The Dutch research programme

Electromagnetic Fields & Health

Eric van Rongen, PhD
Health Council of the Netherlands

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History

2003 First request Dutch government to Health Council of the Netherlands for advise on EMF&H research

2004 Parliament request for research programme on EMF&H

2006 HCN: Proposals for research into health effects of electromagnetic fields (0 Hz - 300 GHz)

2006 Initiation of ZonMw programme Electromagnetic Fields and Health

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ZonMw mission

The Netherlands Organisation for Health Research and Development

Progress requires research and development.

ZonMw funds health research and stimulates use of the knowledge developed to help improve health and health care.

EMF&H programme

- Goals:
  - enhance the Dutch scientific knowledge infrastructure in the field of EMF (0-300 GHz) and health
  - help clarify possible positive and negative health effects of EMF exposure

- Financer: Ministry of Infrastructure and the Environment
- Budget: € 16.6 million (~ $ 24.2 million)
- Time: 2006 - 2014

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Programme features

- Connection to international research effort:
  international committee and call for collaborations
- Focus on three research areas:
  biology, technology and epidemiology
- Various types of grants:
  basic, technological, multidisciplinary, practically oriented, cohort, international and chairs
- Special call for chairs:
  professors are to take centre stage in 3 research areas

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Chairs

What	Who	When
Epidemiology of health effects from exposure to electromagnetic fields	Prof. dr. ir. H. Kromhout (UU, IRAS)	2008-2013
Electromagnetic Fields and Health (technology)	Prof. dr. ir. A.P.M. Zwamborn (TuE) and Prof. dr. ing. G.C. van Rhoon (EMC)	2009-2014
Electromagnetic Fields and Health (biology)	Prof. dr. R. Kanaar (EMC)	2010-2015

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Cohort study

What	Who	When
Pooled community-based cohort study on health effects of exposure to EMF > COSMOS	Prof. dr. ir. H. Kromhout (UU, IRAS)	2008-2016

Technological research

What	Who	When
High resolution thermal analysis of RF exposure guidelines	Prof. dr. ir. J.J.W. Lagendijk (UMCU)	2007-2011
EMF exposure characterisation using personal exposimeters and an Activity Exposure Matrix (EMF AEM)	Dr. J.F.B. Bolte (RIVM)	2007-2010
Assessment of the cumulative exposure of children to EMF	Dr. ing. G.C. van Rhoon (EMC)	2007-2011
Measuring EMF induced tissue heating and physiological changes in-vivo	Dr. ir. C.A.T. van den Berg (UMCU)	2011-2015

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Bolte

- Exposure measured
- Activities recorded (questionnaires)
- Large variability
- ~40% explained by behaviour

Environment International 48 (2012) 133–142

Contents lists available at SciVerse ScienceDirect

Environment International

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

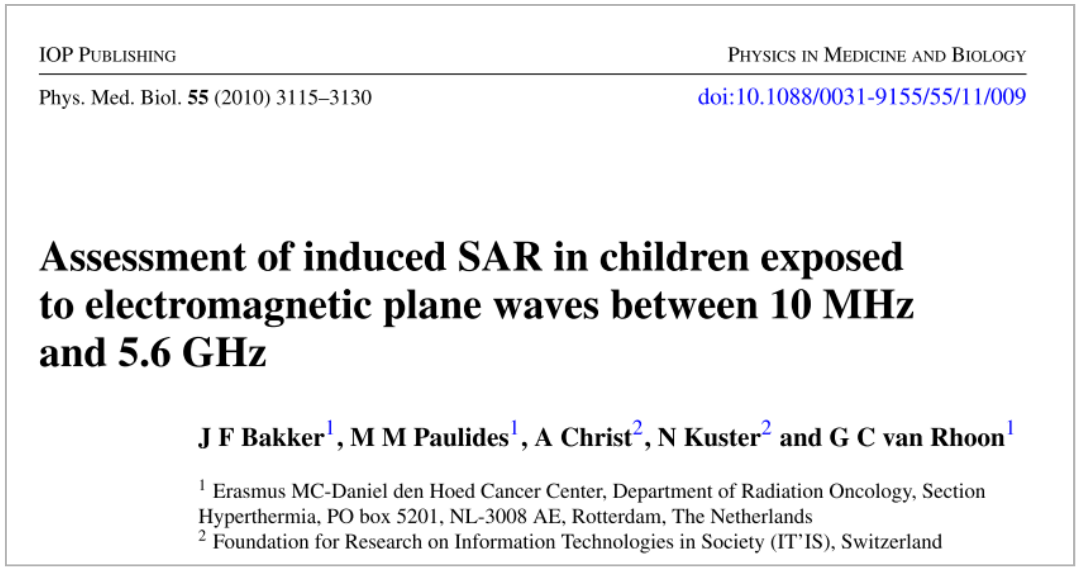
Personal radiofrequency electromagnetic field measurements in the Netherlands: Exposure level and variability for everyday activities, times of day and types of area

John F.B. Bolte *, Tessa Eikelboom [1]

Laboratory for Radiation Research, National Institute for Public Health and the Environment (RIVM), PO Box 1, 3720 BA Bilthoven, The Netherlands

Van Rhoon

- Model calculations
- Children: ~ 2 GHz ICNIRP reference levels too high
  - exposure at reference level > exceeding basic restriction



IOP PUBLISHING PHYSICS IN MEDICINE AND BIOLOGY

Phys. Med. Biol. **55** (2010) 3115–3130 doi:10.1088/0031-9155/55/11/009

Assessment of induced SAR in children exposed to electromagnetic plane waves between 10 MHz and 5.6 GHz

J F Bakker[1], M M Paulides[1], A Christ[2], N Kuster[2] and G C van Rhoon[1]

[1] Erasmus MC-Daniel den Hoed Cancer Center, Department of Radiation Oncology, Section Hyperthermia, PO box 5201, NL-3008 AE, Rotterdam, The Netherlands
[2] Foundation for Research on Information Technologies in Society (IT'IS), Switzerland

Multidisciplinary research

What	Who	When
Health effects of exposure to MRI-related EMF	Prof. dr. ir. H. Kromhout (UU, IRAS)	2008-2013
Non-specific physical symptoms in relation to living in the vicinity of UMTS base stations	Dr. I. van Kamp (RIVM)	2008-2012
Modulation of immune response through low frequency EMF exposure	Prof. dr. P.W.M. Hermans (UMCN)	2008-2012
Effects of EMF on morphogenesis and gene expression during embryo development in an animal model	Dr. H. Woelders (WUR)	2009-2012

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Basic research

What	Who	When
In vitro assessment of the neurotoxic potential of EMF in embryonic neurospheres: developmental exposure	Dr. R.H.S. Westerink (UMCU)	2011-2015
Perceived risk, concerns and unexplained medical symptoms associated with different sources of EMF by the general public and professional workers	Dr. D.R.M. Timmermans (VUMC)	2008-2012
EMF effects on the innate immune system at the molecular, cellular and whole animal level	Dr. B.M.L. van Kemenade (WUR)	2007-2010

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Van Kemenade

- Small effect on immune system in carp
- No health effects

Basic research

What	Who	When
Modulation of immune surveillance by low frequency EMF exposure: effects on calcium fluxes and cytoskeleton structure to influence leukocyte recruitment	Dr. B.M.L. van Kemenade (WUR)	2011-2015
Effects of EMF on cellular and molecular mechanisms of immune sensing and signaling in intestinal epithelium in an in vitro and ex vivo model	Dr. H. Woelders (WUR)	2011-2014

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Practically-oriented research

What	Who	When
Children's' cognitive function and exposure to environmental EMF – A collaborative study with the municipal health services to gain insights into exposure and associated risks	Dr. A. Huss (UU, IRAS)	2011-2014
Electromagnetic hypersensitivity: definition, tool and assessment in the Netherlands	Dr. A. Huss (UU, IRAS)	2013-2016
MAnifestation of Non-specific physical Symptoms and personal exposure to EMF in electromagnetic sensitive Individuals and cONtrols: a panel study (MANSION)	Dr. ir. R.P. Bogers (RIVM)	2011-2014

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Practically-oriented research

What	Who	When
Improving communication about EMF risks by taking into account people's concerns and prior beliefs; a mental models approach	Dr. D.R.M. Timmermans (VUMC)	2009-2012
The introduction of new EMF equipment and the effects on people’s perception of and worries about the health risks of EMF in relation to their well-being and health	Dr. D.R.M. Timmermans (VUMC)	2011-2015
EMF health risk perception – the effect of politics on risk communication	Dr. ing. C. Bröer (UvA)	2010-2014

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International collaboration

What	Number
500 k€	1
50 k€	20
10 k€	5

Knowledge platform EMF

- Cooperation between
  - RIVM (National Institute for Public Health and the Environment)
  - TNO (Netherlands Organisation for Applied Scientific Research)
  - KEMA (DNV KEMA Energy & Sustainability; consultancy, testing, inspections & certification, risk management, and verification)
  - Regional Health Services
  - Telecom Agency
  - ZonMw

  Health Council: advisor
- Goal
  - inform citizens and (semi-)professionals about national en international scientific information in the field of EMF
- Stakeholders group
- Info: www.kennisplatform.nl

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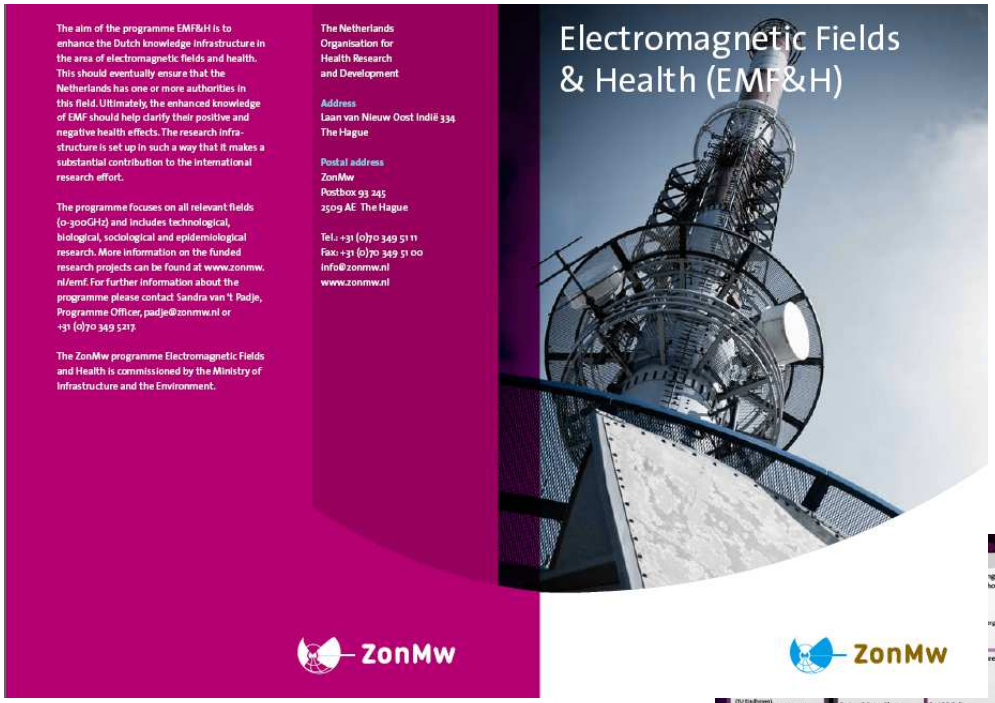
Further information



Sandra van 't Padje, Programme Officer
Tel: +31 (0)70 349 52 17
Email: padje@zonmw.nl

Website: www.zonmw.nl/emf (english)

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