



ITU-T: Workshop on international, regional and national policies concerning human exposure to electromagnetic fields, Geneva, Switzerland



WHO's recent activities on EMF and health

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25 May 2023

The World Health Organization



Established on **7 April 1948**

Function: act as the UN directing and coordinating authority on international health work

Objective: attainment by all peoples of the highest possible level of health

Health: “A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO Constitution, 1948)





SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	 SUSTAINABLE DEVELOPMENT GOALS





Health in all policies



HOW THE ENVIRONMENT IMPACTS OUR HEALTH

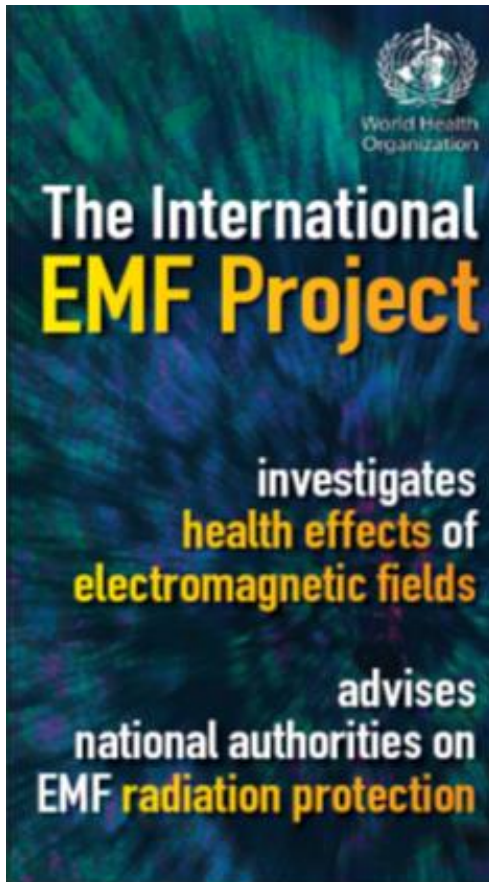
People are exposed to risk factors in their homes, work places and communities through:





Both **ionizing** and **non-ionizing** radiation are covered by the WHO Radiation and Health Unit





WHO International EMF Project

- Established in 1996
- Coordinated by WHO HQ
- Objectives
 - Review the scientific literature on health effects of EMF exposure and formally assess health risks;
 - Promote a focused agenda of high-quality EMF research;
 - Encourage internationally acceptable harmonized standards;
 - Provide information on risk perception, risk communication, risk management



Partners



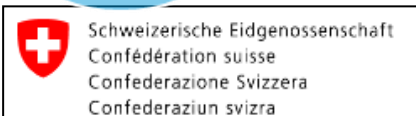
World Health Organization

Member States

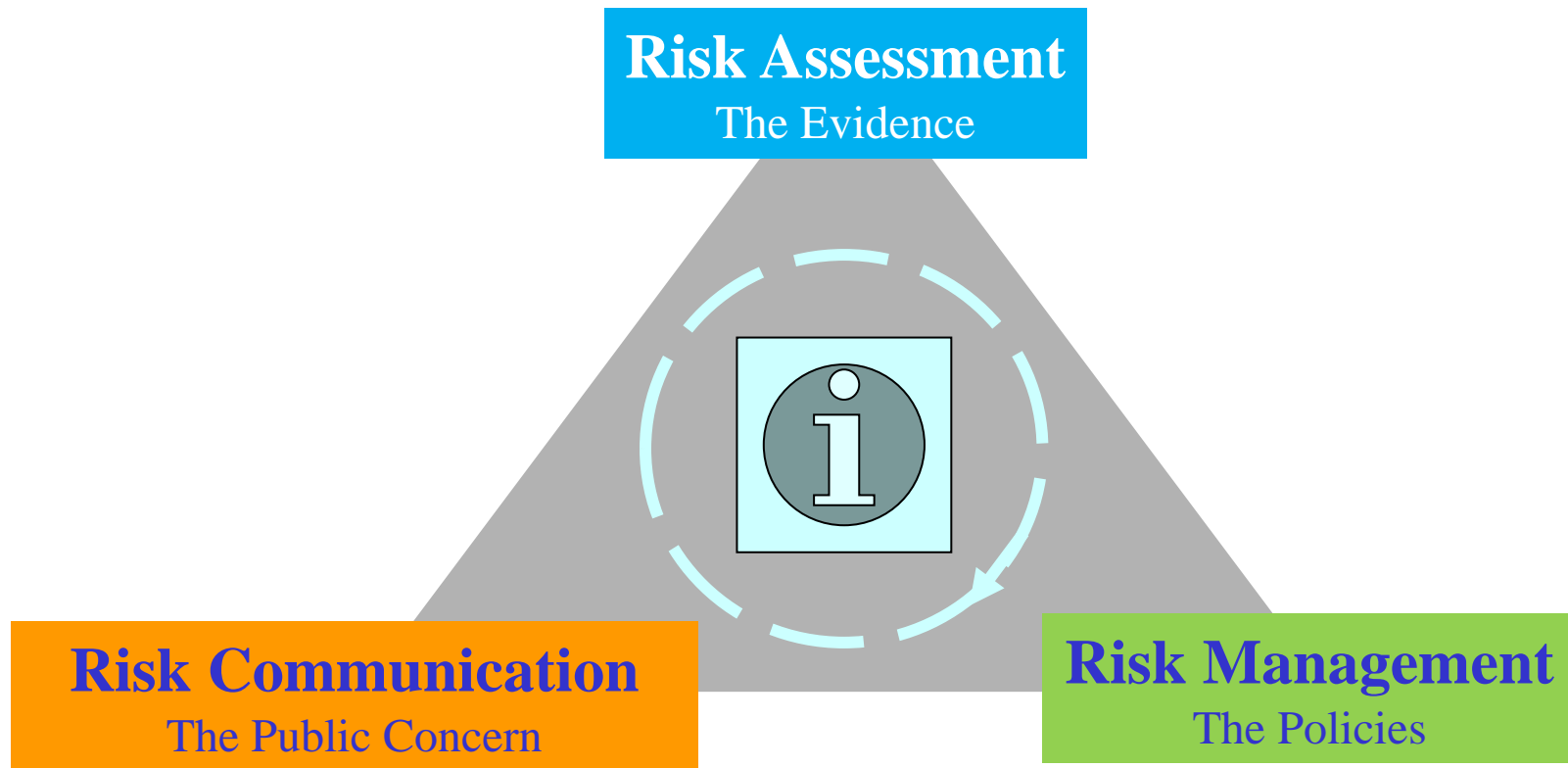
International organizations

Non-governmental organizations

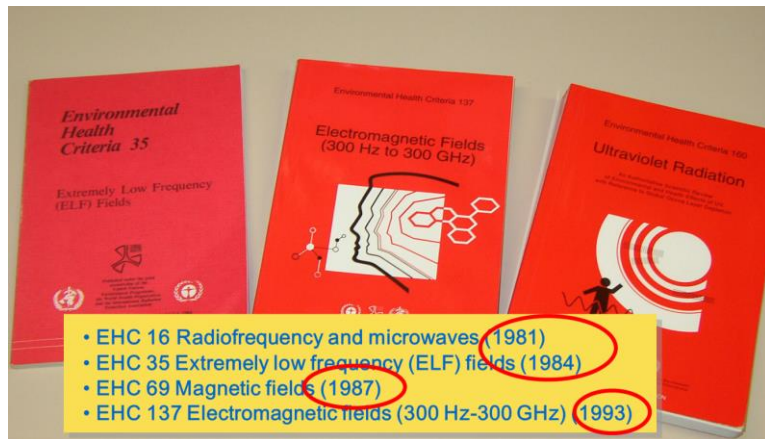
Collaborating Centres



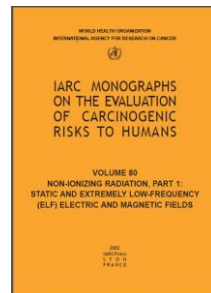
Do EMFs pose a health risk?



WHO Monographs on EMF



Health risk assessments



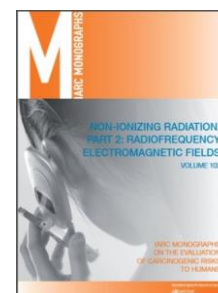
2002



2006



2007

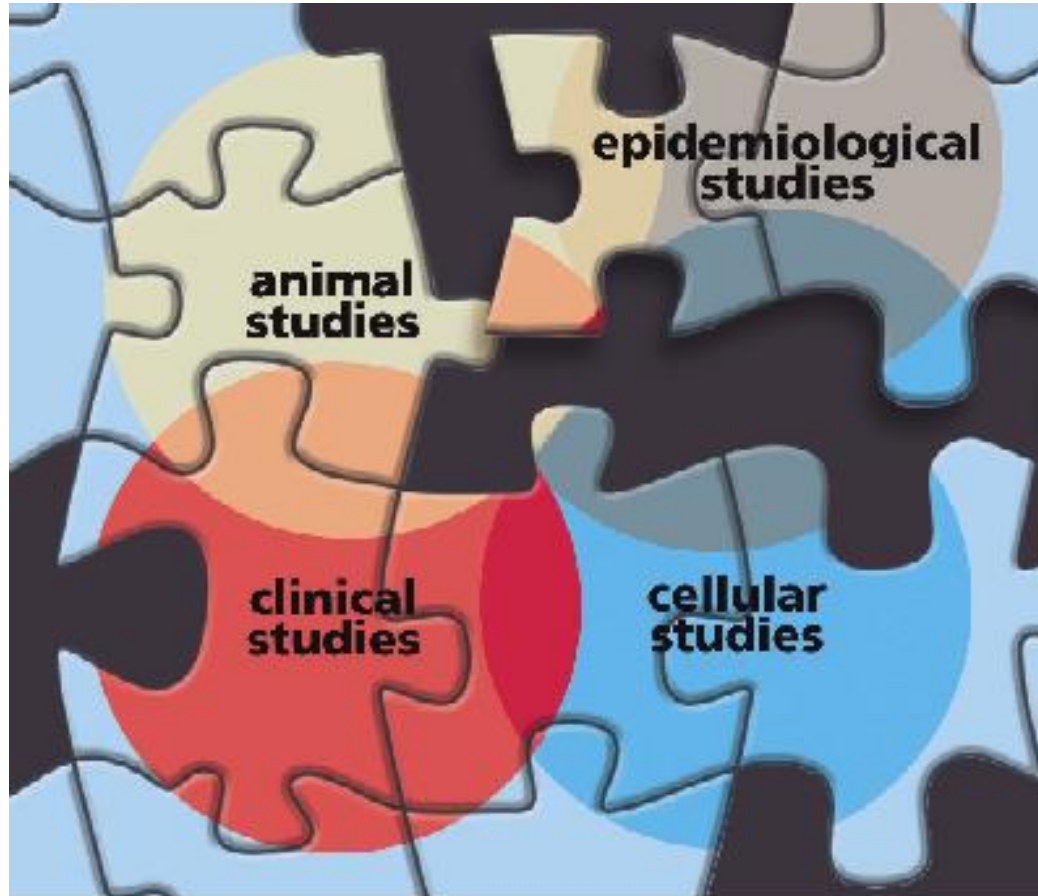


2013



Evaluating the health risks

Review of research



<http://www.niehs.nih.gov/emfrapid/booklet/emf2002.pdf>



RF Environmental Health Criteria Objectives



- To review the scientific literature regarding **adverse health effects** from exposure to radiofrequency fields
- To perform a **health risk assessment** of all studied health endpoints, as far as the evidence can offer
- To identify gaps in knowledge



RF Environmental Health Criteria Objectives (cont'd)



- To compile a **summary of national policies** around the world (based on a survey performed in Fall 2012)

Radiation Protection Dosimetry (2014), pp. 1–6

doi:10.1093/rpd/ncu324

RISK MANAGEMENT POLICIES AND PRACTICES REGARDING RADIO FREQUENCY ELECTROMAGNETIC FIELDS: RESULTS FROM A WHO SURVEY

Amit Dhungel^{1,*}, Denis Zmirou-Navier^{1,2} and Emilie van Deventer³

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²Lorraine University School of Medicine, av. de la Forêt de Haye, 54505 Vandoeuvre-Les-Nancy, France

³Radiation Programme, Department of Public Health, Environmental and Social Determinants of Health, World Health Organization, Geneva, Switzerland

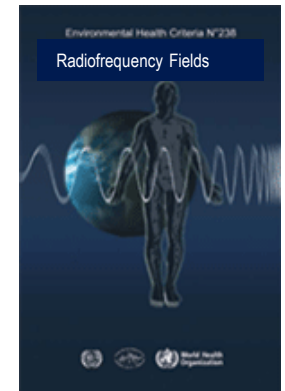
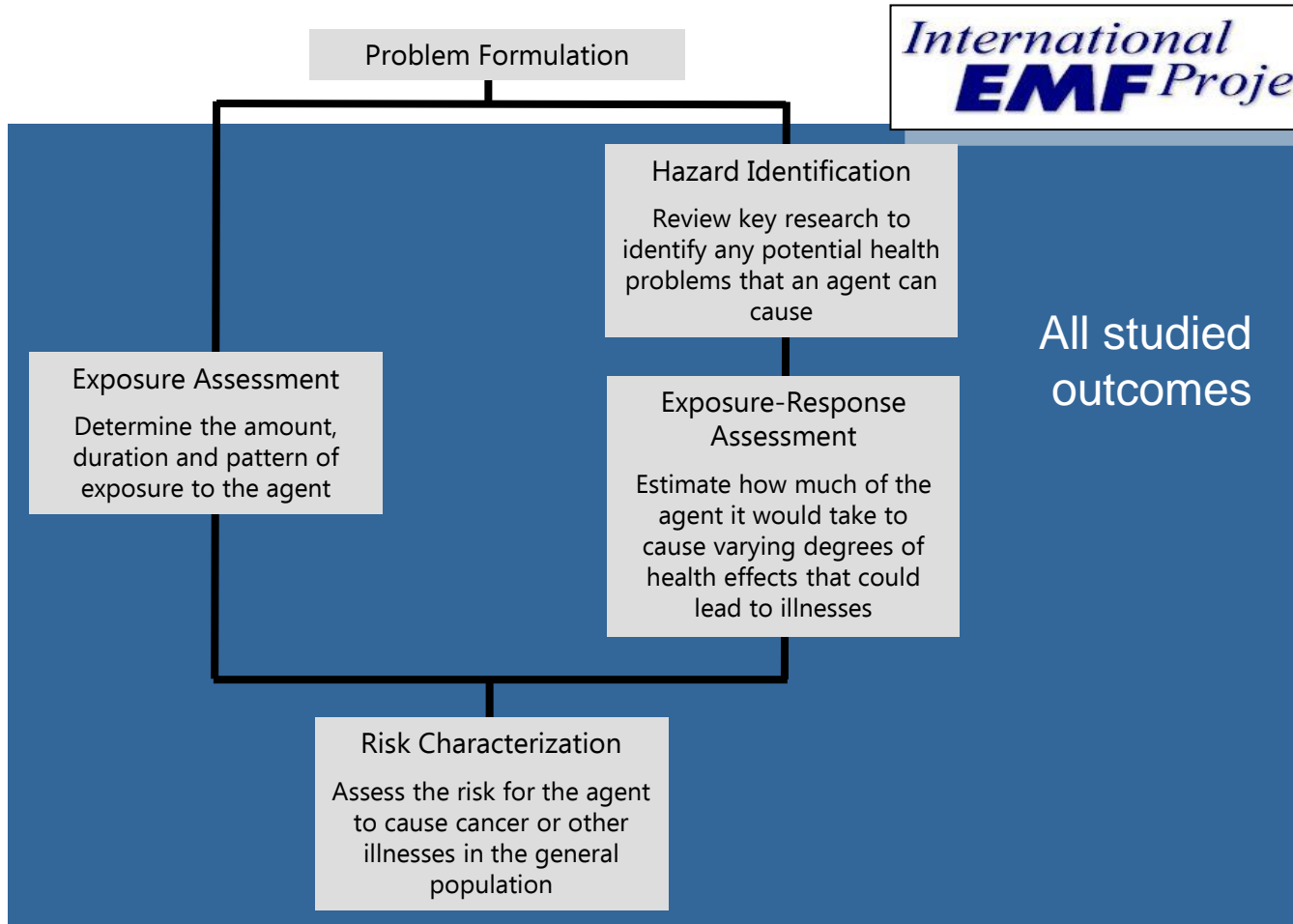
- Updated survey being finalized
- Your help needed!!



Health Risk Assessment



International
EMF Project



Risk Assessment
The Evidence



Scope and target audience

Scope

- Radiofrequency fields from 100 kHz to 300 GHz
- Public and occupational exposures (not medical exposures)

Target audience

- National policy-makers in Ministries of Health, Environment, Labour, Telecommunications, ...
- Bodies involved in recommending or setting exposure guidelines for RF EMF, such as non-governmental organizations
- Professional societies and academics studying the health effects of RF EMF



Technical outputs

The appraisal of the evidence for health risks associated with exposure to RF fields to result in



Scoping Report

1. Introduction
2. Description of methods
3. Thermal effects
4. Cancer
5. Symptoms and well-being
6. Brain physiology and function
7. Fertility, reproduction and childhood development
8. Neurodegenerative disorders
9. Cardiovascular diseases
10. Neuroendocrine system responses
11. Autonomous nervous system
12. Auditory and vestibular function
13. Ocular function
14. Immune system
15. Haematological changes
16. Biological mechanisms

Appendix A– Sources, measurements and exposures

Appendix B – Radiofrequency electromagnetic fields inside the body

Appendix C– Biophysical mechanisms

WHO Scoping Report

- 16 chapters, > 3000 references
- All published studies (in-vitro, animal and human) of health effects reported in the literature with sufficient quality - until about 2017-2020
- Developed by a Core Group (6 experts) and ~ 30 contributors
- To be published as a WHO document

Systematic reviews

WHO Systematic reviews

- 6 prioritized health effects/mechanisms commissioned by WHO: heat-related effects, cancer, fertility, cognitive function, symptoms, oxidative stress
- 10 protocols (9 published and registered)
- 12 systematic reviews (in progress)
- Developed by 10 SR teams (> 80 contributors)
- To be published as journal papers in a Special Issue of *Environment International*



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WHO assessment of health effects of exposure to radiofrequency electromagnetic fields: systematic reviews

Edited by Sharea Ijaz, Jean-François Doré, Sarah Driessen, Paul Whaley

<https://www.sciencedirect.com/journal/environment-international/special-issue/109J1SL7CXT>



Contributors

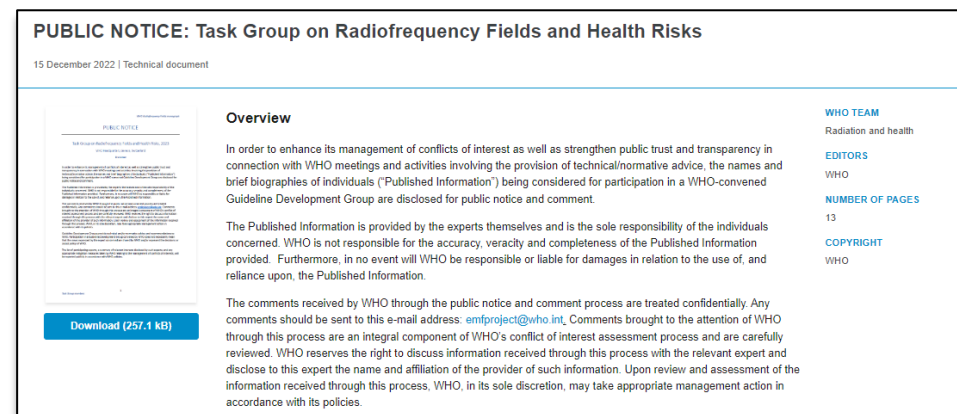
- Core Group (6 members) and expert working group members (~ 20-30)
- Systematic review teams
- Task Group members
 - Individual scientists, not representatives of their organizations
 - Composition dictated by range of expertise and views, gender and geographical distribution
- Observers
- Secretariat



The RF Task Group



- Call for Experts published (October-December 2021)
- 66 candidates applied
- Selection committee was convened
- 19 members were selected after strict due diligence review by WHO
 - **Individual scientists, not representatives of their organizations**
 - Composition: range of expertise and views, gender and geographical distribution



International exposure guidelines



- International non-governmental organizations produce exposure guidelines on electromagnetic fields. Many countries currently adhere to the guidelines recommended by:
 - The International Commission on Non-Ionizing Radiation Protection and,
 - The Institute of Electrical and Electronics Engineers, through the International Committee on Electromagnetic Safety
- These guidelines are not technology-specific. They cover radiofrequencies up to 300 GHz.



Global Health Observatory

Worldwide EMF standards



• Your help needed!!



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THE GLOBAL HEALTH OBSERVATORY
Explore a world of health data

Indicators Countries

GHO Home Indicators Countries Data API Map Gallery Publications Data Search

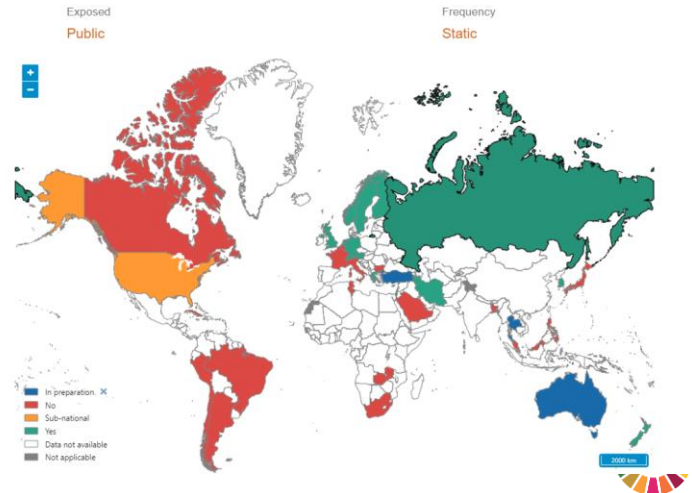
Data / GHO / Themes / Topics
Electromagnetic fields

Appears in: Public health and environment

Electromagnetic fields are present everywhere in our environment. Electric fields are produced by natural sources such as the local build-up of electric charges in the atmosphere associated with thunderstorms while the earth's magnetic field is used by birds and fish for navigation. Human-made sources include medical equipment using static fields (e.g. MRI), electric appliances using low frequency electric and magnetic fields (50/60 Hz), and various wireless, telecommunications and broadcasting equipment using high radiofrequency electromagnetic fields (100kHz-300 GHz).
When properly used, electromagnetic fields greatly improve our quality of life, health and well-being. However, above certain levels, these fields can be harmful to health and affect the human body in different ways depending on their frequency. Therefore, countries have set standards to limit exposure to electromagnetic fields, either for specific frequencies and applications, or over the whole electromagnetic field spectrum.

Related indicators

<https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/electromagnetic-fields>



Risk Management
The Policies

Risk communication



THE NEW YORK TIMES INTERNATIONAL EDITION

12 | WEDNESDAY, JULY 17, 2019

SCIENCE

How bad science stoked 5G fears

An inaccurate chart drawn by an ill-informed scientist grew into a cancer scare

BY WILLIAM J. BROAD

In 2000, the Broward County Public Schools in Florida received an alarming report. Like many affluent school districts at the time, Broward was considering laptops and wireless networks for its classrooms and 250,000 students. Were there any health risks?

The district asked Bill P. Curry, a consultant and physicist, to study the matter. The technology, he reported back, was "likely to be a serious health hazard."

He summarized his most troubling evidence in a large graph labeled "Microwave Absorption in Brain Tissue (Grey Matter)."

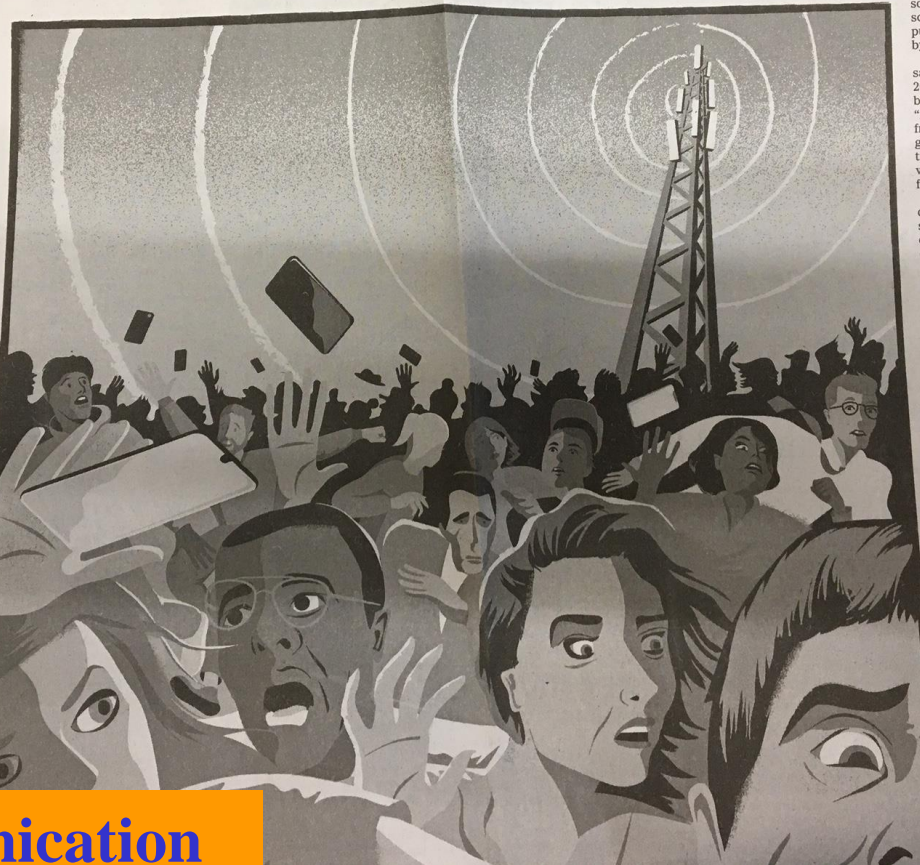
The chart showed the dose of radiation received by the brain rising from left to right as the frequency of a wireless signal increased. The slope was gentle at first, but when the line reached the wireless frequencies associated with computer networking, it shot straight up, indicating a dangerous level of exposure.

"This graph shows why I am concerned," Dr. Curry wrote. The body of his report detailed how the radio waves could sow brain cancer, a terrifying disease that kills most of its victims.

Dr. Curry's warning spread, resonating with educators, consumers and entire cities as the frequencies of cellphones, cell towers and wireless local networks rose. To no small degree, it sowed anxiety over 5G technology can trace to a single scientist and a sin-chart.

But Dr. Curry and his graph got it wrong.

According to experts on the biological effects of electromagnetic radiation, radio waves become safer at higher frequencies, not more dangerous. (Especially high-frequency energies, such as X-rays, behave differently and do



sought to force the Portland, Ore., public schools to abandon their wireless computer networks. The suit had been filed by a worried parent.

As an expert witness, Dr. Carpenter said in a legal declaration on Dec. 20, 2011, that the graph showed how the brain's absorption of radio-wave energy "increases exponentially" as wireless frequencies rise, calling it evidence of grave student danger. The graph "illustrates the problem with the drive of the wireless industry toward ever higher frequencies," he said.

In response to such arguments, the industry noted that it obeyed government safety rules. The judge in the Portland case said the court had no jurisdiction over federal regulatory matters and dismissed the lawsuit.

Despite the setback, Dr. Carpenter's 2011 declaration, which included Dr. Curry's graph, kept drawing attention. In 2012, he introduced it as part of his testimony to a Michigan state board assessing wireless dangers, and it soon began circulating online among wireless critics.

And he saw a new danger. Between 2010 and 2012, the frequencies of the newest generation of cellphones, 4G, rose past those typical of the day's wireless networks. Dr. Carpenter now had a much larger and seemingly more urgent target, especially since cellphones were often held snugly against the head.

But mainstream science rejected his conclusions. Two Oxford University researchers described them as "scientifically discredited."

A 'FACT' IS BORN

Unbowed, Dr. Carpenter worked hard to revise established science. In 2012, he became editor in chief of *Reviews on Environmental Health*, a quarterly journal. He published several authors who filed alarmist reports, as well as his own.

"The rapid increase in the use of cell phones increases risk of cancer, male infertility, and neurobehavioral abnormalities," Dr. Carpenter wrote in 2013.

As the frequencies of wireless devices continued to rise, an associated risk of brain cancer was repeated uncritically often without attribution to Dr. Curry or Dr. Carpenter. It came to be regarded by activists as an established fact.

"The higher the frequency, the more dangerous," according to Radiation

Stop



Home

Defen

, privacy, and safety



Out* Fees

Flyers

Risk Communication
The Public Concern

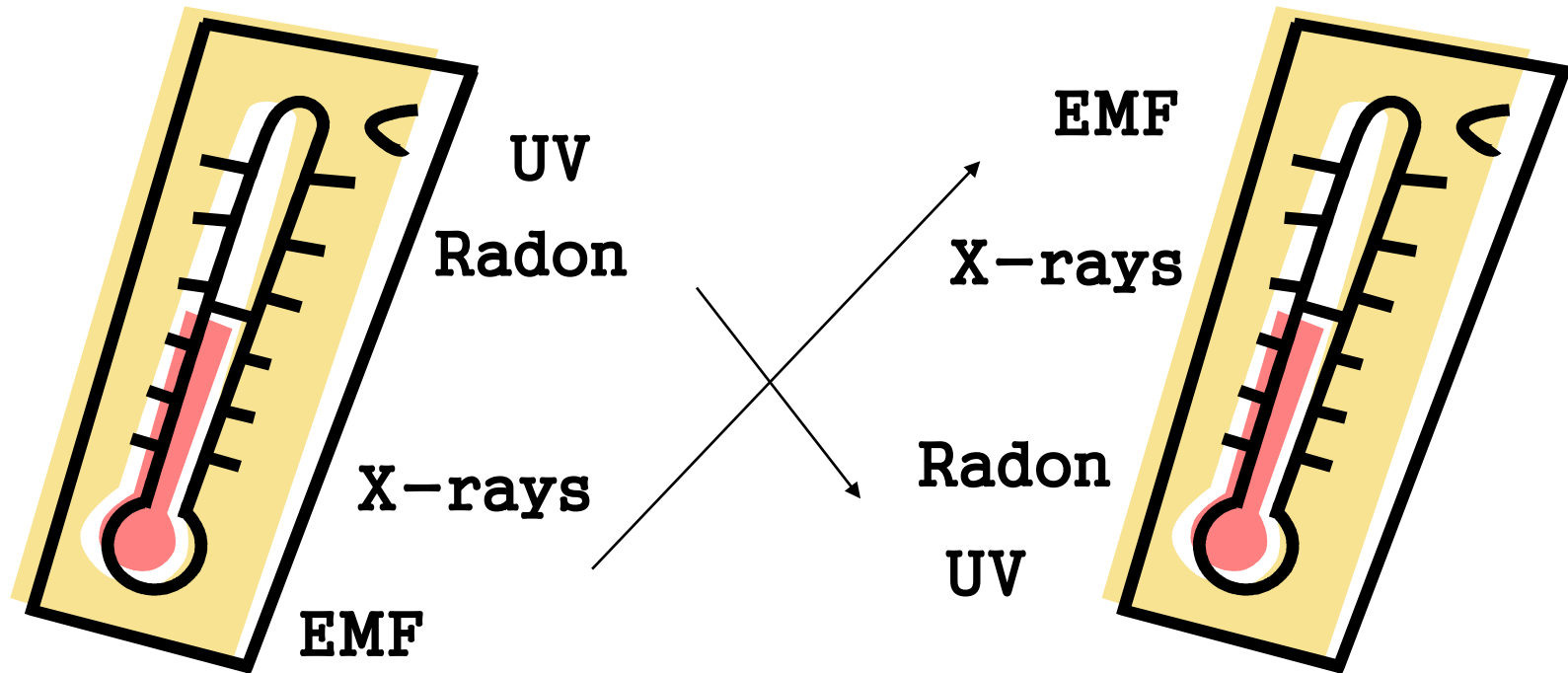


Radiation

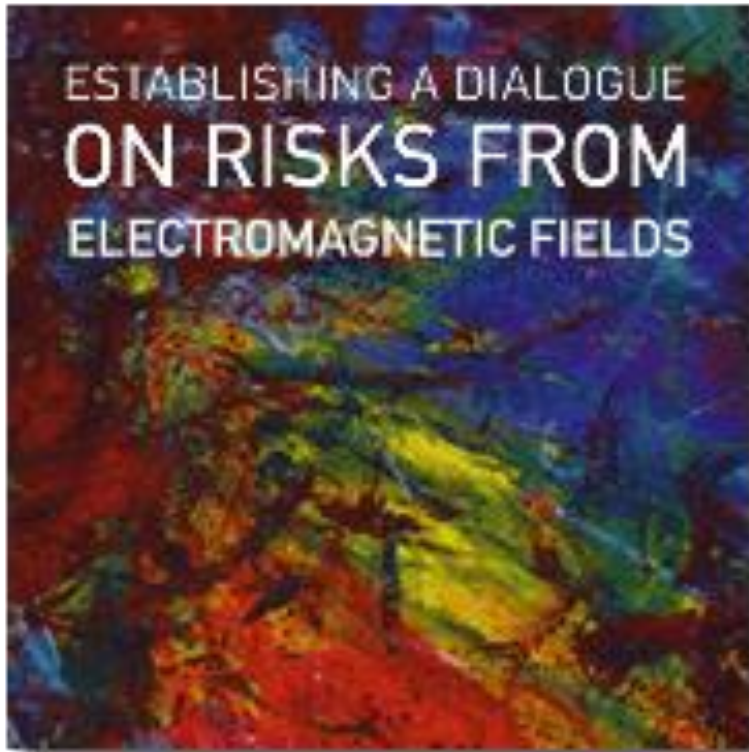
Risk Communication

Public Health

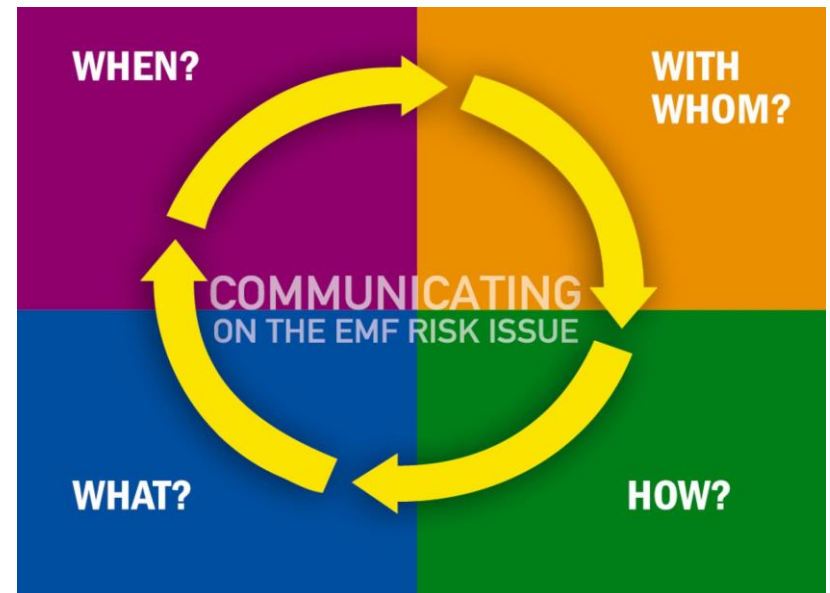
Public Concern



Managing EMF Risk Communication



<https://apps.who.int/iris/handle/10665/42543>



Risk Communication

The Public Concern



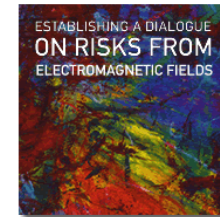
Update of the “EMF Dialogue” handbook

- Published in 2002
- Translated in 14 languages (latest Malay 2021)
- Review and revision in terms of content (e.g., social media) and design
- Interest by other international organizations to co-sponsor the document

Establishing a Dialogue on Risks from Electromagnetic Fields

WHO handbook

Originally published by WHO in 2002 (in English), this handbook is intended to support decision-makers faced with a combination of public controversy, scientific uncertainty, and the need to operate existing facilities and/or the requirement to site new facilities appropriately. Its goal is to improve the decision-making process by reducing misunderstandings and improving trust through better dialogue. Community dialogue successfully implemented helps to establish a decision-making process that is open, consistent, fair and predictable. It can also help achieve the timely approval of new facilities while protecting the health and safety of the community.



Download Establishing a Dialogue on Risks from Electromagnetic Fields pdf, 2Mb

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Portuguese / Português
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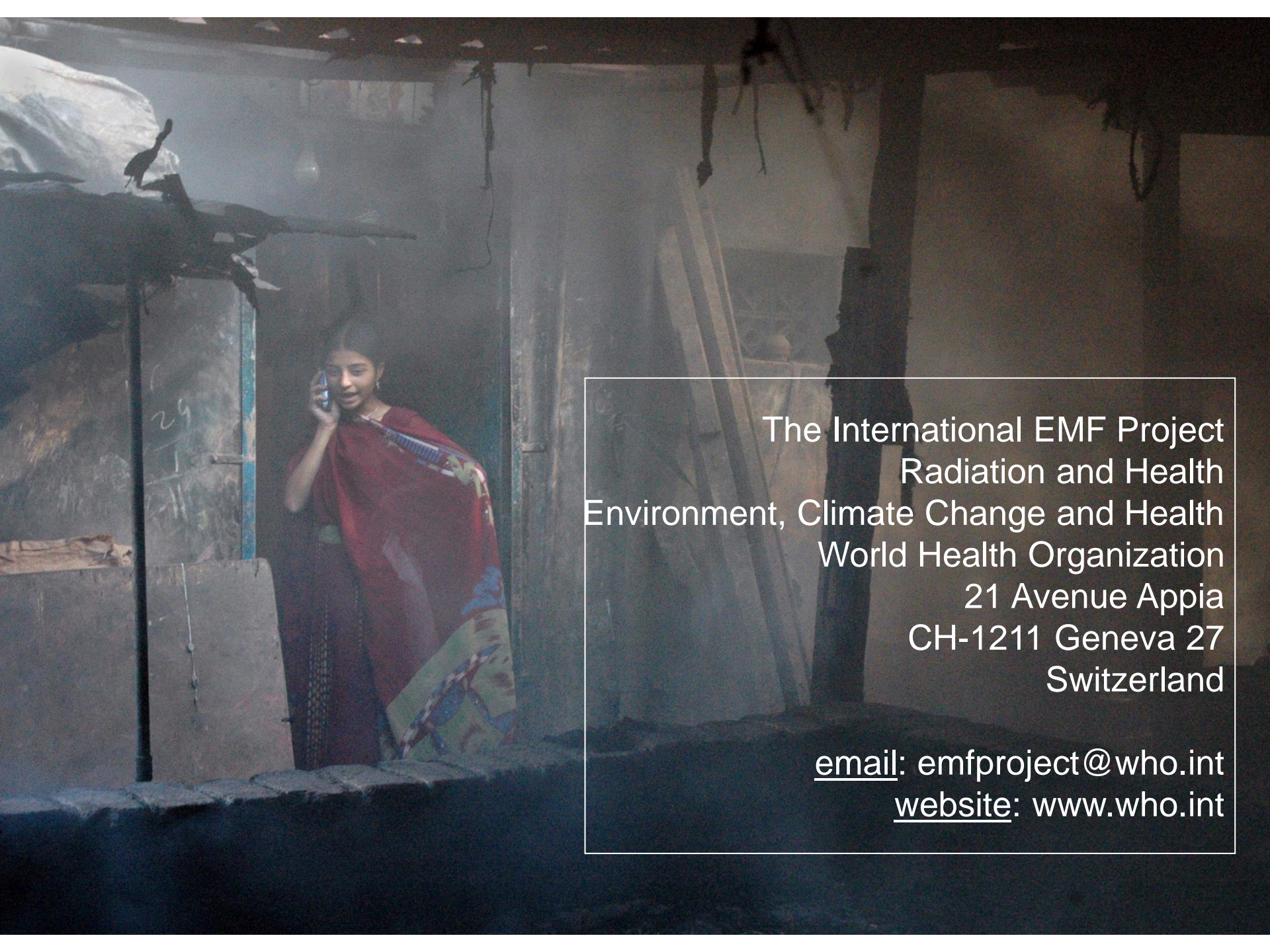


Download the handbook in sections

- ↓ Acknowledgements pdf, 384kb
- ↓ Chapter 1. Electromagnetic fields and public health: the present evidence pdf, 373kb
- ↓ Chapter 2. EMF Risk Communication: dealing with public perception pdf, 792kb
- ↓ Chapter 3. EMF Exposure guidelines and policies: The present situation pdf, 311kb
- ↓ Glossary and further reading pdf, 56kb

• Your help needed!!





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