

The International EMF Project

Update on WHO EMF Activities

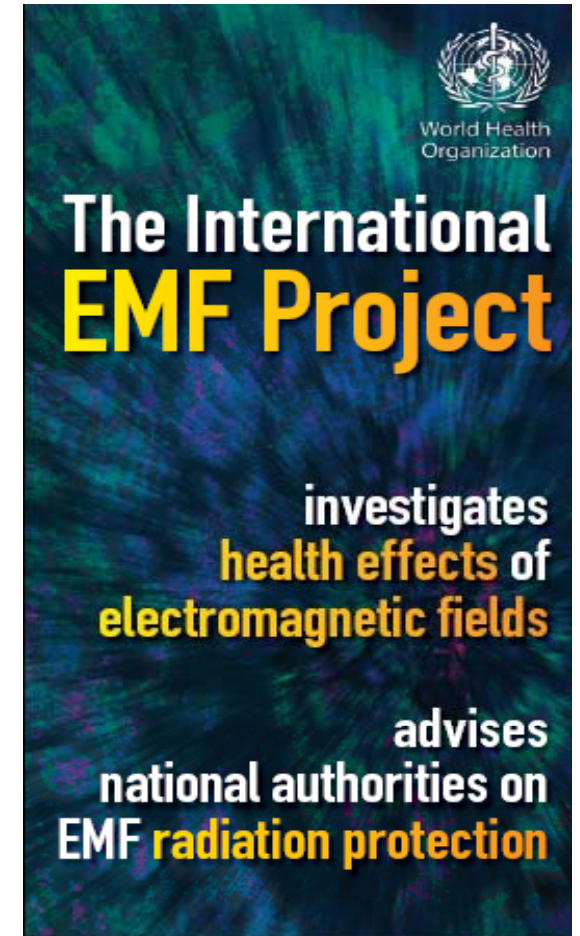
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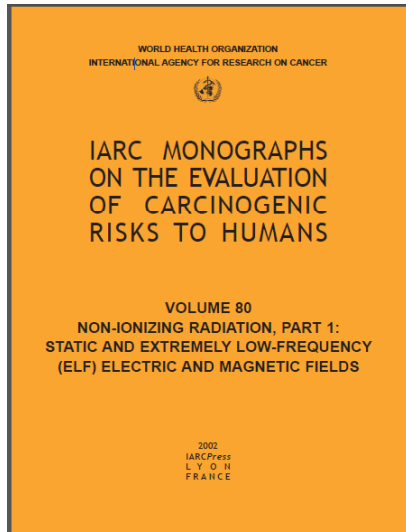


WHO International EMF Project

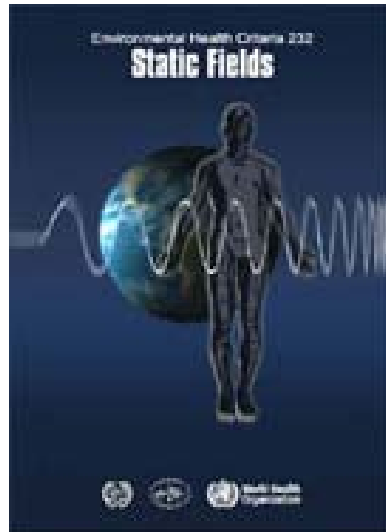
- Established in 1996
- Coordinated by WHO HQ
- Objectives
 - Review the scientific literature on health effects of EMF exposure and formally assess health risks;
 - Promote a focused agenda of high quality EMF research;
 - Encourage internationally acceptable harmonized standards;
 - Provide information on risk perception, risk communication, risk management



WHO EMF Monographs



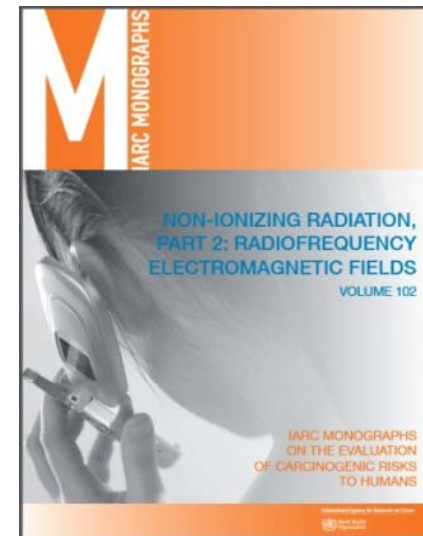
2002



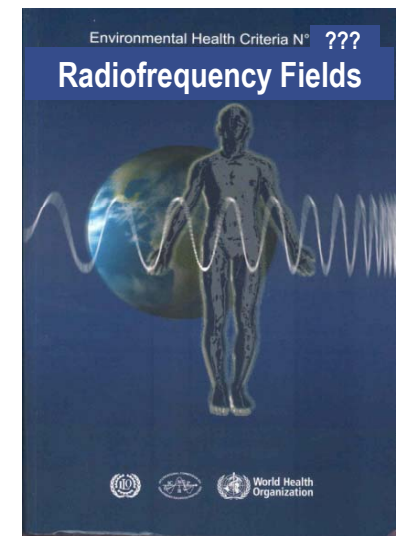
2006



2007



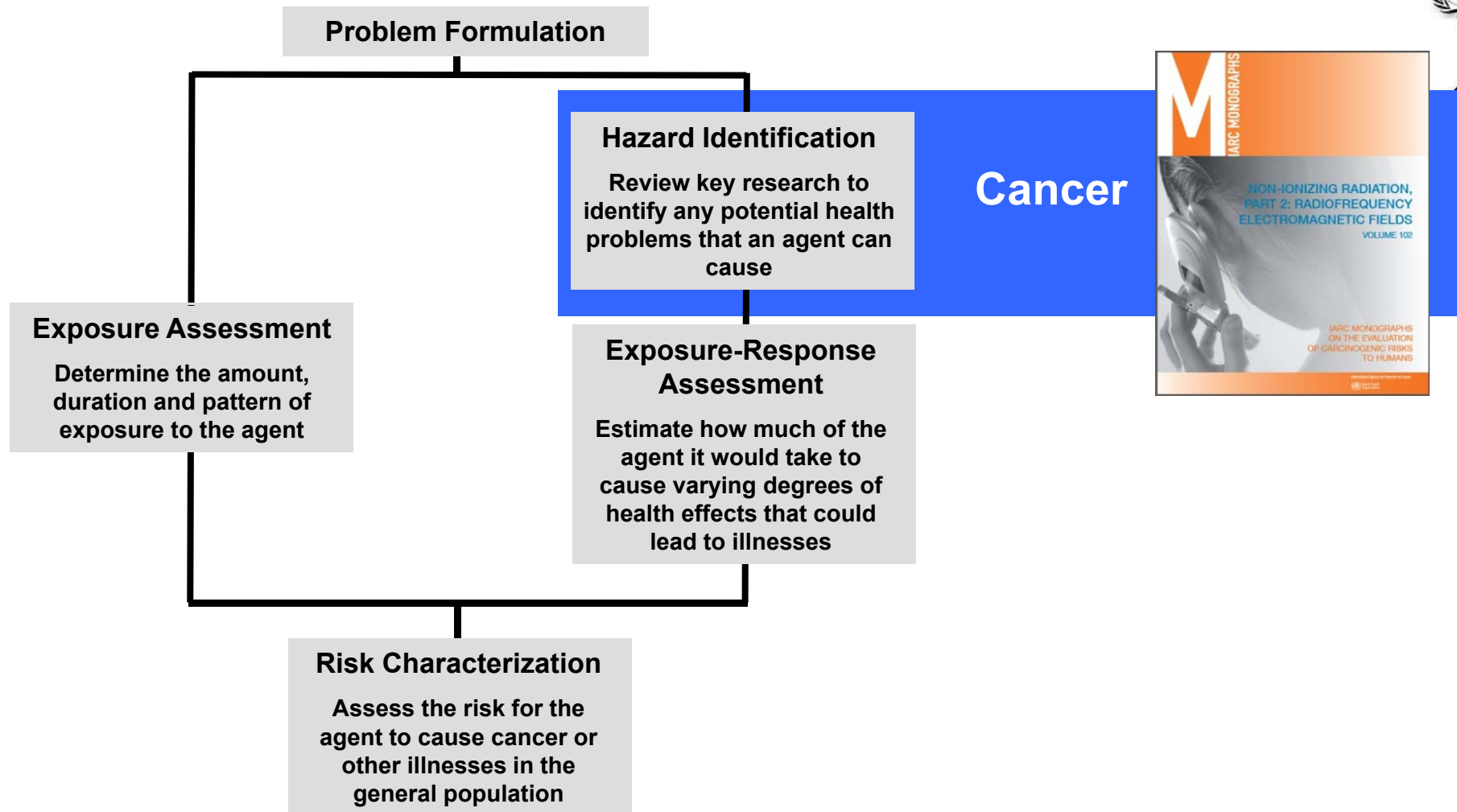
2013



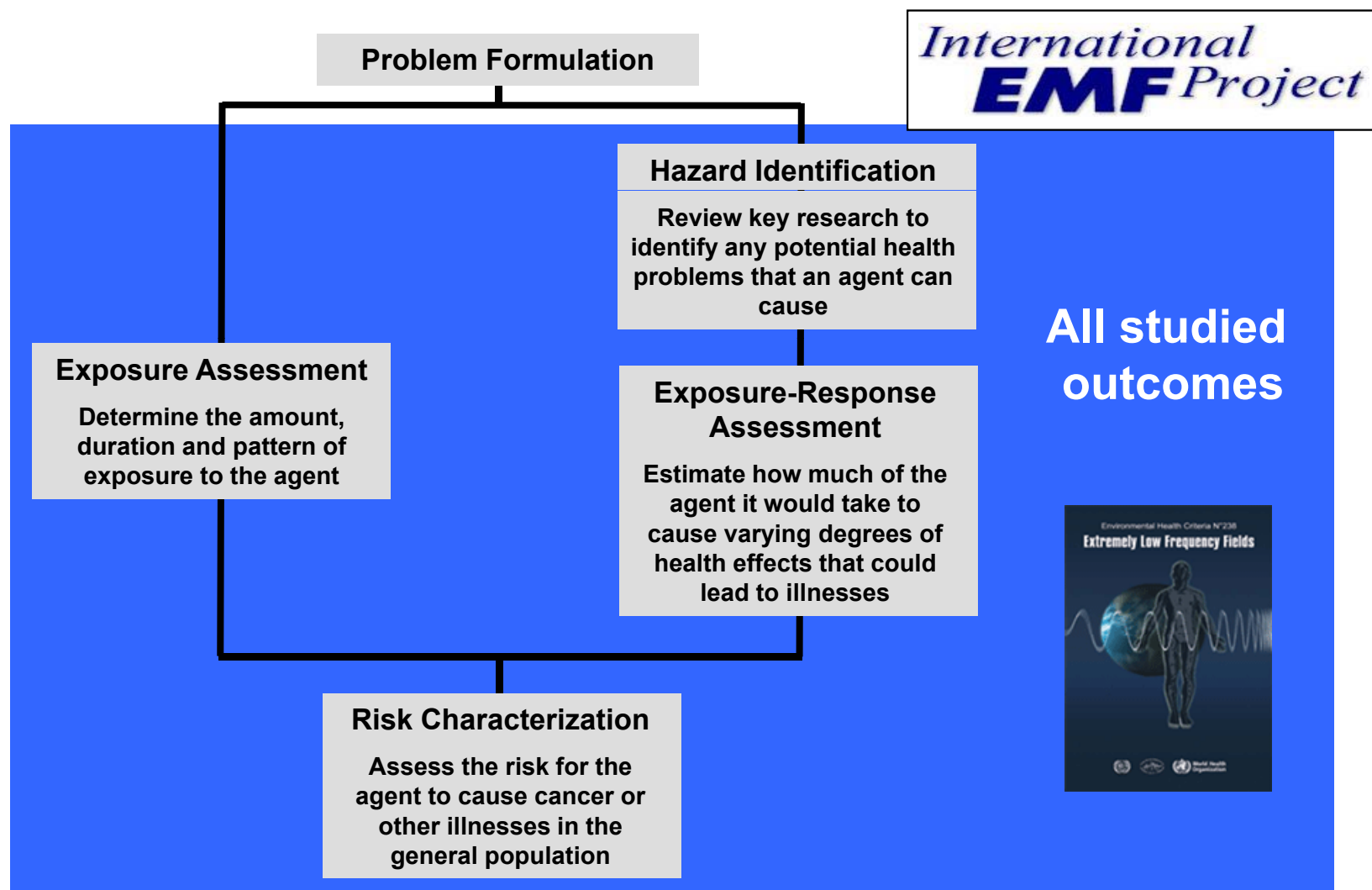
2017

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Health Risk Assessment



Health Risk Assessment



RF Environmental Health Criteria Objectives

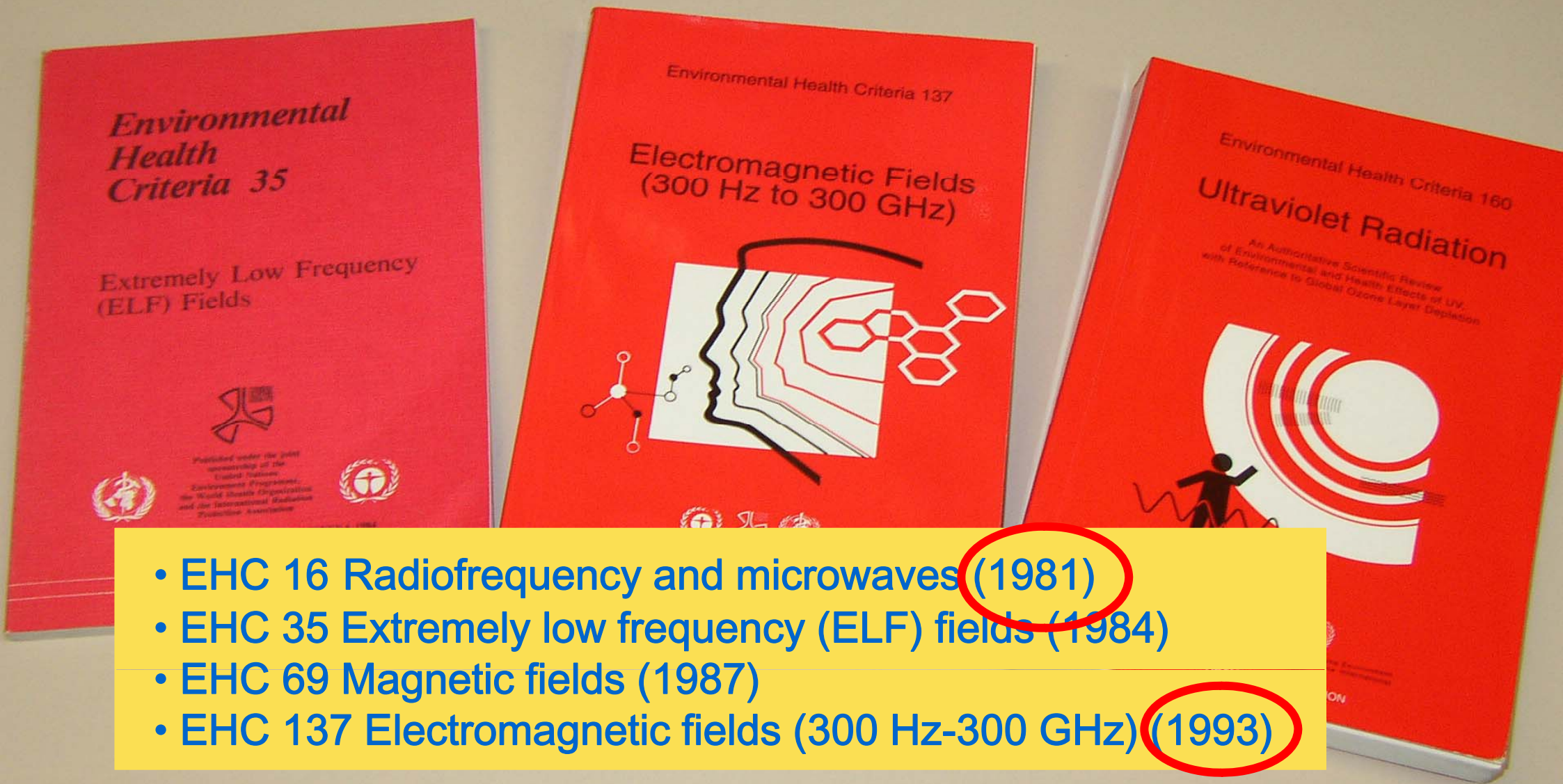
- Review the scientific literature regarding **adverse health effects** from exposure to radiofrequency fields
- Perform a **health risk assessment** of all studied health endpoints, as far as the evidence can offer
- Compile a **summary of national policies** around the world (based on a survey performed in Fall 2012 and update in 2017)
- Identify gaps in knowledge and highlight **research priorities** from a public health perspective

RF Environmental Health Criteria

Target audience

- Target audience
 - Policy-makers in Ministries of Health, Ministries of Environment, Ministries of Telecommunications,
 - Nongovernmental organizations
 - Professional societies
 - Academia

EMF EHC Monographs



RF Environmental Health Criteria

Scope

- Frequency range:
 - 100 kHz - 300 GHz
 - Include UWB, pulses, mm-waves
- Sources:
 - wireless networks, broadcasting, industrial RFID, EAS, radars,...
- Health benefits not included
 - Hyperthermia, MRI, medical treatments, diathermy, RF ablation surgery

RF Environmental Health Criteria Contributors

- Review team (around 20 contributors)
- Task Group members
 - Individual scientists, not representatives of their organizations
 - Composition dictated by range of expertise and views, gender and geographical distribution
 - Membership approved by Assistant Director General
 - Role: assess risks to health, reach agreements by consensus, make final conclusions and recommendations that cannot be altered after the Task Group meeting
- Observers
- WHO Secretariat



Declaration of Interests

DECLARATION OF INTERESTS FOR WHO EXPERTS

WHO's work on global health issues requires the assistance of external experts who may have interests related to their expertise. To ensure the highest integrity and public confidence in its activities, WHO requires that experts serving in an advisory role disclose any circumstances that could give rise to a potential conflict of interest related to the subject of the activity in which they will be involved.

All experts serving in an advisory role must disclose any circumstances that could represent a potential conflict of interest (i.e., a situation in which your personal or financial interests may conflict with your professional duties). You must disclose any potential conflict of interest, even if it is not a direct conflict, and even if it is not a financial interest.

Code of Conduct for WHO Experts

Should be sent with the DOI form

WHO values and relies upon the normative and technical advice that is provided by leading subject matter experts in the context of similar processes. Such advice contributes to the development of policies and programs that are promulgated by WHO for the benefit of the world.

CONFIDENTIALITY UNDERTAKING

Should be sent with the invitation or appointment letter

1. The World Health Organization (WHO), acting through its Department of [redacted], has access to certain information relating to [redacted], which information WHO considers to be proprietary to itself or to parties collaborating with it (hereinafter referred to as "the Information").
2. The Undersigned, as a member of the [redacted] advisory meeting, group or committee (collectively referred to as the "the Advisory Process"), may have access to the Information in the course of his/her participation in the Advisory Process (whether



RF Environmental Health Criteria Process

- Following WHO internal processes for scientific review and recommendations development
 - Systematic reviews
 - GRADE process
- Process
 - Set search criteria and quality criteria, include several languages
 - Published peer-reviewed literature since 1993 (> 1000 refs)



Relevant studies

- Development of an extensive database
 - Peer-reviewed scientific publications
 - Meta-analyses not included
 - May not have used the same inclusion and quality criteria as used in the EHC
 - Conclusions may partly be based on studies excluded from the EHC
- Search period: Jan 1992 – present
- Languages

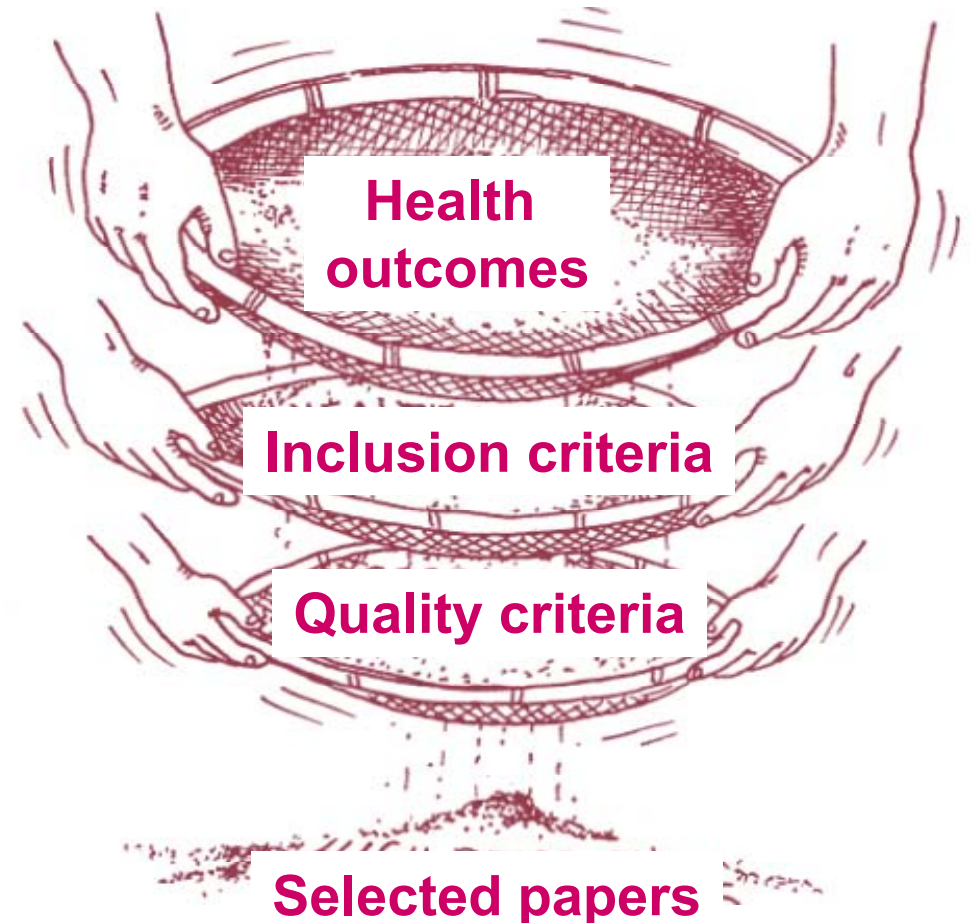
Relevant studies (cont'd)

- Epidemiological studies
 - Diff. categories of study designs (no case-report or case-series)
- Human studies
 - Laboratory, intervention studies
- Animal studies
 - Laboratory (including ex vivo studies), observational studies (domestic animals)
- In vitro studies
 - Cell cultures, isolated tissue samples



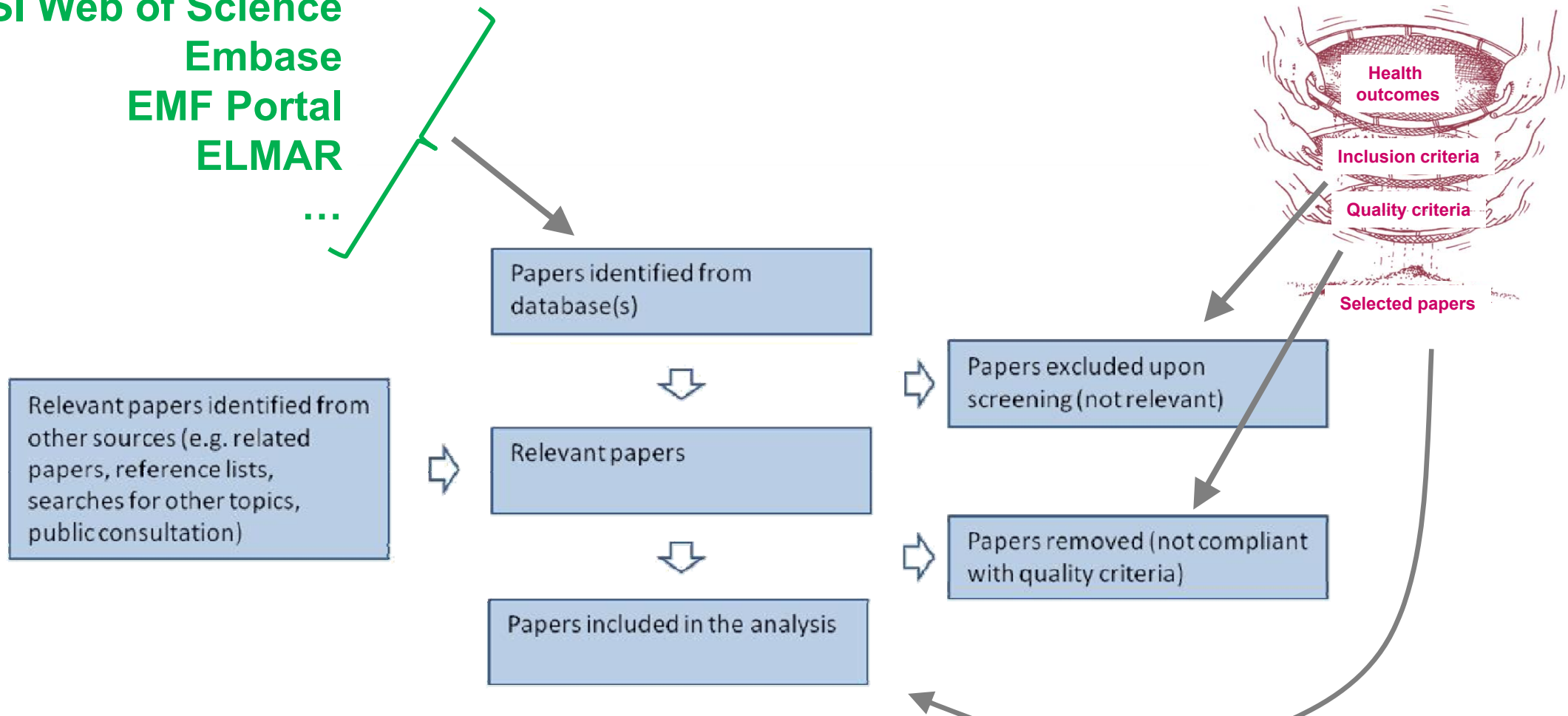
Process

- Search strategy
 - Predefined and registered search criteria
- Screening
 - Predefined and registered selection criteria
- Analysis



Process

PubMed
ISI Web of Science
Embase
EMF Portal
ELMAR
...



Quality criteria

- Epidemiological studies
 - STROBE checklist, GRADE, Newcastle-Ottawa Scale
- Volunteer studies
 - CONSORT statement and checklist, Gold Standard Publication Checklist
- Animal studies
 - Gold Standard Publication Checklist
- In-vitro studies
 - Dosimetry, statistical analysis, T control,...

Quality criteria (cont'd)

- Statistical precision/statistical power (width of confidence intervals when provided, primarily study size)
- Potential biases
- Consistency and plausibility of results and, when relevant, exposure-response relationship
- Directness (validity in relation to, e.g. study population, exposure, time lag between exposure and outcome assessment, and endpoints)



Public consultation

October 1 to
December 15, 2014

Radio Frequency fields: Environmental Health Criteria Monograph

Consultation on the scientific review for the upcoming WHO Environmental Health Criteria

The public consultation is now closed

The World Health Organization is undertaking a health risk assessment of radiofrequency electromagnetic fields, to be published as a monograph in the Environmental Health Criteria Series. This publication will complement the monographs on static fields (2006) and extremely low frequency fields (2007), and will update the monograph on radiofrequency fields (1993).

The draft chapters of this document which contain the scientific content are now open for technical consultation by RF experts. We are seeking comments on the accuracy and completeness of the information contained in these chapters. Please note that the literature searches have been done up to December 2012 (in a few instances to December 2013), so the more recent studies are currently not yet included. While the searches and chapters will be updated before finalization of the document, any suggestions for inclusion of peer reviewed studies are welcomed.

The process used in developing the chapters is described in Appendix X. Note that the chapters 1, 13 and 14 which will provide a summary, health risk assessment and protective measures are not available for this consultation. The drawing of conclusions from the literature and the drafting of these chapters is the remit of a formal Task Group that will be convened by WHO at a later stage in the process.

If you have questions, please contact us at: emfproject@who.int

Share

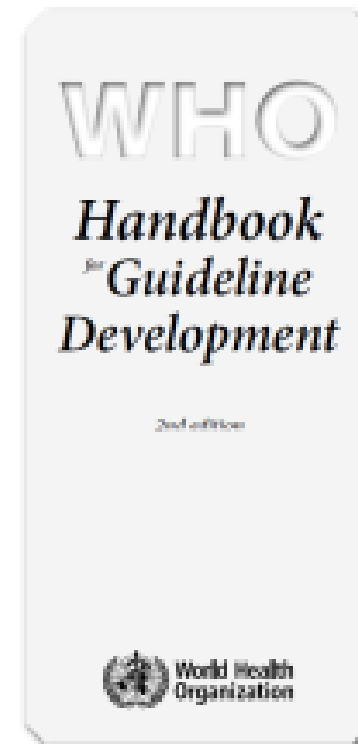
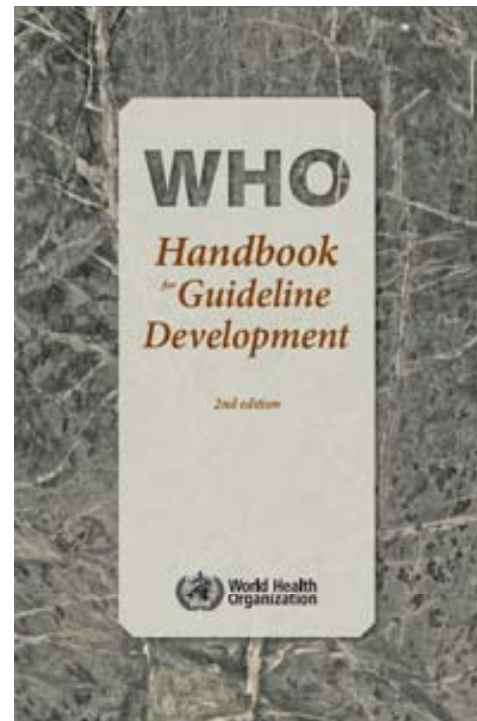
Print

Last update:

8 April 2015 16:44 CEST

- 686 comments
- 73 respondents through website + several by email
- 300 missing papers





WHO process to derive exposure limits

- Examples
 - WHO Air quality guidelines (indoor and outdoor)
 - WHO Nanotechnology guidelines
 - WHO Environmental noise guidelines
- Guideline **exposure limits** indicate a level of exposure beyond (below) which the TG is certain (reasonably confident) that there is a (no) risk
- The guideline exposure level will be based on a relevant risk increase of the **most important adverse health outcomes** for which there is evidence in the systematic reviews

Most important adverse health outcomes?

(Local increase in temperature)

Cataracts Pain Burns

Male fertility

Environmental exposure

Personal exposure

(Core body temperature)

Exhaustion Heat shock

Dehydration

Occupational exposure

IEI-EMF

Foetal development

Humans

Cognition

Blood-brain barrier

Animals

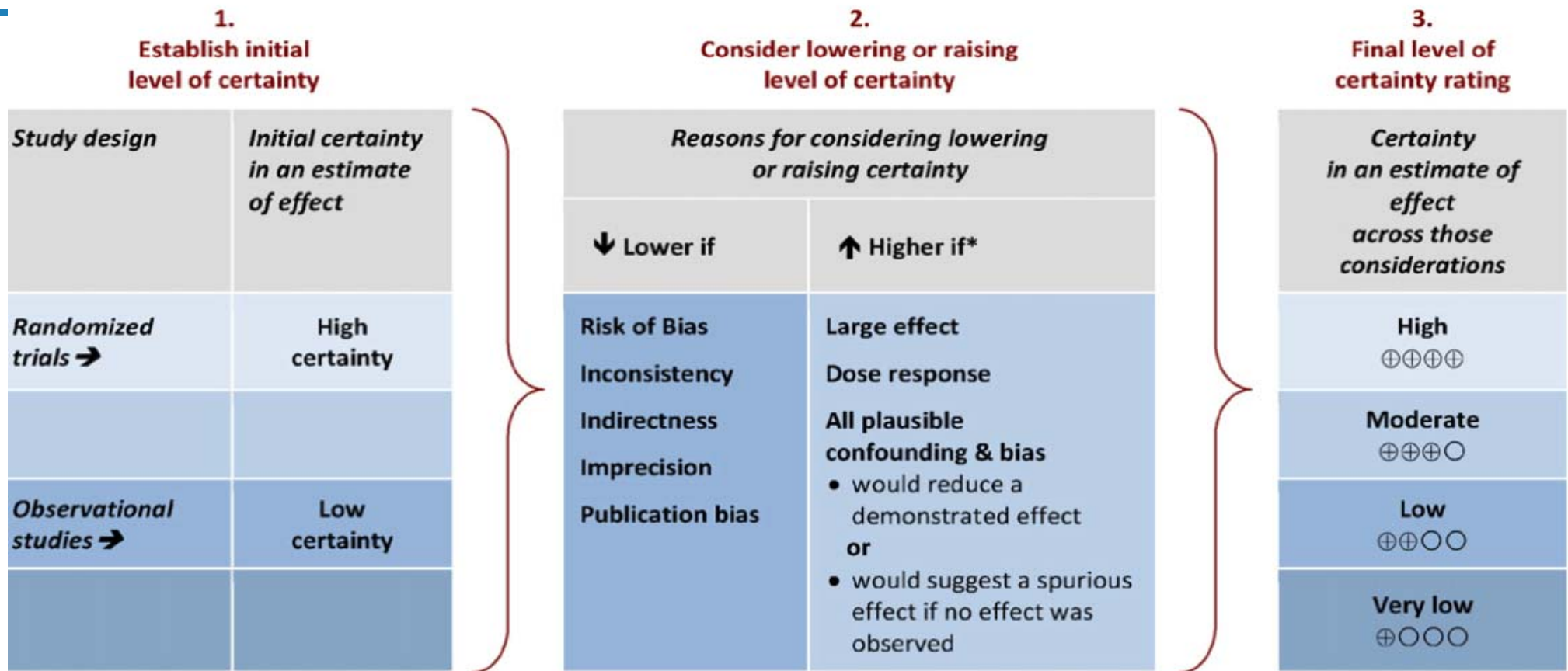


WHO process to derive exposure limits

- Take into account the quality of the evidence regarding the risks
- Evidence for an effect of exposure/intervention:
 - Effect size: relative risk, risk difference, mean difference
 - Precision of the effect: 95% confidence interval
 - Confidence in the underlying studies



GRADE (official) approach



*upgrading criteria are usually applicable to observational studies only.

Adapted from “Methodological idiosyncracies, frameworks and challenges of non-pharmaceutical and non-technical treatment interventions” (Schünemann 2013)



Contents lists available at ScienceDirect

Environment International

journal homepage: www.elsevier.com/locate/envint



How credible are the study results? Evaluating and applying internal validity tools to literature-based assessments of environmental health hazards



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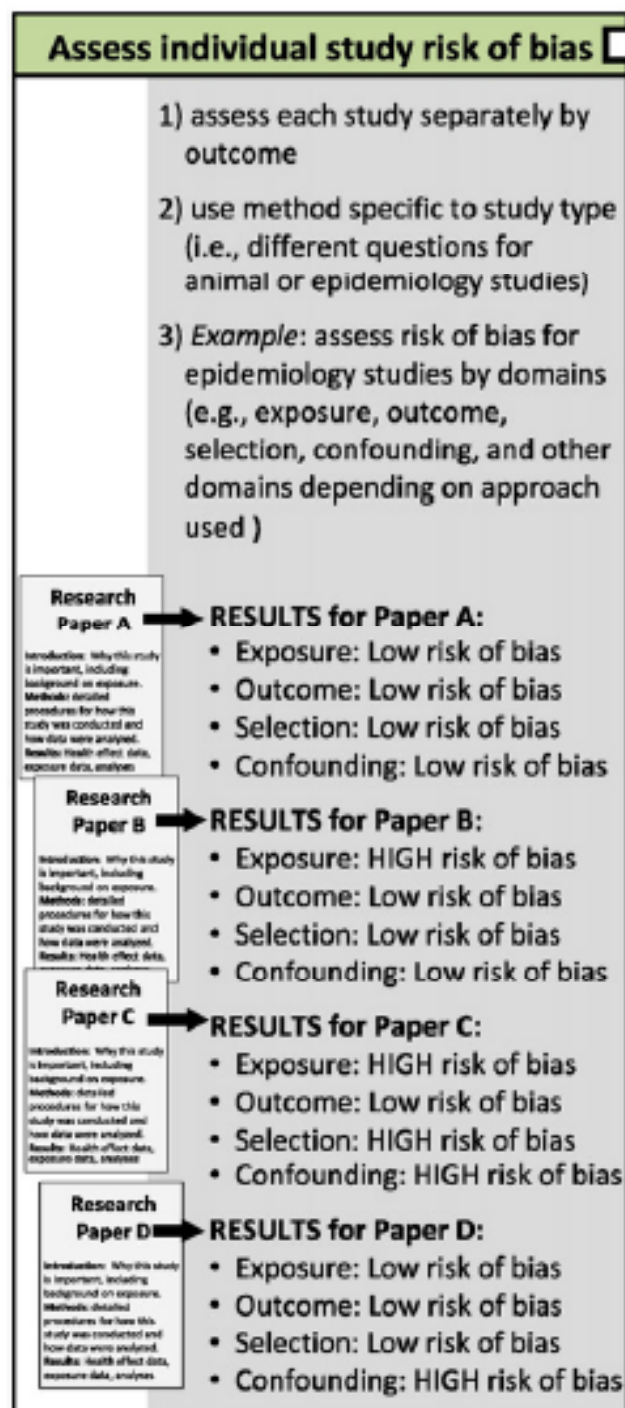


Fig. 1. Risk of bias of individual studies and its use in the evaluation of the body of evidence.

WHO process to derive exposure limits

- **Balance** these risks against the benefits and the effectiveness and costs of the interventions to remove the risks.
- Take into account the values and preferences of different sub-populations that are exposed to risk such as the general public and workers
- Based on these arguments, determine the final level and strength of recommendation of a specific guideline exposure value



RF Environmental Health Criteria Summary

- Update following expert consultation (Fall 2014)
- Involvement of a guideline methodologist
- Monthly conference calls, face-to-face meetings (The Hague, Sept 2016)
- **Prioritization of most relevant outcomes**
- **Perform full systematic reviews and GRADE-ing**
- **Update of the 2012 RF Policy survey (Spring 2017)**
- **Task Group meeting – Fall 2017**



Thank you - ありがとうございます

