



IITU-T: 14th Symposium on ICT, Environment, Climate
Change and Circular Economy
Rome, Italy



Radiofrequency Electromagnetic Fields and Health

A WHO perspective

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25 October 2022

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





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



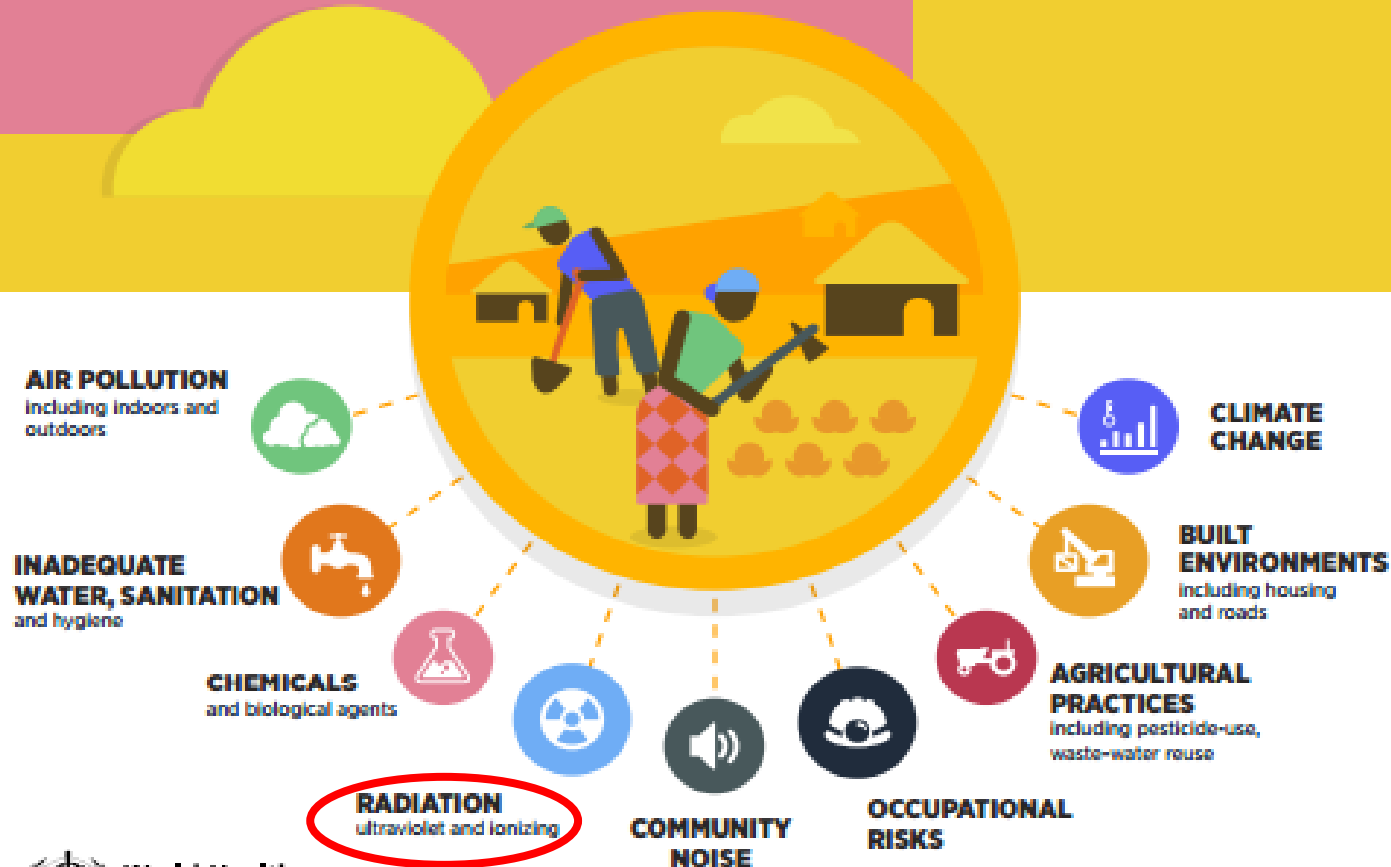


Health in all policies



HOW THE ENVIRONMENT IMPACTS OUR HEALTH

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



POWER LINES



RADAR



TRAINS



0 Hz 10^2 10^4 10^6 10^8 10^{10} 10^{12}

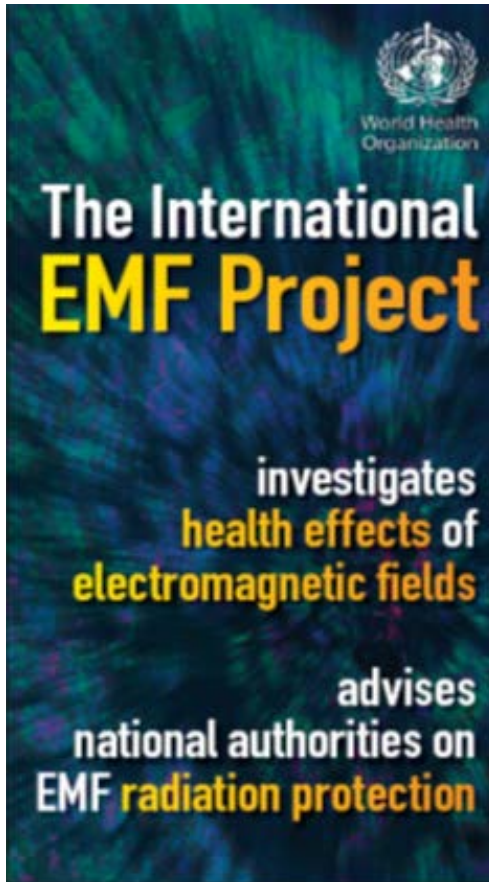
FREQUENCY (Hz OR CYCLES PER SECOND)



PERSONAL COMPUTER



CELL PHONE



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



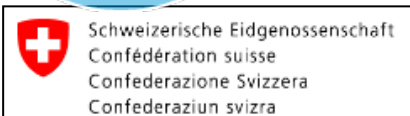
World Health Organization

Member States

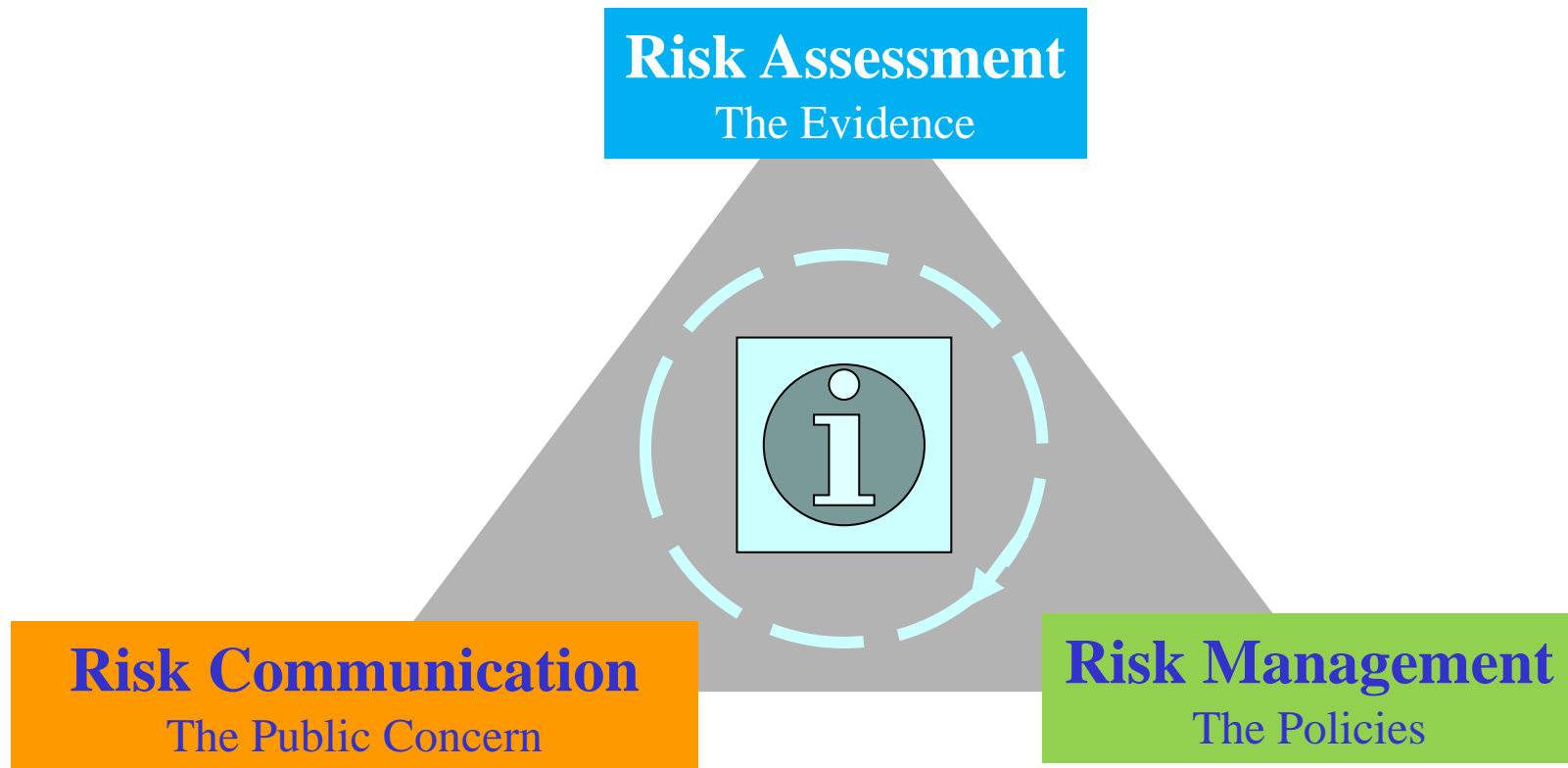
International organizations

Non-governmental organizations

Collaborating Centres



Do EMFs pose a health risk?



What do we know?

100 kHz

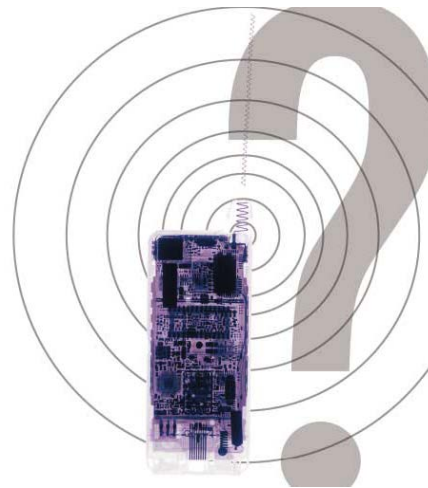
300 MHz

10 GHz

Frequency

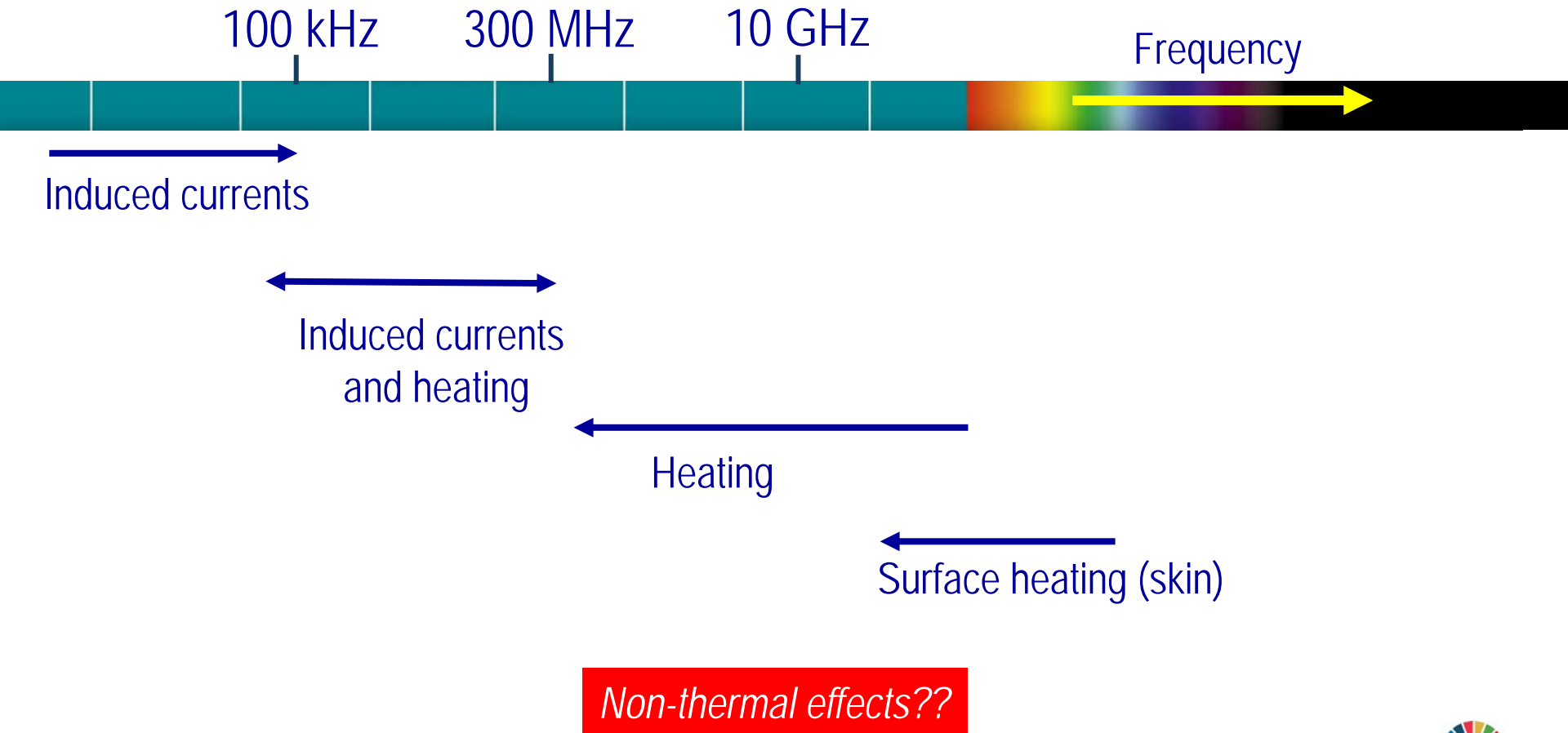


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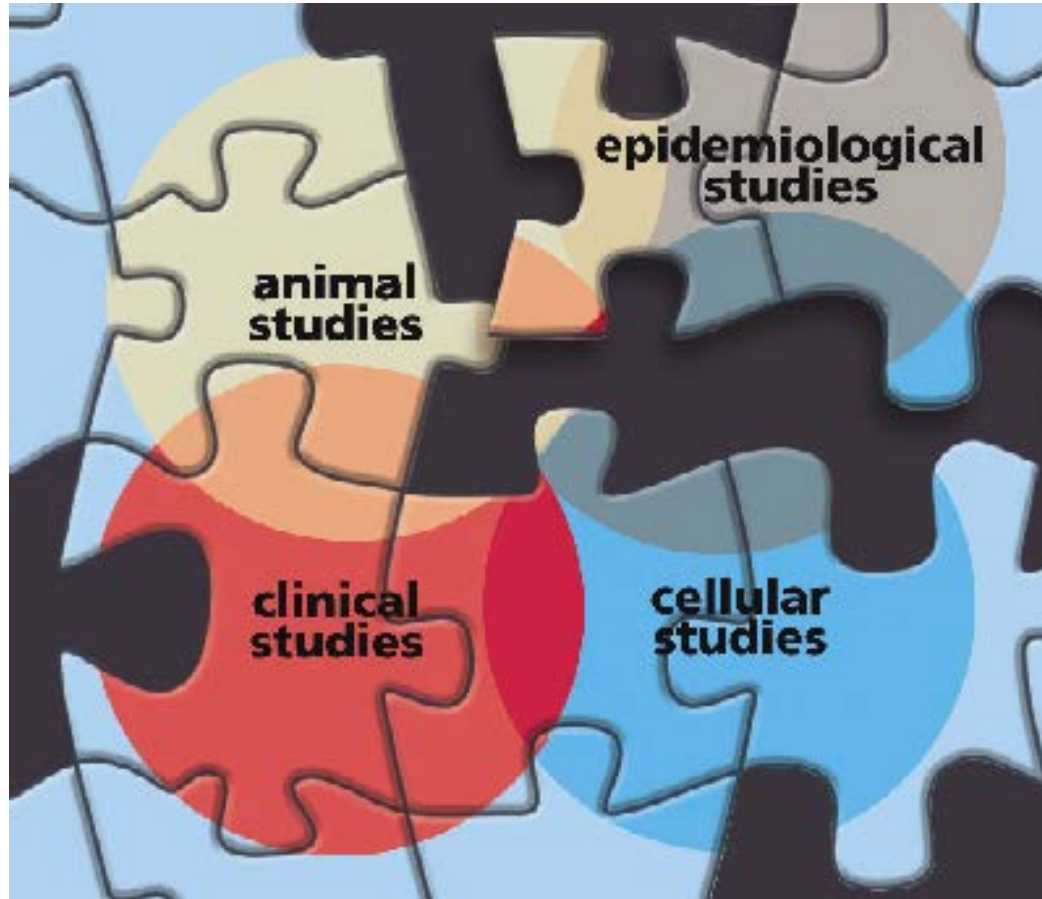
What do we know?

Mechanisms of interaction



Evaluating the health risks

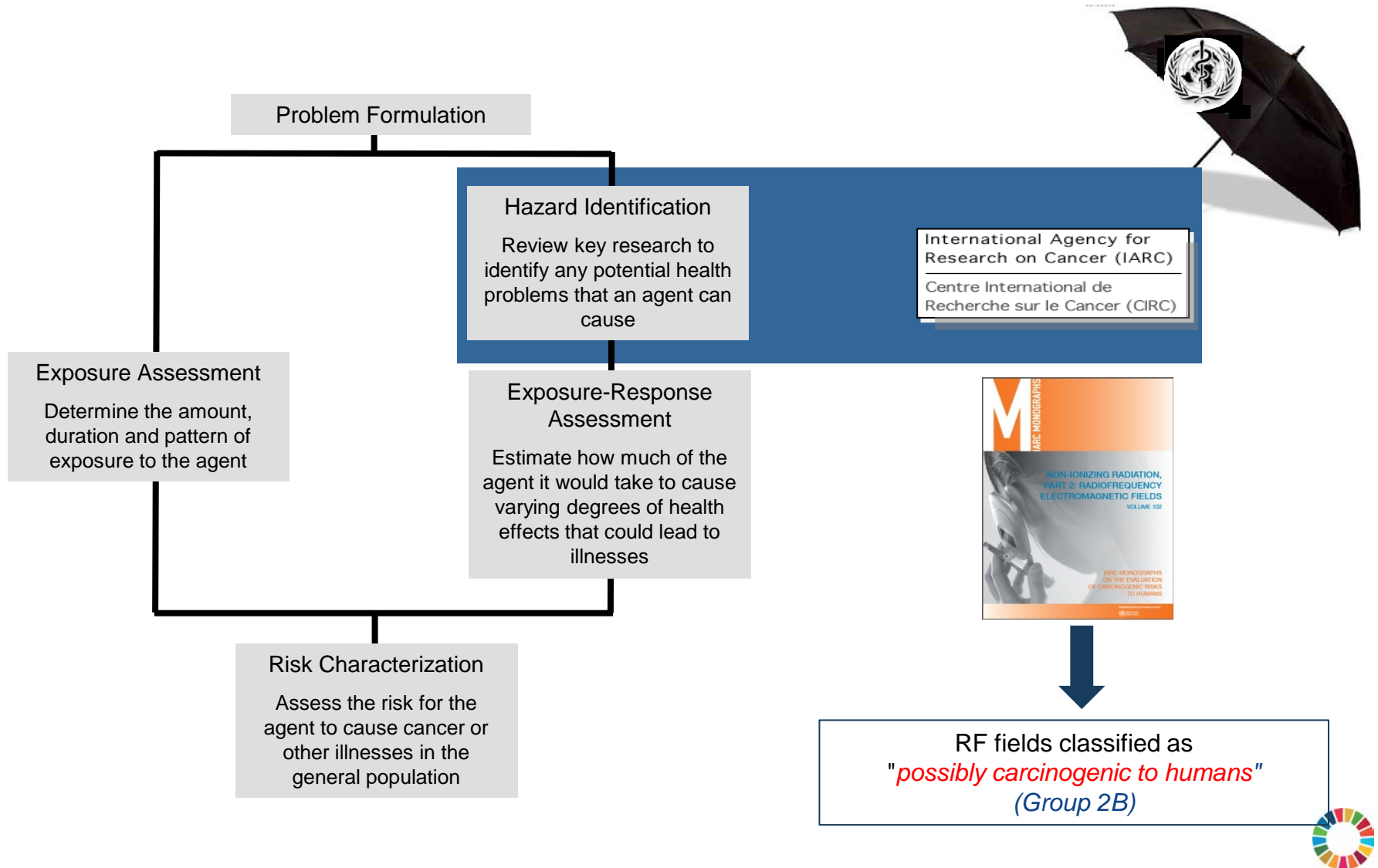
Review of research



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



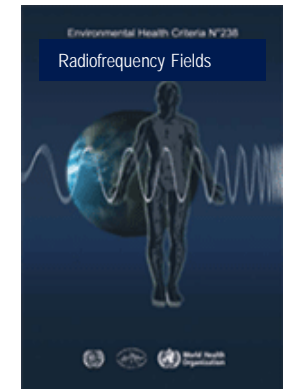
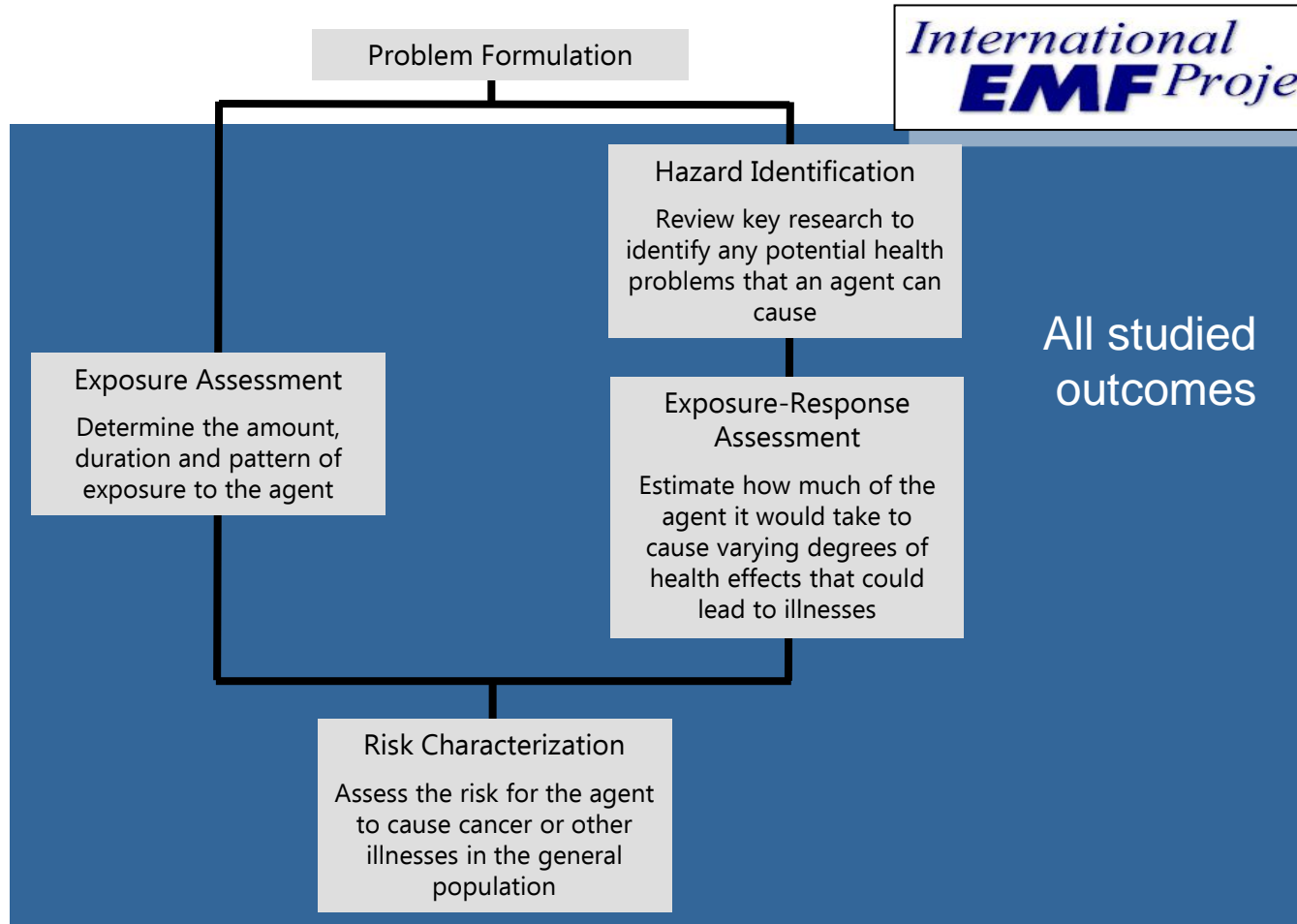
Health Risk Assessment



Health Risk Assessment (cont'd)



International
EMF Project



Special journal issue on the WHO RF assessment



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Impact Factor

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

Edited by Sharea Ijaz, Jean-François D...
et al.

Nine out of the 10 systematic review protocols have been
published

FEEDBACK

Risk Assessment
The Evidence



International exposure guidelines

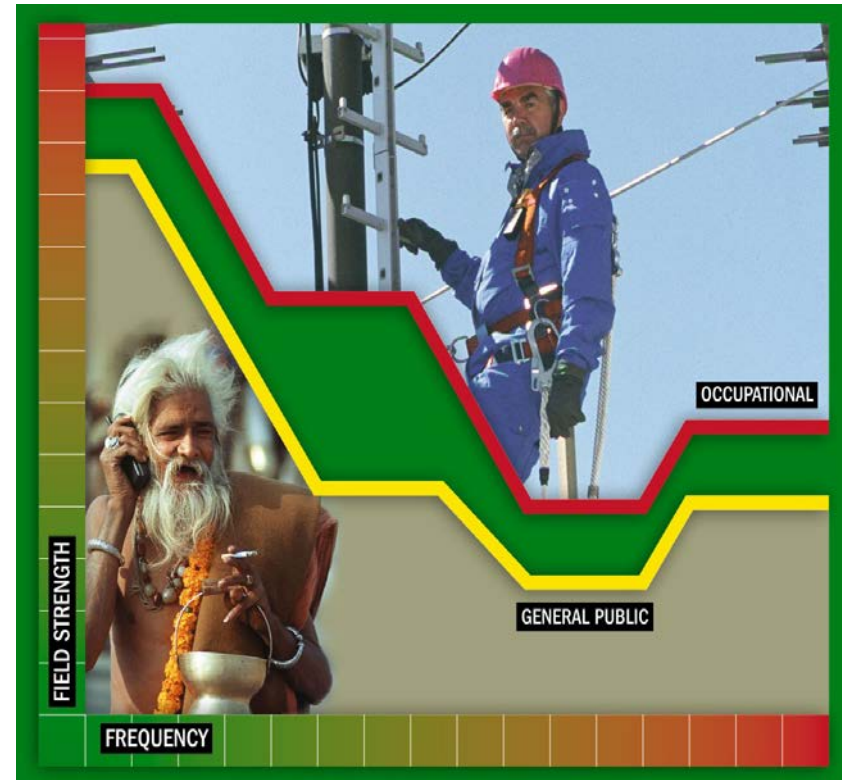


- International non-governmental organizations produce exposure guidelines on electromagnetic fields. Many countries currently adhere to the guidelines recommended by:
 - The International Commission on Non-Ionizing Radiation Protection and,
 - The Institute of Electrical and Electronics Engineers, through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



Exposure guidelines

- Exposure guidelines are frequency dependent
- A number of countries have legislation over the whole EMF spectrum, which therefore covers the frequencies to be used by 5G
- Countries that have precautionary limits (well below thermal thresholds) may face difficulty deploying 5G



Global Health Observatory

Worldwide EMF standards



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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

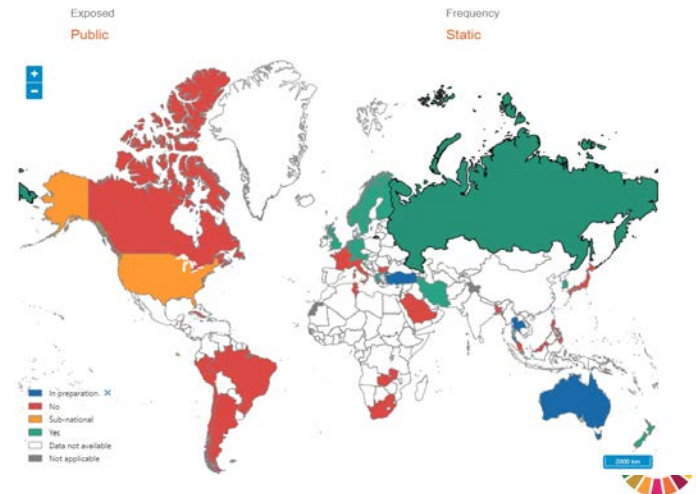
Data / GHO / Themes / Topics
Electromagnetic fields

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>





Mobiles 'boost cancer'

Radiation may make tumours

use are still unclear.

The biggest British study, led by Sir William Stewart two years ago, could find no evidence of a risk to health. But Sir William still recommended a precautionary approach, particularly in children.

The World Health Organisation has called for more research and has urged people to limit mobile use.

Now Italian scientists believe they could be closer to the truth.

Dr Fiorenzo Marinelli, of the National Research Council in

Cancer develops when control signals in a normal cell go wrong and an abnormal cell results. Instead of destroying itself the mutant cell keeps on dividing and forms a lump or tumour.

The results of the Italian study support the belief of some scientists who say radiation can damage DNA and destroy the cell repair system - making tumours more deadly.

Dr Peter de Pomerai of the University of Nottingham, who studied effects on the body...



Stop Smart Meters!

Fighting for health, privacy, and safety



Risk Communication
The Public Concern

Meters? Actions You Can Take Direct Action The Science Protest "Opt Out" Fees

SSM Bulletins Press Releases Local Contacts Links Order/ Download Flyers



WHO COVID-19 myth buster

Viruses cannot travel on radio waves/mobile networks.

COVID-19 is spreading in many countries that do not have 5G mobile networks.

COVID-19 is spread through respiratory droplets when an infected person coughs, sneezes or speaks.

People can also be infected by touching a contaminated surface and then their eyes, mouth or nose.

FACT:
5G mobile networks
DO NOT spread COVID-19



WHO and 5G

- WHO Questions and Answers (27 February 2020)
<https://www.who.int/news-room/q-a-detail/5g-mobile-networks-and-health>

What is 5G?



What are the main differences between 5G and previous technologies?



Exposure levels



What are the potential health risks from 5G?



What are the international exposure guidelines?



What is WHO doing?



Challenges to governments....

- Rapidly evolving RF technologies
- Launched on the market before health evaluation
- Disparities in risk management measures and regulations around the world
- Concern from the public

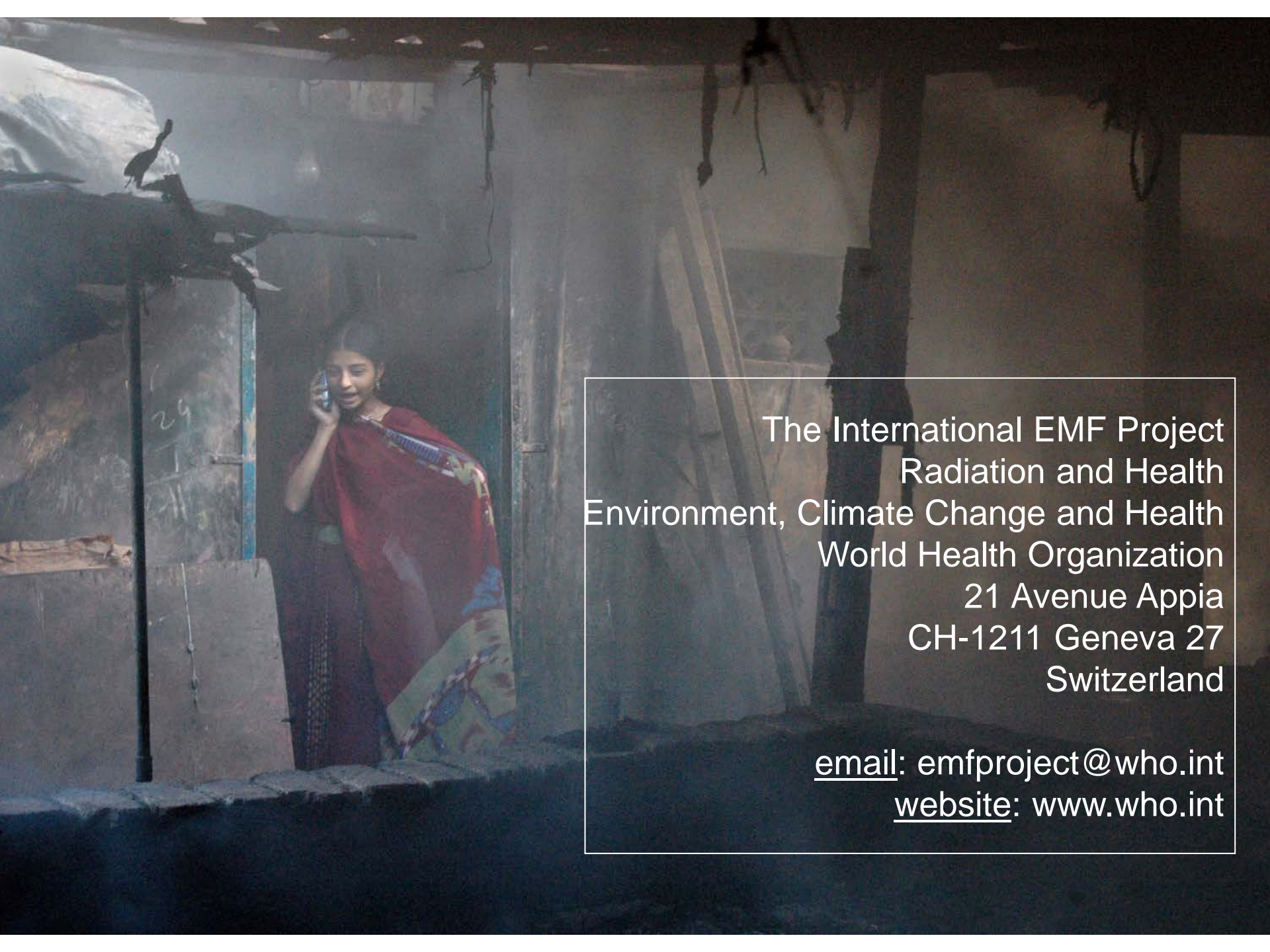
- Balancing any potential **risks** with major **benefits** from digital technologies for health (e-health, m-health, artificial intelligence, ...)



Conclusions

- Need for **clear roles and responsibilities** in government on this topic
- Need for adoption and compliance of **health-based standards**
- Need for a public information program and dialogue with **stakeholders**
- Need for promoting (good quality) **research** to reduce uncertainty





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