

IIAS/EHT Expert Forum 2017: Wireless Radiation and Health— The Big Picture

Risks are bigger than you believe
Benefits can be stranger than you imagine
& solutions are easier than you think

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January 23, 2017 Opening Reception

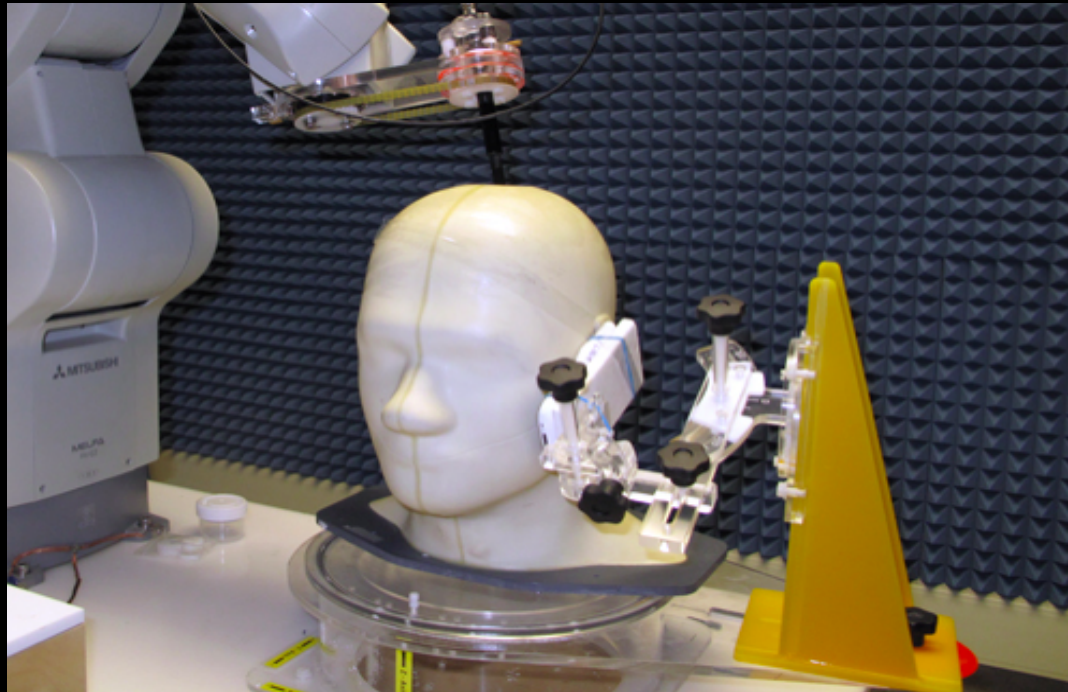


World Health Organization International Agency for Research on Cancer

- 2010: Expert Work Groups determined cell phone and other wireless radiation is a *possible human carcinogen*—same category as lead, engine exhaust and formaldehyde
- Our IIAS/EHT Expert Forum will review all evidence gathered since then including non-cancer endpoints such as neurological, behavioral, immunological and reproductive impacts.



1996 Standards for Cell Phones Based on Outdated Assumptions



- Typical user was military, medical, or business
- Homogenous Head from a 220 lb male
- Avoid heating after 6 minutes
- Does not consider new studies of cancer, reproductive or other chronic effects

Repeated calls for research on infants, toddlers, young children, pregnancy

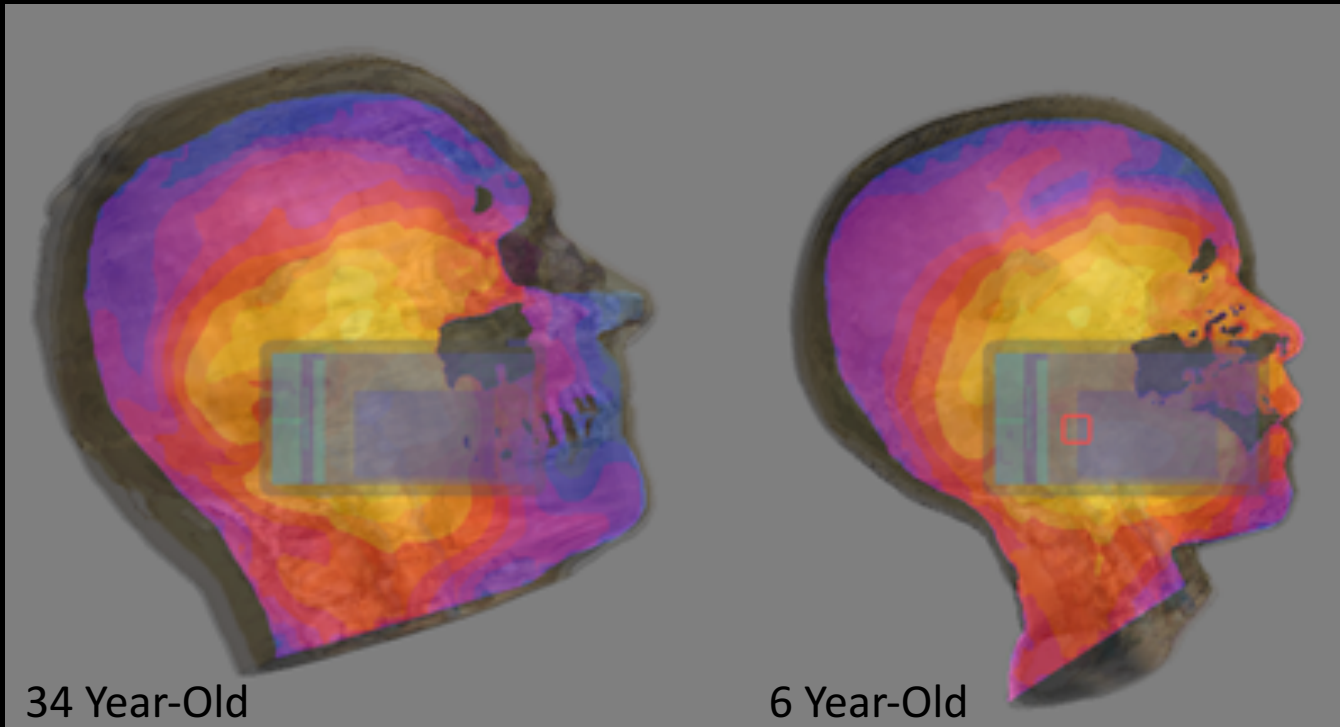


Same Exposures Result in Different Responses



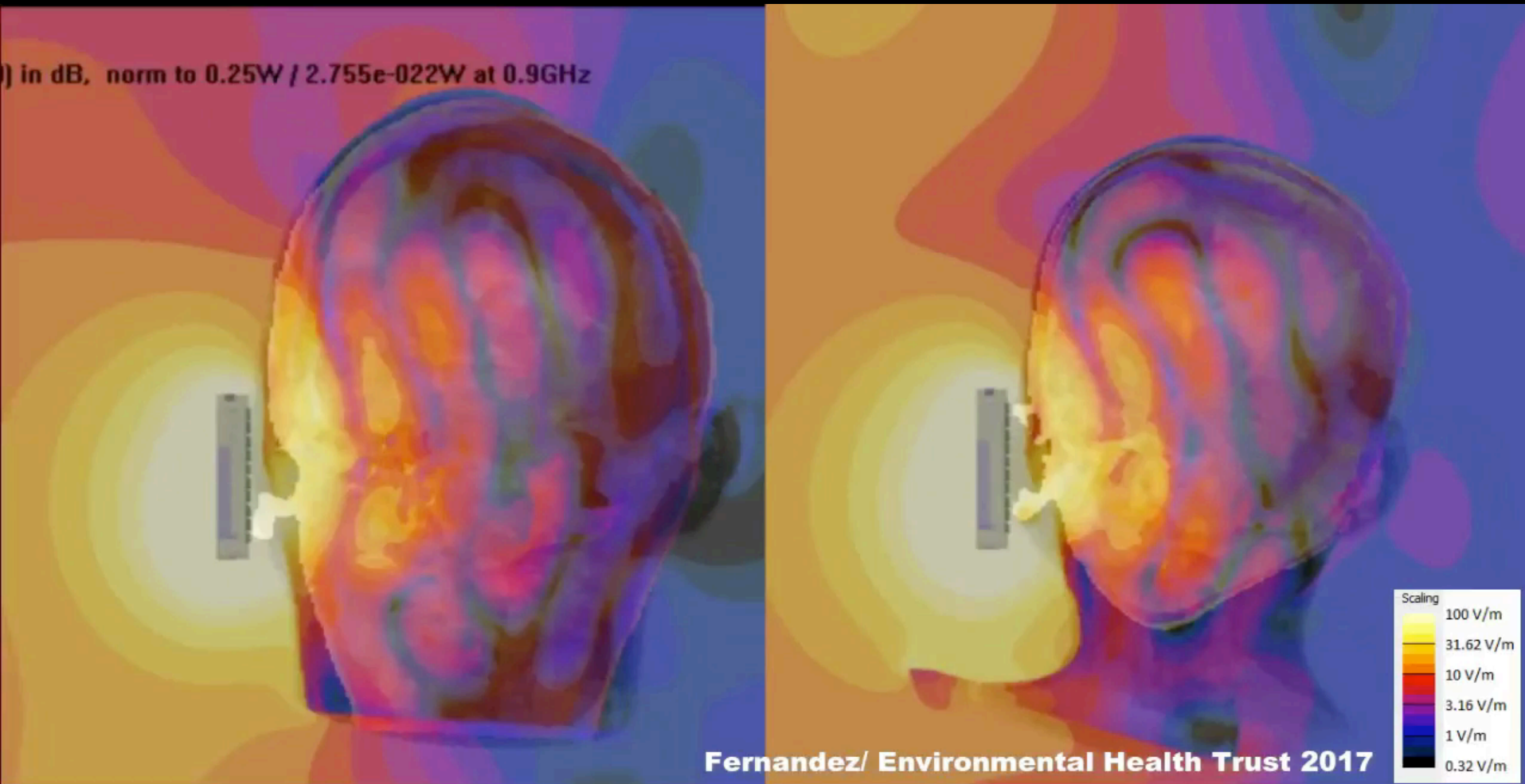
Identical sunlight to my red-haired blue-eyed granddaughter and my darker daughter yields different biological responses

Exposure to RF is proportionally greater and deeper in a child's brain vs. an adult brain



Fernandez, Personal Communication (2017)

SAR (2mW, 50dB) in an oblique slice 5 cm from the cell phone's plane. Exposure is proportionally bigger and deeper in the child and the psSAR is higher in the child's brain.



Cell Phone Radiation into Adult Male and 6 Year Old Child

Simulations of Peak Spatial Exposures to Children and Adults
from Multiple Devices

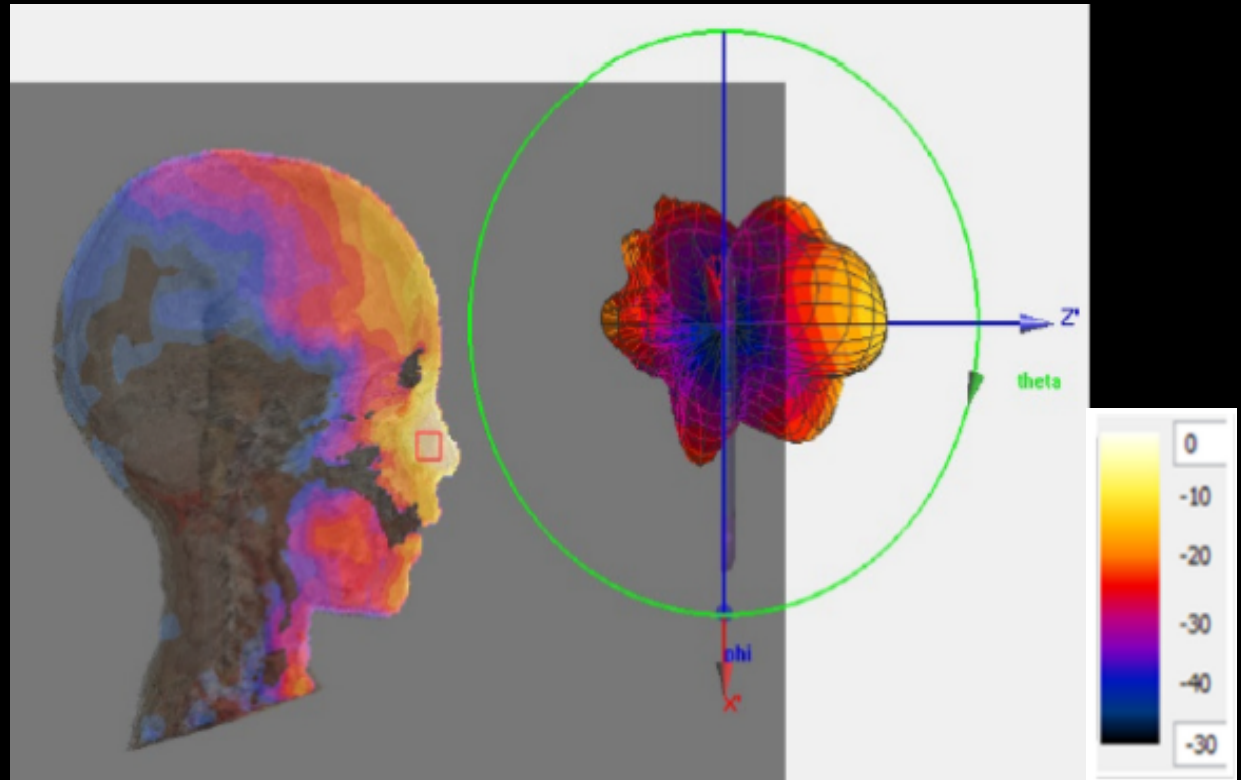


Fernandez & Ferreira 2017 Environmental Health Trust

Wi-Fi Tablet Radiation Pattern into a 6 Year Old Child

SAR in 6 Year Old from 2.45 GHz Wi-Fi Tablet

Tablet at 150 mm (5.9 inches)
from eye lens

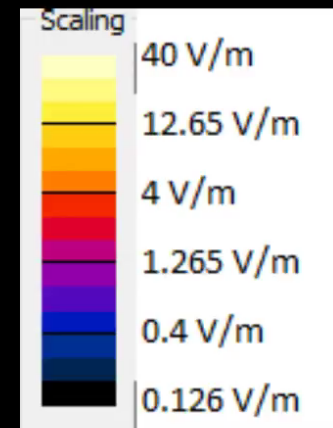
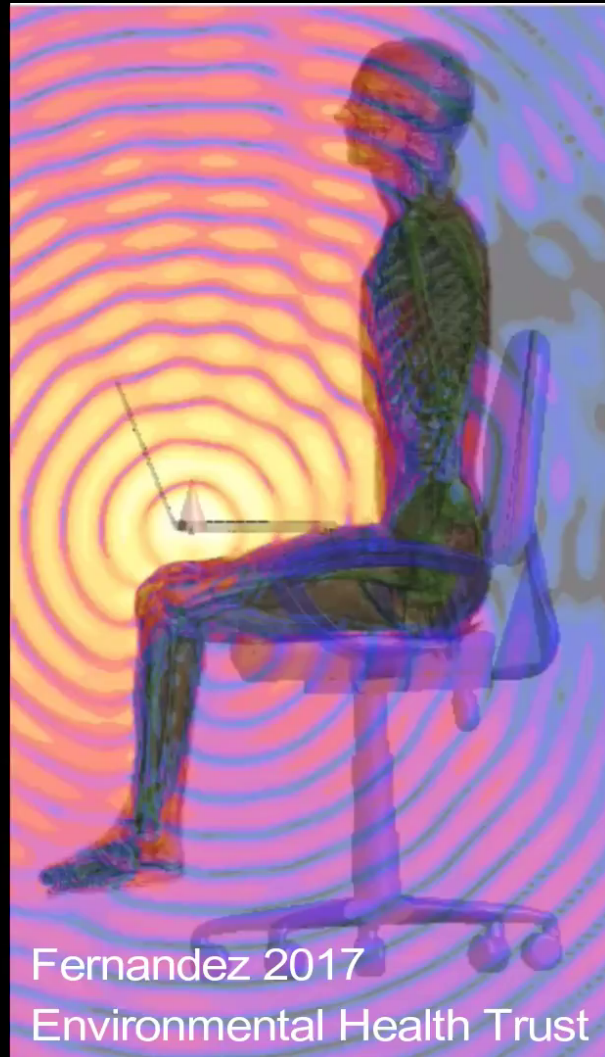


JULIANA BORGES FERREIRA, AND ALVARO AUGUSTO ALMEIDA DE SALLES (2015)

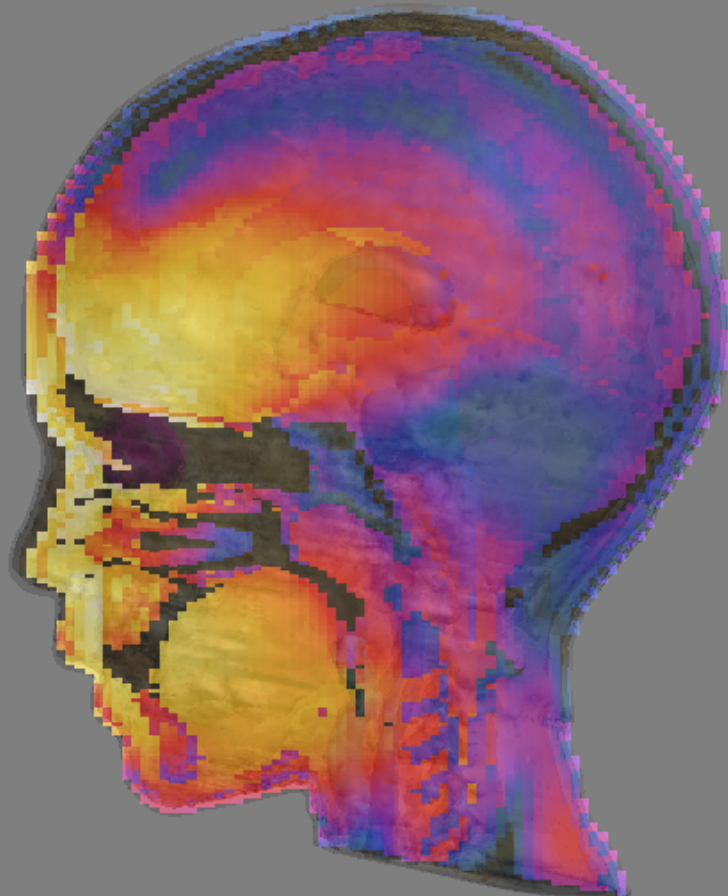
Radiation pattern normalized to $0.0132 \text{ W/kg} = 0 \text{ dB}$, with a 30 dB color scale, and SAR averaged over 1g cube of tissue.

Specific Absorption Rate (SAR) into the 6 year old head from tablet RF

2.45 GHz (Wi-Fi)
34 Year Old Male
Notebook on Lap

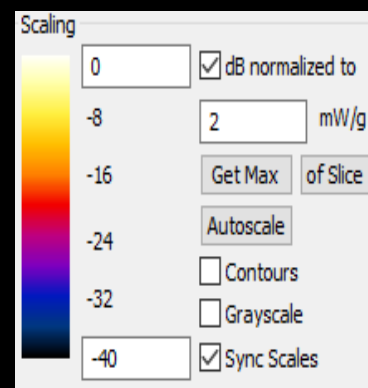


Microwave Radiation into the 6 Year Old Child from Virtual Reality Simulations



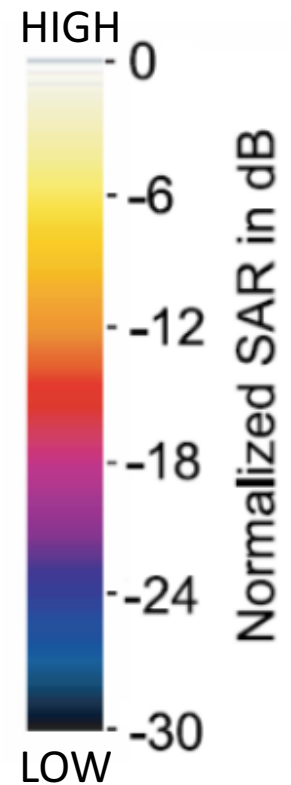
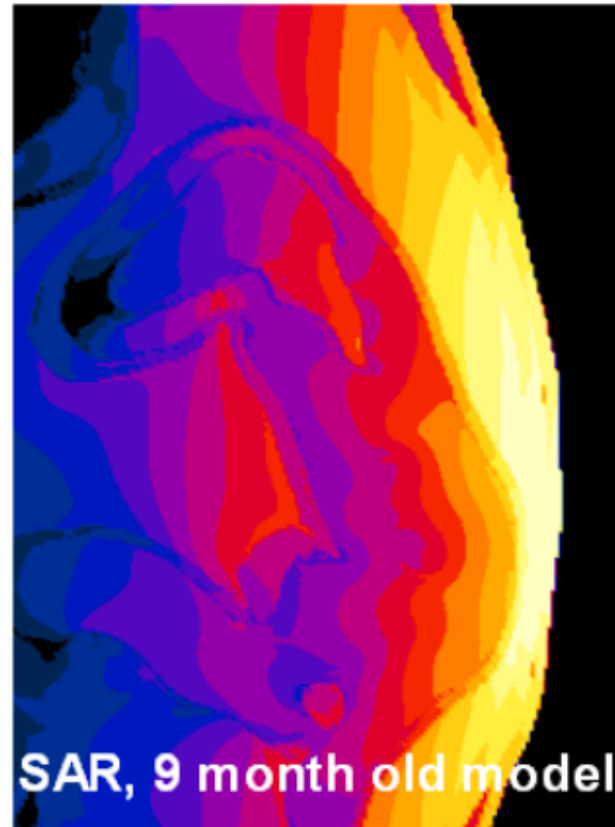
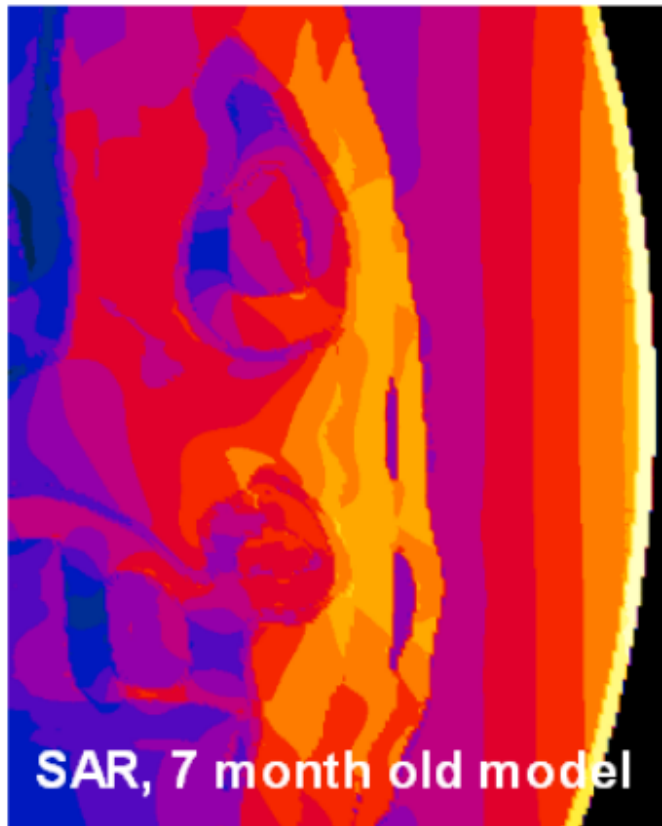
© 2015 EHT/University of Porto Alegre

40dB color Scale.
Smartphone placed
directly in front of
the eyes when
using cardboard
virtual reality
holder.



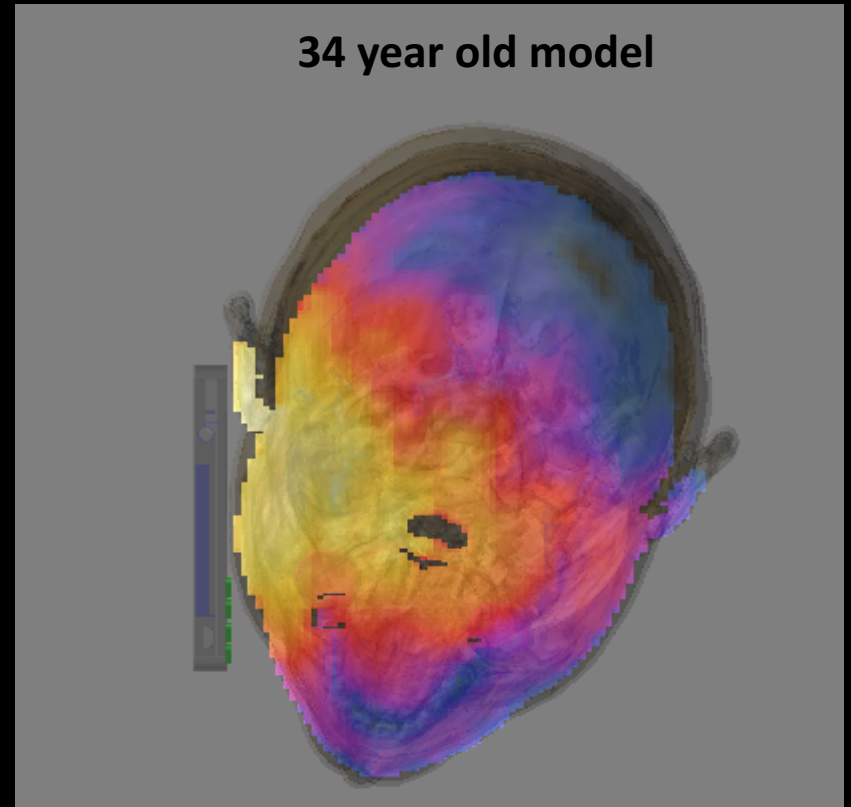
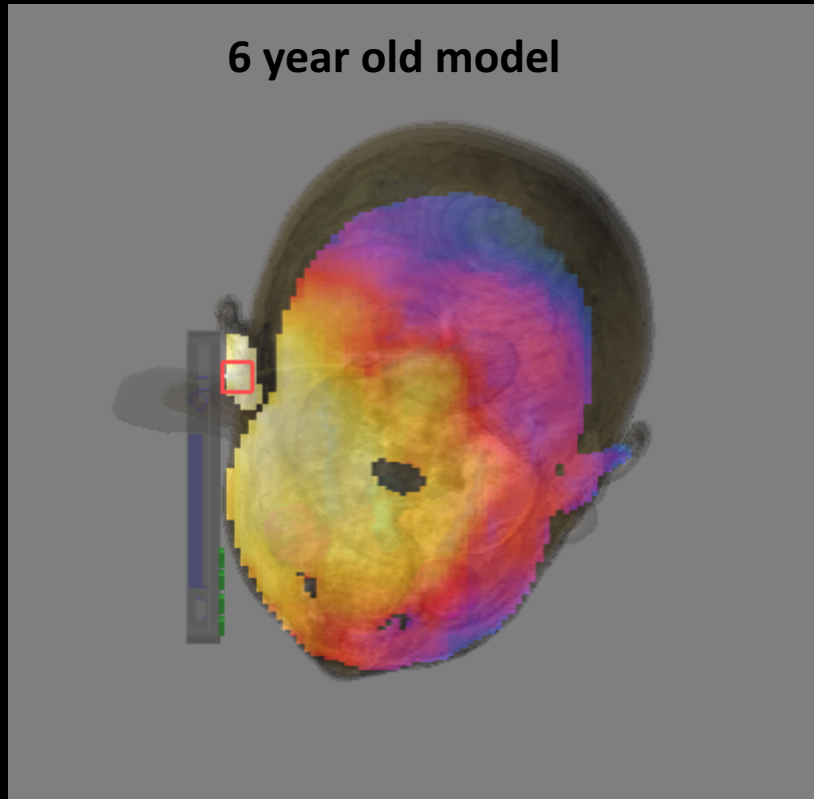
Greatest exposure occurs to fetal head/spinal cord

Normalized SAR when 9 month fetus exposed to a dipole antenna in front of abdomen



(courtesy Andreas Christ, IT'IS, 2013)

Children Absorb Greater Microwave Radiation in Proportion to Adults



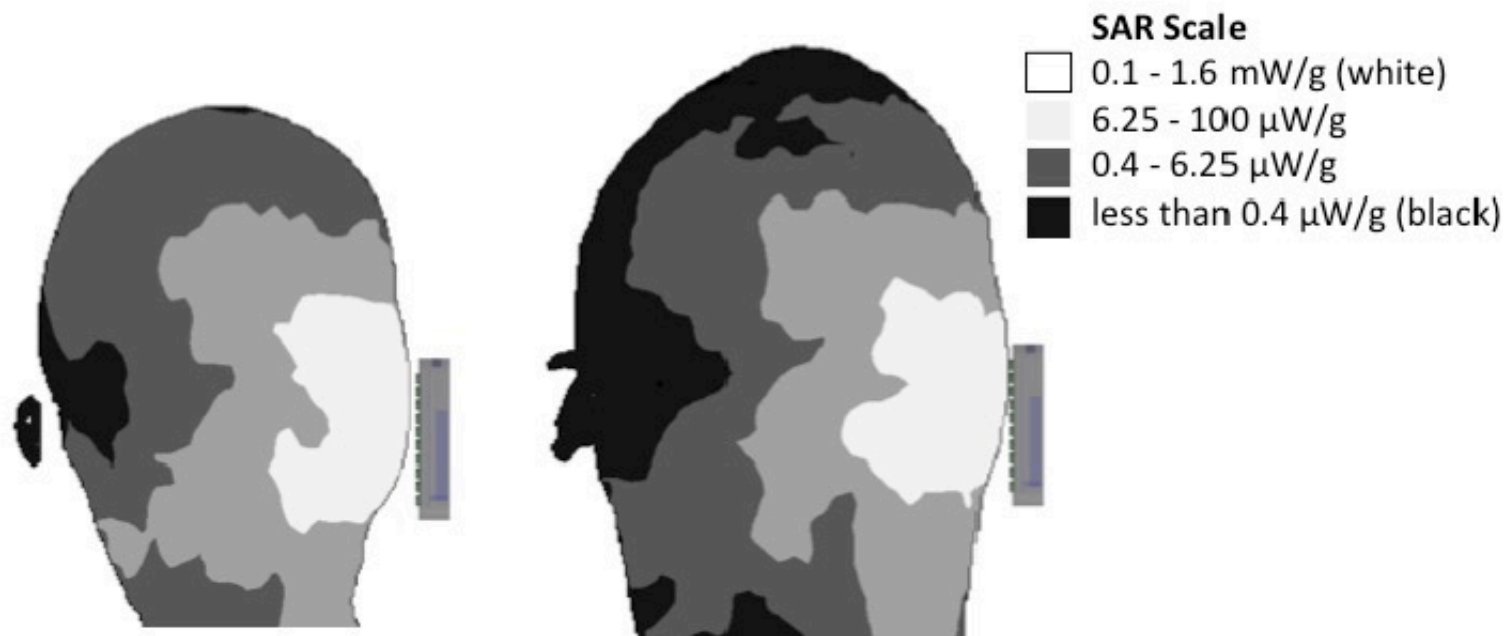
Fernandez, Personal Communication (2016)

EMF Delivered from GSM Cell Phone

Children Absorb More Microwave Radiation than Adults

Specific Absorption Rate (SAR) in 6 year old child (on left) and adult male.

FDTD modeling averaged over 1 g tissue with 900 MHz cell phone held to the ear; slice perpendicular to phone, through peak spatial SAR.



Modeling courtesy of

C. Fernandez PhD, Federal Institute of Rio Grande do Sul, Brazil
Environmental Health Trust, U.S.A. (www.EHTrust.org)

Fernandez, Personal Communication (2016)

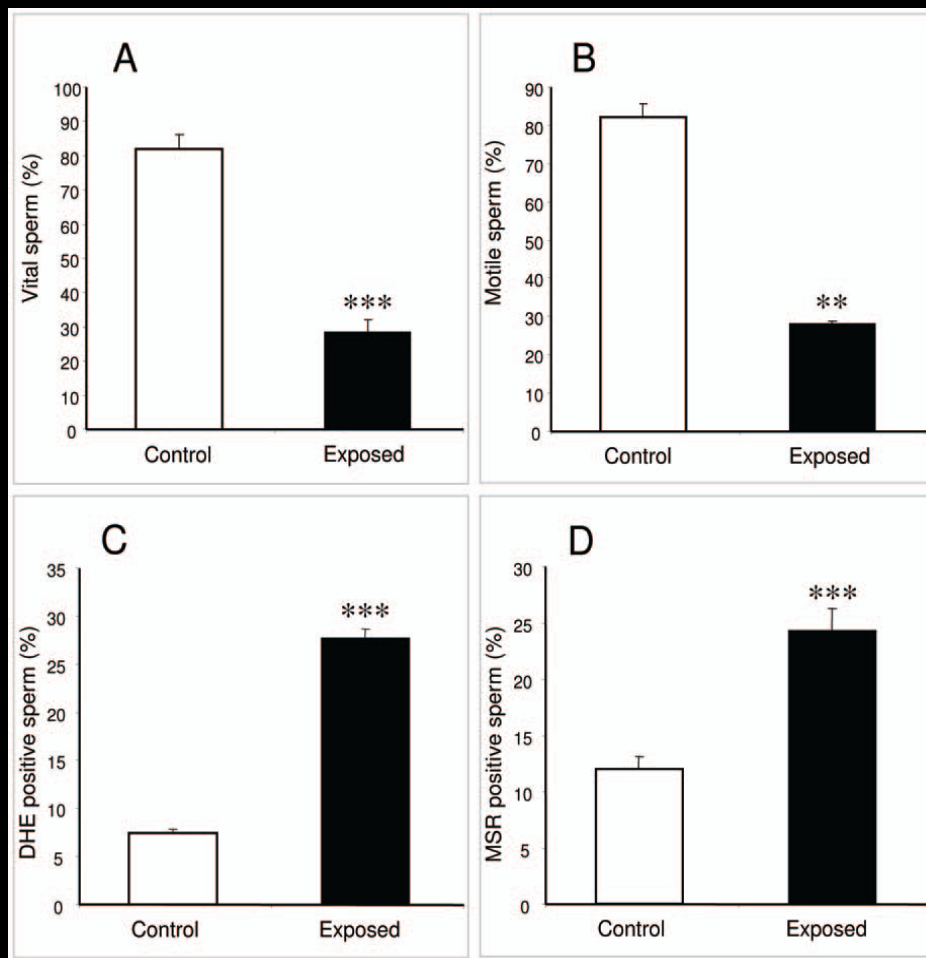
EMF Delivered from GSM Cell Phone

Mobile Phone in Pocket Dose to Gonads and Bone Marrow



Fernandez, Personal Communication (2016)

RF Damages Human Sperm



De Iuliis, et al. (2009)

RF-EMR exposure decreases motility and vitality of human sperm while also increasing damaging reactive agents

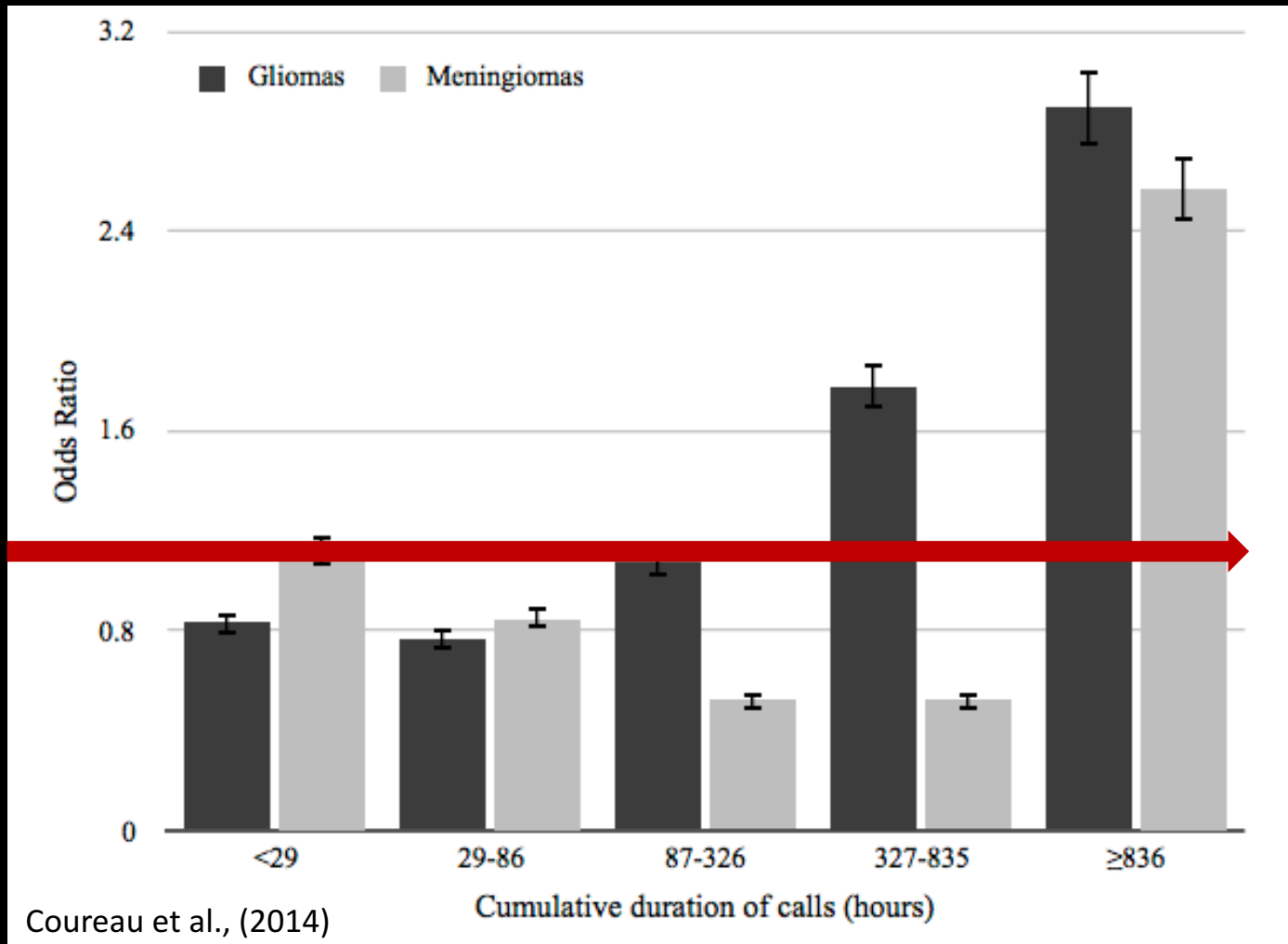


2016 Largest best-designed Final Analyses by U.S. government (\$25 Million) Finds Increased Rare, Malignant Cancers in Rats Exposed to Cell Phone Radiation with None in Control Groups



- 2-Year Exposures to Cell Phone Radiation – CDMA and GSM (prenatal in rats)
- Daily exposure to RFR for ~9 hours (10min on/10min off cycles); Mice at 1900 MHz, Rat at 900 in **shielded chambers**
- Exposures comparable to 36 years of half an hour daily from currently used phones (appx 3000 animals)

Increased risk of gliomas and meningiomas with heaviest cell phone users in gFrench study (2014)



Children's Cereal & Snack Boxes

Promote Virtual Reality

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VIRTUAL REALITY
APP
AND VIEWER

Download the free *Kellogg's®* Marvel's Captain America: Civil War VR app and buy any three participating *Cheez-It®*, *Keebler®*, *Kellogg's®* or *Pringles®* products.

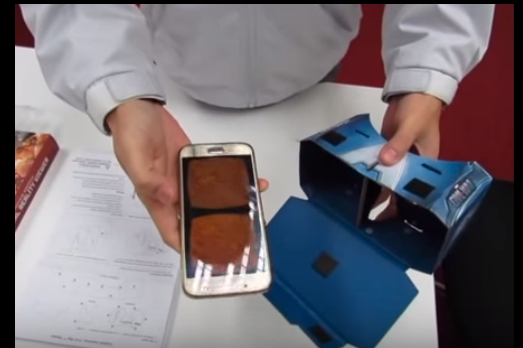
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[See All Participating Products](#)



Viewers appropriate for ages 8 and up.



Medical & Other Non-Thermal RF Uses

- Pulsed Radiofrequency Energy to Treat Post-operative Pain and Edema
- Laser Therapy for Bone Stimulation and Repair
- Wound-healing and Collagen Synthesis
- Anti-inflammatory
- Increased Microbial Reactions
- Speeds up Immunological Assays
- Enhances the Uptake of Chemotherapy
- Alternating Electric Fields for Treatment of Glioma Other Solid Tumors



American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

Calls for the reevaluation of RF regulations, consumer disclosure and a national research program “to protect children’s health and wellbeing.”

“Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children.”

Letter to FCC, 2016 based on NTP
findings

Several Commercial Insurance Firms Exclude Damages from EMF



“GENERAL INSURANCE EXCLUSIONS:

Electromagnetic fields directly or indirectly arising out of, resulting from or contributed to by electromagnetic fields, electromagnetic radiation, electromagnetism, radio waves or noise.”

<http://www.eperils.com/pol/cfc-a&mcmb-v32.pdf>

Public Service Announcements



US. District Court

Precautionary ruling 2014

“If there is even a reasonable possibility that cell phone radiation is carcinogenic, the time for action in the public health and regulatory sectors is upon us.”

‘Even though the financial and social cost of restricting such devices would be significant, those costs pale in comparison to the cost in human lives from doing nothing, only to discover thirty or forty years from now that the early signs were pointing in the right direction. If the probability of carcinogenicity is low, but the magnitude of the potential harm is high, good public policy dictates that the risk should not be ignored.’

- Judge Frederick Weissberg

Right to Know Legislation Invoked in United States



"To assure safety, the Federal Government requires that cell phones meet radio frequency (RF) exposure guidelines. If you carry or use your phone in a pants or shirt pocket or tucked into a bra when the phone is on and connected to a wireless network, you may exceed the federal guidelines for exposure to RF radiation. Refer to the instructions in your phone or user manual for information about how to use your phone safely." – Berkeley Cell Phone Right to Know Ordinance, 2015

Similar law introduced into Massachusetts State Legislature by Senator Julian Cyr
January 20, 2017

Harvard Professor Larry Lessig, reflecting EHT Right to Know Tool Kit (SD.2053 & SD.1881), 2016

Precautionary Policy Being Invoked in Israel and Globally



Haifa Mayor Yona Yahav,
ordered wired systems for all
schools in April 2016:
“When it comes to the health
of our children, if there is any
doubt about their health risks
there is no doubt about what
needs to be done.”



Berkeley Right to Know about Cell Phone
Radiation, 2015, crafted and defended by
Harvard Law Prof Lawrence Lessig and Yale
Law Dean Robert Post



Massachusetts proposes similar
law to Berkeley last week, 2017
State Senator Julian Cyr

Argentina: “Need for Research and Policy for Environmental Health”—National Legislation Introduced

“The Ministry of the Environment strongly supports the draft Bill that was submitted to the Congress of the Nation by the PRO Party, entitled "Authorization and control regime of radio stations and systems for the provision of telecommunications services ".

“The regulation of non-ionizing electromagnetic radiation or the activities that generate them must be subject to the principles of environmental policy settled in the Law N° 25.675 (General Environmental Law), **especially the precautionary and solidarity principles.**”

Stelian Gelberg email to Gideon Leichner

Regarding WiFi in Classrooms

1. What is the problem and/or danger with WiFi in classes, when using 20 or more tablets/laptops?

Un-justified radiation exposure from the tablets/laptops' transmitters.

2. What is your position and recommendation for the Ministry of Education and/or to the local authorities regarding installing wired and/or wireless network in the schools?

Using a wired network. The local authority must explain why it is not installing a wired network. A situation where there is an active wireless network in a school without a clear written explanation as to why a wired network was not installed is not an acceptable situation.

7. What is the difference in strength and shape of the wave between cellular and WiFi network radiation?

They are more or less the same, except that theoretically at least, the difference between the maximum output and the average is much higher in case of WiFi networks.

14. Who is responsible for safety and for the different radiation measurements in the schools?

The mayor or the head of the local municipality.

The world is not dangerous
because of those who do harm
but because of those who look
at it without doing anything.

•Albert Einstein

Dr. Devra Lee Davis

IIAS/EHT Wireless Radiation and Health

Opening Reception – *Radiation and Health – The Big Picture*

Reference List

Ferreira, Juliana Borges, Alavaro Augusto Almeida de Dalles, and Claudio Enrique Fernández-Rodriguez. [“SAR simulations of EMF exposure due to tablet operation close to the user’s body.”](#) *Microwave and Optoelectrics Conference* (2015). *IEEE* (2016).

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