



## **Electrohypersensitivity (EHS) in the Netherlands A Questionnaire survey**

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*Abbreviated version. The complete version is available at the internet address given in the footnote.*

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### **The questionnaire**

This report is based on 250 questionnaires received during the period 2003-2007.

The questionnaire is developed by an informal Working group on EHS (WEO) in the Netherlands in 2001 ([www.electroallergie.org](http://www.electroallergie.org)), which in 2007 developed into the Dutch EHS Foundation ([www.stichtingehs.nl](http://www.stichtingehs.nl)). Our aims were to assess the EHS problem through close contacts with electrosensitives and to find out:

1. What kind of health problems do they have?
2. Is there a characteristic 'marker' symptom for the condition of EHS?
3. Is there a common risk factor in the way of specific electromagnetic fields from appliances and installations?
4. What medical and paramedical help, or which alternative (complementary) therapies have they sought?

With this knowledge it should be possible:

1. to help electrosensitive people understand the complexity of their EHS problem. And give them advice on EMF management strategies.
2. to design provocation experiments to assess their ability to detect EMFs.

We postulated that the conditions under which individuals are exposed to EMFs and then questioned about their subjective experiences would have to be re-defined. In particular attention should be paid to both high and low frequency EMFs.

### **Procedure**

As the WEO working group became more widely known, well over a thousand electrosensitives contacted us for advice and support. Some 300 questionnaire forms were handed over to EHS people, or were handed to them. Over 200 of them completed the form and send them back, the other 50 forms were completed on-line through website [www.stichtingehs.nl](http://www.stichtingehs.nl). They were handed the questionnaire before being admitted as a member. As we gained

knowledge step by step, irrelevant questions were left out and new questions added to the questionnaire. These revisions evolved into the list presented here. Most people were contacted by one of our staff and invited to an in-depth interview, once we were sure the person involved was indeed electrosensitive.

## **General remarks**

This questionnaire survey represents a pilot experiment helping us to learn the questions to ask for assessing the EHS condition of those seeking our advice. It should be stressed that we had no control group of 'normal' people; for that reason it is not possible to determine to what extent problems with vision, smelling, hearing etcetera would be indicative for the EHS condition; many healthy people may suffer as well from those ailments at certain times. None of the health problems reported here is specific for EHS. The most solid confirmation of the EHS condition is the experiment in which all electricity in the house is shut off during a couple of days, or to go to a place (refuge) where EMFs are minimal and base stations remote. That helps: within a few days symptoms are gone, as people reported. But not forever: problems reappear soon after homecoming.

Questions to be asked in future queries may well be focussed more on system level, for instance immune system and auto immune system, psychological problems, titres of stress hormones, tissue hormones (cytokines), analysis of brain function, integrity of the brain-blood barrier, etcetera.

## **Summary of the answers presented in the Appendix.**

### **1. Demographic data**

- Symptoms of electrical hypersensitivity occurred in all age groups and became apparent most commonly in adults.
- There were more EHS females (68%) than males
- Only a minority of people had a full time job (38%).

### **2. Self-reported general health problems**

- The biggest group of people felt moderately healthy, but 77% experienced improved health after a transfer to an electrically 'clean' environment.
- Most respondents (63%) consider themselves to be an emotional person but 55% have never taken tranquillisers.
- Fifty-four people mentioned that one or more of their relatives also show EHS symptoms.

### **3. Specific health problems**

We found no specific EHS distress marker shared by all respondents. Individuals develop their personal range of stress symptoms, and complaints varied greatly. 70% of respondents suffered from both neurological or somatic problems or both.

Health problems usually comprised both subjective and objective aspects and occurred in a wide variety of forms.

- Most-cited neurological complaints include chronic fatigue (70%), headache, sleep and concentration problems, insomnia, numb feeling in the head, hearing phantom sounds (tinnitus) and others.
- Most-cited somatic complaints include (87%), problems with facial skin, vision, pressure in the head, impaired vision, smell and hearing and pains in joints and muscles.
- Almost all respondents mentioned problems with their head (numb feeling, pain, pressure, sick feeling, tight band around the head).
- Skin complaints were reported by half of the respondents, with an emphasis on facial skin problems (66%).

#### **4. Modifying factors**

Several electrosensitives have a history of ill-health and many are influenced by environmental factors such as odours, UV light, pollen, and allergens. Some report a burnout, posttraumatic stress disorder or similar conditions.

The EHS condition sometimes develops in close association with external and internal factors that cause the sensations to vary in intensity.

- Thirty-seven percent of respondents have been suffering from a whole variety of illnesses or conditions like burnout, multiple chemical sensitivity, fibromyalgia, chronic fatigue syndrome, etcetera. Some suffer from more than one of such conditions.
- For 38% the EHS condition was the originating factor in such parallel conditions; others claim that EHS is the consequence of these parallel conditions.
- Sixty-eight percent mentioned that they were also allergic to a wide range of biological agents such as foods, chemicals, medicines, pollen, dust mites, monosodium glutamate etc.
- A similar percentage show an intolerance for loud noises, smells, sunlight, normal light or other environmental factors.
- It is particularly disturbing that 14% reported that medical care such as time spent in hospital, anaesthesia, or other treatments induced their EHS condition.

#### **5. Electromagnetic fields causing electrical hypersensitivity**

EMF sources reported to cause or maintain EHS symptoms vary greatly. No specific source is mentioned by all individuals, although the use of household equipment such as Dect phones, WiFi, TV, PC and energy saving lamps bring on problems for at least half of the respondents. The number of people expressing EHS appears to have increased during the last year. The proximity of external EMF sources such as GSM/UMTS is often mentioned. AC magnetic fields emitted by underground electricity cables and 'dirty power' were

recognized by the authors as a new source of concern, although this information followed mainly from personal contacts and field measurements separate from this questionnaire.

## **6. Search for health care**

Almost every person with EHS visited a physician for help and advice, and several of them visited a medical specialist. Very few people were satisfied with the advice they received and the physicians' failure to recognize the complaint. About 60% of the respondents went to one of the numerous types of alternative practitioner for some understanding and help and their number seems to have increased during the last year. Only 14% of them reported that those consultations were really effective, and even in these cases their health still left much to be desired.

We conclude from their information that the only effective protective strategy is avoiding the disturbing EMFs. This may require shielding living quarters against high-frequency fields from outside, shielding electric equipment and installations, or moving to a cleaner environment.

## **Discussion of the data in the questionnaire (see Appendix)**

### *Individual experiences*

The tables in the questionnaire show that EHS affects people of all age groups, genders, and professions, with a wide variety of health problems related to all sorts of EMF radiating equipment and machinery. It is this variation and seeming incoherence that causes disbelief among people who are not themselves electrosensitive.

Health complaints include only certain symptoms (sometimes only headaches, pain in the neck or the like). Usually there was an increase in sensitivity over time as well as an increase in the spectrum of disturbing EMFs.

### *Common risk factors*

It is remarkable that the people's major concern is not the GSM/UMTS mast in their vicinity, but rather regular electric and electronic tools in the household or office. In other words, although high-frequency sources may be a threat at relatively short distance, most annoying are the equipment and utilities found in most households. Dect phones, personal computers and TV are among the most-disturbing items. The possibility that high- and low-frequency EMFs interact and reinforce each other in biological effect should be further explored. Also the so called dirty power could play a role.

## **Related questionnaire surveys**

Several other investigators have collected data on self-reported annoyance from EMFs and resulting health complaints: Grant (2000), Hillert (2001), Carlsson et al. (2005), Rööslü et al. (2004), Huss and Rööslü (2005), WHO

(2007). It is of interest that these data are essentially similar in different countries. The most reported EHS symptoms are fatigue, headache, and skin problems. Yet, early experiments in Sweden indicate a much higher incidence of skin problems than later studies (Hillert 2002, Stenberg et al. 1995). This could be the consequence of exposure of office workers to older types of CRT monitors which produced stronger EMFs than modern monitor types (Wall, 1995, and Nordström, 2004). In short, the self-reported problems haven't changed markedly over recent years.

The organization Safe Wireless Initiative organized a questionnaire survey on the prevalence of the EHS condition in the UK, N-Ireland and the Channel Islands in the short time-frame of November 2007 (McKinney and Crofton, 2007). The questions asked resembled ours. It would be interesting to find region-specific differences in EHS problems.

## References

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- Hillert L, N. Berglind, B.B. Arnetz, T. Bellander (2002)**, *Prevalence of selfreported hypersensitivity to electric or magnetic fields in a population-based questionnaire survey*. Environ Health 28: 33-41.
- Huss A. and Rösli M. (2005)**, *Befragung von Ärztinnen und Ärzten zum Thema elektromagnetischer Felder in der hausärztlichen Praxis*. Studie in Auftrag des Bundesamtes für gesundheit (BAG). Universität Bern. 40 pp.
- McKinney H. and K. Crofton (2007)**, SWI-ES survey. A health study on the prevalence of the electro-sensitivity condition. Safe wireless initiative. [www.safewirelessinitiative.org](http://www.safewirelessinitiative.org).
- Nordström, G. (2004)**, *The invisible disease. The dangers of environmental illnesses caused by electromagnetic fields and chemical emissions*. O-Books Winchester, New York. 239 pp.
- Rösli M., M. Möser, Y. Baldinini, M. Meier, C. Braun-Fahrlander (2004)**, *Symptoms of ill health ascribed to electromagnetic field exposure - A questionnaire survey*. Int. J. Hyg. Environ Health 207: 141-150.
- Stenberg B., N. Erikson, K. Hansson Mild, J. Hoog, M. Sandstrom, Sundell and Wall S (1995)**, *Facial skin symptoms in visual display terminal (VDT) workers. A case-referent study of personal, psychosocial, building and VDT-related risk indicators*. Int. J. Epidemiol. 24: 796-803.
- World health organization (2007)**, *Extremely low frequency fields*. In: Environmental health criteria Monograph No. 238.

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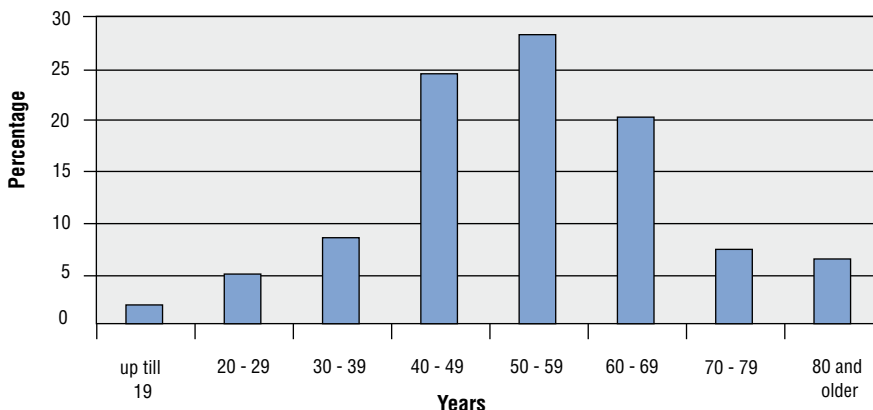
## Appendix

### The questionnaire data

The percentages given refer to the number of answers that were received and that are given in brackets in the legends of the graphs.

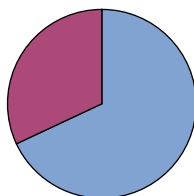
## 1. Demographic data

Age of respondents (n=250)



Gender (n=250)

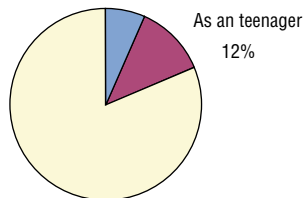
Men 32 %



Women 68 %

When did problems start? (n=177)

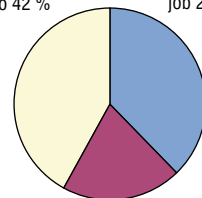
As an child 7%



As an adult 81%

Working in a paid job? (n=162)

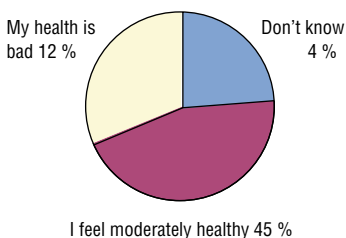
No 42 %



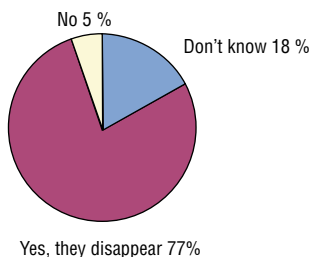
Yes, part time job 20%

## 2. Self-reported health problems: General

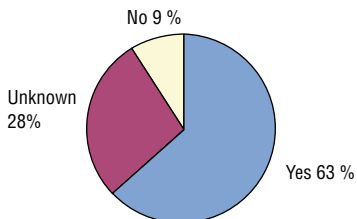
### How is Your health now? (n=180)



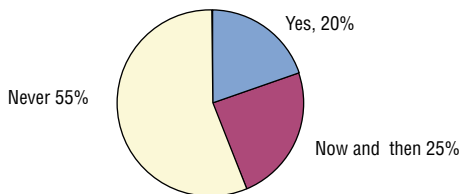
### Complaints disappear in clean environment?



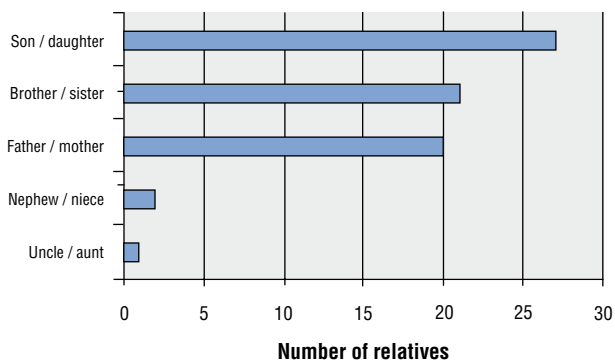
### Are you an emotional person? (n=191)



### Do you ever use tranquilizers (n=138)

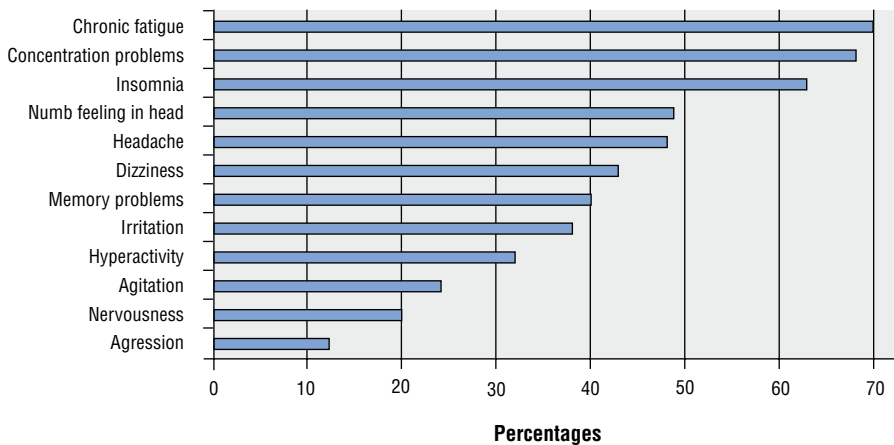


### Relatives reported to be EHS (n=54)

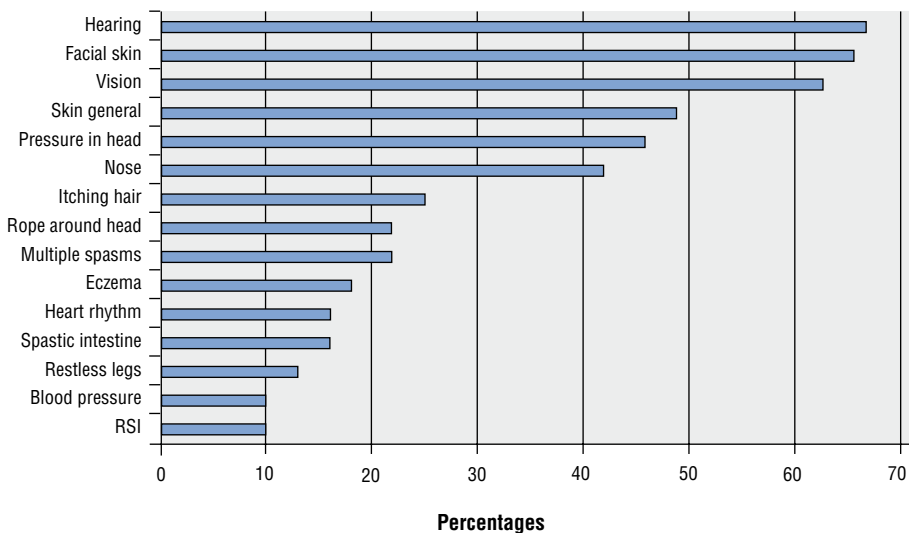


### 3. Self-reported health problems: Specific problems

#### Most cited health problems - Neurological

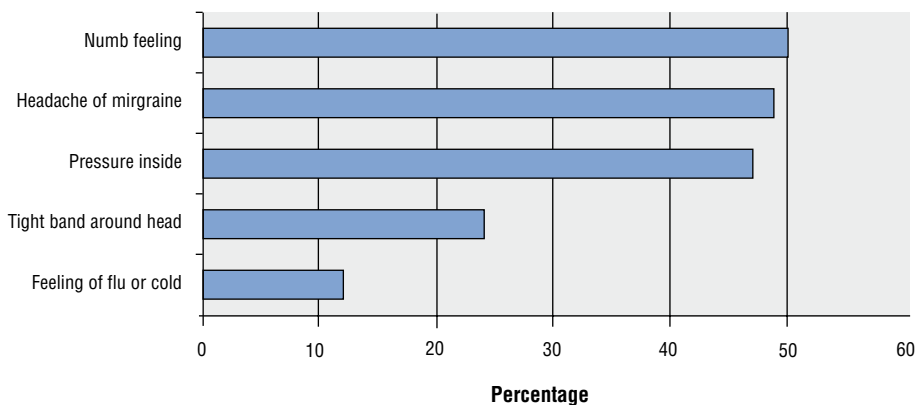


#### Most cited health problems - Somatic

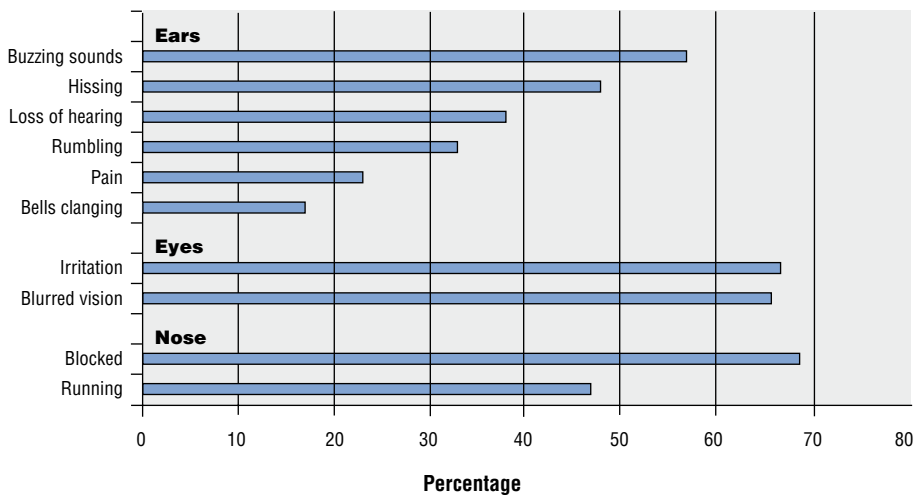




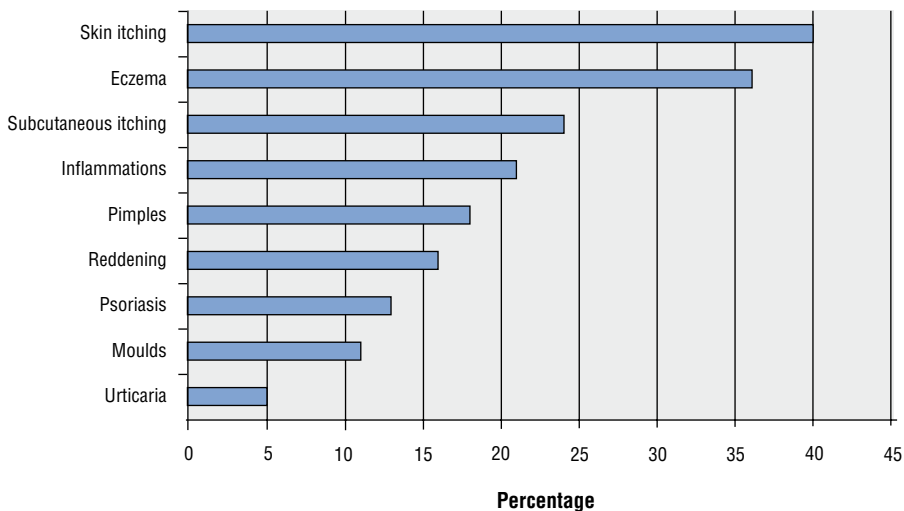
### Head problems (n=246)



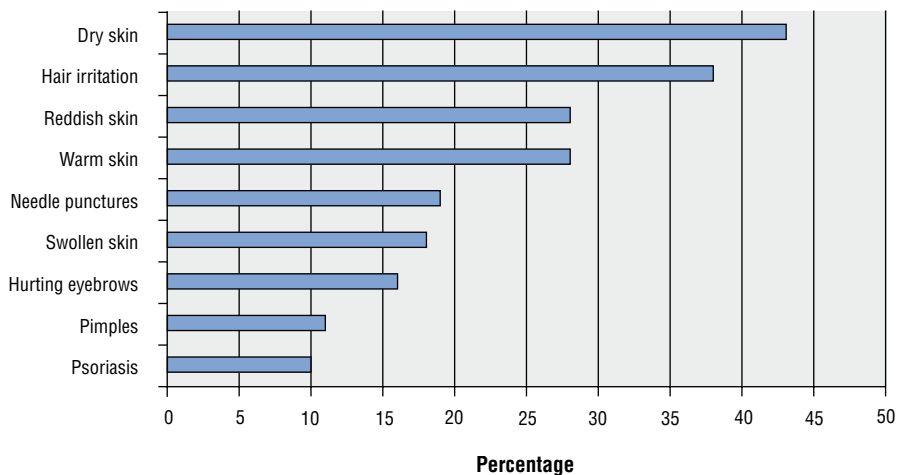
### Problems with sense organs



### General skin problems (n=123)

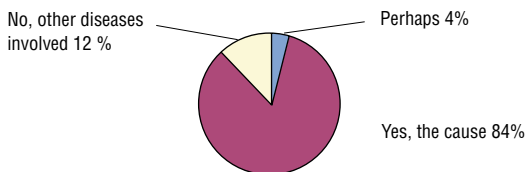


### Facial skin problems (n=166)

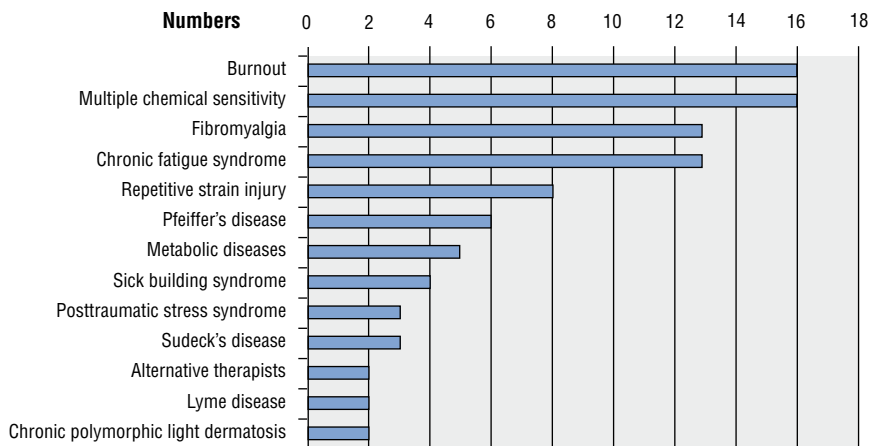


## 4. Modifying factors

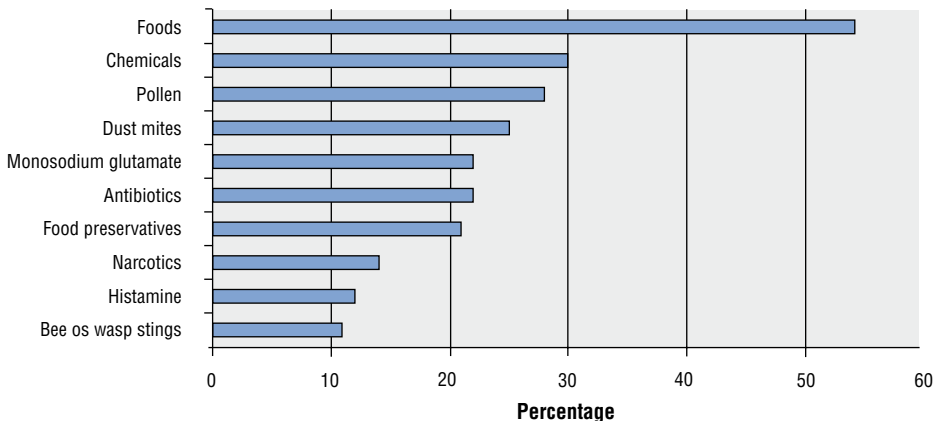
### Is EHS the cause or consequence of environmental illness? (n=96)



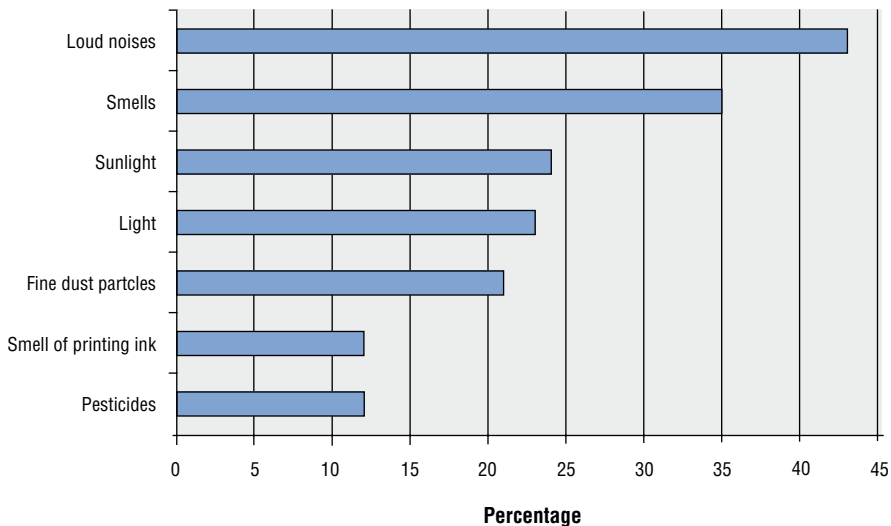
### Illnesses contributing tot EHS problems (n=93)



### Allergies to biological agents (n=169)



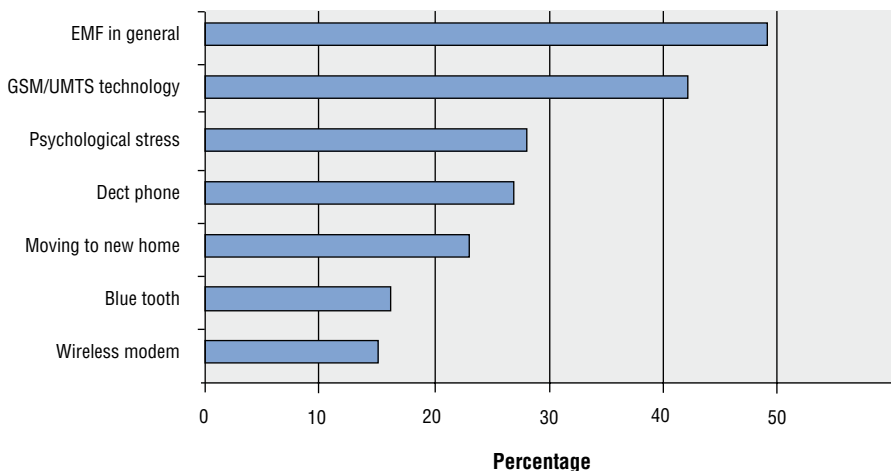
**Intolerances for environmental factors (n=169)**



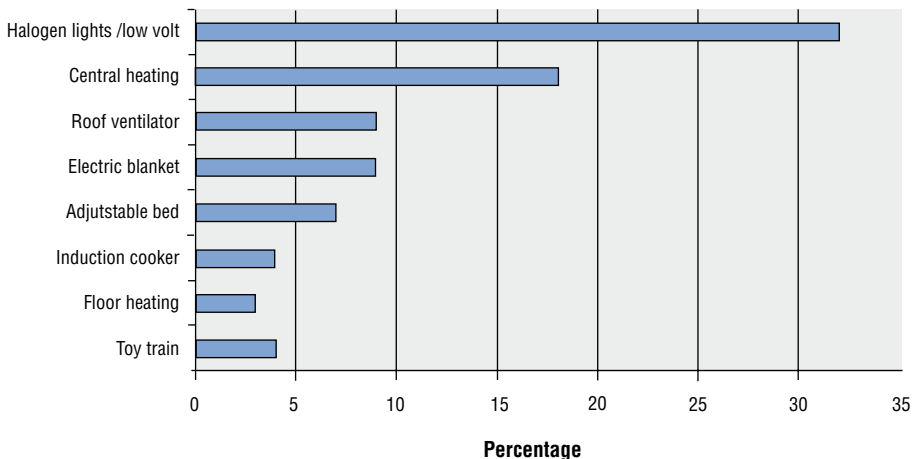
**5. Electromagnetic fields causing electrohypersensitivity**

**5A. Home-based electronics**

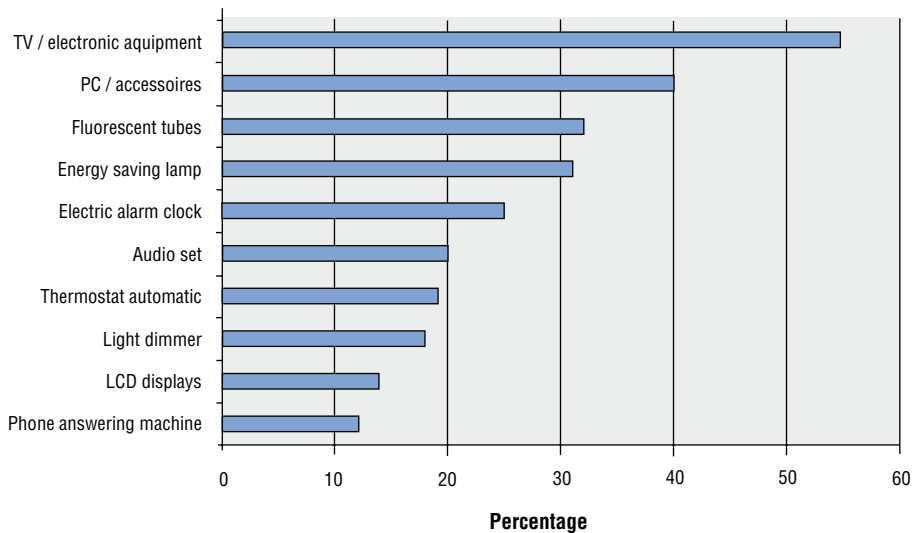
**Self-reported causes of EHS (n=164)**



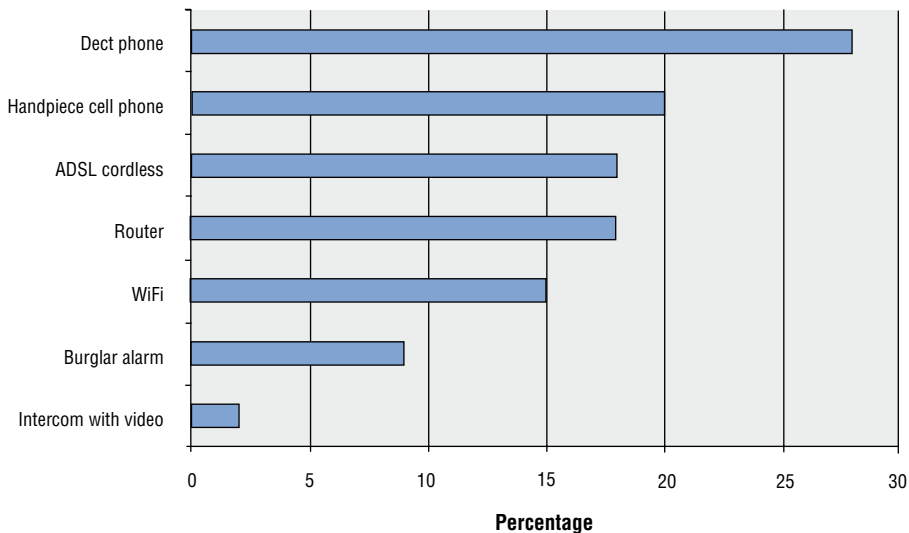
### Appliances causing problems - Analogue EMF components



### Appliances causing problems - Digital EMF components

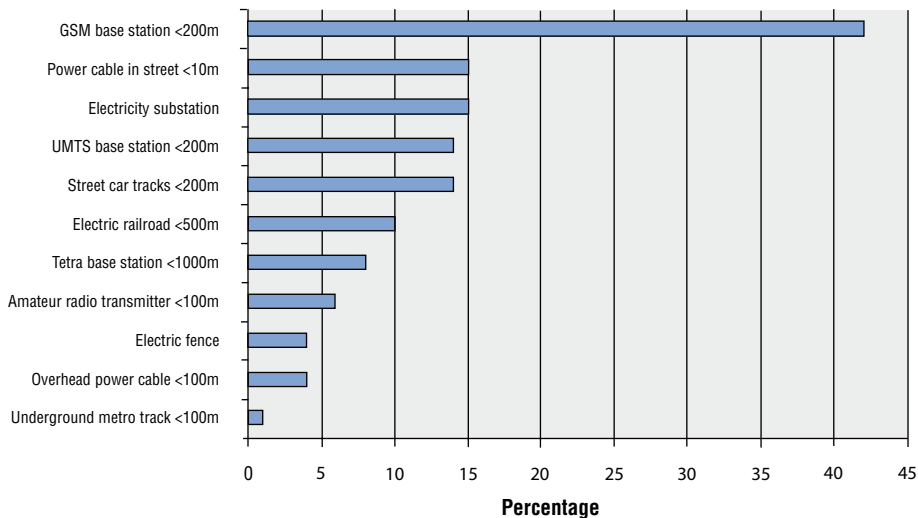


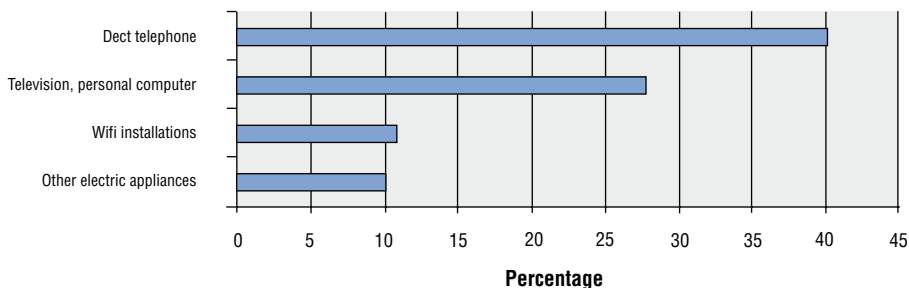
### Appliances causing problems - HF EMF



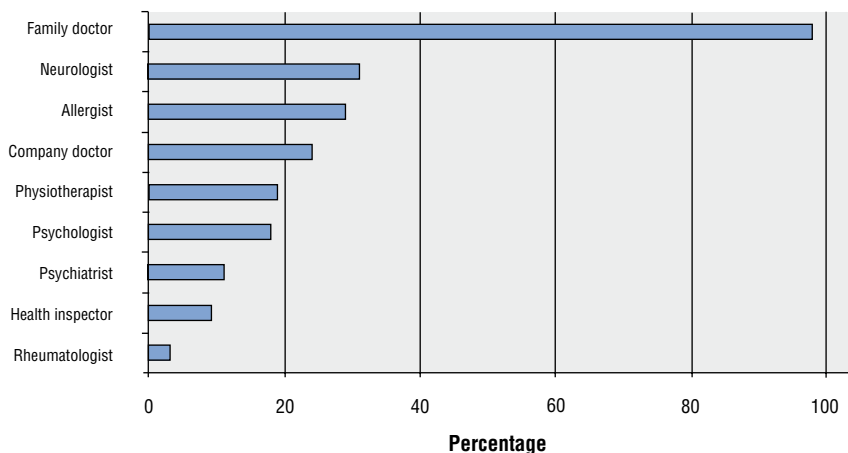
## 5B. Environmental EMF hazards

### External EMF hazards (n=196)

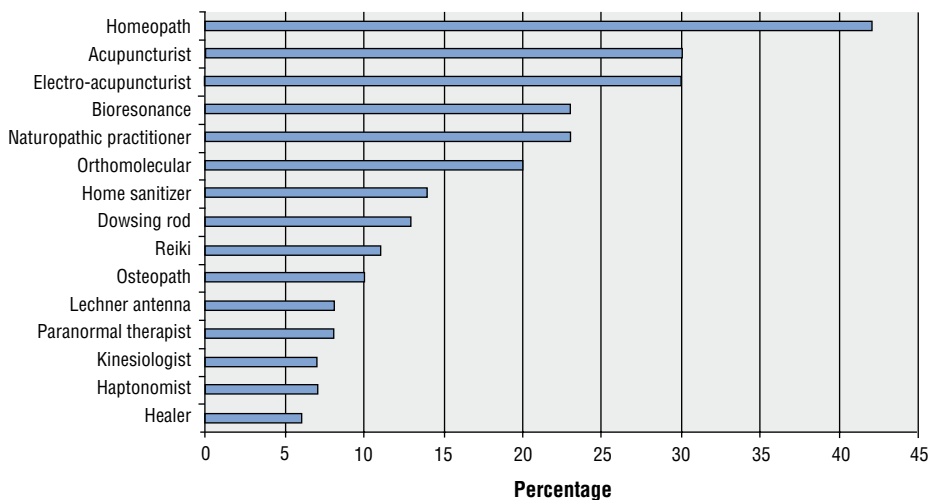


**Which appliances are bothering you most?(n=189)****(5). Addendum**

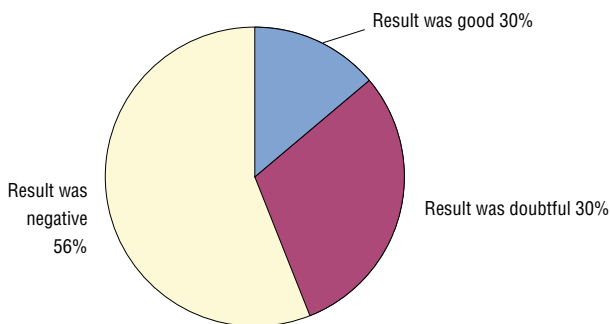
Magnetic brakes of coaches going downhill, machinery in fitness centres driven by –or retarded by electric power, battery chargers, electric razors, electric traction of wheel-chairs, power tools, detection gates in airports and shops, electronic dog watches, check-out counters in shops, high frequency plastic sealing equipment, digital photo camera's, all types of LCD screens in cars and navigational systems, data transmission lines in offices, electric connections between GSM base station antennae and the power supply of these masts, handsets for mobile communication, digital heat sensors for monitoring home radiator temperatures, hybrid motor cars, (combination of electric and combustion), electric fences and microwave oven.

**6. Search for health care****Medical help sought**

### Alternative therapy sought (n=151)



### What was the result of the alternative therapies (n=91)



### (6). Addendum

Apart from this list, a broad variety of therapists have been consulted that were believed to have the gift of localizing and neutralizing of (undefined) fields in home or environment, and the gift of protecting the body. As these practitioners have not documented the rationale of their therapies, we have made no attempt to analyze their effectiveness. All together, 142 persons (56.8%) have indicated to have contacted one or more of these alternative therapists.