwave radiation . . . will not cause long-term adverse health effects."[68]

a) Dr. Linda Birnbaum, former NIH and NTP director, has stated: "Every agent known to cause cancer in humans will also produce it in animals when adequately tested."[69] **"**Overall, the NTP findings demonstrate the potential for RFR **to cause cancer in humans**."[70] [Emphasis added.]

3. **Federal Communications Commission (FCC)**
   a) **The FCC admitted in 2019** that at least some types of RF radiation can cause instantaneous, non-thermal adverse effects with RF radiation frequencies ranging between 3 KHz and 10 MHz.[71] Despite this, the FCC does not regulate for RF frequencies below 150 KHz, except for Class A digital devices for commercial use.[72] The FCC averages exposure levels are for 30 minutes,[73] which obscures the effects of the **constant peaking and pulsations of RF radiation which are the cause of adverse biological effects**, and does not account for 24/7 exposure by the population.[74]

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[68] FDA letter to NTP, May 19, 1999, pp. 2, 3, 7, available at https://ehtrust.org/wp-content/uploads/FDA-Nomination-for-Cell-Phone-NTP-Study-.pdf.
[69] Dr. Birnbaum's statement in Attorney Joe Sandri's Amicus Brief filed 8-5-2020 in connection with *Environmental Health Trust, et al v. FCC, https://ehtrust.org/fcc-amicus-briefs/* (below the fold, right column) at 9.
[70] Ibid at 11.
[71] Proposed Changes in the Commission's Rule Regarding Human Exposure to Radiofrequency Electromagnetic Fields, 34 FCC Rcd 11687, 11743-11745, ¶¶122- 124 & nn. 322-335 (2019).
[72] See, e.g., 47 CFR 15.107(a) and (b) on conducted limits, https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15/subpart-B/section-15.107.
[73] 47 CFR 1.1307(b)(2): "Time-averaging period is a time period not to exceed 30 minutes for fixed RF sources or a time period inherent from device transmission characteristics not to exceed 30 minutes for mobile and portable RF sources," https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-1/subpart-I/section-1.1307#p-1.1307(b).
[74] Human-made electromagnetic fields: Ion forced-oscillation and voltage-gated ion channel dysfunction, oxidative stress and DNA damage (Review) (2021) Pangopolous DJ, et al. International Journal of Oncology. August 23, 2021. https://pubmed.ncbi.nlm.nih.gov/34617575/.

Computational modeling investigation of pulsed high peak power microwaves and the potential for traumatic brain injury. Sci Adv. 2021 Oct; 7(44).

b) **The FCC received in its docket**, when requesting public comment on the adequacy of its 1996 RF radiation emission limits, 11,000 pages of peer-reviewed, scientific studies showing biological effects from RF radiation and about two hundred personal accounts of injury. When the FCC closed the docket, it declined to update its limits. The FCC was sued and in 2021 the D.C. Circuit Court of Appeals ruled against the FCC and remanded the case back to the FCC to examine long-term effects on the public, especially children. The court concluded that the FCC failed to provide a reasoned explanation for not updating its limits and ignoring the current science.[75] The FCC has not yet complied. The FCC has also failed to reply to three petitions seeking compliance.[76]

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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8555891/. "These studies reveal that the MAE threshold depends on the energy in a single pulse (not the average power density) for sufficiently short pulses [e.g., 32 μs in (46)], and peak power densities of 102 to 105 mW/cm2 have been known to cause auditory effects in human participants (45)."

"Diplomats' Mystery Illness and Pulsed Radiofrequency/Microwave Radiation," Dr. Beatrice Golomb. Neural Comput. 2018 Nov; 30(11):2882-2985. https://pubmed.ncbi.nlm.nih.gov/30183509/; "Reported facts appear consistent with pulsed RF/MW as the source of injury in affected diplomats."

"5G: Great risk for EU, U.S. and International Health! Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them," Martin L. Pall, PhD, https://peaceinspace.blogs.com/files/5g-emf-hazards--dr-martin-l.-pall--eu-emf2018-6-11us3.pdf.
Belyaev, I., Dean, A., Eger, H. et al. "EUROPAEM EMF Guideline 2016 for the prevention, diagnosis, and treatment of EMF-related health problems and illnesses." Rev environ Health. 2016;31(3):363-397. Doi:10.1515/reveh-2016-0011.B. W. G. (2012). "Bioinitiative Report 2012: A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation."

[75] https://media.cadc.uscourts.gov/opinions/docs/2021/08/20-1025-1910111.pdf

[76] Petitions:

- On 11/30/2021, Environmental Health Trust (EHT) filed a Request to Reopen and Refresh Record in Remand of Emissions Guidelines Notice of Inquiry;
- On 6/30/2022, Environmental Working Group (EWG) filed a petition with 22,000 signatures requesting that the FCC protect children's health by setting strict standards limiting public exposure to radiofrequency radiation;
- On 4/4/2023, Children's Health Defense (CHD) filed a Petition to Implement D.C. Circuit Judgment and Mandate, Reopen Notice of Inquiry and Perform Tasks

c) **FCC's Maximum Permissible Exposure Limit (MPEL)** are the limits of RF radiation for human exposure. MPEL allows for a very high human exposure limit of ten million microwatts per square meter.[77] The FCC has acknowledged a "worst-case" scenario of transmitters "operating simultaneously and continuously" at the MPEL with an individual "in the main transmitting beam and within a few feet of the antenna for several minutes or longer."[78] While the FCC dismisses this scenario as "extremely remote," it is allowing 4G and 5G cell towers to be installed[79] just feet from a home, business or school where individuals and children are in the main transmitting beam for many hours a day or for 24/7.

d) **The FCC's MPEL** is based on IEEE (Institute of Electrical and Electronic Engineers) guidelines[80] which "have not been changed since 1991 and do not consider children."[81] Testing was performed on "a model head with dimensions based [on] the 90th percentile of U.S. military recruits in the year 1989. The corresponding body of the head would be a six foot, two inches, 220 lb. male."[82] A Specific Absorption Rate (SAR) – rate of absorption of

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Ordered by the Court, Petition to Implement CEQ-Mandated NEPA Procedures Update and Request for Prompt Ruling. CHD stated: *"Any continued non-action will violate the judgment and mandate and expose the Commission to further judicial review and, ultimately, a mandamus order requiring compliance."*

[77] 47 CFR 1.1310(e)(1)(II) shows 1 mW/cm2, which is equivalent to 10 million uM/m2, https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-1/subpart-I/section-1.1310.

[78] FCC's *Guidelines for Cellular Antenna Site Calculations,* https://www.fcc.gov/consumers/guides/human-exposure-radio-frequency-fields-guidelines-cellular-and-pcs-sites#:~:text=In%201996%2C%20the%20FCC%20adopted,lower%2Dpowered%20cell%20site%20transmitters.

[79] *In re Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Inv.*, 33 F.C.C.R. 9088, 9104-05 (2018).

[80] FCC guidelines are set forth at 47 CFR 1.1310, see note at (d)(4); see also, https://www.fcc.gov/consumers/guides/human-exposure-radio-frequency-fields-guidelines-cellular-and-pcs-sites#:~:text=In%201996%2C%20the%20FCC%20adopted,lower%2Dpowered%20cell%20site%20transmitters.

[81] *The Effects of RF-EMF on the Child Brain*, Aaron Skaist, Vol 12, No. 2, 2019, at 2, The Science Journal of the Lander College of Arts and Sciences, https://touroscholar.touro.edu/cgi/viewcontent.cgi?article=1218&context=sjlcas.

[82] Ibid at 3.

electromagnetic radiation -- is then calculated based on thermal effects (heating tissue) of that model head.[83] However, biological effects from RF radiation are also non-thermal, documented by the studies cited herein, yet neglected in FCC testing. The FCC's limits are based on "outdated exposure metrics and circumvent important animal data" and "do not address conclusions from scientific organizations, such as the IARC."[84]

e) **The FCC failed to disclose** that in 2019 when it tested cell phones next to the body (which is the way that the public typically uses cell phones), the cell phones exceeded the limits of RF radiation for human exposure (discovered via FOIA). [85]

4. **A U.S. Naval Medical Academy Research** report from 1971 by Dr. Zory Glaser[86] linked 23 chronic diseases to RF radiation based on over 2300 studies.[87] A Feb 2025 report correlates Dr. Glaser's findings from 1971 of biological effects of RF radiation and millimeter wave (5G) technology to reported cases of chronic disease.[88] The 2025 report states that Dr. Glaser reported biological effects and diseases related to the central and autonomic nervous systems, genetic / chromosomal, vascular, blood, metabolic, endocrine and gastrointestinal disorders.[89] In 1976, Dr. Glaser updated the total bibliography to 3700 reports relating to the biological effects of RF radiation.[90]

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[83] Ibid.

[8484] Dr. James C. Lin, distinguished former member of the International Commission on Nonionizing Radiation Protection (ICNIRP) and the Institute of Electrical and Electronic Engineers (IEEE), "RF Health Safety Limits and Recommendations [Health Matters]," IEEE Microwave Magazine, May 8, 2023, DOI: 10.1109/MMM.2023.3255659.

[85] https://ehtrust.org/press-release-concealed-fcc-cell-phone-radiation-tests-show-human-exposure-limits-were-exceeded/.

[86] About Dr. Zory Glaser, https://zoryglaser.com/.

[87] https://www.magdahavas.com/wp-content/uploads/2010/06/Navy_Radiowave_Brief.pdf.

[88] Report: "Safety of Wireless Radiation, a Scientific View, Feb 2025, Richard Lear and Camilla Rees, https://www.researchgate.net/publication/388763046_Safety_of_Wireless_Technologies_The_Scientific_View at 12-13.

[89] Ibid at 3.

[90] https://ehtrust.org/wp-content/uploads/Naval-MRI-Glaser-Report-1976.pdf.

5. **A U.S. Air Force report** from 1994[91] states that "[i]t is known that electromagnetic radiation [EMR] has a biological effect on human tissue" covering a wide range including adverse cardiovascular, neurological and behavioral effects including the risk of cancer. Since 1956, the Dept. of Defense directed the Armed Forces (Army, Navy, Air Force) to study EMR. The report found that EMR can interact with human tissue's bioelectrical function and Eastern Europe and the then Soviet Union found that human tissue may be more sensitive to EMR's non-thermal effects.

6. **Central Intelligence Agency (CIA).** In 2012, the CIA declassified and approved for release a 1977 Russian study on the "Biological Effects of Millimeter Radiowaves" which found that while millimeter waves only penetrate the skin, they trigger a cascade of adverse biological effects within the body.[92]
    a) The study coins the term **"radiowave disease"** to describe these effects.[93] Adverse effects on the skin included demyelination of sections of nerve fibers (damage or destruction to the insulation around nerve fibers which disrupts normal nerve impulse transmission), fragmented neural conductors, and deformation of sensory receptors, leading to neurological disorders.
    b) The people observed working with millimeter radio wave generators had disturbances in their blood and immuno-biology.[94]
    c) Exposure in lab animals inhibited "oxygen consumption rate by the mitochondria" of the liver, spleen, heart and brain.[95]
    d) The degree of adverse effects **increased with more exposure**;[96] the lab animals had been exposed for 15 minutes a day for 60 days. When exposure ceases, disorders from low millimeter radio waves are reversible.[97] However, if adverse effects depend on duration of exposure, then Americans exposed continuously 24/7, 365 days a year, would suffer adverse biological effects without reprieve and without the ability to recover.

Independent Research on Biological Effects of RF Radiation, Disregarded by Federal Agencies:

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[91] *Radiofrequency / Microwave Radiation Biological Effects and Safety Standards, a Review (1994),* Scott Bolen, Rome Laboratory, Griffiss Air Force Base, at 1, https://youandemf.com/wp-content/uploads/2025/01/EMR-US-Military-Report.pdf.
[92] https://mdsafetech.org/wp-content/uploads/2019/02/biological-effects-of-millimeter-wavelengths.-zalyubovskaya-declassif-by-cia-1977-biol-eff-mm-waves.pdf.
[93] Ibid at 57.
[94] Ibid at 60.
[95] Ibid at 59.
[96] Ibid at 59.
[97] Ibid at 58.

1. **The World Health Organization's (WHO) International EMF Project Review of April 2025** of animal studies found reliable evidence that RF radiation increases the risk of cancer.[98] This reinforces the 2018 findings of cancer from the National Toxicology Program for 2G and 3G cell phones and the Ramazzini Institute for cell towers. Scientists may call for the WHO's International Agency on Research on Cancer (IARC) to augment its RF radiation classification from "possible" Class 2B in humans set in 2011 to "probable" or "known" carcinogenicity in 2025.[99]

    a) **The WHO's IARC** (composed of independent scientists) classified EMF as a **Class 2B possible human carcinogen** in 2011[100] (similar to lead, diesel fuel and gasoline engine exhaust). This was based on "epidemiological observations in humans which exhibited higher risks for the glioma-type of malignant brain cancer and of benign vestibular schwannoma of the vestibulocochlear nerve among heavy or long-term subscribers of cell or mobile phones."[101]

    b) "[R]esults from animal experiments that the IARC was lacking were later provided by the U.S. National Toxicology Program (NTP). The NTP had reported two types of cancers in lab animals that were exposed, lifelong, to 2G and 3G cell phone RF radiation frequencies below 6 GHz . . . did not exceed 1°C,"[102] i.e., did not heat tissue.

    c) Since the WHO 's 2011 IARC Class 2B classification, other factions within the WHO have sought to produce industry-aligned pronouncements. For example, its website states a lack of causality of harm from wireless radiation,[103] but does not state that, nonetheless, IARC concluded Class 2B possible carcinogenicity.

        i. Researchers have called for the retraction of:

[98] https://www.sciencedirect.com/science/article/pii/S0160412025002338.
[99] See, e.g., https://icbe-emf.org/who-funded-study-reports-high-certainty-of-the-evidence-linking-cell-phone-radiation-to-cancer-in-animals/.
[100] https://www.iarc.who.int/wp-content/uploads/2018/07/pr208_E.pdf.
[101] J. C. Lin, "RF Health Safety Limits and Recommendations [Health Matters]," in IEEE Microwave Magazine, vol. 24, no. 6, pp. 18-77, June 2023, doi: 10.1109/MMM.2023.3255659. keywords: {Radiation detectors;Human factors;Safety;Radiation effects;Cellular phones;Radio frequency}.
[102] Ibid.
[103] https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health.

- A study commissioned by the WHO, conducted by Karpidis, et al, which concluded in 2024 no hazards from wireless radiation,[104] but the study was found to be severely flawed with no scientifically valid assessment,[105] its conclusion contradicted the scientific evidence and was drawn from data showing hazards.[106] Researchers have called for the retraction of the study.[107]

- Another WHO study in 2024 on RF-induced oxidative stress which identified 11,599 studies on oxidative stress within the 800-2450 MHz

[104] K. Karipidis, D. Baaken, T. Loney, M. Blettner, C. Brzozek, M. Elwood, C. Narh, N. Orsini, M. Röösli, M.S. Paulo, S. Lagorio, The effect of exposure to radiofrequency fields on cancer risk in the general and working population: A systematic review of human observational studies - Part I: Most researched outcomes
Environ Int., 191 (2024), Article 108983, 10.1016/j.envint.2024.108983.

[105] John W. Frank, Joel M. Moskowitz, Ronald L. Melnick, Lennart Hardell, Alasdair Philips, Paul Héroux, Elizabeth Kelley, *The Systematic Review on RF-EMF Exposure and Cancer by Karipidis et al. (2024) has Serious Flaws that Undermine the Validity of the Study's Conclusions*, Environment International, Vol. 195, 2025, 109200, ISSN 0160-4120, https://doi.org/10.1016/j.envint.2024.109200.
(https://www.sciencedirect.com/science/article/pii/S0160412024007876)

[106] "WHO to build neglect of RF-EMF exposure hazards on flawed EHC reviews? Case study demonstrates how 'no hazards' conclusion is drawn from data showing hazards," 7/10/24, https://www.degruyter.com/document/doi/10.1515/reveh-2024-0089/html;
"WHO's EMF Project's Systemic Reviews on the Association between RF Exposure and Health Effects Encounter Challenges," James Lin, IEEE Microwave Magazine, Jan 2025, https://www.dropbox.com/scl/fi/xq492i5ha6f2431vyxn3g/World_Health_Organizations_EMF_Projects_Systemic_Reviews_on_the_Association_Between_RF_Exposure_and_Health_Effects_Encounter_Challenges_Health_Matters.pdf?rlkey=o77i19den485rdo2k4ktdzhgj&st=842p0rbv&dl=0.

[107] Lennart Hardell, Mona Nilsson. A Critical Analysis of the World Health Organization (WHO) Systematic Review 2024 on Radiofrequency Radiation Exposure and Cancer Risks. Journal of Cancer Science and Clinical Therapeutics. 9 (2025): 09-26., https://cdn.fortunejournals.com/articles/a-critical-analysis-of-the-world-health-organization-who-systematic-review.pdf.

range, but remarkably discarded more than 99% of those studies.[108] Researchers have called for a retraction of that study, as well.[109]

d) Dr. Miller, former Senior Epidemiologist and Senior Scientist at the IARC has, since 2011, stated **"[t]here is sufficient evidence to now classify radiofrequency radiation as a human carcinogen," [110]** a Group 1 carcinogen (the highest level of evidence).[111] The WHO's EMF Project Review of April 2025 review reinforces that conclusion.

2. **The Ramazzini Institute** in Italy in 2018 found increased malignant heart schwannomas and malignant brain gliomas in lab animals from cell tower base stations, similar to what the NTP found from 2G/3G cell phones.[112]

Note: *"Since the IARC evaluation in 2011, the evidence on human cancer risks from RF radiation has been strengthened based on human cancer epidemiology reports [IARC Class 2B designation for RF radiation], animal carcinogenicity studies [NTP study finding clear evidence of cancer] and experimental findings on oxidative mechanisms [associated*

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[108] Frank, John W., Melnick, Ronald L. and Moskowitz, Joel M.. "A critical appraisal of the WHO 2024 systematic review of the effects of RF-EMF exposure on tinnitus, migraine/headache, and non-specific symptoms" Reviews on Environmental Health, 2024. https://doi.org/10.1515/reveh-2024-0069; "Another WHO RF Review Challenged, More than 99% of Studies on Oxidative Stress Discarded," Microwave News, 8/21/24, https://www.microwavenews.com/short-takes-archive/another-who-rf-systematic-review-challenged.

[109] Ibid.

[110] Professor Miller, MD, FRCP, FRCP (C), FFPH, FACE, is an eminent physician and expert in preventative medicine, a scientific advisor to various scientific and health authorities, and a former Senior Epidemiologist and Senior Scientist at the World Health Organization's (WHO) International Agency for Research on Cancer (IARC), https://phiremedical.org/2020-nir-consensus-statement-press-release/; see Prof. Miller's statement at 00:15:06 at https://www.youtube.com/watch?v=S16QI6-w9I8; see also Proceedings from a Symposium on the Impacts of Wireless Technology on Health, Prof. Miller at 8, https://www.womenscollegehospital.ca/wp-content/uploads/2022/06/Symposium_Document_Final_Jan_12.pdf.

[111] Hardell, L., Carlberg, M."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 54, no. 1 (2019): 111-127. https://doi.org/10.3892/ijo.2018.4606

[112] https://pubmed.ncbi.nlm.nih.gov/29530389/; see also J. C. Lin, "RF Health Safety Limits and Recommendations [Health Matters]," in IEEE Microwave Magazine, vol. 24, no. 6, pp. 18-77, June 2023, doi: 10.1109/MMM.2023.3255659. keywords: {Radiation detectors;Human factors;Safety;Radiation effects;Cellular phones;Radio frequency}.

with increased DNA damage][113] and genotoxicity [associated with increased DNA damage][114]. Therefore, the IARC Category should be upgraded from Group 2B to Group 1, a human carcinogen[115].”[116] [Some internal footnotes omitted]

3. **International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF).** “Scientific evidence invalidates health assumptions underlying the FCC and ICNIRP exposure limit determinations for radiofrequency radiation: implications for 5G.”[117]

    a) The FCC wireless radiation limits for human exposure are based **largely** on 1980s experiments “**involving 40-60 minute exposures in 5 monkeys and 8 rats**, and then applying arbitrary safety factors to an apparent threshold specific absorption rate (SAR) of 4 W/kg . . . Adverse effects observed at exposures below the assumed threshold SAR include non-thermal induction of reactive oxygen species, DNA damage, cardiomyopathy, carcinogenicity, sperm damage, and neurological effects . . . “[118]

4. **Panagopoulos, et al, *Review on human-made EMF’s ion forced-oscillation and voltage-gated ion channel dysfunction, oxidative stress and DNA damage (2021)*.** “[E]xtremely low frequency (ELF) band, and the microwave/radio frequency (RF) band which is always combined with ELF, may lead to DNA damage [which is] connected with cell death, infertility and other pathologies, including cancer.”[119]

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[113] Yakymenko I, Tsybulin O, Sidorik E, Henshel D, Kyrylenko O, Kyrylenko S. Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation. Electromagn Biol Med. 2016;35:186–202. doi: 10.3109/15368378.2015.1043557.

[114] Smith-Roe SL, Wyde ME, Stout MD, Winters JW, Hobbs CA, Shepard KG, Green AS, Kissling GE, Shockley KR, Tice RR, et al. Evaluation of the genotoxicity of cell phone radiofrequency radiation in male and female rats and mice following subchronic exposure. Environ Mol Mutagen. 2020;61:276–290. doi: 10.1002/em.22343.

[115] Carlberg M, Hardell L. Evaluation of mobile phone and cordless phone use and glioma risk using the Bradford Hill viewpoints from 1965 on association or causation. BioMed Res Int. 2017;2017:9218486. doi: 10.1155/2017/9218486.

[116] Health risks from radiofrequency radiation, including 5G, should be assessed by experts with no conflicts of interest, LHardell, MCarlberg, Oncol Lett. 2020 Jul 15;20(4):15. doi: 10.3892/ol.2020.11876.

[117] EnvironHealth 21, 92 (2022). https://doi.org/10.1186/s12940-022-00900-9.

[118] Ibid.

[119] https://pmc.ncbi.nlm.nih.gov/articles/PMC8562392/Dr. Dimitris J. Panagopoulos is an EMF-biophysicist at the Choremeion Research Laboratory, Medical School, University of Athens, Greece, https://www.researchgate.net/profile/Dimitris-Panagopoulos-3.

5. **New Hampshire Commission** studied the biological effects of wireless radiation and issued a report Nov. 2020[120] with former commissioner Kent Chamberlin, PhD, explaining a "key finding being that exposure to wireless communication radiation is harmful to the health of humans and the environment. Those findings apply to all forms of wireless radiation, which include all generations of cellphone radiation." [121]

6. **Thousands of scientific and medical studies** show neurological disorders; increased risk of cancer[122] and brain tumors; DNA damage; oxidative stress; immune dysfunction; cognitive processing effects; altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and damage to the blood-brain barrier.[123]

7. **Eight case studies** since Jan 2023 in Sweden show adverse health impacts from exposure to 5G towers. Previously healthy individuals developed typical "microwave syndrome" symptoms shortly after the towers were installed: headaches, abnormal fatigue, heart arrythmia, burning skin, trouble concentrating.[124] The significance of these reports is that non-ionizing

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120 http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf.

121 Kent Chamberlin, PhD, Professor & Chair Emeritus, Fulbright Distinguished Chair, Univ of NH, Coll. Of Eng. and Physical Sciences, Dept of Electrical and Computer Engineering, 2-13-23 letter to NYC Community Board 12 in Queens.

122 *Mobile phone radiation causes brain tumors and should be classified as a probable human carcinogen (Review),* Journal of Oncology, https://www.spandidos-publications.com/10.3892/ijo.2015.2908.

123 A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation, 2022, https://bioinitiative.org/conclusions/; see also, Adverse health effects of 5G mobile networking technology under real-life conditions, May 1, 2020, https://pubmed.ncbi.nlm.nih.gov/31991167/; Wireless Radiation (RFR) – Is U.S. Government Ignoring Its Own Evidence for Risk? March, 28, 2019, https://electromagnetichealth.org/electromagnetic-health-blog/u-s-gov-ignoring-own-evidence/; Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency Radiation, Electromagnetic Biology and Medicine, 35(2), 186-202, Yakymenko, I., Tsybulin, O., Sidorik, E., Henshel, D., Kyrylenko, O., & Kyrylenko, S. (2016), https://pubmed.ncbi.nlm.nih.gov/26151230/.

124 https://mdsafetech.org/2023/11/20/5g-health-effects-5-case-reports-of-health-symptoms-after-5g-cell-towers-placed-in-sweden/; e.g., Jan 2023 study of 63 year old man and 62 year old woman where 5G antennas were installed on the rooftop of their home, https://www.gavinpublishers.com/assets/articles_pdf/Case-Report-The-Microwave-Syndrome-after--Installation-of-5G-Emphasizes-the-Need-for--Protection-from-Radiofrequency-Radiation.pdf and https://childrenshealthdefense.org/defender/5g-radiation-microwave-syndrome-symptoms/; Feb 2023 study of two previously healthy men

radiation[125] from 5G — well below levels allowed by authorities — can cause health problems in individuals who had no prior history of electromagnetic sensitivity.[126] Dr. Lennart Hardell, lead author of the reports and world-renowned scientist on cancer risks from radiation, affirms these reports as "groundbreaking" because they serve as the "first warning of a health hazard."[127]

8. **One-third of Americans suffer from symptoms from RF radiation**, based on a 2019 Bevington study which analyzed the prevalence of symptoms from RF radiation within any given population. [128] Based on a population of 332.4 million people in the U.S.,[129] 120 million have symptoms, 2% of which (7 million) have severe symptoms or can't work.

9. **The Bioinitiative Report's** review of 1800 studies found biological effects of RF radiation which can occur within minutes of exposure,[130] and recommends **no more than 0.1 microwatts per centimeter squared** for human exposure[131] (compared to

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where 5G antennas were installed on the rooftop of their business, https://www.anncaserep.com/open-access/development-of-the-microwave-syndrome-in-two-men-shortly-after-9589.pdf; April 2023 study of 52 year old woman whose apartment was 60 meters from a 5G base station, https://acmcasereport.com/pdf/ACMCR-v10-1926.pdf?fbclid=IwAR2J-mE3XeBxqaXPQdFxslf9Q23bMCer9vgUBHnCvJXBrgBv-w7YdRUDwF0; see also, "The microwave syndrome or electro-hypersensitivity: historical background," https://pubmed.ncbi.nlm.nih.gov/26556835/.

[125] https://childrenshealthdefense.org/emr/emf-key-terms-descriptions/.

[126] https://childrenshealthdefense.org/emr/emf-wireless-health-impacts/.

[127] https://www.stralskyddsstiftelsen.se/two-studies-show-that-5g-caused-the-microwave-syndrome-in-healthy-persons/.

[128] "The Prevalence of People with Restricted Access to Work in Manmade Electromagnetic Environments," Journal of Environment and Health Science, https://mdsafetech.files.wordpress.com/2019/10/2018-prevalence-of-electromagnetic-sensitivity.pdf.

[129] https://www.commerce.gov/news/blog/2022/01/us-population-estimated-332403650-jan-1-2022#:~:text=As%20our%20nation%20prepares%20to,since%20New%20Year's%20Day%202021.

[130] *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 4, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf.https://bioinitiative.org/; see also, BioInitiative 2012 Conclusions, https://bioinitiative.org/conclusions/.

[131] *Key Scientific Evidence and Public Health Policy Recommendations* 2007, at 22-23, https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2007_Key_Scientific_Studies.pdf.

the FCC's MPEL of 580 microwatts per centimeter squared for the general public[132]). Chronic or prolonged exposure to cell towers can result in biological effects; RF radiation exposures "prevent the body from healing damaged DNA, produce immune system imbalances, metabolic disruption . . . lower resistance to disease . . . pervasive impairment of metabolic and reproductive functions."[133]

10. **Children absorb more RF radiation and are at greater risk than adults**.[134]
    a) **From cell phones:**[135]

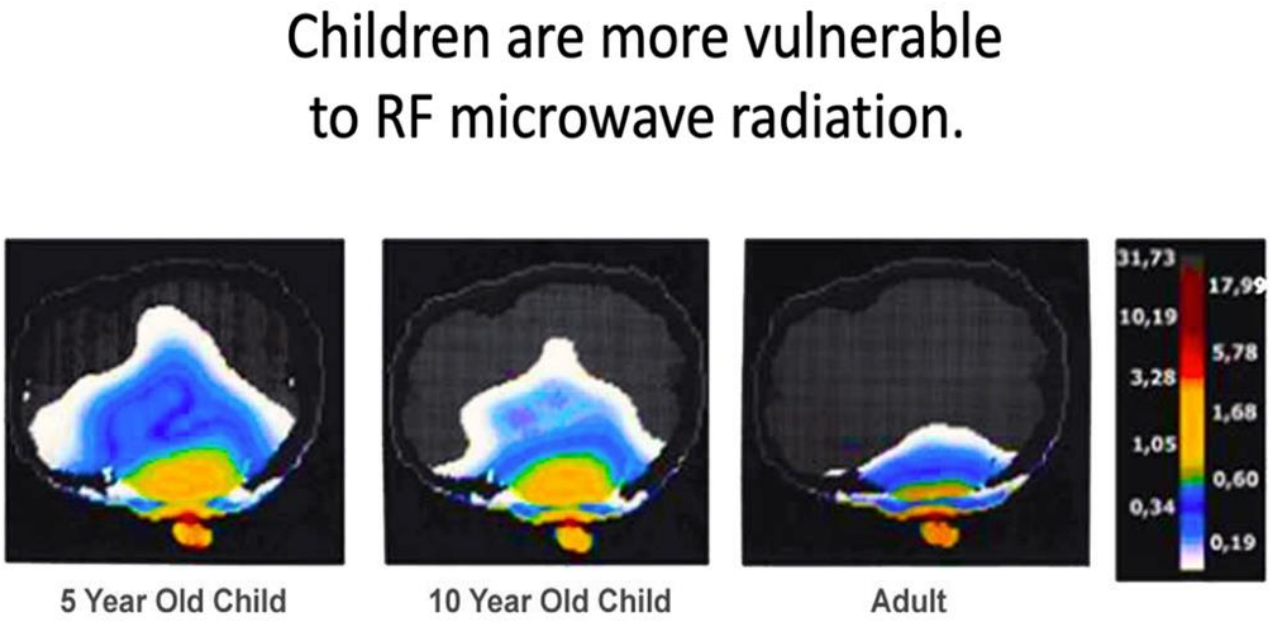
[INTENTIONALLY LEFT BLANK]

[132] https://www.fcc.gov/consumers/guides/human-exposure-radio-frequency-fields-guidelines-cellular-and-pcs-sites#:~:text=In%20the%20case%20of%20cellular,personnel%20working%20on%20the%20rooftop.

[133] *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 4, https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf.https://bioinitiative.org/; see also, BioInitiative 2012 Conclusions, https://bioinitiative.org/conclusions/.

[134] Wireless technologies, non-ionizing electromagnetic fields and children: Identifying and reducing health risks," Devra Davis PhD, MPH, Linda Birnbaum PhD, Paul Ben-Ishai PhD, Hugh Taylor MD, Meg Sears MEng, PhD, Tom Butler PhD, MSc, Theodora Scarato MSW, bCurr Probl Pediatr Adolesc Health Care, 2023 Feb;53(2):101374 https://doi.org/10/1016/j.cppeds.2023.101374; see also, *Children and Wireless Radiation,* https://ehtrust.org/educate-yourself/children-and-wireless-faqs/.

[135] Exposure limits: the underestimation of absorbed cell phone radiation, especially in children, Gandhi, Morgan, Augusto de Salles, Han, Heberman, Davis, October 14, 2011, https://pubmed.ncbi.nlm.nih.gov/21999884/.



Depth of absorption of cell phone radiation in a 5-year old child, a 10-year old child, and in an adult from GSM cell phone radiation at 900 MHz. Color scale on right shows the SAR in Watts per kilogram. Source: Exposure limits: the underestimation of absorbed cell phone radiation, especially in children

b) **American Academy of Pediatrics:** children are disproportionately affected by cell phone radiation due to their lower bone density and amount of fluid in the brain allowing for absorption of greater quantities of RF radiation than in adults.[136]

c) **Greater risk for fetuses:** risk of "degeneration of the protective myelin sheath that surrounds brain neurons."[137]

d) **School-age children:** risk of "[d]igital dementia."[138]

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[136] *Key Scientific Evidence and Public Health Policy Recommendations*, Supplement 2012, at 21, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2012_Key_Scientific_Studies.pdf.https://bioinitiative.org/.

[137] *Why children absorb more microwave radiation than adults: The consequences,* Morgan, Kesar and Davis, Journal of Microscopy and Ultrastructure, Vol. 2, Issue 4, December 2014, 197-204, https://www.sciencedirect.com/science/article/pii/S2213879X14000583.

[138] Ibid.

e) **Childhood leukemia**, increased risk.[139]

f) **Potential dangers of cell towers near schools.**[140]

i. **Elementary school children** exposed to high RF radiation from mobile phone base stations 200 meters from their schools "had a significantly higher risk of type 2 diabetes mellitus" than those exposed to lower RF radiation.[141]

ii. **Adolescent school children** exposed to high RF radiation from mobile phone base stations within 200 meters from their schools had "delayed fine and gross motor skills, spatial working memory and attention" than those exposed to lower RF radiation.[142]

iii. **A ten-year old child** testified of his cardiac condition being caused by exposure to RF radiation from a router in the library where he was being tutored.[143]

11. **Neurobehavioral Symptoms Near Cell Towers.** The following chart shows a worsening of symptoms when closer to a cell tower but a lessening of symptoms when farther away from a cell tower. [144]

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[139] *Key Scientific Evidence and Public Health Policy Recommendations*, 2007, at 19, David O. Carpenter, MD, Director, Institute for Health and the Environment University at Albany, Cindy Sage, MA, Sage Associates, https://bioinitiative.org/wp-content/uploads/pdfs/sec24_2007_Key_Scientific_Studies.pdf.

[140] Dr. Magda Havas: WiFi in Schools is Safe. True or False? https://www.youtube.com/watch?v=6v75sKAUFdc.

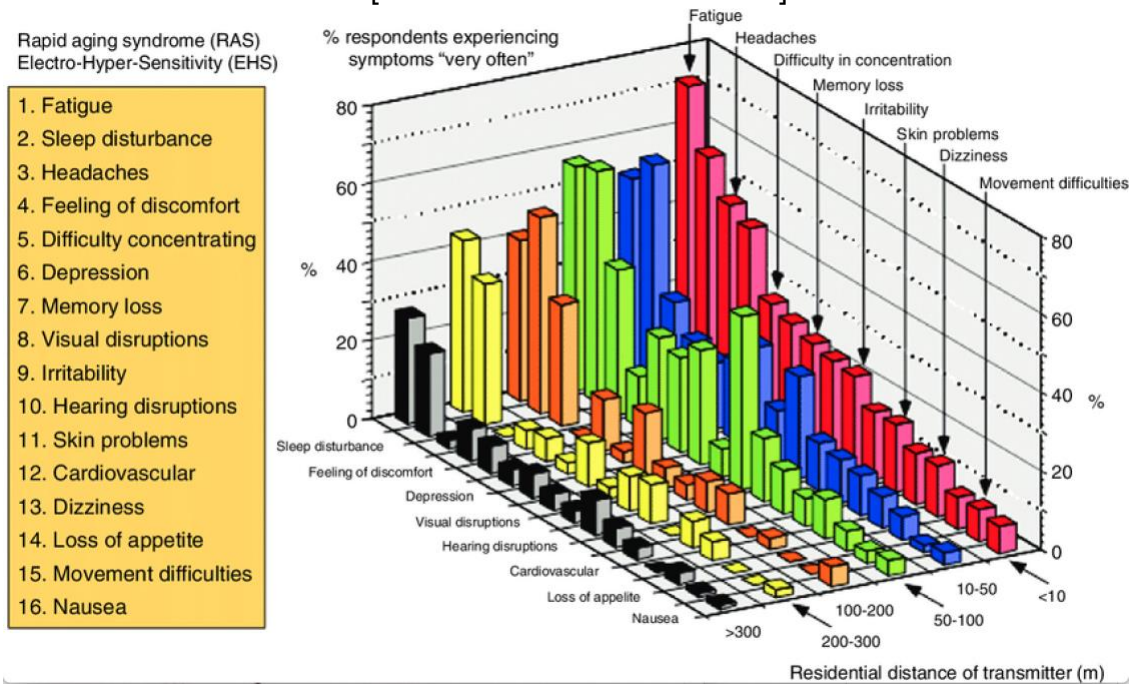
[141] *Association of Exposure to Radio-Frequency Electromagnetic Field Radiation (RF-EMFR) Generated by Mobile Phone Base Stations (MPBS)with Glycated Hemoglobin (HbA1c) and Risk of Type 2 Diabetes Mellitus*, Sultan Ayoub Meo et al, International Journal of Environmental Research and Public Health, 2015; https://www.researchgate.net/publication/283726472_Association_of_Exposure_to_Radio-Frequency_Electromagnetic_Field_Radiation_RF-EMFR_Generated_by_Mobile_Phone_Base_Stations_with_Glycated_Hemoglobin_HbA1c_and_Risk_of_Type_2_Diabetes_Mellitus.

[142] Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2018). *Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health*, American Journal of Men's Health; https://pubmed.ncbi.nlm.nih.gov/30526242/.

[143] Child With Heart Problems From Wireless: 5G Health Risks California SB 649 Hearing, https://www.youtube.com/watch?v=OgNLR9fQOX4&list=PLT6DbkXhTGoDakSqp1i_7milpwGx4xMFq.

[144] *Cell Tower Health Effects*, Physicians for Safe Technology, https://mdsafetech.org/cell-tower-health-effects/.

[INTENTIONALLY LEFT BLANK]



Symptoms experienced by people near cellular phone base stations; RF radiation affects the blood, heart and autonomic nervous system.[145] Source: Santini, et al (France): Pathol Biol. 2002;50:S369-73; Dr. Magda Havas, PhD.

12. **RF Radiation Effects.** A group of toxicology researchers from multiple universities concluded that overall, high frequency RF radiation even below the FCC limits "can result in: carcinogenicity (brain tumors/glioma, breast cancer, acoustic neuromas, leukemia, parotid gland tumors), genotoxicity (DNA damage, DNA repair inhibition, chromatin structure), mutagenicity, teratogenicity, neurodegenerative diseases (Alzheimer's Disease, Amyotrophic Lateral Sclerosis), neurobehavioral problems, autism, reproductive problems, pregnancy outcomes, excessive reactive oxygen species/oxidative stress, inflammation, apoptosis, blood-brain barrier disruption, pineal gland/melatonin production, sleep disturbance, headache, irritability, fatigue, concentration difficulties, depression, dizziness, tinnitus, burning and flushed skin, digestive disturbance, tremor, cardiac irregularities, adverse impacts on the neural, circulatory, immune, endocrine, and skeletal systems" and "from this perspective, **RF is a highly pervasive cause of disease**." [146]

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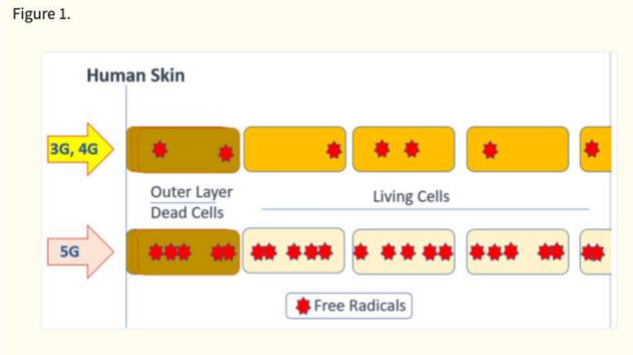
[145] Dr. Magda Havas, https://www.researchgate.net/figure/Symptoms-experienced-by-people-near-cellular-phone-base-stations-based-on-the-work-of_fig2_258313941.

[146] Ronald N. Kostoff, Paul Heroux, Michael Aschner, Aristides Tsatsakis, "Adverse health effects of 5G mobile networking technology under real-life conditions," Toxicology Letters, Vol 323, 2020, pp. 35-40, ISSN 0378-4274, https://doi.org/10.1016/j.toxlet.2020.01.020.

13. **5G's Biological Effects.** Contrary to claims that 5G's higher frequencies (millimeter waves) simply "bounce" off the skin, researchers have documented that the coiled portion of the skin's sweat duct can be regarded as a helical antenna in the sub-THz band and the skin, our largest organ, can intensely absorb the higher 5G frequencies.[147] The millimeter wave technology of 5G will not only directly and adversely affect the skin and eyes [e.g., skin cancer, cataracts], but will, in turn, cascade into systemic signaling effects within the body, "on the nervous system, heart and immune system."[148] The free radicals accumulating on the skin from 5G (see figure below) cause oxidative stress which can lead to DNA strand breaks, cancer and atherosclerosis.[149]



14. **Clumping of blood cells.** A Feb 2025 study found that when an otherwise healthy person is in close proximity to a cell phone, red blood cells clumped together

[147] N. Betzalel, Y. Feldman and P. B. Ishai, "The Modeling of the Absorbance of Sub-THz Radiation by Human Skin," in IEEE Transactions on Terahertz Science and Technology, vol. 7, no. 5, pp. 521-528, Sept. 2017, doi: 10.1109/TTHZ.2017.2736345, https://ieeexplore.ieee.org/document/8016593.

[148] Ronald N. Kostoff, Paul Heroux, Michael Aschner, Aristides Tsatsakis, "Adverse health effects of 5G mobile networking technology under real-life conditions," Toxicology Letters, Vol 323, 2020, pp. 35-40, ISSN 0378-4274, https://doi.org/10.1016/j.toxlet.2020.01.020; J J B, A R M, S M J M. A New Look at Three Potential Mechanisms Proposed for the Carcinogenesis of 5G Radiation. J Biomed Phys Eng. 2020 Dec 1;10(6):675-678. doi: 10.31661/jbpe.v0i0.2008-1157. PMID: 33364204; PMCID: PMC7753259, https://pmc.ncbi.nlm.nih.gov/articles/PMC7753259/#ref7.

[149] J J B, A R M, S M J M. A New Look at Three Potential Mechanisms Proposed for the Carcinogenesis of 5G Radiation. J Biomed Phys Eng. 2020 Dec 1;10(6):675-678. doi: 10.31661/jbpe.v0i0.2008-1157. PMID: 33364204; PMCID: PMC7753259, https://pmc.ncbi.nlm.nih.gov/articles/PMC7753259/#ref7; Russell C L. 5 G wireless telecommunications expansion: Public health and environmental implications. EnvironMental Research. 2018;165:484–95. doi: 10.1016/j.envres.2018.01.016.

(rouleaux formation), which leads to blood abnormality, less oxygen transport, and potential blockages, stroke and heart problems.[150]

15. **"The 5G Appeal"** to the United Nations to halt the proliferation of 5G, warning of potential biological effects, was signed by experts on these effects -- 252 scientists and professionals from 43 countries, 40 scientists of which are from 15 U.S. states, including scientists and medical professionals from Columbia and Harvard.[151] Other scientists have joined in consensus statements.[152]

16. **International Association of Fire Fighters** passed a resolution in 2004 that disapproved of cell towers on or near fire stations until safety can be proven.[153]

17. **Increases in brain cancer** in the U.S. have been reported, with scientists attributing a high probability on RF radiation from cell phone use.[154]

18. **Comprehensive overview** of the adverse biological effects on people and the environment is provided at https://ehtrust.org/wp-content/uploads/EHT-5G-Health-and-Environment-Open-Letter-3_2021-3.pdf.

Chronic Disease and Clusters Near Cell Towers:

1. **Near Duluth, MN**, a woman suffered 51 strokes after a nearby cell tower was "upgraded," in addition to experiencing nausea, blind spots in her vision, orientation and balance difficulties.[155]

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[150] "Hypothesis: ultrasonography can document dynamic in vivo rouleaux formation due to mobile phone exposure," Robert R. Brown, Barbara Biebrich, Front. Cardiovasc. Med. , 10 February 2025 Sec. Atherosclerosis and Vascular Medicine, Volume 12 - 2025 | https://doi.org/10.3389/fcvm.2025.1499499; see also, https://ehtrust.org/cellphones-and-your-blood-what-you-need-to-know/.

[151] http://www.5gappeal.eu/the-5g-appeal/; see also, Dr. Martin Blank, PhD, Dept of Physiology and Cellular Biophysics, Columbia University, announcing the appeal early on and warning on wireless radiation, https://www.youtube.com/watch?v=HgECRrabuZQ; see also, https://childrenshealthdefense.org/defender/5g-rollout-harm-regulation-profit/.

[152] https://phiremedical.org/wp-content/uploads/2020/11/2020-Non-Ionising-Radiation-Consensus-Statement.pdf.

[153] https://www.iaff.org/cell-tower-radiation/.

[154] See, e.g., Brain Tumor Rates Are Rising in the US: The Role of Cellphone & Cordless Phone Use; The Incidence of Meningioma, a Non-Malignant Brain Tumor, is Increasing in the U.S.; New review study finds that heavier cell phone use increases tumor risk; Expert report by former U.S. govt. official: High probability RF radiation causes brain tumors; Cell phone and cordless phone use causes brain cancer: New review; and https://ehtrust.org/scientific-documentation-cell-phone-radiation-associated-brain-tumor-rates-rising/.

[155] https://childrenshealthdefense.org/defender/marcia-haller-cell-tower-rf-radiation-sickness/.

2. **Clusters of sickness near cell towers (not exhaustive).**
    a. **In Pittsfield, MA,** many residents have been constructively evicted from their houses after a 115-foot 4G cell tower was installed in their area in 2020. Seventeen residents reported "headaches, ringing in the ears, dizziness, heart palpitations, nausea, and skin rashes," and a child who had "to sleep with a bucket next to her bed in case she needs to throw up."[156] These were just some of the findings of the **Board of Health** of Pittsfield, MA which then issued an emergency cease and desist order in April 2022 to turn off the cell tower which it concluded was injuring those residents, citing thousands of scientific, peer-reviewed studies of known adverse biological effects. Most of the residents have evacuated their homes.[157] One of those who remained has since died of cancer. Because the telecom carrier threatened to sue, the Board of Health was compelled to rescind the order. The residents filed suit against the city but lost on federal preemption, i.e., **no legal recourse for health claims** under Section 704 of the Telecommunications Act.

    b. **In Ripon, CA** when a cell tower was placed on the property of an elementary school, 4 children (ages 6-11) got cancer (brain, liver, kidney) and 4 teachers got breast cancer. [158] One of the children who contracted brain cancer (glioblastoma) when he was 10 years, after about 30 surgeries to save his life, died in Aug 2024.[159] After the 4th student was diagnosed with cancer, the tower was removed.[160] Since the tower was removed, it was reported that there were no more instances of cancer at the school.[161]

    c. **In an Idaho town** after 5G cell towers were installed, it was reported that a cluster of residents developed atrial fibrillation (a-fib). One of those residents who had undergone surgery for a-fib brought an action in the 9th Circuit against the telecom carrier under the Americans with Disabilities Act to provide accommodation under the Act.[162]

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[156] https://ehtrust.org/family-injured-by-cell-tower-radiation-in-pittsfield-massachusetts/.
[157] https://ehtrust.org/cease-and-desist-order-against-verizon-cell-tower-by-board-of-health-pittsfield-ma/, see below the fold for link to the Order, p.12.
[158] See beginning of video at https://www.youtube.com/watch?v=-9TMTexPb_0&t=128s .
[159] See the lists of treatments and surgeries that this child endured before he died, https://www.gofundme.com/f/support-the-ferrulli-family-in-memory-of-mason.
[160] https://mdsafetech.org/2019/03/25/cell-tower-to-be-removed-after-4th-ripon-student-diagnosed-with-cancer/.
[161] See beginning of video at https://www.youtube.com/watch?v=-9TMTexPb_0&t=128s .
[162] https://childrenshealthdefense.org/press-release/chd-files-in-series-of-lawsuits-seeking-disability-accommodation-for-people-injured-by-rf-radiation-from-cell-towers/

and https://childrenshealthdefense.org/defender/henry-hank-allen-chd-verizon-lawsuit-radiofrequency-radiation-cell-towers/.