National Program for Scientific Integration and Professional Education on Electromagnetic Exposure and Health

A four stage proposal for evidence review and interdisciplinary consensus

J. Joaquín Machado
EMR Researcher and EFEIA Institute Director

Proposed by EFEIA Foundation

EFEIA proposes a national program to integrate scientific knowledge on electromagnetic exposure and health, review the adequacy of current assessment criteria, and translate the findings into university education, continuing professional development, and public information. The intended result is an updated, shared framework for evaluating and managing electromagnetic risk, supported by a transparent review of the evidence.

The central concern is the fragmented transfer of knowledge between research and professional practice. Engineering, exposure science, biology, physiology, medicine, and public health address different aspects of the same environment. A structured program would connect their findings and establish what professionals should understand, measure, interpret, and communicate. Its scope would include extremely low and low frequency fields, higher frequency exposures, radiofrequency, and microwave sources, with methods appropriate to each range.

Stage 1 Scientific integration and evidence assessment

Convene a multidisciplinary scientific group to assemble and critically assess the relevant literature, technical standards, exposure methods, and clinical evidence. Universities, professional societies, metrology specialists, and public health institutions should participate through a process with declared interests, balanced expertise, and external review.

Organize the evidence by exposure conditions, measurement quality, biological or clinical endpoint, reproducibility, and relevance to real environments. Distinguish established findings, emerging evidence, inconsistent results, and unanswered questions. Include findings that support current criteria as well as those that challenge them, and separate biological responses from demonstrated adverse health effects.

Stage output An accessible evidence synthesis and common technical glossary identifying agreements, disagreements, measurement limitations, and priorities for further investigation.

Stage 2 Review of criteria and development of consensus

Use the evidence synthesis to examine the scope and adequacy of existing exposure assessment criteria. Evaluate their treatment of frequency, duration, temporal variability, simultaneous sources, actual conditions of use, and populations whose exposure or susceptibility may differ. Identify specifically where current methods remain supported, where they require extension, and where evidence is insufficient to justify a change.

Develop recommendations through documented deliberation, independent peer review, and public consultation. Record the strength of evidence supporting each recommendation and retain unresolved disagreements. Where warranted, propose changes to testing, monitoring, research priorities, or regulatory assessment; a revised numerical limit would require its own scientific justification.

Stage output A consensus report proposing an updated framework for electromagnetic exposure assessment and risk management, with explicit evidence boundaries and a process for periodic revision.

Stage 3 University and professional education

Translate the reviewed evidence and consensus recommendations into university modules and continuing education for engineering, medicine, physiology, environmental health, occupational health, and related professions. A shared foundation should explain electromagnetic quantities, exposure characterization, biological interaction, evidence appraisal, uncertainty, and responsible risk communication.

Provide discipline specific learning pathways. Engineers and measurement professionals would address instrumentation, dosimetry, source interactions, and interpretation of complex environments. Medical and physiological training would cover the assessment of reported symptoms, differential diagnosis, the interpretation of research findings, appropriate referral, and the limits of causal attribution from an exposure history alone. Public and occupational health training would address population assessment, prevention, and communication.

Use joint workshops and practical cases so participants learn how to exchange information across professions. Pilot the modules with participating institutions, assess knowledge and applied competence before wider adoption, and seek continuing education recognition through the relevant accrediting bodies. Revise teaching materials as the underlying evidence changes.

Stage output A common competency framework, adaptable university teaching modules, and evaluated continuing education pathways for the participating professions.

Stage 4 Public education and transfer into practice

Convert the professional framework into clear public guidance for households, schools, workplaces, and local authorities. Explain what exposure assessments and compliance limits address, what conclusions they support, and what uncertainties remain. Describe practical exposure management measures in proportion to the evidence for their effectiveness and relevance.

Develop materials jointly with educators, clinicians, engineers, and community representatives. Test their comprehension, usefulness, accessibility, and effects on anxiety before broad release. Guidance should build the ability to make informed decisions and distinguish measured exposure reduction, demonstrated health benefit, and unverified product claims.

Evaluate the program through public understanding, professional use of the guidance, and the quality of decisions it supports. Maintain a public channel for questions and corrections, and connect revised public materials to updates in the scientific and professional components.

Stage output Tested public information and practical education resources that communicate the same evidence and uncertainty standards used in professional training.

Coordination and continuity

We propose federal coordination with participating universities and professional organizations, with HHS as a proposed health sector convener and technical participation from agencies responsible for communications, measurement, and occupational exposure. Each stage would produce a reviewable output that informs the next. Scientific updates would feed back into the consensus framework, teaching, and public guidance, making the program a continuing national capability rather than a single educational campaign.