WHO MODEL EMF LEGISLATION & REFERENCE LEVELS

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- **Need to develop Model Legislation to enable government agencies to limit the exposure of people to electromagnetic fields (EMF) was expressed by members of the International Advisory Committee (IAC) to WHO's International EMF Project.**
- **Such legislation would facilitate introduction of appropriate measures to protect the public and workers from potential adverse effects of EMF.**
- **To assist countries not having appropriate legislation to protect their population, the International EMF Project has developed a Model Act and a Model Regulation that provide the legal framework to provide this protection.**
- **An important aspect of this model legislation is that it uses international standards that limits EMF exposure of people (ICNIRP exposure standards) and international standards that limit the emissions of EMF from devices (IEC and IEEE device emission standards).**
- **Model Legislation follows the widely accepted practice among lawmakers of setting out an enabling Act that permits the responsible Minister to subsequently issue Regulations, Statutory Orders or Ordinances as appropriate to deal with specific areas of concern.**

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Three elements of Model Legislation:

- a Model Act to enable an Authority to initiate regulations and statutes that limit the exposure of its population to electromagnetic fields in the frequency range 0 Hz to 300 GHz

- a Model Regulation which sets out in detail the scope, application, exposure limits and compliance procedures that are permitted under the Act to limit people's exposure to electromagnetic fields (EMF)

- an Explanatory Memorandum describing the approach to the Act and its Regulations

- If a national authority wants to develop its own exposure limits, it should use or consider the WHO Framework for Developing EMF Standards.

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

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Model Electromagnetic Fields Human Exposure Act

I. Preliminary and General

1. Short Title
2. Purpose
3. Scope and Application
4. Definitions

II. EMF Exposure Limits and Compliance Procedures

5. EMF EXPOSURE LIMITs
6. COMPLIANCE
7. ENFORCEMENT
8. Record Keeping and Information Provision
9. ENTRY INTO FORCE

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Model Human EMF Exposure Limit Regulation

I. Preliminary and General

1. **SHORT TITLE**
2. **PURPOSE and OBJECTIVES**
3. **SCOPE and APPLICATION**
4. **DEFINITIONS**

II. EMF Exposure Limits and Compliance Procedures

5. EMF Exposure Limits

Two kinds of EMF exposure limits:

- **Basic Restrictions that should always be complied with Reference Levels that may be exceeded provided the Basic Restrictions are not exceeded. Basic Restrictions are quantities that may be difficult to measure directly. In some instances, they can only be calculated using mathematical methods or measured in a phantom.**

- **Reference Levels, in contrast, are expressed in quantities that can be readily measured by a variety of scientific instruments.]**
  - **Basic Restrictions for public exposure in areas to which the public have access are set out in Table 1 "Basic Restrictions – Public Exposure".**
  - **Reference Levels for public exposure in areas to which the public have access are set out in Table 2 "Reference Levels – Public Exposure".**
  - **Basic restrictions for trained workers in their occupational environment are set out in Table 3 "Basic Restrictions – Occupational Exposure".**
  - **Reference Levels for trained workers in their occupational environment are set out in Table 4 "Reference Levels - Occupational Exposure".**

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6. COMPLIANCE PROCEDURES

7. REPORTING AND MEASUREMENTS

III. RESPONSIBILITIES AND ENFORCEMENT

8. RESPONSIBILITIES

9. ENFORCEMENT

10. REPORT KEEPING

11. ENTRY INTO FORCE

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BASIC RESTRICTIONS AND REFERENCE LEVELS, Tables

ICNIRP Tables on Basic restrictions for time varying electric and magnetic fields for frequencies up to 10 GHz shall be from December 2019 Guidelines

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ICNIRP Tables on Basic restrictions for power density for frequencies between 10 and 300 GHz.[a]

Exposure Characteristic	Power Density (W m^{22})
Occupational Exposure	50
Public Exposure	10

[a] Note

1. Power densities are to be averaged over any 20 cm^2 of exposed area and any $68/f^{1.05}$-min period (where f is in GHz) to compensate for progressively shorter penetration depth as the frequency increases.
2. Spatial maximum power densities, averaged over 1 cm^2, should not exceed 20 times the values above.

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ICNIRP Table on Reference levels for occupational exposure to time-varying electric and magnetic fields from December 2019 Guidelines shall be applicable

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ICNIRP Table on Reference levels for general public exposure to time-varying electric and magnetic fields from December 2019 Guidelines shall be applicable

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MEASUREMENT AND EVALUATION

Measurement or evaluation methods should be those developed by international standards setting agencies such as the IEC, CENELEC or IEEE.

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EXPLANATORY MEMORANDUM

I. MODEL ACT

The Articles

SHORT TITLE

Article ……

PURPOSE

Article ……

SCOPE AND APPLICATION

Article ……

DEFINITIONS

Article …….

EMF EXPOSURE LIMITS

Article……

Compliance

Articles……..

Enforcement

Article……

Record Keeping

Article……

Entry into Force

Article ……..

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WHY A STANDARDS FRAMEWORK?

- The need to understand the potentially harmful effects of EMF on human health has been met by several decades of research, but the development of exposure standards is more recent, and a variety of national standards now exist.

- The disparities in EMF standards around the world have arisen from the use of only national databases, different criteria for accepting or assessing individual studies, varying interpretations of the scientific data or different philosophies for public health standards development.

- Such differences in EMF exposure guidelines might reflect, in part, deficiencies in communications among scientists between different regions as well as certain social differences.

- Large disparities between national limits and international guidelines can foster confusion for regulators and policy makers, increase public anxiety and provide a challenge to manufacturers and operators of communications systems who need to tailor their products to each market.

- These factors have motivated the world health organization (who) to build a framework for developing health-based EMF exposure standards using a rational scientifically driven process.

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GUIDING PRINCIPLES

- WHO encourages the establishment of exposure limits and other control measures that provide the same or similar level of health protection for all people.
- It endorses the guidelines of the international commission on non-ionizing radiation protection (ICNIRP) and encourages member states to adopt these international guidelines.
- However, if a member state wants to develop its own standards, this framework can be used as a guide.

PURPOSE

- The framework for developing health-based EMF standards provides advice on how to develop science-based exposure limits that will protect the health of the population from EMF exposure.
- The framework is intended for national advisory and/or regulatory bodies that are either developing new standards for EMF or reviewing the basis

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SCOPE

- **The framework addresses how quantitative exposure standard scan be developed.**
- **The general steps in this process include an evaluation of the scientific literature, determination of threshold levels, choice of safety factors for different populations at risk, and derivation of exposure limits.**
- **Other considerations regarding the overall practicability of the standard, compliance procedures and the use of precautionary measures are also addressed.**

2. EMF STANDARDS

- **A standard is a general term incorporating both regulations and guidelines and can be defined as a set of specifications or rules to promote the safety of an individual or group of people.**
- **The goal of health-based EMF standards is to protect human health.**
- **However, there is often confusion about the various types of standards that exist to limit human exposure to EMF.**

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EXPOSURE, EMISSION AND MEASUREMENT STANDARDS

- **EMF standards can specify either limits of emission from a device, or limits of human exposure from all devices that emit EMF into a living or working environment.**
- **Exposure standards are basic standards of personal protection that generally refer to maximum levels to which whole or partial body exposure is permitted from any number of emf emitting devices.**
- **This type of standard normally incorporates safety factors and provides the basic guide for limiting personal exposure.**
- **Such standards have been developed by the**

- **international commission on non-ionizing radiation protection (ICNIRP, http://www.icnirp.org),**
- **the institute of electrical and electronic engineers/ international committee on electromagnetic safety (IEEE/ ICES, http://grouper.Ieee. Org/groups/scc28/)**
- **and many national authorities.**

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VOLUNTARY AND MANDATORY STANDARDS

- At the country level, regulations for exposure EMF can be broadly categorized as either voluntary or mandatory instruments.

- **Voluntary instruments** include guidelines, instructions and recommendations that are not legally mandated, and generally have no legal force. International guidelines, such as those developed by ICNIRP, IEEE and others, provide guidance to national agencies, and only become legally binding if the country incorporates them into its own legislation.

- **Mandatory, compulsory or legally binding instruments** include laws, acts, regulations, ordinances, decisions, and decrees, and require a legislative framework. Procedures should exist to ensure compliance of mandatory standards. For EMF exposure standards, an agency is normally mandated to check compliance through calculations and measurements made in the workplace and other areas. For emission standards, compliance of devices is usually certified by the manufacturer.

- At present, there are no internationally mandated standards for EMF. However, for telecommunications services, **ITU recommends adoption of the ICNIRP guidelines where no national standard exists (ITU, 2004).** Given the large differences between national standards and the varied bases on which these standards have developed exposure limitation, **WHO's EMF project felt, it was more helpful to promote existing international standards and, at the same time, to develop model legislation that would enable national authorities to enact international EMF standards or their own standards.** For details on model legislation see: http://www.Who.Int/peh-emf/standards/emf_model/en/index.html

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Determining the need for standards

WHO strongly recommends that member states adopt international standards that limit both EMF exposures to people and EMF emissions from devices. If international emission standards do not exist for certain devices that emit EMF at levels approaching exposure limits, then member states should strongly encourage the development of standards by the appropriate international organization.

Member states who do not want to adopt international standards, should carefully consider the reasons for and the value of developing their own standards before embarking on this long process.

Questions to address before developing national standards include:

- **Do international standards truly not provide adequate protection?**
- **In developing national standards, what is the accrued benefit to health?**
- **Is the development of a separate, more stringent national standard and the additional compliance procedures truly cost-effective from both a public health and an implementation perspective?**
- **Will more conservative limits be a barrier to the introduction of new technologies, which may have significant benefits to health, and to international trade?**
- **If the underlying reason comes from public concern, will the existence and implementation of these new regulations or guidelines alleviate the problem?**

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ASSESSMENT OF THE SCIENTIFIC RESEARCH

- **Types and hierarchy of scientific data**
- **Review of the scientific literature**

KEY ELEMENTS OF EMF STANDARD SETTING

- **Threshold levels**
  - http://www.who.Int/docstore/peh-emf/emfstandards
- **Safety factors**
- **Basic Restrictions and Reference Levels**
- **Protecting different populations**
- **Exposure Standard Requirements**

Points to be addressed:

› **Frequency**:

› **Exposure level:** the level of exposure can be practically expressed in terms of reference levels. Situations where simultaneous exposure can occur to multiple frequency fields must be accounted for in the standard.

› **Exposure duration:** the time of exposure to various power levels should be quite precise. In many standards a certain power level is set for continuous exposure for 8 or 24 h per day, but higher levels of exposure are generally permitted for short periods of time. In this respect, the time over which the exposure level is averaged is important.

› **Whole-body and partial-body exposure**: for cases where only part of the human body is close to the emf source (near field), supplementary guidelines should be provided for partial body exposure in addition to whole-body exposure.

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- **Practicability of Standards**
- **Verification of Compliance**
- **Precautionary aspects**
- **Periodic Evaluation**
- **Standards Terminology**

  http://www.who.int/emf/glossary

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ICNIRP Basic Limits from December 2019 Guidelines to apply

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QUESTIONS, if any before Session Closure or even later

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