

The Dutch National Platform Radiation Risks (NPS) signals urgent issue¹:

“Research electromagnetic fields should find new roads”

Long-term exposure, but no knowledge, no safety standards

Citizens and ecosystems are nowadays increasingly exposed to a long-term growth of low- and high-frequency electromagnetic fields from an ever wider range of electrical equipment, power lines and wireless applications. The knowledge about possible health effects of long-term effects of such fields is hardly or not available. This also applies to an accumulation of these influences. In line with this, the current standards primarily focus on the prevention of acute health effects occurring at exposure to individual fields. By consequence are man and nature in the current situation not protected against possible long-term health effects by a colorful mix of these electromagnetic fields.

Insufficient knowledge infrastructure health and environment

The above situation seems related to a multiple inadequacy of the available knowledge infrastructure, frames of reference and research methodology to uncover links between environment and health. Traditional medical frameworks and opinions related to the industry, more and more appear to be less appropriate for modern environmental health problems. Indications for it are continuing controversies and discrepancies between social and academic turmoil, the use of rest explanations for both unexplained diseases, and unexplained symptoms of electromagnetic fields ('psychosomatic', 'symptom attribution' et cetera) and non-recognition of disorders that do not fit traditional medical frameworks. Against this background, a growing awareness develops that a different approach is needed for the detection of possible long-term effects of electromagnetic fields and associated mechanisms. This is an integrated biological orientation, with a corresponding frame of reference, problem definition and instrumentation.

Social signaling of EMF-effects requires completion from science

Citizens and social organizations can only identify a few striking links between electromagnetic fields (EMF) and health, for example electro-hypersensitivity or cancer. The domain “electromagnetic fields, bioelectricity and health” forms a blind spot for many. Compared to other, better observable environmental factors such as soot, noise or particulate matter, citizens rarely contribute today's health problems to the presence of electromagnetic fields. At present, a large proportion of the potential health effects of electromagnetic fields cannot be observed directly in daily life, but given correct information by civil authorities people could form indirect references to the importance of electromagnetic fields on health. This may be done by comparing the contemporary diseases that social organizations give priority to - for example stress, non-specific health problems, sleep disturbances, cardiovascular diseases, hormonal disturbances or hypersensitivity to chemical substances - to the extent in which these conditions are associated with electromagnetic fields by science. Linking scientific knowledge to social signaling thus provides an additional possibility for the field of electromagnetic fields to identify environmental health problems.

Increase of chronic prosperity diseases

In society there is an increase of a large number of welfare diseases in recent decades. Examples are chronic stress, cardiovascular disease, diabetes, learning and behavioral problems in children, neuro-hormonal disorders, sleep disorders, obesity, allergies, acquired immune deficiency syndrome (AIDS), rheumatic disorders, fertility problems, forms of cancer, and a group of related syndromes with a disruption of regulatory systems and changes to the central nervous system related to chronic stress, such as CVS/ME, multiple chemical sensitivity, burnout, depression, anxiety disorders and Alzheimer's disease.

Large increase in numbers of biological disruptions by EM fields

Although not fully understood, scientists report an ever increasing amount of heterogeneous

biological disruptions and other changes, due to exposure to electromagnetic fields in recent decades. This reinforces the understanding that all these biological disruptions together can accumulate into different health effects over the longer term. It indicates a growing awareness that a potential long-term degradation of public health is realistic. Combined with the fact that protection against possible long-term health effects of electromagnetic fields is missing, given current standards, it is likely that such effects on health are already developing within the community and that some of these effects will already be revealed in part of the above chronic conditions.

Growing cooperation between scientists: BioInitiative Report 2007

The many thousands of heterogeneous biological disruptions of electromagnetic fields were hitherto only integrated for some smaller biological areas. The growing realization that the whole of all these effects might have consequences for public health, brought parties together. In 2007 leading scientists, researchers, public health and government professionals in the field of electromagnetic fields and health united themselves worldwide. They delivered a collective BioInitiative Report to feed the global debate. The report outlines the state of science on possible health effects of low and high frequency fields. To this end, the group brought together the growing amount of reported disruptions in a dozen important biological areas where the Group thinks there now exists sufficient consistent evidence for substantial biological disruptions by electromagnetic fields. They cover a wide field of gene-functioning and protein expression, genotoxic effects and DNA damage, general stress response of cells, effects on the immune function, a range of effects on neurology and behavior, brain and auditory nerve tumors, leukemia in children, to effect on melatonin, Alzheimer and breast cancer. By using a multidisciplinary approach on a biological basis, and bringing all the material together into larger parts, a scientific based picture of a whole arises. It suggests that in these areas substantial long-term effects on human health may occur. The BioInitiative Group emphasizes that many of the observed biological disruptions can also develop a thousand times below the current exposure standards.

Comparison attention requiring disorders with BioInitiative Report

Using the BioInitiative Report (BR), it becomes possible to supplement the identifying of environmental health problems related to electromagnetic fields. For this, the diseases that are prioritized in the Dutch signaling report², and the increasing unexplained prosperity disorders in society, have to be compared with the potential health effects that the BioInitiative Report points to. It shows that for some of the attention requiring disorders in nowadays society, a combination of different disruptions in biological areas could occur, which are presented in the BioInitiative Report as proven biological effects of electromagnetic fields. The range of effects that electromagnetic fields have on neurology and behavior for instance, could well be related with the current increase in sleep disorders, depression, anxiety disorders and learning disabilities among the population. In combination with the broad stress response that electromagnetic fields generate in the body, these neurological effects of electromagnetic fields might also form a basis for the unexplained group of related syndromes, with disturbed communication between regulation systems, changes in the central nervous system and chronic stress. Furthermore, the major changes that electromagnetic fields generate in the immune system according to the BioInitiative Report, in the form of stimulation of allergic responses and inflammation, might be an important factor in the current increase in allergies and inflammatory diseases, such as rheumatoid arthritis.

Progressive actions at European level

The steady progression of scientific knowledge on the relation between electromagnetic fields and health, and the growing consensus among scientists about possible far-reaching long-term effects on public health has not gone unnoticed within the EU. For example, the European Parliament is currently preparing a report in which it requests the Council to tighten the exposure standards of radio frequency electromagnetic fields. It also requests the Council and Commission to work towards a global standard for extremely low-frequency exposure. In addition, the draft report contains several proposals for actions in order to avoid

excessive exposure to high frequency radiation from wireless equipment. Special caution is called for the use of mobile phones by children. The report also emphasizes the need to improve information supply to consumers.

Economy no longer precedence over public health

Nowadays electrical equipment and wireless applications offer the society an almost unprecedented amount of options. But the balance between benefits and costs should always be in the eye. At present, there are strong and growing scientific indications that the societal costs of these techniques for years have been underestimated and insufficiently recognized. It no longer seems justified that the economy is given priority above public health and that costs from one sector are shifted off. Public health is an important engine of the economy and forms the basis for the welfare of many. Serious signals that public health is getting affected must therefore be answered with appropriate actions. This might save high social costs of unhealthy people.

It is now half past eleven - developing long-term effects

Given the above situation the National Platform of Radiation Risks considers it likely that long-term effects of electromagnetic fields already are developing among the population and ecosystems. Part of specified prosperity diseases will be the long-term effects of frequent exposure to a mix of electromagnetic fields. For the ever expanding amount of observed biological disruptions at low exposure levels, combined with the absence of a protective standard for long-term and cumulative effects of electromagnetic fields, makes long-term degradation of public health likely. Moreover, the range of increasing prosperity diseases displays global similarities with the range of disruptions by electromagnetic fields that the BioInitiative Report warns of.

Turning point in knowledge, thinking and action needed

The National Platform Radiation Risks believes that now a turning point is nearby, in terms of available knowledge and insights. The growing amount of information is so extensive and points to such significant health effects that the burden of proof should be reversed. It is no longer ethically justifiable to maintain a view there is insufficient scientific basis for a threat to public health and to delay policy actions any longer. Unless it can be proven that electromagnetic fields do not affect public health in the long term. It also seems essential to generate a swing in knowledge, scientific frameworks and related research methodologies. The whole would have to change from traditional medical-reductionistic, towards a more integrating biological direction. Since more of the same type of research in this field does not make sense, as glasses and yardstick whereby things are observed are not changed.

Strengthening of Public Health approach needed

There is still time to take a different path. National Platform Radiation Risks (NPS) recommends to start immediately reducing exposure as a preventive measure. This can be done by providing practical information to citizens for a low-stress design/furnishing of interior environments. Also will have to be worked towards a healthy system of electricity and wireless communication and promoting less burdensome household equipment. At the same time ongoing research is needed, based on a new approach. Among them are system biological studies needed on other diseases than forms of cancer, where growing indications exist for possible links. Furthermore, in an era of high electromagnetic density in society, also fundamental system-biological studies of the complex interaction of bio-electrical processes in organisms are of high importance. A list of specific opportunities for policy measures in terms of reducing low-frequency fields and high-frequency fields, further necessary research and adaptations of the knowledge infrastructure can be found on the NPS site:

<http://xn--hgi.ws/NPS>

Final remarks

To get a balanced picture of what is desirable and an objective picture of the current state of science, it is recommended that policy action is not only be based on the advice of established institutes in which business is represented, but also on views of civil society organizations.

In this paper the National Platform Radiation Risks have been placed the findings of the BioInitiative Report 2007 in a wider context, supplemented with some recent developments. Based on this widened social and scientific perspective we recommend the preventive measures are reconsidered, as highlighted in the BioInitiative Report, and to immediately take preventive measures as recommended at the above site. Optionally, the National Platform Radiation Risks will be willing to provide further explanation on this paper at any time.

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