ITU National Workshop on EMF Harmony
International, Regional and National Policies, Strategies and Standards Related to Human Exposure to Electromagnetic Fields

Chisinau, Moldova

Session: Update on the International Standards related to EMF

WHO's recent activities on EMF and health

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23 September 2025

Statement slide

I have no conflicts of interest to disclose

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)

HOW THE ENVIRONMENT IMPACTS OUR HEALTH

World Health Organization

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

AIR POLLUTION
including indoors and outdoors

INADEQUATE WATER, SANITATION
and hygiene

CHEMICALS
and biological agents

RADIATION
ultraviolet and ionizing

COMMUNITY NOISE

OCCUPATIONAL RISKS

AGRICULTURAL PRACTICES
including pesticide-use, waste-water reuse

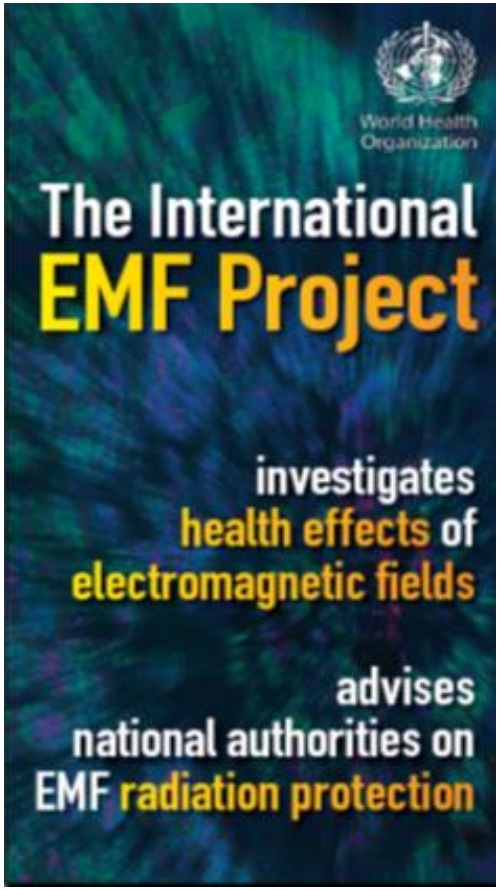
BUILT ENVIRONMENTS
including housing and roads

CLIMATE CHANGE

World Health Organization

#EnvironmentalHealth

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

https://www.who.int/initiatives/the-international-emf-project

WHO International EMF Project

- This Project is overseen by an **International Advisory Committee** (Member States and other relevant stakeholders) which meets every year in June
- Next meeting: May or June 2026 in Geneva, Switzerland
- **Member States representatives are welcome to join!!**

Partners

World Health Organization

UNEP

ILO

ITU

IAEA
International Atomic Energy Agency

ICNIRP
INTERNATIONAL COMMISSION ON NON-IONIZING RADIATION PROTECTION

ICOH

ICRP

Bundesamt für Strahlenschutz

Australian Government
Australian Radiation Protection and Nuclear Safety Agency

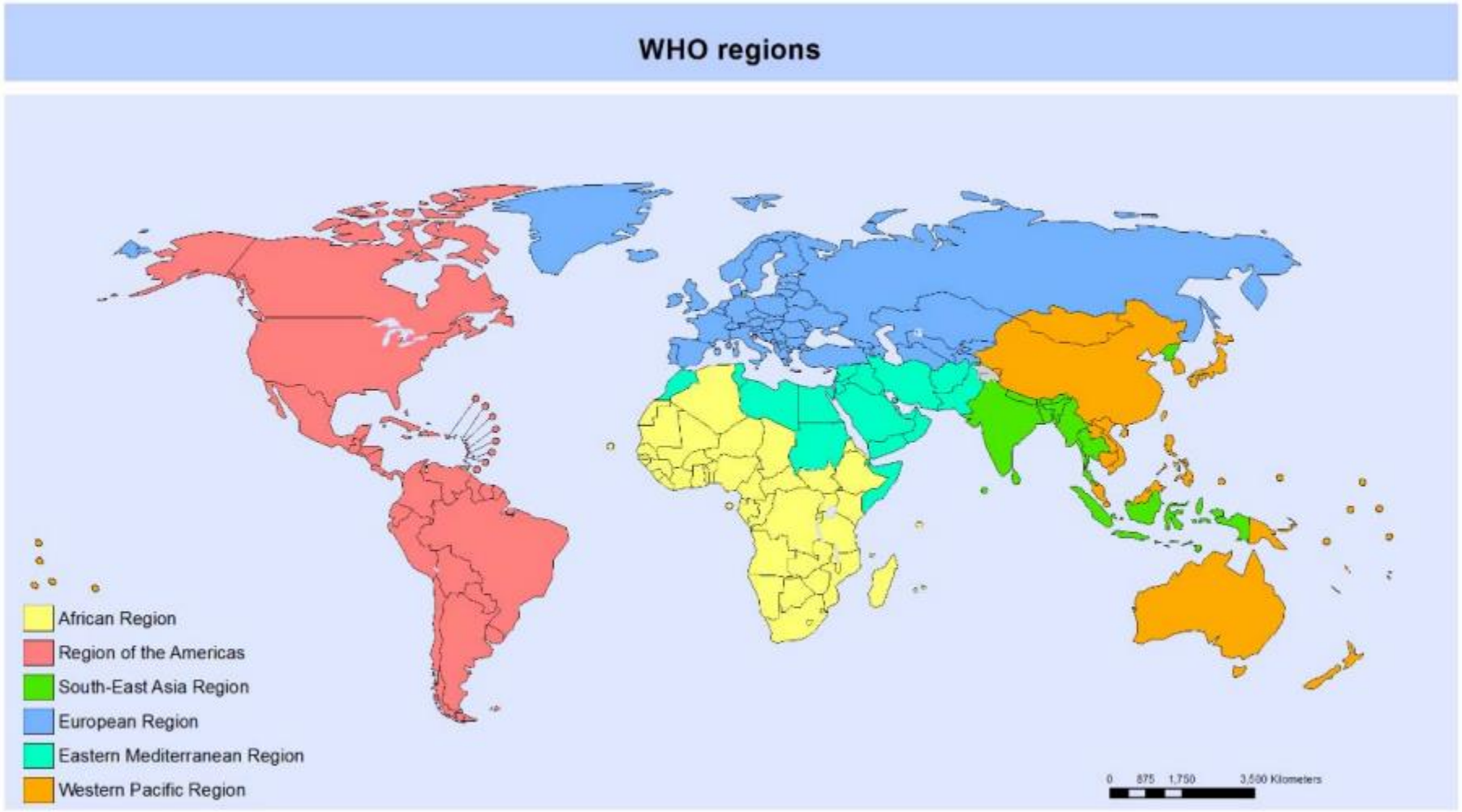
UK Health Security Agency

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Federal Office of Public Health FOPH

Cancer Council Victoria

WHO regions

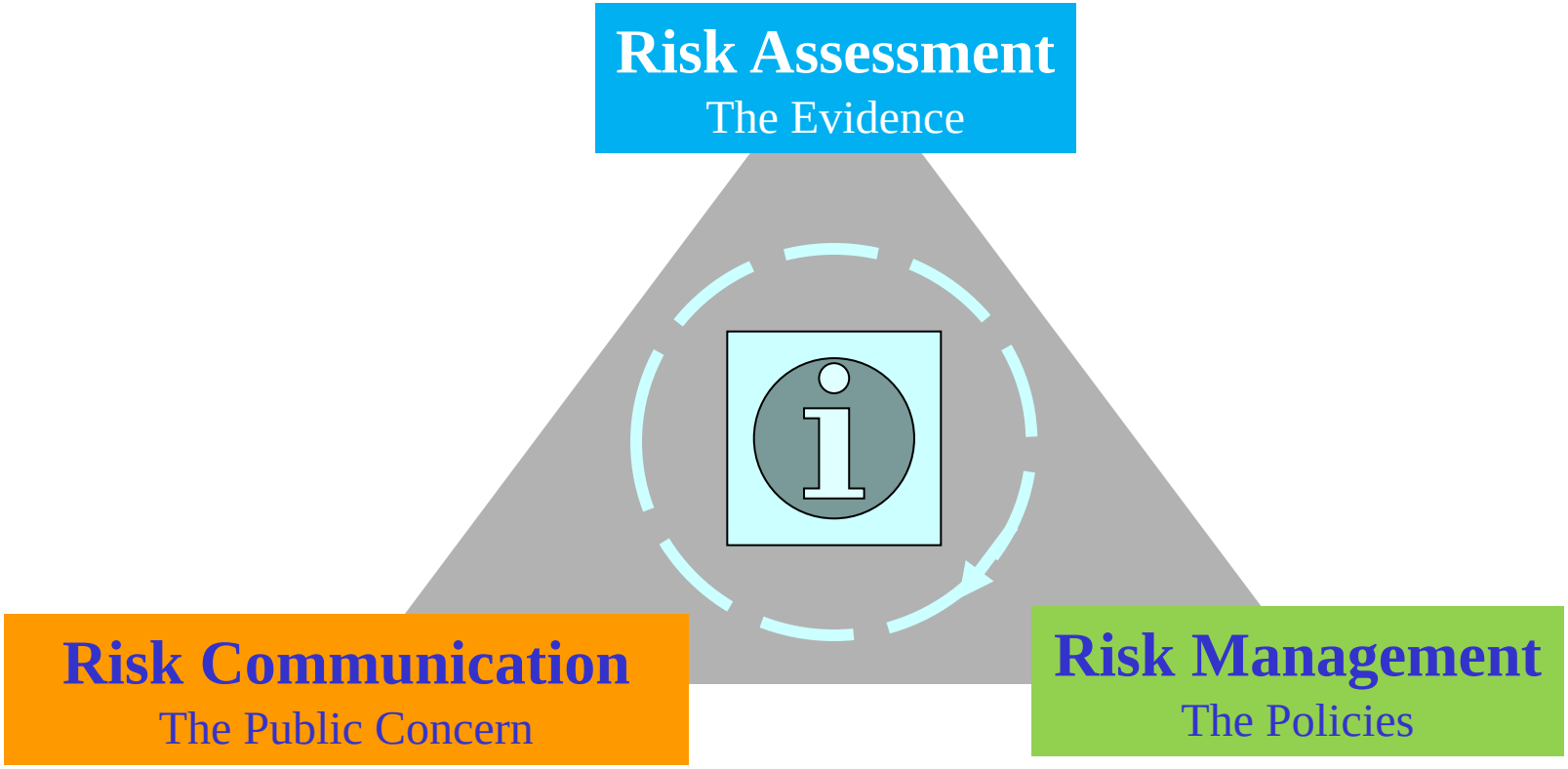
World Health Organization



WHO European Region (EURO)

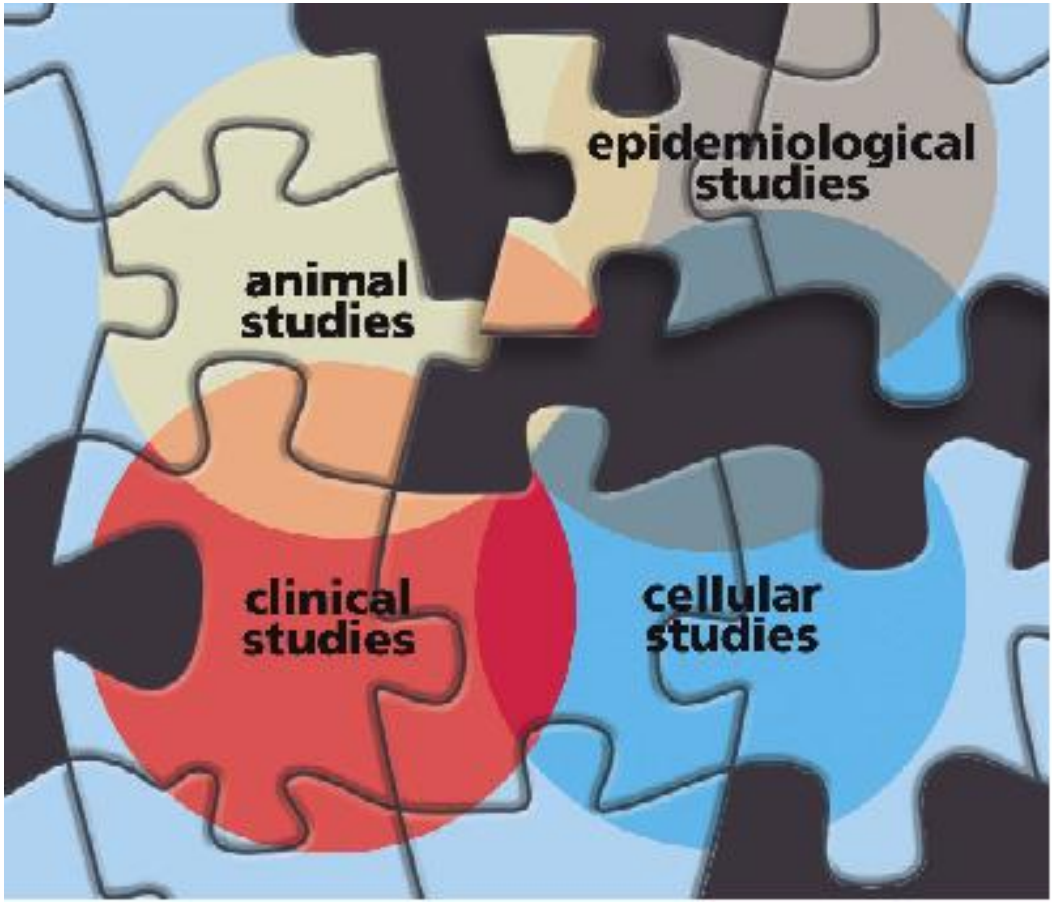
World Health Organization

Do EMFs pose a heath risk?



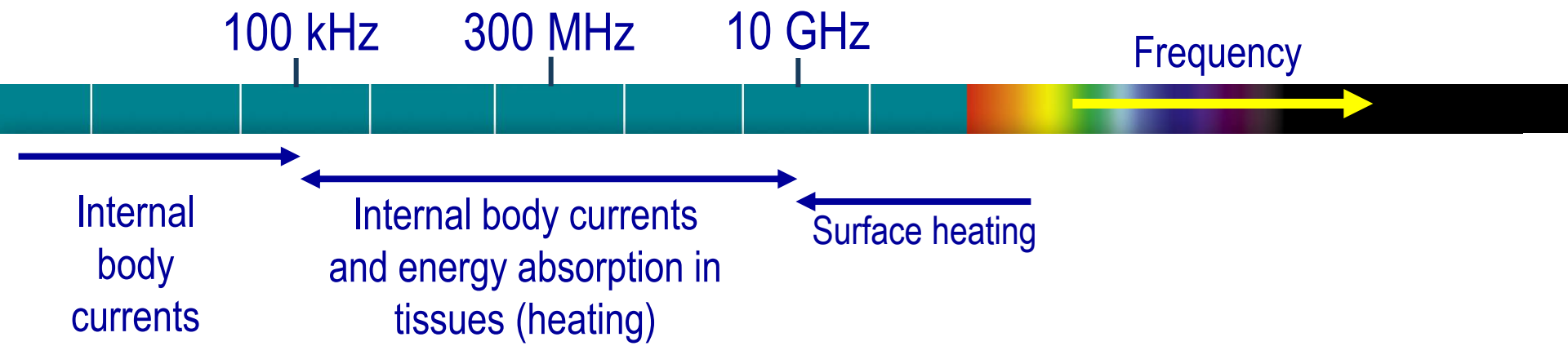
Evaluating the health risks
Review of research

World Health Organization



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

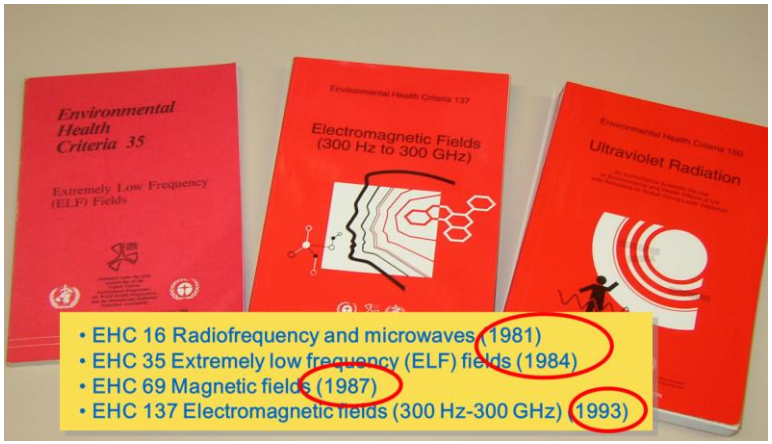
What do we know?
Mechanisms of interaction



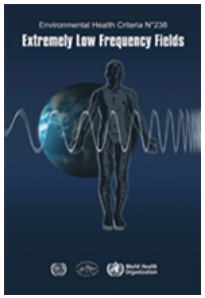
Non-thermal effects??

WHO Monographs on EMF
Health risk assessments

World Health Organization



2006

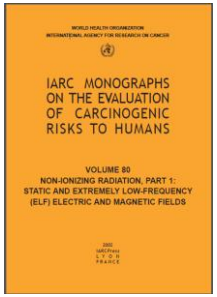


2007

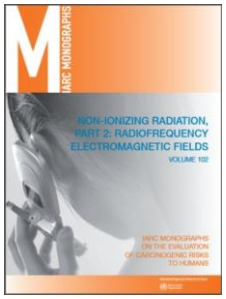
RF Fields

International Agency for Research on Cancer

World Health Organization



2002



2013

RF fields classified as "*possibly carcinogenic to humans*"

Risk Assessment
The Evidence

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

Risk Assessment

The Evidence

Scope and target audience

World Health Organization

Scope

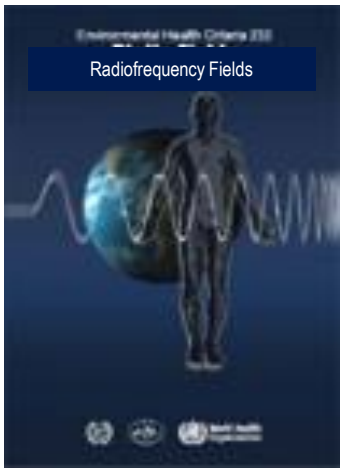
- Radiofrequency fields from 100 kHz to 300 GHz
- Public and occupational exposures (not medical exposures)

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



EHC Monograph

WHO Scoping Report

Systematic reviews

+

Research Agenda

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 technical document

Systematic reviews

World Health Organization

ScienceDirect

Journals & Books

Environment International

Open access

22 CiteScore | 11.8 Impact Factor

Articles & Issues | About | Publish | Search in this journal | Submit your article | Guide for authors

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/special-issue/1092DR596MG

WHO Systematic reviews

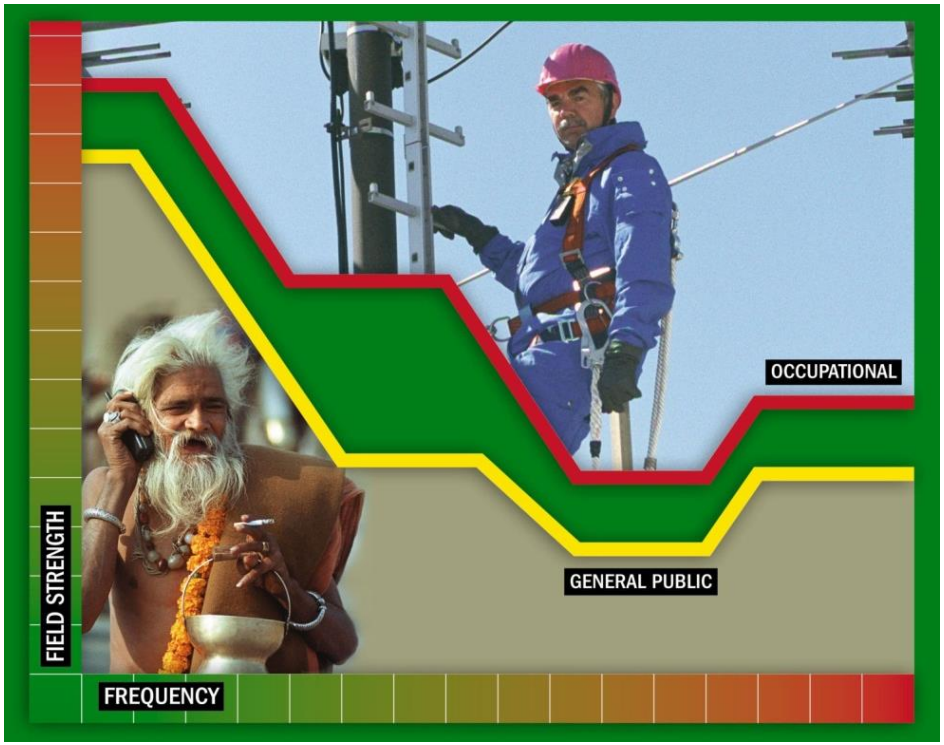
- 6 prioritized health effects/mechanisms commissioned by WHO: heat-related effects, cancer, fertility, cognitive function, symptoms, oxidative stress
- 9 protocols - published and registered
- 12 systematic reviews published
- Developed by 9 SR teams (> 80 contributors)
- Published as journal papers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

Risk Assessment
The Evidence

Contributors

- Core Group (6 members) and expert working group members (~ 20-30)
- Systematic review teams (>80 experts)
- Task Group members (20 members)
  - Individual scientists, not representatives of their organizations
  - Composition dictated by range of expertise and views, gender and geographical distribution
- External reviewers
- Methodologist
- Secretariat

Exposure guidelines (EMF)



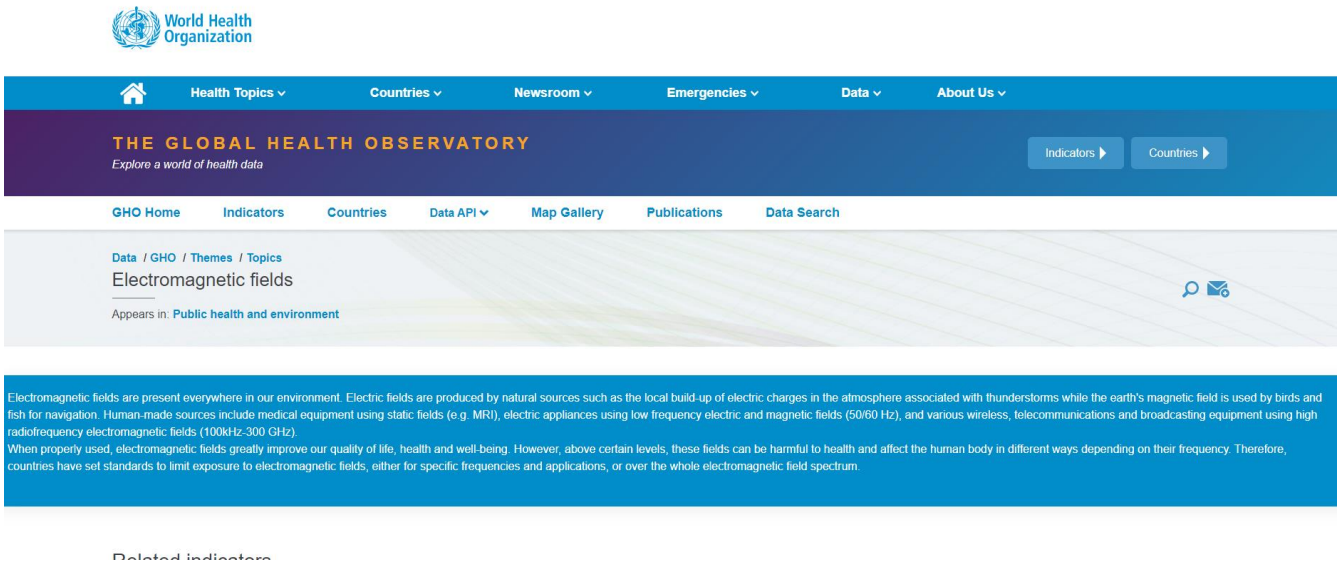
- Different guidelines for public and workers
- Exposure guidelines are frequency dependent, and are independent of any specific technology
- A number of countries have legislation over the whole EMF spectrum, while others for only some frequencies

International exposure guidelines

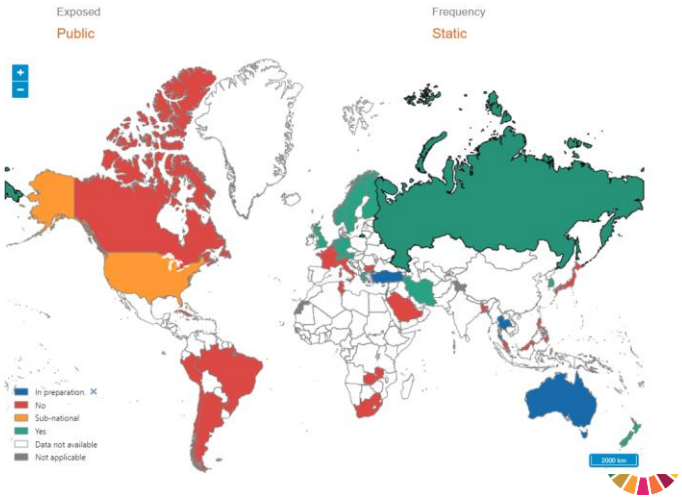
- To date, WHO has not developed EMF exposure guidelines
- International non-governmental organizations produce exposure guidelines on electromagnetic fields. Many countries currently adhere to the guidelines recommended by:
  - The International Commission on Non-Ionizing Radiation Protection and,
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

Global Health Observatory
Worldwide EMF standards

World Health Organization



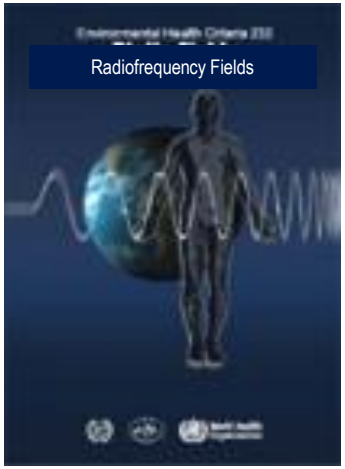
https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/electromagnetic-fields



Risk Management
The Policies

National RF Regulations and Policies

- To compile a **summary of national RF policies** around the world for the public and workers
- Previous 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

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

Risk communication

World Health Organization

THE NEW YORK TIMES INTERNATIONAL EDITION

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)."

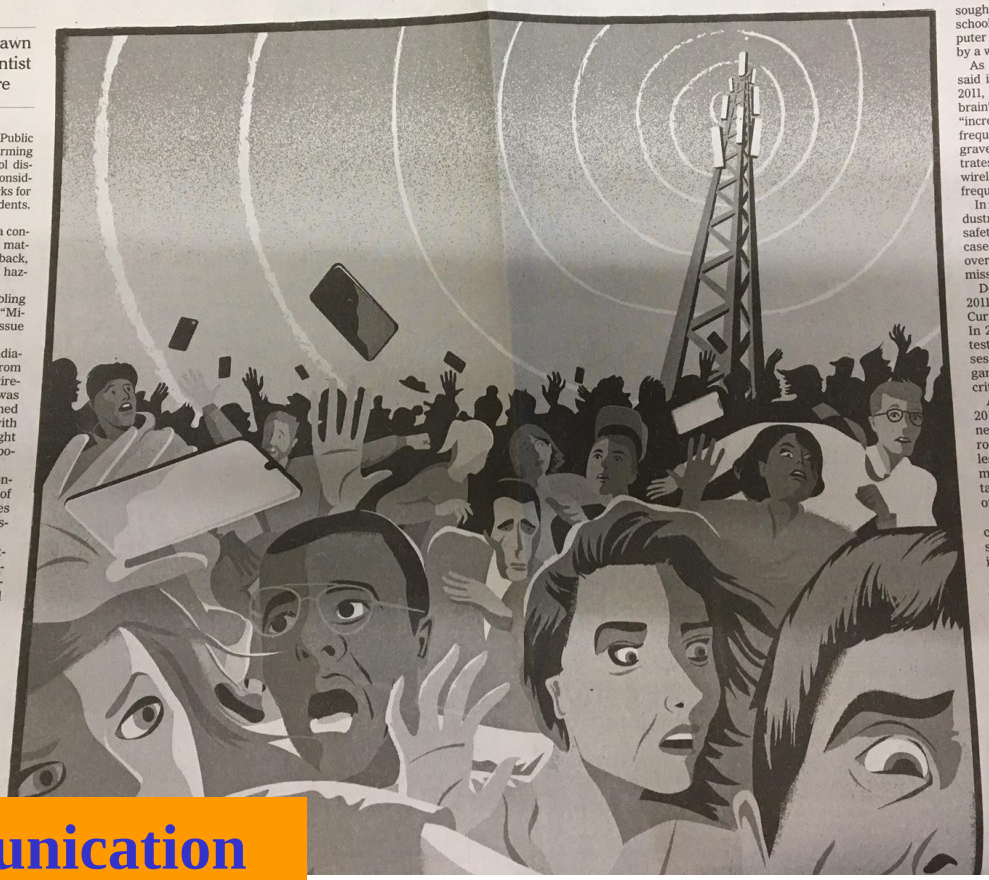
The chart showed the dose of radiation received by the brain rising from left to right as the frequency of a wireless signal increased. The slope was gentle at first, but when the line reached the wireless frequencies associated with computer networking, it shot straight up, indicating a dangerous level 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, growing anxiety over 5G technology can be traced to a single scientist and a single 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. (Extremely 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."

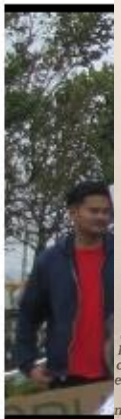
A 'FACT' IS BORN

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 in fertility, and neurobehavioral abnorma ities," Dr. Carpenter wrote in 2013.

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

"The higher the frequency, the mor dangerous," according to Radiatio

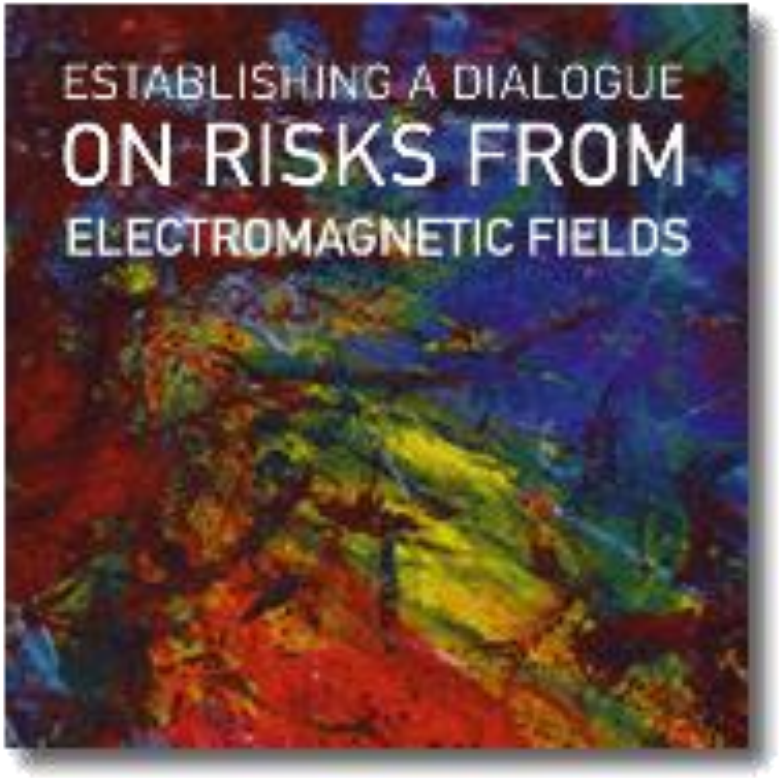


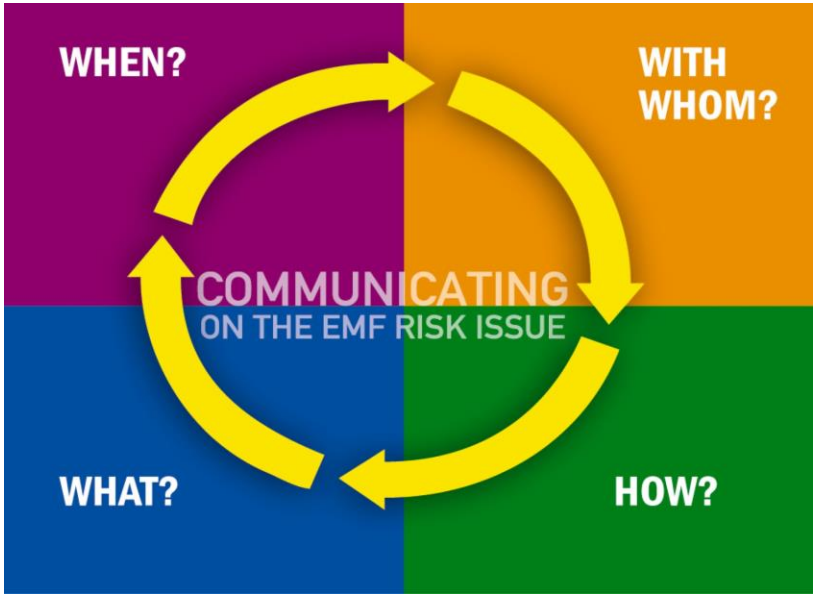
Risk Communication

The Public Concern

Managing EMF Risk Communication

World Health Organization





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
- Currently being reviewed and revised in terms of content (e.g., social media) and design

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
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Download the handbook in sections

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- Chaper 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

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