Workshop on
Technical and Regulatory Aspects
of the Effects of Non-Ionizing Electromagnetic Emissions
CITEL, Committee II
19 June 2006
Lima, Peru

The WHO International EMF Project

Dr E. van Deventer

Radiation and Environmental Health
Public Health and Environment

World Health Organization
Geneva, Switzerland

World Health Organization

OUTLINE

- Introduction
- The WHO International EMF Project
  - Risk assessment of EMF research
  - Risk management programs
  - Risk communication tools
- Conclusions

World Health Organization

The Present Global Context

- Ever more sophisticated RF systems
- Increasing number of devices and users

⇨ Increasing exposure to EMF

⇨ Increasing concern from the public

Daily Mail
24 October 2002
Page 43

Mobiles 'boost cancer'

Radiation may make tumours grow faster

By **Tim Utton**
Science Reporter

NEW safety fears about mobile phones emerged yesterday over a possible link with cancer.

Radiation from the phones could promote the growth of tumours, according to scientists.

A new study suggests the radiation can kick cancer cells into 'high gear' and make tumours grow much more aggressively.

There are 40million mobile users in the UK, but despite the millions spent on research in the last decade, the health implications of sustained 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 Bologna, exposed leukaemia cells in the laboratory to 48 hours of continuous radio waves at a similar power and frequency to mobile phone emissions.

Initially, the radiation killed the cancer cells. But then the scientists noticed this lethal effect had gone into reverse as a 'survival mechanism' was triggered, which made them replicate at a ferocious speed.

Dr Marinelli said: 'We don't know what the effects would be on healthy human cells.

'But in leukaemia cells the response is always the same.'

The radiation may initially damage DNA, he said, interfering with chemical signals in a way that ultimately triggers the defensive reaction prompting cancer cells to replicate faster.

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 earlier this year, said the research was 'intriguing'.

Radiation may indirectly damage DNA by affecting its repair system, he said. If the DNA repair mechanism does not work as well as it should, mutations in cells could accumulate – with disastrous consequences.

'Cells with unrepaired DNA damage are likely to be far more aggressively cancerous,' said Dr de Pomerai. Dr Marinelli presented his results at the International Workshop on the Biological Effects of Electromagnetic Fields, held in Greece.

The study is published in this week's New Scientist.

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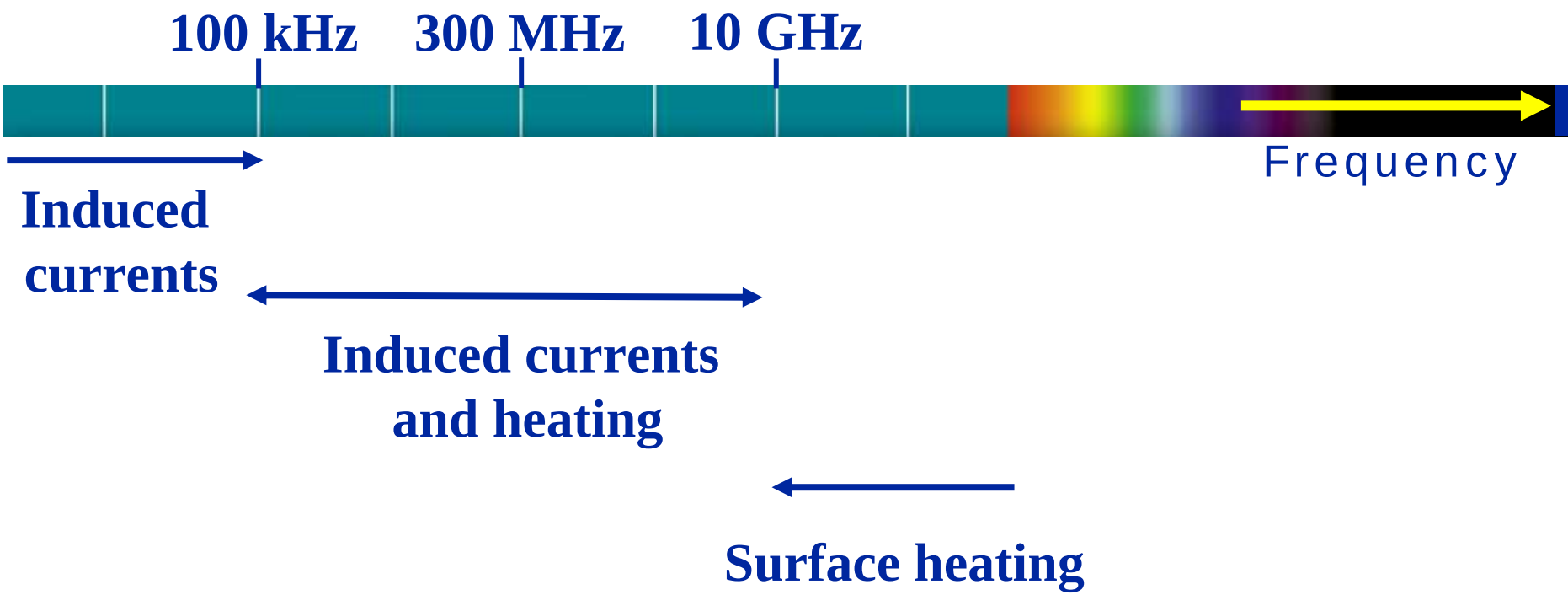
The Present Scientific Knowledge

- Large and increasingly sophisticated database
- Known mechanisms
- Health effects not established below international guidelines
- Scientific uncertainty … precaution?

Interaction Mechanisms



World Health Organization

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WHO's Definition of Health

"HEALTH is a state of COMPLETE physical, mental and social well-being and not merely the ABSENCE of disease or infirmity"

(WHO Constitution)

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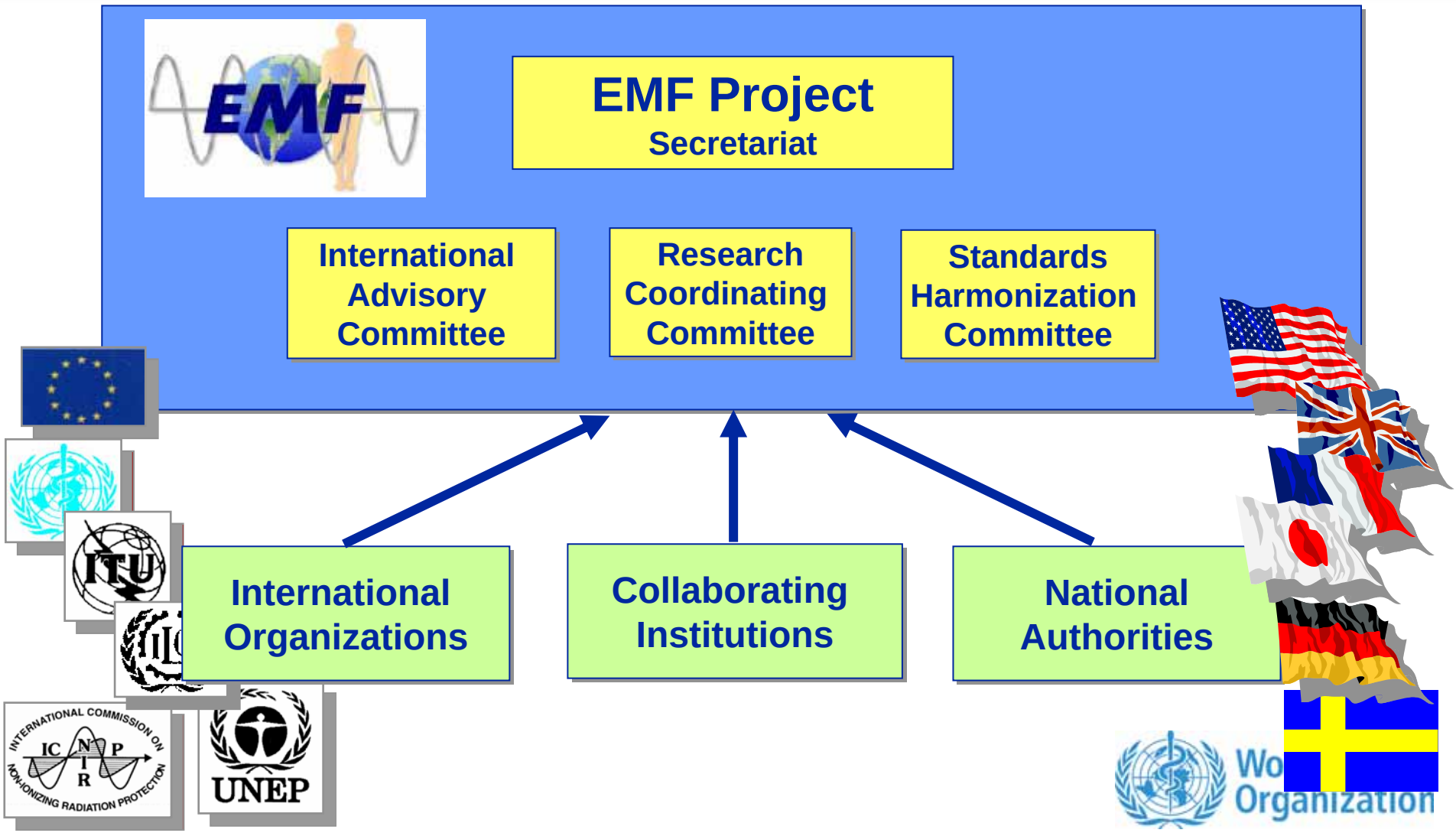
International EMF Project

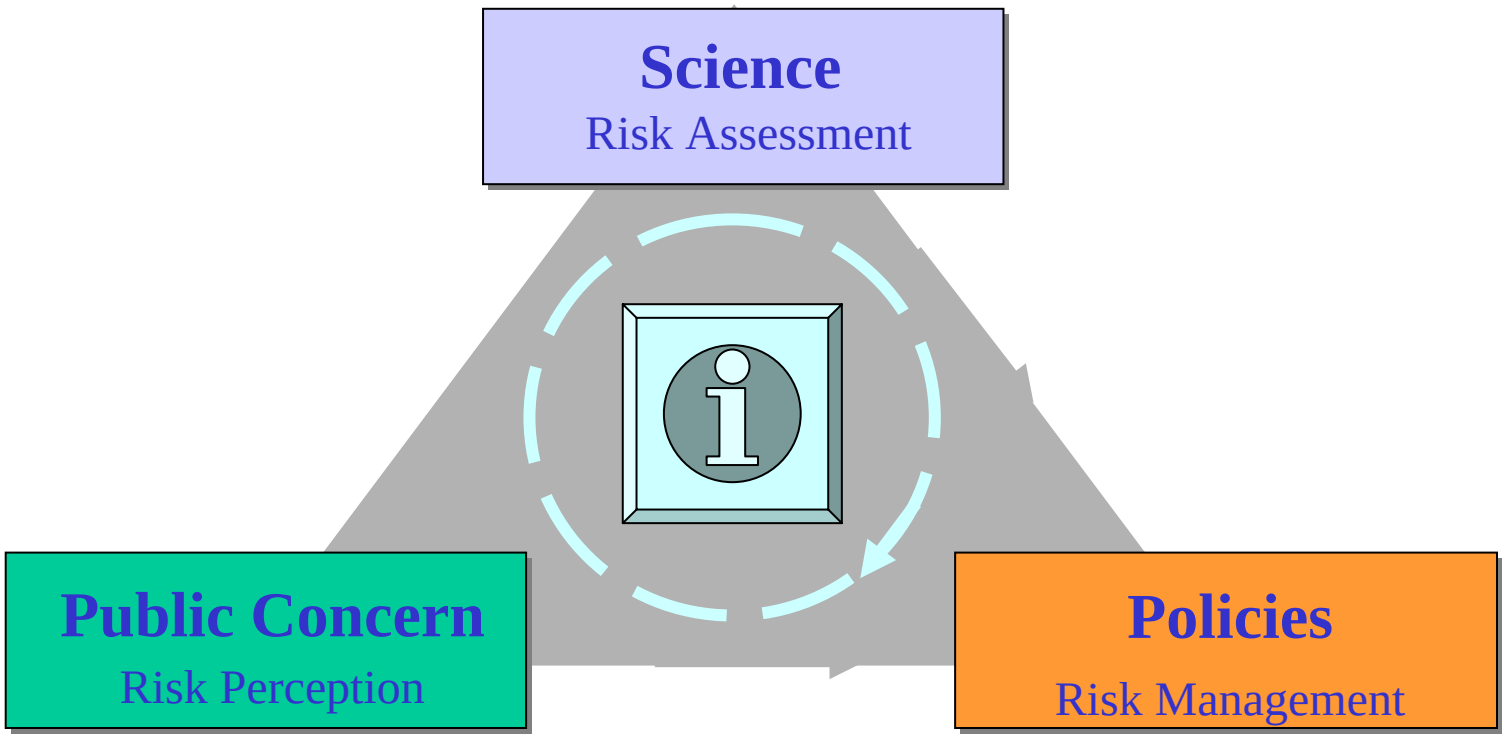
- Established in 1996
- To assess health and environmental effects of exposure to electromagnetic fields in the frequency range from 0 to 300 GHz
- A multinational, multidisciplinary effort to create and disseminate information appropriate to human health risk assessment for EMF
- Coordinated by WHO

World Health Organization

Structure


EMF
EMF Project
Secretariat
International Advisory Committee
Research Coordinating Committee
Standards Harmonization Committee
International Organizations
Collaborating Institutions
National Authorities
ITU
INTERNATIONAL COMMISSION ON NON-IONIZING RADIATION PROTECTION
IC N I P R
UNEP
Wo
Organization

EMF: An Environmental Risk?



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WHO EMF Project and Research

☒ WHO does NOT perform research

☒ WHO does NOT fund research

☑ WHO coordinates research

- E.g. French-Russian study

☑ WHO assesses research

- Scientific workshops
- Health risk assessments

World Health Organization

WHO and EMF Research

http://www.who.int/emf

What has been done?

What is being done?

What needs to been done?

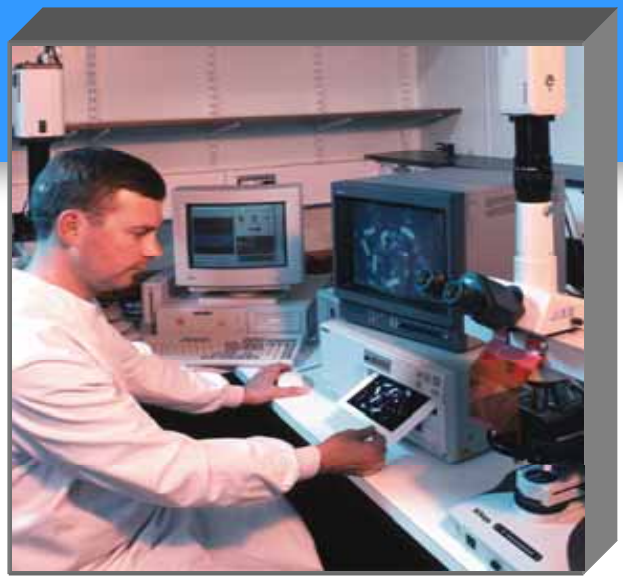
time

- WHO Research reviews
- Health Risk Assessments

WHO Research Database

WHO Research Agenda

World Health Organization



Funding Agencies

Sixth Framework Programme
2002 - 2006

MTHR
Mobile Telecommunications and Health Research

World Health Organization

Research agenda

Introduction

This Introduction is followed by the definitions used by WHO International EMF Projec
The next section of the agenda is a list of needed EMF research that still needs to be co
assessments of any health risks from exposure to EMF.

The list of required research is followed by a set of general guidelines for quality EMF r
that includes resources for further investigation of the characteristics of good EMF resea

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Scientific Process

Science

Define hypothesis

Design study

Seek funding

Conduct study

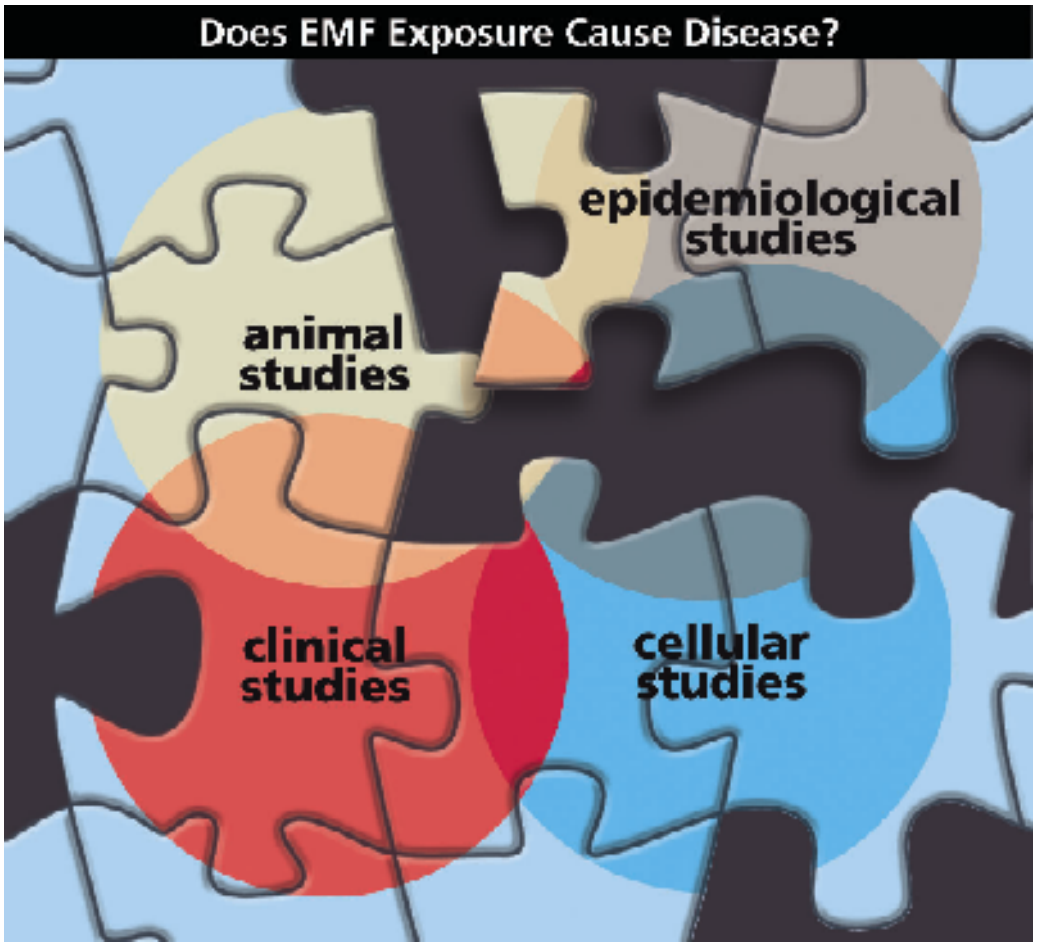
Publish study

Incorporate study
in health risk assessment

Policies

World Health Organization

RESEARCH
Balance of studies needed



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

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WHO Health Risk Assessment

Risk assessment
of **all health outcomes**
(Environmental Health Criteria)

International EMF Project

Hazard identification and classification
of possible **carcinogens**
(Monographs)

International Agency for Research on Cancer (IARC)

Centre International de Recherche sur le Cancer (CIRC)

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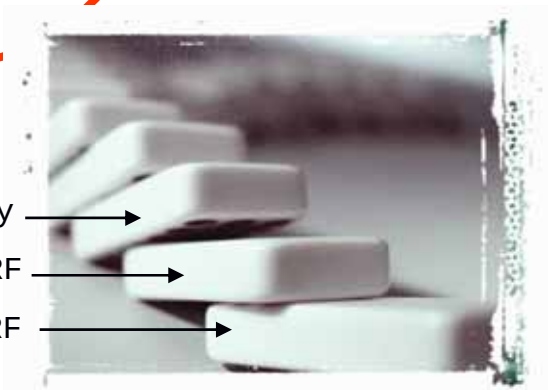
Health Risk Assessment
Schedule

Static	ELF	RF
IARC 2001-2002 EHC 2002-2005	IARC 2001-2002 EHC 2002-2006	IARC 2007 EHC 2007-2008
		

INTERPHONE multinational epidemiologic study →

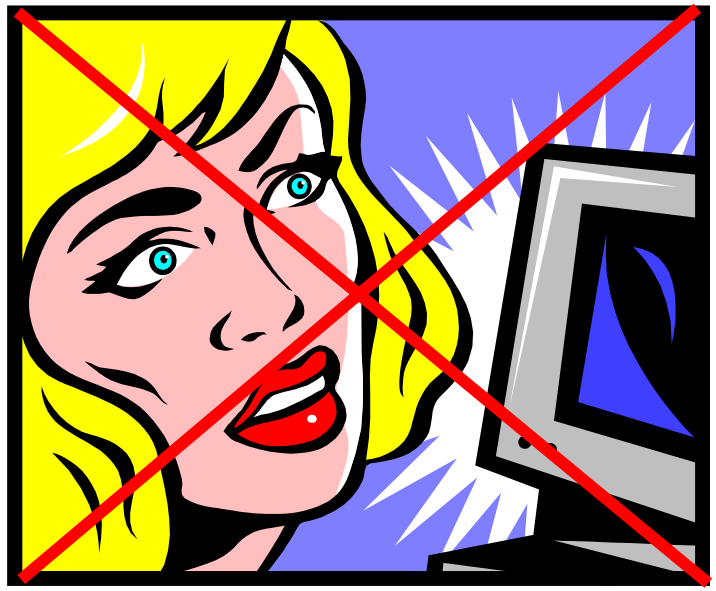
IARC evaluation of **carcinogenic** risks to humans from RF →

WHO assessment of all health risks to humans from RF →



Key Issues

WHO workshop on
Children sensitivity to EMF
Istanbul, June 2004



WHO workshop on
Electromagnetic hypersensitivity
Prague, October 2004

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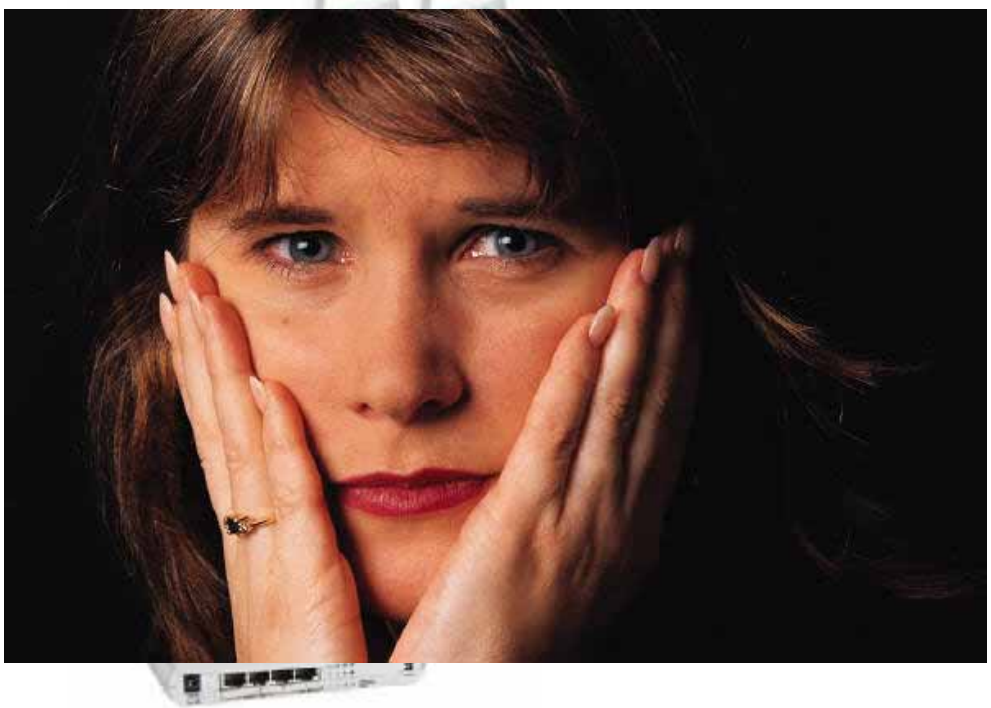
Key Issues

WHO workshop on
Base stations and wireless networks
Geneva, June 2005



http://www.who.int/peh-emf/meetings/base_stations_june05/en/
N. Kuster, WHO Base station workshop, June 15, 2005
http://www.who.int/peh-emf/meetings/archive/bsw_kuster.pdf

Nota descriptiva N°304
Mayo 2006

Nº 304

Los campos electromagnéticos y la salud pública

Estaciones de base y tecnologías inalámbricas

Hoy día la telefonía móvil es algo corriente en todo el mundo. Esa tecnología inalámbrica se basa en una amplia red de antenas fijas o estaciones de base que transmiten información mediante señales de radiofrecuencia (RF). Hay más de 1,4 millones de estaciones de base en todo el mundo, y la cifra está aumentando de forma considerable con la aparición de las tecnologías de tercera generación.

Hay otras redes inalámbricas que permiten obtener servicios y acceso a Internet de alta velocidad, como las redes de área local inalámbricas (WLAN), cuya presencia también es cada vez más frecuente en los hogares, las oficinas y muchos lugares públicos (aeropuertos, escuelas y zonas residenciales y urbanas). A medida que crece el número de estaciones de base y de redes locales inalámbricas, aumenta también la exposición de la población a radiofrecuencias. Según estudios recientes, la exposición a RF de estaciones de base oscila entre el 0,002% y el 2% de los niveles establecidos en las directrices internacionales sobre los límites de exposición, en función de una serie de factores, como la proximidad de las antenas y su entorno. Esos valores son inferiores o comparables a la exposición a las RF de los transmisores de radio o de televisión.

OUTLINE

Science

- Scientific Reviews
- Health Risk Assessment

- Introduction

Communication

- Information
- Risk Perception
- Dialogue

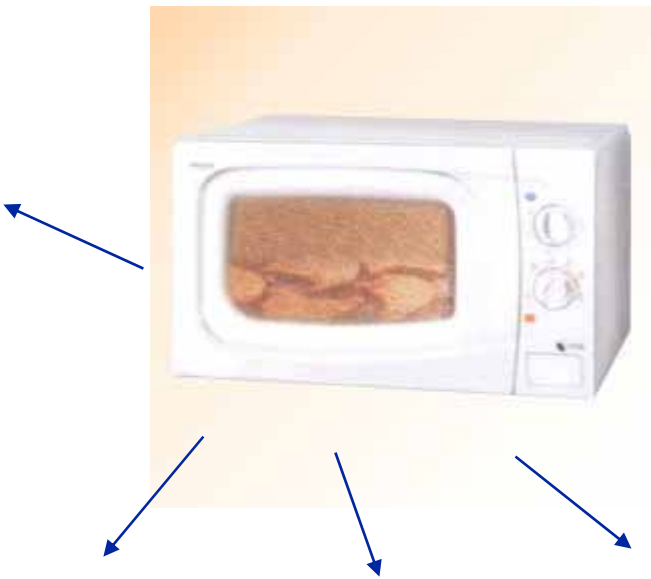
Policies

- Standards
- Legislation
- Precaution

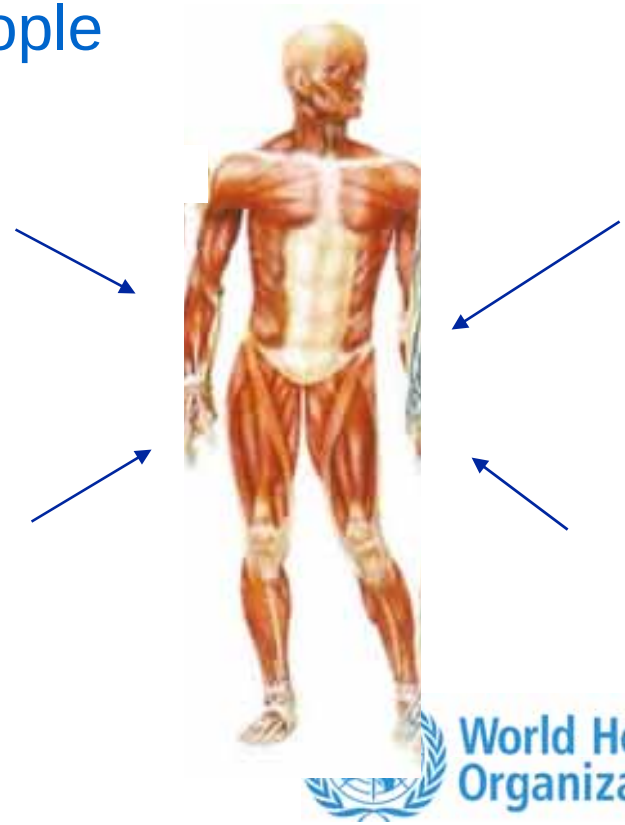
World Health Organization

Norms, Standards and Guidelines

- **Emission standards** have specifications that limit the EMF emissions from devices



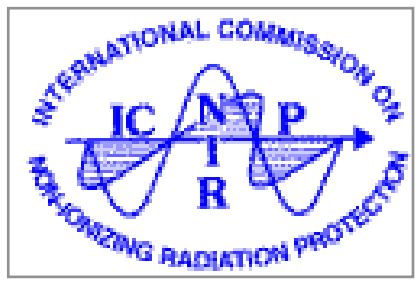
- **Exposure standards** have specifications that limit EMF exposure to people



Norms, Standards and Guidelines

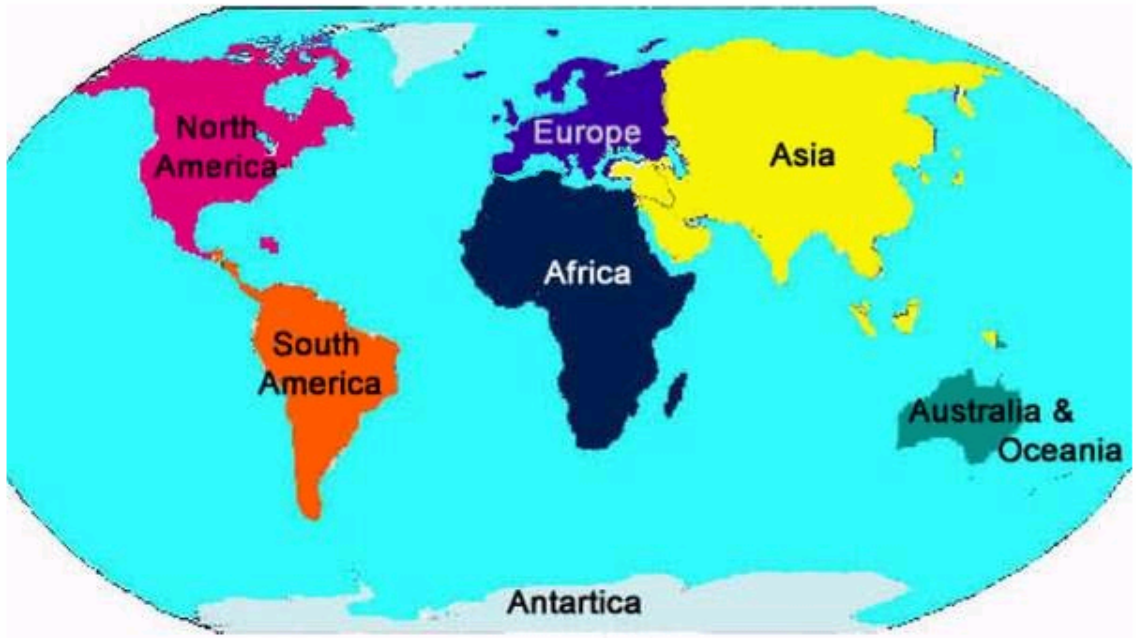
- **Emission standards** have specifications that limit the EMF emissions from devices

- **Exposure standards** have specifications that limit EMF exposure to people



International EMF Project

EMF WORLD WIDE STANDARDS



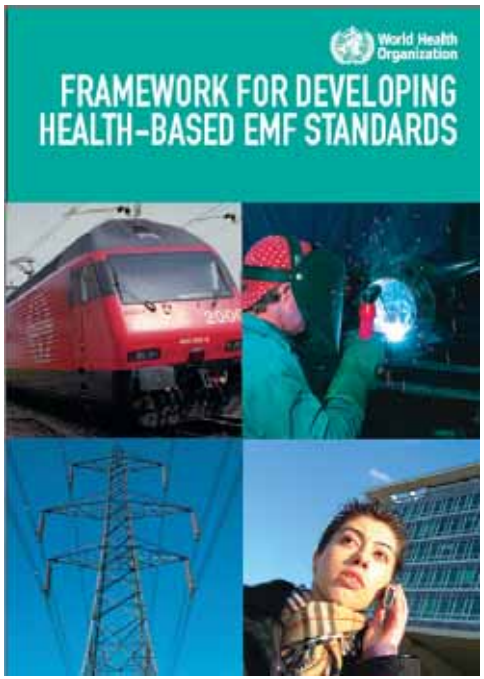
Compiled by Dr Dina Simunic

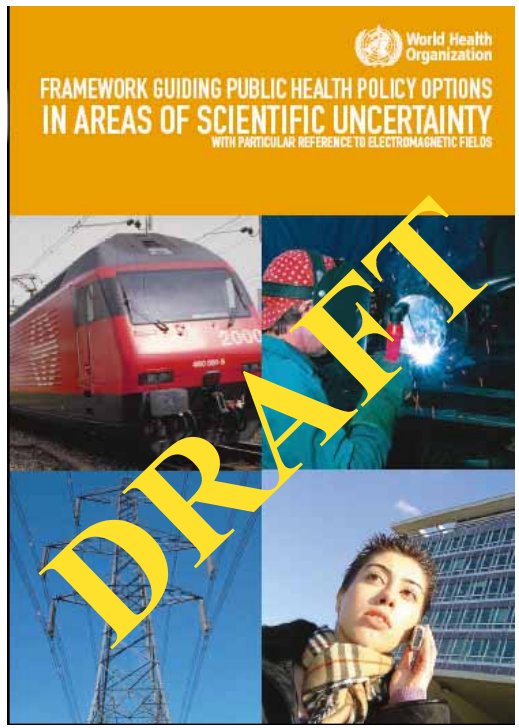
SOUTH AMERICA

Electromagnetic Fields (EMF) Protection

Country #1	**Peru**
EMF protection #2	Yes
Instrument type #3	Decree
Instrument coverage #4	National
Title of Instrument #5	
a.	Establishment of Maximum Permissible Limits for Non-Ionizing Radiations from Telecommunications, Supreme Decree No. 038-2003-MTC
Issued by whom? #6	Ministry of Transport and Communications, MTC
Issued when? #7	July 2003
Is there a revision pending? #8	Yes
Are the limits based on ICNIRP? #9	Yes
Compliance #10	Mandatory for MTC- licencees and grantees
If mandatory - how is	MTC review and supervisory activities

New policy documents ….





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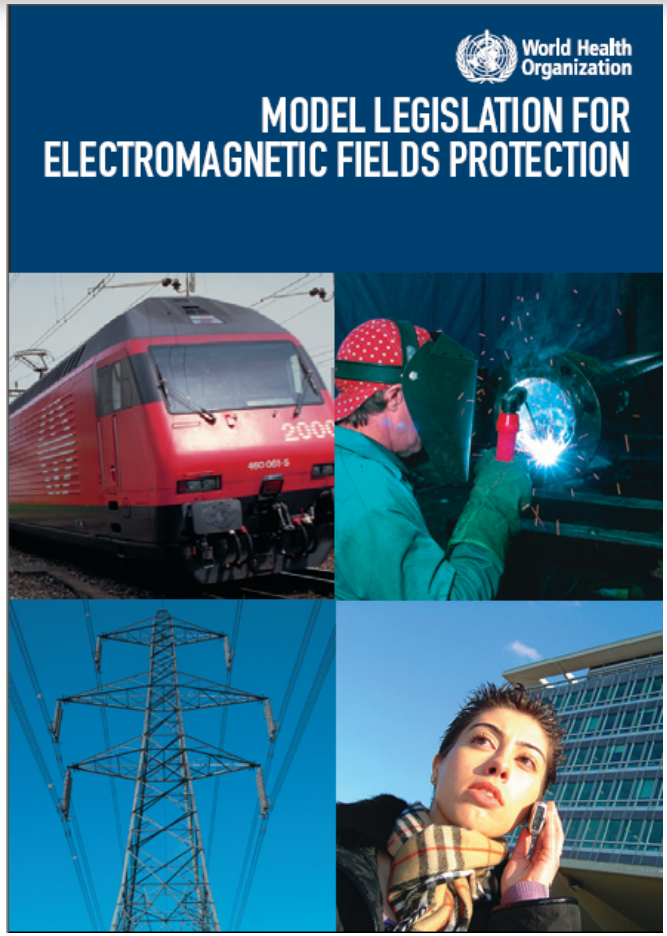
Model Legislation

- To assist countries without appropriate legislation to protect their population from EMF
- Uses international standards for exposure and emission limits

- Model Act and
- Model Regulation
- Explanatory Memorandum



http://www.who.int/peh-emf/standards/emf_model/en/index.html

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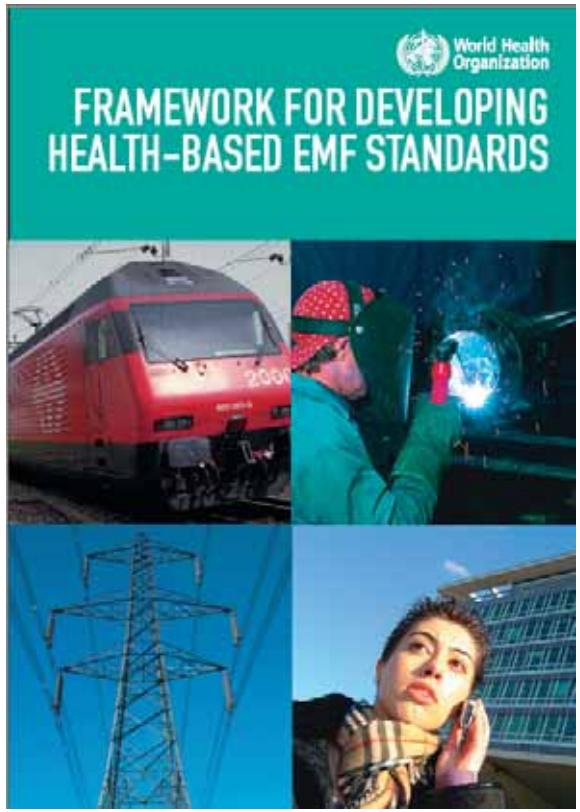
Framework for Developing EMF Standards
Motivation

- Many countries currently considering new EMF standards
- Concerns about public safety and anxiety about increasing EMF exposures from new technologies
- Large differences between national standards



http://www.who.int/peh-emf/standards/framework/en/index.html

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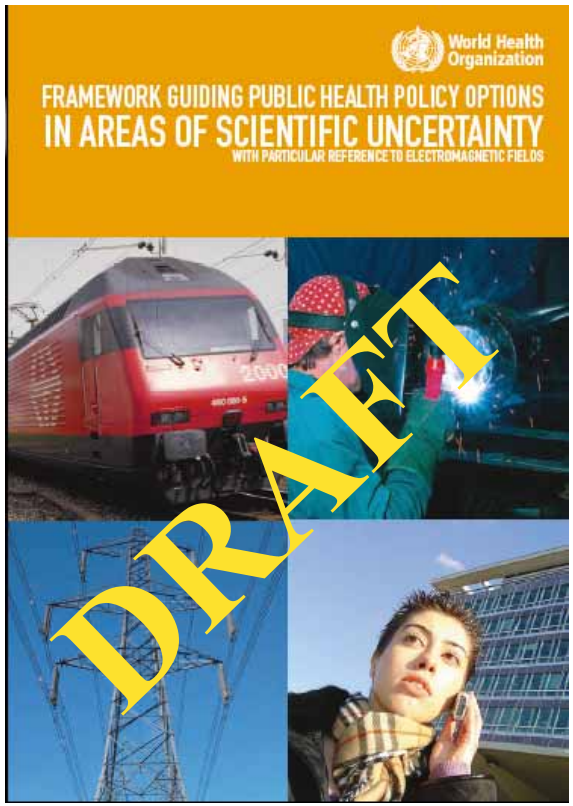
Framework Guiding Public Health Options in Areas of Scientific Uncertainty



- Science-based and precautionary options for EMF
- ELF and RF case studies

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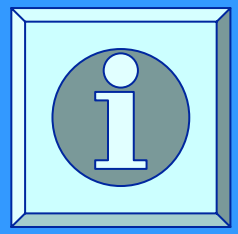
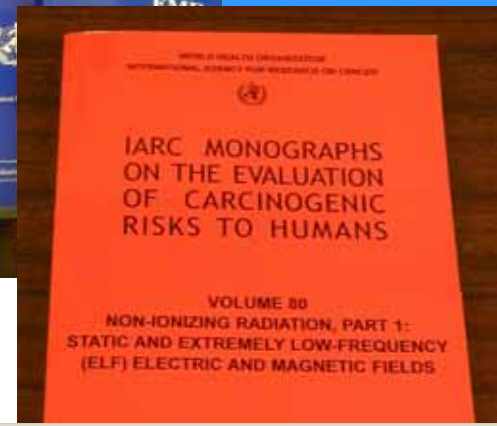
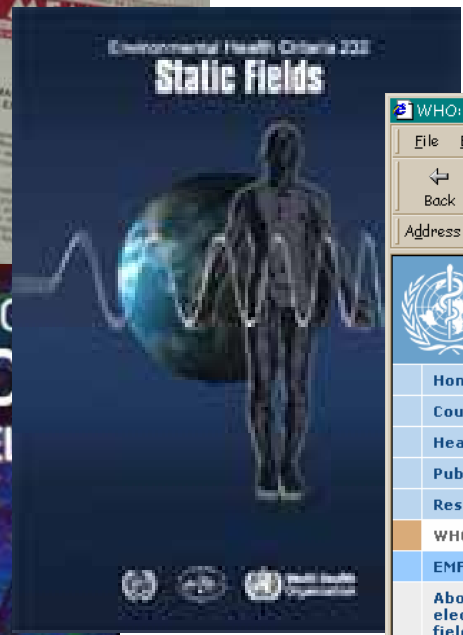


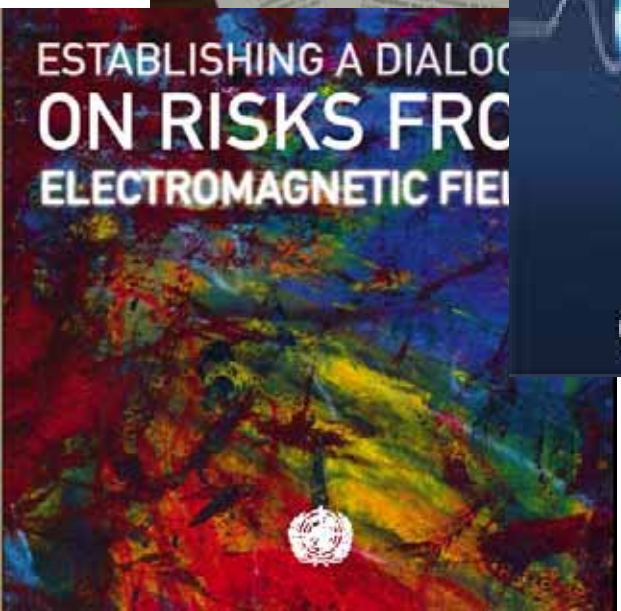

Science Reprint
Science and the Precautionary Principle


BIOLOGICAL EFFECTS, HEALTH CONSEQUENCES AND STANDARDS FOR PULSED RADIOFREQUENCY FIELDS
EFFECTS OF ELECTROMAGNETIC FIELDS ON THE LIVING ENVIRONMENT


IARC MONOGRAPHS ON THE EVALUATION OF CARCINOGENIC RISKS TO HUMANS
VOLUME 80
NON-IONIZING RADIATION, PART 1: STATIC AND EXTREMELY LOW-FREQUENCY (ELF) ELECTRIC AND MAGNETIC FIELDS


FACT SHEET
1948
1998
AIDE


Environmental Health Criteria 232
Static Fields


ESTABLISHING A DIALOG
ON RISKS FRO
ELECTROMAGNETIC FIEL


WHO: Electromagnetic fields (EMF) - Microsoft Internet Explorer provided by WHO
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit
Address http://www.who.int/peh-emf/en/
Links
www.who.int/emf
English | Español | Français
World Health Organization
Search
OK
Home
Countries
Health topics
Publications
Research tools
WHO sites
EMF Home
About electromagnetic fields
EMF Project
Research
Standards
EMF publications & information
Electromagnetic fields (EMF)
About us | Contact us | Publications
Location: WHO > WHO sites > EMF Home
Electromagnetic fields (EMF)
EMF
Electromagnetic fields of all frequencies represent one of the most common and fastest growing environmental influences, about which anxiety and speculation are spreading. All populations are now exposed to varying degrees of EMF, and the levels will continue to increase as technology advances.
As part of its Charter to protect public health and in response to public
WHAT'S NEW!
Sensitivity of children to EMF exposure, June '04
Istanbul, Turkey
Abstracts deadline 30 April 2004, more information
New RF research agenda - July 2003
More information
Recent Powerpoint Presentations
Click here
Framework for developing EMF Standards
We invite public comment on the draft
Internet
Start
15:45

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Challenges

- Technologies on the market before health evaluation
- Lack of harmonization in standards
  - Restrict technological advances and loss of benefits
- Public concern
  - Need for scientists and decision-makers to communicate with all stakeholders

World Health Organization

The International EMF Project
Radiation and Environmental Health
Protection of the Human Environment
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website: www.who.int/emf