

**The Case for Mitigating Wireless Radiation in the  
School Setting as Primary Prevention**  
*to support children's physical and mental health*

Theodora Scarato MSW  
Executive Director of Environmental Health Trust

# Presenter Disclosures

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The following personal financial relationships with commercial interests relevant to this presentation existed during the past 24 months: None.

Wireless radiation is an environmental exposure in school.  
Wireless is radiofrequency (RF).  
Although RF frequencies are non-ionizing they can impact biology.



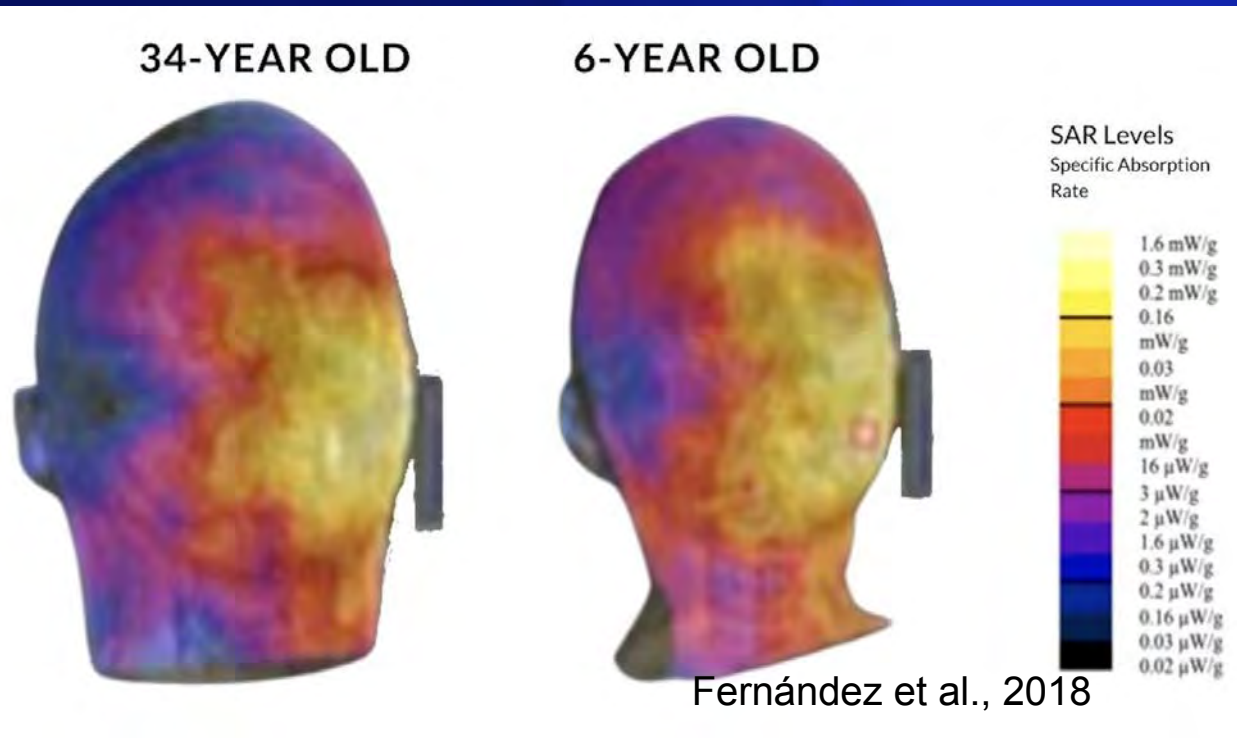
# Children Receive High Environmental Exposures to Wireless Radiation in the Classroom Due to Multiple Sources

Cell Phones  
Laptops/Tablets  
Wi-Fi Routers  
Cell Boosters  
White Board  
Projector  
Smartwatches  
Fitness Trackers  
Keyboard  
Bluetooth and Wi-Fi  
Cell Tower



Higher in schools with more sources: Mannan et al., 2020, Hedendahl et al., 2017, Davis et al., 2023

“Children are disproportionately affected by environmental exposures, including cell phone radiation.” American Academy of Pediatrics (2012)



Higher RF Absorption Rates:

- Thinner skulls
- Higher water content

Scientific Modeling Studies

- 10-fold greater into pediatric cerebellum and bone marrow of the skull
- 30-fold greater in the hippocampus
- 2 to almost 5-fold higher into the eyes.

(Fernández et al., 2018, Davis, et al 2023)

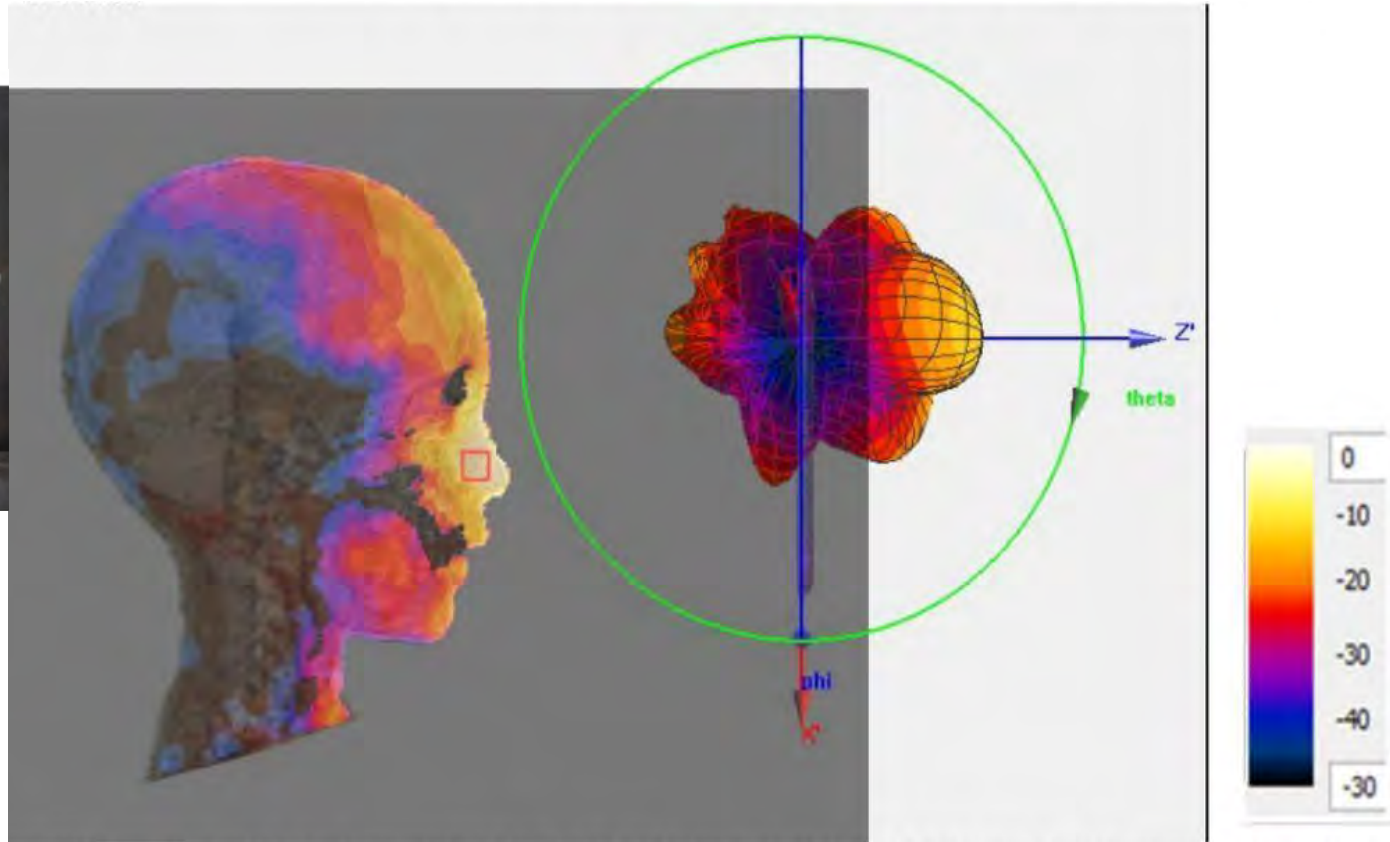
enrust.org

# Wi-Fi Tablet Radiation Into Brain



## Wi-Fi Tablet SAR

2.45 GHz Wi-Fi tablet model tablet at 150 mm (5.9 inches) from eye lens.



Ferreira, J., & Almeida de Salles, A. (2015). Specific Absorption Rate (SAR) in the head of Tablet users. The 7th IEEE Latin-American Conference On Communications (Latincom 2015), 1538, 5-9. Retrieved 3 June 2020.

# Children's Brains and Bodies Are More Sensitive

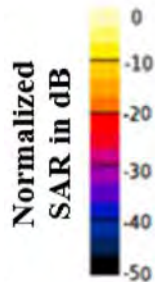
- Faster rate of cell growth
- Myelin sheath not fully formed
- Critical windows of vulnerability
- Stem cells are more active in children

They will have a lifetime of daily exposure.

(Davis et al 2023, Redmayne, M., & Johansson, O. (2015).



Wi-Fi radiation is absorbed into the body.



SAR distribution when the 2.4 GHz antenna is at 10 cm from the lap  
Fernández-Rodríguez et..al., (2019) "[RF Exposure Due to Mobile Devices Operated Close to the Human Body.](#)"





# International Agency for Research on Cancer



World Health  
Organization

PRESS RELEASE  
N° 208

31 May 2011

## IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS

“This classification applies to all RF emitting devices, including Wi-Fi.”  
-Robert Bann Ph.D, International Agency For Research on Cancer

IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. (2013).

Today, over a decade later, numerous scientists conclude **the scientific evidence is robust enough to conclude wireless is a probable or even proven human carcinogen.** Recent findings include the large scale animal studies of the NIH National Toxicology Program and Ramazzini Institute.

# Growing Scientific Evidence Links Wireless Exposure to a Broad Range of Impacts

- **Cancer:** brain, breast, thyroid, tumor promotion
- **Neurological:** memory, behavior, neurotransmitters, brain development, headaches
- **Reproductive:** sperm, ovaries, pregnancy, birth weight
- **Endocrine:** lowered thyroid and testosterone hormones
- **Synergistic:** with other toxins including lead, black carbon etc.
- **Flora and Fauna:** birds, bees, trees



Belpomme et al., (2018), Hardell and Carlberg (2019), Hu et al., (2021), International Commission on the Biological Effects of Electromagnetic Fields (2022), Kelley et al., (2019), McCredden et al., (2022 and 2023) Miller et al., (2019), Davis et al (2023), Lai and Levitt (2021), Lin (2023), Weller et. al., (2023), European Parliamentary Research Services & Belpoggi (2021), Peleg et al., (2022)  
Panagopoulos, D. J. (Ed.). (2022). Electromagnetic Fields of Wireless Communications: Biological and Health Effects (1st ed.). CRC Press.

Additional references in speakers corner and at ehtrust.org

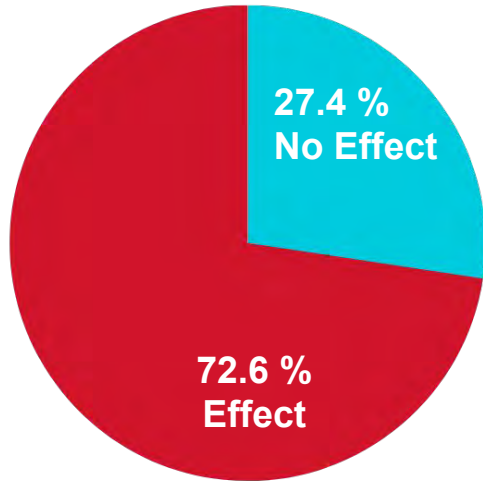
**“Recent experimental and epidemiological studies indicate that RFR induces cancers of the thyroid and breast. DNA damage and cancer in these state-of-the-art studies signal the need for the public to reduce exposures to RFR now.”**

Linda S. Birnbaum, PhD, Hugh S. Taylor, MD,  
Hillel Baldwin, MD, Paul Ben-Ishai, PhD  
JNCI J Natl Cancer Inst (2022)

# The Majority of Studies Find Harm 2007 to 2022

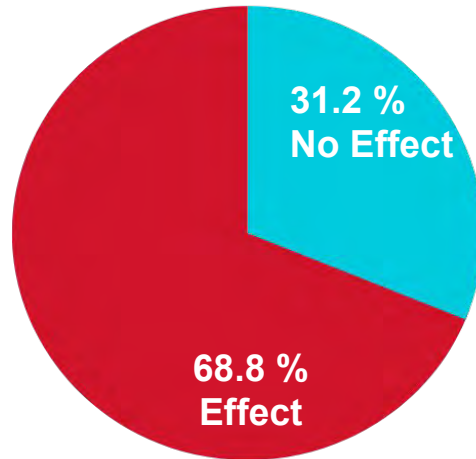
Henry Lai Ph.D, Bioinitiative (2022)

## Neurological 72.6%



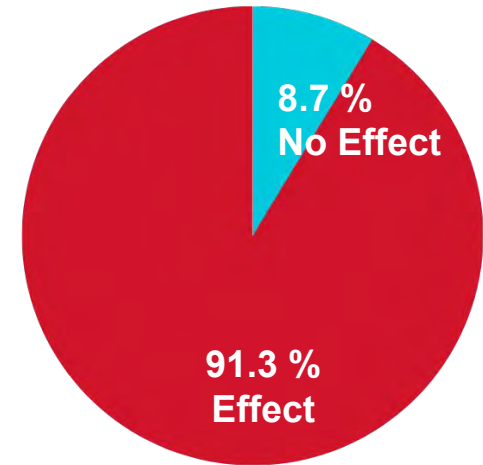
Effects in 244 of 355 studies

## Genetic 68.8%



Effects in 291 of 423 studies

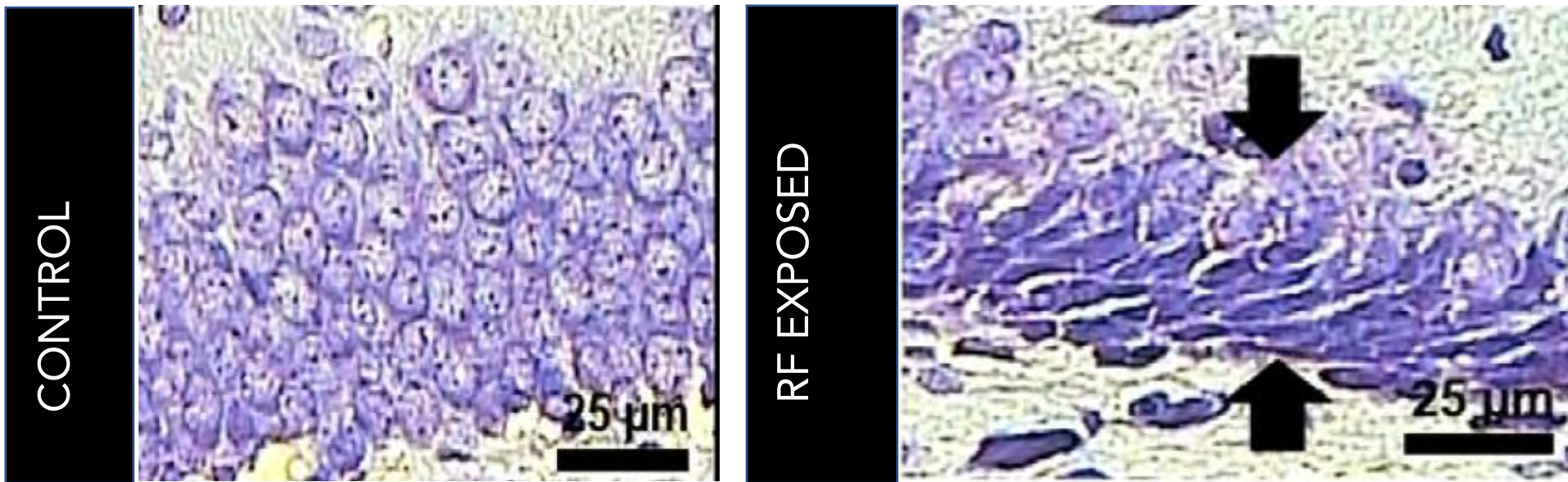
## Oxidative 91.3



Effects in 263 of 288 studies

# Wireless Impacts the Developing Brain

Several experimental studies have found decreased and damaged brain cells in animals exposed as adults and prenatally.



Fewer hippocampal granular cells in newborn rats following prenatal 900 MHz EMF exposure

Odaci E., Bas O., and Kaplan S. (2008)

(See also Suleyman et al, 2016, Sonmez et a 2010, Bas et al.2009, 2009)



# A Lack of Federal Accountability

- No review of the totality of evidence by any U.S. regulatory agency with health or environment expertise.
- EPA defunded from research and the development of safety standards in 1996.

[ehtrust.org](http://ehtrust.org)



# U.S. FCC Guidelines for Wireless Unchanged Since 1996



**Limits are for overheating from short term intense exposures. (The basis for limits are studies with 60 minutes of exposure.)**

**Limits are not designed to address:**

- Biological effects
- Long term exposures
- Environmental impacts

**Data on children's unique vulnerability was not available 27 years ago when the limits were set.**



# Cell Phone Radiation Tests Large Adult Man

- 220 pound
- 12 pound head

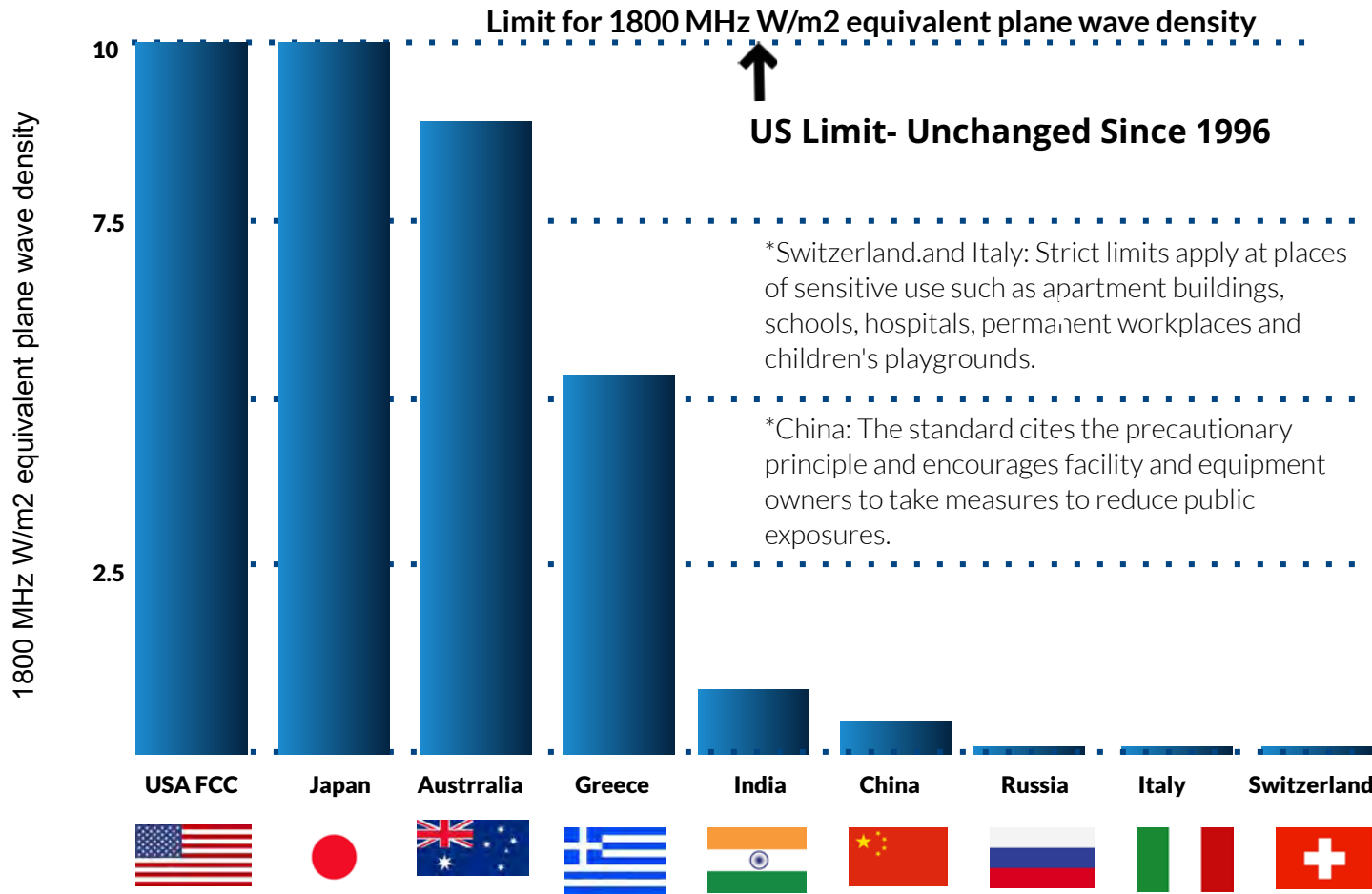
Standard  
Anthropomorphic  
Mannequin (SAM)



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

## Environmental Limit as Applied to Homes and Schools

ehtrust.org



# FCC Mandated To Show Review of Children's Vulnerability & Wireless



**Environmental Health Trust et. al. v the FCC**

**U.S. Court of Appeals, DC Circuit (2021) ordered the FCC to show adequate review of:**

- Long term exposures
- Modern technology since 1996
- Children's unique vulnerability
- Environmental impacts

No response from the FCC.

[ehtrust.org](http://ehtrust.org)

# American Academy of Pediatrics 10 Ways To Reduce Exposure



“If you plan to watch a movie on your device, **download it first, then switch to airplane mode** while you watch in order **to avoid unnecessary radiation exposure.**”



## Recommendations to Reduce Exposure

- American Academy of Pediatrics
- California Department of Public Health
- Austrian and Vienna Medical Association
- Cyprus Medical Association
- Athens Medical Association

## Resolutions

- California Medical Association
- Massachusetts Medical Association

## Dozens of Scientific Appeals

- International EMF Scientist Appeal

(259 scientists who have published in EMFs at [emfscientist.org](http://emfscientist.org))

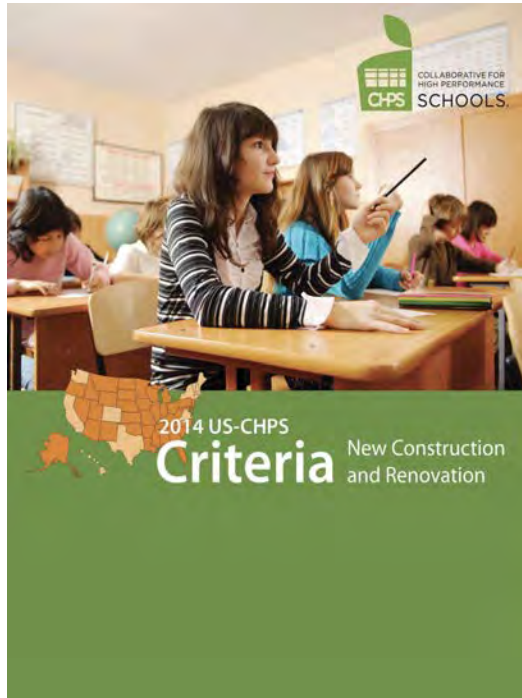
# Santa Clara California Medical Association

Recommendations for Best Practices for Technology in Schools (2023)

- Create a “Safe Tech in Schools Program” to educate on reducing wireless radiation for students and staff.
- Create cell phone-free policies for the classroom.
- Prefer hard-wired ethernet devices instead of Wi-Fi
- Professional RF measurements.
- Avoid installation of smart meters.
- Consider a policy to restrict installation of cell towers on or near school property.

# Solutions Exist

## Several Publications Detail Building Design and Construction Measures to Decrease RF in the Classroom



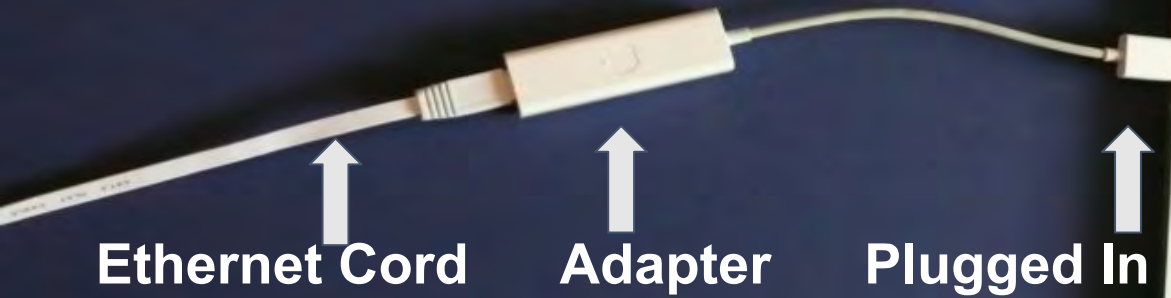
**Collaborative For High Performance Schools**  
(2014) Low EMF Criteria

Clegg et al. (2020). **Building science and radiofrequency radiation: What makes smart and healthy buildings.** *Building and Environment*

Davis (2023). **Wireless technologies, non-ionizing electromagnetic fields and children:** Identifying and reducing health risks. *Current Problems in Pediatric and Adolescent Health Care*

**Tech Safe Schools:** Easy ways to mitigate RF in classrooms.

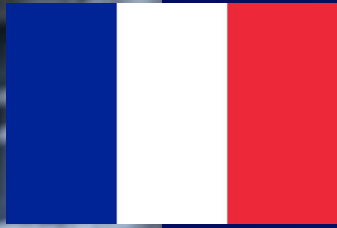
# Hardwired Laptop Internet Connection *No Wi-Fi*



# Internet Connection from a Wire, not Wi-Fi







France

## Consumer Information for RF Emitting Devices

Order by Ministers of Health and Economy  
(2019)

- Reduce exposure: speakerphone
- Children and adolescents should limit call time

"Keep radio equipment **away from the stomachs of pregnant women & adolescents.**"

# Numerous Countries Issue Straightforward Advice That Cell Phone Radiation Exposure to Children “Should” Be Minimized



England



Cyprus



Switzerland



Canada



Republic of Korea



Austria



Belgium



India



French Polynesia



Turkey



Finland



Ireland



Russia



Israel



France



Croatia



Germany



Denmark



# Cyprus: Archbishop Makarios Hospital Removes Wi-Fi from Pediatric and Neonatal Units



Pilot Project and Multimedia Campaigns on Wireless Radiation  
Cyprus National Committee on Environment and Children's Health

# Nations That Restrict Wi-Fi In Classrooms To Protect Children's Health



France



Cyprus



French Polynesia



Israel



Hospitalet, Spain



Ghent Belgium

## Wi-Fi Banned in Kindergartens

- France, Israel, Ghent Belgium, French Polynesia, Cyprus

## Wi-Fi Turned Off as Default or Minimized in Elementary Classrooms

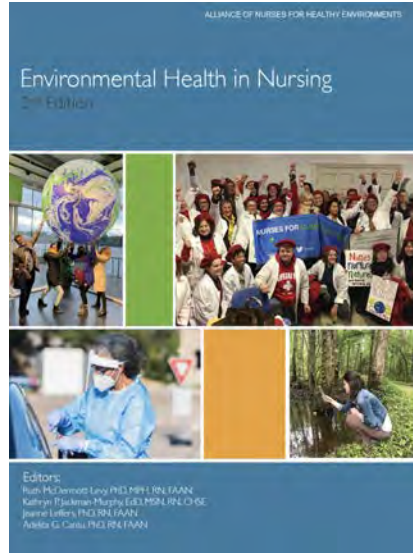
- France, Israel, Cyprus, Numerous Districts

# Student, Staff and Professional Education



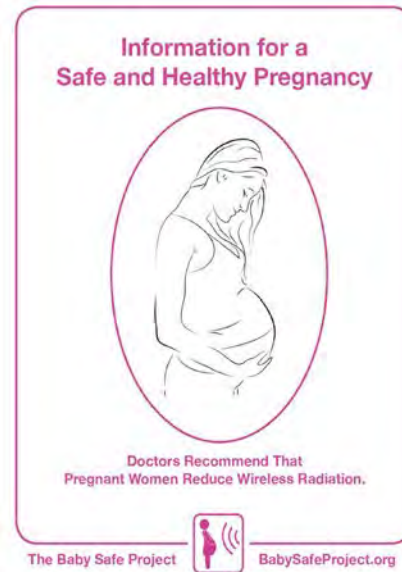
## Classroom Education

Massachusetts Breast Cancer Coalition and EHT



## Chapter on EMF

Alliance of Nurses for Healthy Environments and EHT



## Baby Safe Project

Grassroots Environmental Education and EHT



## EMF Medical Conference 2021

## ALL VIDEOS Free Online

[emfconference2021.com](http://emfconference2021.com)

All children deserve safe technology. Children's healthy future should always be at the center of the decision making process regarding technology choices.

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References at speakers corner and [ehtrust.org/apha](http://ehtrust.org/apha)

[ehtrust.org](http://ehtrust.org)



[wildlifeandwireless.org](http://wildlifeandwireless.org)



[healthytechhome.org](http://healthytechhome.org)



**HEALTHY  
TECH** at **HOME**  
PROJECT



*We have a newsletter !*

# Mitigating Wireless Radiation Levels in School Is Primary Prevention

- Increasing daily exposures
- Mounting evidence of a broad range of health impacts
- Children are uniquely vulnerable
- School exposures are significant
- Solutions exist.

Davis (2023). Wireless technologies, non-ionizing electromagnetic fields and children: Identifying and reducing health risks. *Current Problems in Pediatric and Adolescent Health Care*



“For children in general, and particularly in schools and classrooms, **give preference to wired internet connections**, and strictly **regulate the use of mobile phones...**”

- Parliamentary Assembly  
**Council of Europe**  
Resolution 1815  
2011



# Increasing Daily Exposure in Home and Classroom

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