ENVIRONMENTAL HEALTH TRUST

Submission to the FCC on Docket 13-184 from Environmental Health Trust

Today, we are writing to advise you of the scientific grounds for taking action to mitigate student, teacher and staff exposures to Wi-Fi and other non-ionizing electromagnetic fields.

FCC should not support or promote the installation of Wi-Fi on school buses. This will increase wireless radiation exposure to children across the United States. Many communities use the same buses for transporting kindergarteners, middle and high school students. Now they will have transmitting wireless antennas exposing vulnerable children whether children are using devices or not.

Wireless radiation is not safe for children. A growing base of scientific research studies link wireless radiation to serious health effects on health—such as memory and sleep problems, headaches, cancer, and damage to brain development. Increasing exposures can and will harm children as they are more vulnerable.

Wireless radio frequency (RF) electromagnetic (EMF) radiation and magnetic field/ extremely low frequency electromagnetic fields (ELF-EMF) are a relatively new and rapidly increasing environmental exposure in classrooms today. A substantial body of research has found these types of non-ionizing EMFs associated with numerous adverse effects including cancer, DNA damage, memory damage, headaches, reproductive damage, tumor promotion, blood brain barrier damage, increased oxidative stress, impacts to the endocrine system, brain damage.[1] Many of these effects could be irreversible with grave consequences for the health of staff and students.

Although educational institutions often rely on the 1996 federal regulations of the Federal Communications Commission (FCC) regarding human exposure to wireless radiation, these limits do not ensure safety due to several serious deficits. For example, FCC limits are based on protecting against the heating effects of short term intense exposure but they are not designed to protect against the biological effects of long term chronic exposures.

The FCC should not greenlight Wi-Fi in schools because safety is not assured as FCC human exposure limits have not been properly reviewed.

On August 13, 2021, the United States Court of Appeals for the District of Columbia Circuit ruled in our lawsuit against the FCC that the decision by the Federal Communications Commission (FCC) not to update it's 1996 safety limits for human exposure to wireless radiation (which includes cell tower and Wi-Fi emissions) was "arbitrary and capricious." One of the most important aspects of the court decision was that the court found the FCC ignored scientific evidence on impacts from long term wireless radiation exposure. The court ordered the FCC to show that it had examined the record evidence regarding long term exposure, children's unique vulnerability, non cancer impacts (memory

and reproductive harm) and environmental impacts. So far, the FCC has not responded to the court mandate.

Further, the EHT et al. v FCC court ruling highlights how no federal health agency has reviewed the full body of current research to ensure the current human exposure limits of the FCC are adequately protective.

The peer-reviewed published research clearly shows that compliance with Federal Communications Commission (FCC) regulations regarding human exposure to radiofrequency does not ensure the safety of students and staff. More protective regulations to mitigate, monitor, investigate, and educate are moving forward in the U.S. and internationally[5]. In addition, PTAs and teacher unions are now responding to the strong recommendations by medical organizations, such as the American Academy of Pediatrics, by educating and supporting policy and resolutions on minimizing cell tower, cell phone and wireless radiation in classrooms.

Wireless Radio Frequency (RF) is Classified as Class 2 B Possible Carcinogen by the World Health Organization

Wireless radiofrequency radiation (2011) was classified[6,7]as a Group 2B possible carcinogen by the World Health Organization International Agency for Research on Cancer (IARC). However, since these determinations years ago, the published peer-reviewed scientific evidence has significantly increased-- clearly showing these types of non-ionizing electromagnetic radiation have adverse effects at emission levels governments currently allow.[8,9,10,11]

Current published research has documented that the evidence is robust to now determine that RF is a proven human carcinogen.[12,13,14]

Numerous published scientific reports recommend that the public, especially children and pregnant women, reduce their exposure to non-ionizing electromagnetic radiation in order to protect their health- including the frequencies that range from extremely low frequency fields, to all wireless and the higher frequencies of 5G.[15,16,17,18,19,20,21,22,23]

Children and Pregnant Staff At Risk

Research shows that this type of radiation penetrates deeper and more intensely into children due to their thinner skulls and unique physiology. Furthermore, wireless radiation has been shown to damage brain development and is associated with attention, memory and behavioral problems[24]. The American Academy of Pediatrics has repeatedly written to the FCC on the need for an update to the FCC's 1996 wireless exposure regulations because children are more vulnerable to the exposure.[25]

Human brains are still developing into the 20's and thus college students are also very much at risk. Further, students are heavy users and often sleep with their phones and wireless devices directly on their bodies. They are continuously exposed yet unaware of the risks.

Electromagnetic radiation exposure presents occupational health issues for teachers and staff, especially critical for those who are pregnant or have medical conditions. Yale research[26] found thyroid cancer to be associated with cell phone use in people with genetic susceptibility. Prenatal radiofrequency radiation exposure led to higher hyperactivity, poorer memory, and altered brain function in mice,[27] corroborating prior published research findings of altered brain development after exposure.

Kaiser Permanente researchers have published several studies where pregnant women's exposure to non-ionizing electromagnetic fields was associated with increased miscarriage as well as increased ADHD, obesity, and asthma in prenatally exposed children.

Due to the scientific evidence showing adverse effects from wireless and electromagnetic radiation at legally allowed levels,[28,29,30,31,32] we have joined with hundreds of doctors and scientists[33] calling to halt 5G[34] and to reduce children's overall wireless and non-ionizing electromagnetic radiation exposure. We recommend practical and actionable measures to eliminate and reduce exposures in the school setting.

Safe alternative solutions exist to connect students to the Internet, bridge the digital divide, and ensure equal access. Corded connections in classrooms rather than wireless networks are safer, faster, more secure, and do not pose the serious liability risks posed by EMFs and RF radiation.

Importantly, 5G and cell antennas should not be installed on or near schools, now in schoolbuses.

International Policy Action

Many countries and schools are taking action. More than 20 countries clearly recommend that children reduce cell phone radiation. Cyprus, Belgium, France, and Israel are among the countries banning and restricting Wi-Fi in classrooms and many private schools world-wide[35] have started reducing EMF exposures. New Hampshire[37] launched an investigation into the health effects of electromagnetic radiation and released their final report with 15 recommendations including the recommendation that schools reduce radiofrequency radiation and replace Wi-Fi with wired networks in classrooms.

In regards to ELF-EMFs, over a dozen countries already have some level of protective policy in place with a magnetic field radiation limit for "sensitive areas" that ensures ELF-EMF levels do not exceed levels associated with cancer in research studies. Aside from the California Department of Education

regulation that requires distances between new schools and the edge of a transmission line "right-of-way", there exists little protections in the USA for schools as there is no federal limit for human exposure to magnetic field electromagnetic fields.

We recommend Best Practices to Reduce EMF for schools including:

1. Install a safe wired ethernet communication and information technology infrastructure in classrooms and education buildings to meet educational needs: Numerous solutions exist to eliminate Wi-Fi/5G/4G sources and to reduce exposures to wireless emissions in classrooms.
2. Install corded telephones in all classrooms, dorms and buildings.
3. Measure radiofrequency, magnetic field and extremely low-frequency electromagnetic fields and reduce levels to as low as possible.
4. Ensure school property is not located close to 5G/cell towers, cell network antennas, or electricity substations of high-voltage power lines.
5. Dormitories should have wired ethernet ports, not Wi-Fi connections and corded telephones for students in every room. Students should be educated on how to connect their devices as part of their orientation. Note: cell phones can be ethernet connected as well and this can substantially reduce exposure.
6. Purchasing departments can request software and hardware that will eliminate and/or reduce exposures. For example, office computers should all be ethernet connected with a wired mouse, keyboard etc. Switches should be installed to turn off Wi-Fi access points. Programs should be able to work offline and sync up when connected.
7. Launch an awareness campaign about cell phone and other wireless radiation through a new educational curriculum on how to reduce EMF: Students, teachers, and their families should be given clear information on why and how to reduce exposures to cell phone, wireless and magnetic field EMF's to protect their health.

Please see our recommendations to the U.S. Department of Education below.

1. **Call on the Environmental Protection Agency to develop science-based safety limits for human exposures to RFR and magnetic field non ionizing EMF.** The allowable human exposure limits for RFR were adopted in 1996 and have not been properly reviewed or updated since. The EPA should develop safety limits based on a systematic review of the full body of scientific research including cancer and impacts to the brain and reproduction. The United States must also develop exposure limits on magnetic field EMF and other frequencies in the non-ionizing range used in electricity distribution, wireless power transfer and other applications. Currently there are no safety limits for school EMF exposures.
2. **Develop a national educational technology policy on Best Practices for Digital Devices in Schools that addresses the social, emotional and physical effects of screens.** In addition to

students learning how to minimize the health effects of screens, school practice and curriculum should adhere to best practices developed for various age groups that minimizes health effects to students, teachers and staff.

3. **Call on the Department of Occupational Safety and Health to urgently address EMF as an environmental occupational exposure.** An evaluation of current and projected occupational exposures in educational settings is needed. Practical measures to reduce exposure are critical to supporting the health of teachers and staff.
4. **National Recommendations for No/Low EMF purchases**. Develop a list of school technology hardware and software changes that will eliminate or reduce EMF exposures in classrooms. For example, tablets and laptops should have a convenient ON/OFF hard switch for Wi-Fi and an ethernet port so using ethernet is convenient. Overhead projectors and printers and other educational technology should have Wi-Fi to OFF as the default setting.

The Risk of Inaction is High

Wi-Fi, cell phones, and 5G in the classroom as well as cell towers on school property present serious liability issues.

- Insurers rank 5G and electromagnetic radiation as a "high" risk, comparing the issue to lead and asbestos.[38,39] A 2019 Report by Swiss Re Institute, a world leading provider of insurance,[42] classifies 5G mobile networks as a "high", "off-the-leash" risk stating, "Existing concerns regarding potential negative health effects from electromagnetic fields (EMF) are only likely to increase. An uptick in liability claims could be a potential long-term consequence" and "[a]s the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency."
- Due to their understanding of the magnitude of this future financial risk most insurance plans have "electromagnetic field exclusions" applied as the market standard.[40] Portland Oregon Public School Insurance[41] (Pg 30) states as an example, "Exclusions: This insurance does not apply to: Bodily injury, personal injury, advertising injury, or property damage arising directly or indirectly out of, resulting from, caused or contributed to by electromagnetic radiation, provided that such loss, cost or expense results from or is contributed to by the hazardous properties of electromagnetic radiation."
- US Mobile operators have been unable to get insurance to cover liabilities related to damages from long term exposure to radiofrequency emissions for over a decade.
- Wireless and non ionizing electromagnetic radiation are defined as a type of "pollution" by wireless companies themselves. According to pg. 10 of the Verizon Total Mobile Protection Plan, "Pollution" is defined as "The discharge, dispersal, seepage, migration or escape of pollutants. Pollutants means any solid, liquid, gaseous, or thermal irritant or contaminant including smoke, vapor, soot, fumes, acid, alkalis, chemicals, artificially produced electric fields, magnetic field, electromagnetic field, sound waves, microwaves, and all artificially

produced ionizing or nonionizing radiation and/or waste." We found similar definitions for pollution in the product protection plans for AT&T, Sprint, Verizon, T-Mobile and Asuria.

- Wireless companies warn their shareholders of this potential future risk related to radiofrequency radiation exposure but they do not warn the users of these products, nor do they warn the people exposed to emissions from their products and infrastructure. These corporate investor warnings by companies such as AT&T, Verizon, Vodaphone and Crown Castle are contained in their Annual Reports filed on Form 10-K (or Form 20-F or 40-F for foreign companies) with the Securities and Exchange Commission (SEC) and they clearly inform shareholders that companies may incur significant financial losses related to electromagnetic fields. Safety is not assured.

As an example, Crown Castle states in their 2020 Annual Report, "If radio frequency emissions from wireless handsets or equipment on our communications infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues. The potential connection between radio frequency emissions and certain negative health effects, including some forms of cancer, has been the subject of substantial study by the scientific community in recent years. We cannot guarantee that claims relating to radio frequency emissions will not arise in the future or that the results of such studies will not be adverse to us...If a connection between radio frequency emissions and possible negative health effects were established, our operations, costs, or revenues may be materially and adversely affected. We currently do not maintain any significant insurance with respect to these matters."

We have attached to this letter the following resources and tools you can use to address these environmental exposure in schools:

- The Collaborative for High Performance Schools (the United States' first green building rating program especially designed for K-12 schools) developed Best Practices for Low-EMF classrooms in 2014, addressing both wireless and ELF-EMF.[43]
- In 2017, the Maryland State Children's Environmental Health And Protection Advisory Council issued first ever state recommendations for reducing wireless exposure in schools by providing wired—rather than wireless—Internet connections. In 2022, they issued guidelines on how to reduce exposure for families.
- The New Jersey Education Association article, "Minimize Health Risks from Wireless Devices"[44] details several recommendations for reducing the health risks posed by wireless technology, such as "Keep devices away from the body" and "hard wire all devices, including printers, projectors and boards."Download PDF.[45]
- "Guidelines for Safer Use of Wireless Technology in Classrooms" were developed for the New York State United Teachers, who also passed a Resolution "Hazards of Wireless Radiation Emission."[46,47]

- The United Educators of San Francisco (teacher Union) passed a resolution recommending the California Department of Public Health issued guidance on how to reduce exposure to cell phone radiation be disseminated to all students and staff.[50,51]
- Education modules were developed in partnership with the Massachusetts Breast Cancer Coalition to teach high school and middle schoolers about why and how to reduce radiation from cell phones and wireless devices.[52]
- A 2017 study found the environmental exposure to RF radiation in some schools with Wi-Fi is higher than reported levels for non-thermal biological effects and the researchers recommend schools prefer wired network connections and allow laptop, tablets, and mobile phone usage only in flight/airplane mode.
- A 2019 publication in the industry journal *Building and Environment* details best practices in buildings to reduce radiofrequency as including wired technology instead of Wi-Fi and corded phones.[48]
- Environmental Health Trust has developed a checklist of actions for schools to reduce EMF.[49]

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