German Mobile Telecommunication Research Programme

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Rapporteur's Report
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Welcome and introduction

Mr Roger Matthes, from the Federal Office for Radiation Protection (BfS), opened the meeting and welcomed the international and national experts attending the meeting. He thanked Dr. E. van Deventer of the World Health Organization for accepting to be the Rapporteur for the workshop. There were no objections to the meeting being audio taped in order to assist preparation of the report and to publish Proceedings of this workshop.

Mr Matthes reviewed the goals of the German Mobile Telecommunication Research Programme started in 2001. This programme was set up in a similar way to several other European research programmes, supporting WHO in its health risk assessment. At that time, it was decided that the research priorities would include not only the classical areas of dosimetry, biology, epidemiology and medicine, but also social aspects. This decision was made because of the widespread public concern. Problems were many folds, as it was not clear what the real concerns were, what information was needed to alleviate the concern, how to reach people, and how to manage conflicts. While significant improvement has been attained in terms of relevant information, there is still a long way ahead to understand aspects of risk perception, and Mr Matthes invited experts in this field to continue their research.

Mr Matthes explained that the national programme was close to being finalized, and that there would be a series of workshops to review the results of all the projects. This workshop was the second in a series, designed to discuss the outcomes of the projects dealing with risk communication (only two are not finalized). A meeting on dosimetry was held in July 2006, one on biological effects was scheduled for December, and 2 others for spring of 2007.

One of the goals of the meeting was to extend the discussion beyond the national programme to what is currently being done in other countries, to identify research needs and gaps in knowledge, and to discuss the following general questions during the final discussion on the second day.

- What has been achieved by the projects? What are the lessons learned?
- Where do we still have gaps?
- What impact do the findings have for practice in the field of information and risk communication?
- Are there lessons learned that could be transferred to similar situations in future?

In the interest of time, and because the representative of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, had not arrived, the first session was started.

Session 1
Risk Perception EMF

Gunde Ziegelberger of BfS chaired this session during which there were three presentations followed by a panel discussion.

1.1) Identifying the general public's fears and anxieties with regard to the possible risks of high frequency electromagnetic fields of mobile telecommunications
Janina Belz, Institute for Applied Social Sciences (Infas), Bonn

From 2003 to 2006, Infas analysed the public's perception of health risks from high frequency electromagnetic fields (EMF) in a series of annual studies on behalf of the Federal Office of Radiation Protection (BfS). The nation-wide representative surveys (population aged 14 and older) were carried out annually in autumn (this year in summer) by conducting 2,500 telephone interviews (CATI). These replications with a largely identical questionnaire analysed the potential changes in the population's perception throughout the observation period.

The use of mobile phones and cordless phones has been increasing considerably within the observation period, but few have used new technologies (WLANs, ..). Yet, the perception of risks concerning mobile phone radiation remains surprisingly steady. A number of people are concerned about EMF in general, without being able to name a certain source. Approx. 30 percent characterize themselves throughout all four surveys as concerned about, and approx. 10 percent as impaired by EMF from mobile telecommunications (e.g. sleeping problems, headache/migraine).

The concern refers more intensely to mobile phone transmitters than to mobile phones. Cordless phones are not yet noticed as potential health risks. However, the public is by far less concerned about different aspects of mobile communication than about other issues, such as air pollution, consumption of meat of unknown origin, or genetically modified food. The public's perception of all analysed potential health risks has proven to be quite time-consistent, only resulting in minor deviations.

Multivariate statistics were used to analyse potential influencing variables regarding the probability of concern about EMF from mobile telecommunications. Concern was categorized with respect to gender, age, geographical region, education and information level, use of mobile phone, proximity to transmitter, etc.. The survey also comprised further indicators of risk perception, the population's subjective level of information, sources of information (e.g. TV, radio, newspapers, ..), familiarity with the SAR value, and application of preventive measures (e.g. decreased use of mobile phones, remodeling bedroom, shielding, ..).

Discussion
A question was asked regarding the survey method using random dialling, and the fact that earlier epidemiological studies showed possible social selection bias. In response, it was explained that coverage of land-line phones in Germany is very high (95%) and thus this does not pose a limitation.

Reference was made to the point that many people were not informed about EMF. From a risk communication point of view, it would be interesting to know if they wished to be, and if they get most information from TV (passive learning) or through the internet (active learning). However, this question was not asked in the survey.

There was a suggestion that it would be interesting to cross-analyse the large amount of data gathered, e.g. level of concern vs. level of information and level of education. Ms. Belz mentioned that the report delivered to BfS indeed provided a lot of data in large tables, which could be

further cross-analysed, but such analysis had not been undertaken as the study focused mainly on concern and impairment.

A question was asked regarding the increasing number of people refusing to participate, thereby introducing a systematic bias in the data, a usual challenge of low response rate. This was a particular problem with males in 2006, since the survey was performed during the World Cup. It was monitored by a neutral introduction to the survey, mentioning health, environment and mobile communications rather than mentioning BfS or radiation.

1.2) Analysis of target groups for differentiated information

C. Pölzl, BfS

Ms. Pölzl, as the responsible liaison of this project at BfS, presented the work since the principal investigator of this study could not attend. The premise of this project is that the public cannot be characterized as one homogeneous entity with respect to its perception and assimilation of information on mobile telecommunication. There are many influencing factors and differentiating attributes among the population. The objective of the study was to identify target groups among the public by defining their properties and characteristics and to devise specific information and communication approaches for the different target groups.

For this purpose a representative nation-wide telephone survey (CATI) of 1,000 persons, age 14 and up, was carried out in June 2004. The target persons were questioned by Ipsos, Germany, with respect to their view on technical innovations, the associated risk potentials, the whole subject of mobile communications/EMF, their respective status of information as well as their way of life, and their modes of behavior and communication.

A cluster analysis was performed on the basis of the data collected, grouped by consideration of socio-demography, psychography and behavior. The following key characteristics were studied: mobile phone usage, informational behavior, personality structure, general and mobile phone-related risk attitude, confidence in the state and socio-demography (age, gender, education, income). The following five target groups were defined:

- Target group 1: unconcerned interested frequent users (23%), "EMF is not a problem"
- Target group 2: worried information-demanding users(17%), "Risks are high, precautionary measures are necessary"
- Target group 3: unconcerned uninterested infrequent users(24%), "No interest in EMF topic, feels overtaxed"
- Target group 4: unconcerned uninterested frequent users(12%), "Uninterested, but accessible for information"
- Target group 5: moderately concerned infrequent users(24%), "Mobile telecommunication is not personally relevant"

Target groups are characterized by a complex composition of different parameters. The specific target groups include persons with similar characteristics, as listed above. However, isolated features, such as usage of mobile phones, or demographic features, such as age or education, are only significant to a limited extent to define people's risk attitude towards mobile communication.

Information is only important to some of the target groups (1, 2, and 5). For about 60% of the population, EMF is not an important issue and interest could only be raised with a major effort over a long time period.

Another finding of the study was that accessibility of the different groups to information is limited, as only 40% of the population can be accessed well. The Internet is not yet a universal channel of information. Heterogeneous information sets are required to cover the different needs (offline, online, target group specific format and speech). The study showed a strong parallelism between

EMF risk perception and general attitudes towards life (e.g. in relation to technology, risks, institutions, and the media).

Discussion

One question related to how the target groups were worked out, based on different types of personality and descriptors of mobile telephony usage and interest for information. The starting data was based on the questionnaire and the target groups from the cluster analysis.

It was asked whether (i) there was a necessity to provide information to one of these target groups, and (ii) the best way to inform TG5 and TG3, and maybe TG4 would be at points of sale when buying EMF appliances. Ms Pölzl mentioned that, for BfS, it is difficult to provide information to the all population. The most relevant groups to focus on may be those who are concerned (TG2, but the challenge is that they don't trust the state) and those who are frequent users (TG1 and TG 4 - young people). Relating to provision of information at the point of sale, it is not clear whether people may be interested and receptive at that time, but TG4 could possibly be informed through peer groups

It was mentioned that the classification of these target groups would change when dealing with new site installations, and thus this work could not be generalized to this other challenge.

Ms Pölzl was asked about the reason for selecting these target groups on the basis of concern and phone usage. She answered that the aim was to develop targeted information material for ideal types, e.g. realizing that some people who want information also lack trust in the state, and that it is not possible to develop information relevant to all target groups.

There was some discussion of the actual need to inform all, i.e. should uninterested groups be left out, noting that 60% of people are not interested. It was mentioned that the survey report provides data that can be further analysed by different interested parties (e.g. BfS, operators) to come up with tailored recommendations and information.

The point was made that because the survey did not include questions on other sources of EMF, (e.g. power lines, transmitter stations) besides the usage of mobile phones, the overall impact of this study may be limited. However, it was pointed out that the survey included several questions on risk attitude in general and general affinity to technology, and that for other EMF sources, the starting point would be quite similar.

A technical question was asked regarding the methodology of the bottom-up cluster analysis, and the description of the groups in terms of central tendency, mean variance and medium values. Further technical data is reported in the final project report.

The topic of providing information to the 60% uninterested people was discussed further. The point was made that, rather than providing information mostly to interested users (who can find the information easily on their own); it is the TG2, TG4, TG5 and even TG3 that need information support.

1.3) A socio-psychological analysis of the characteristics and needs for information and communication of electromagnetic hypersensitive persons

Svend Ulmer, Katalyse e.V., Institute for applied environmental research

The objective of this project was to compile descriptive information on electromagnetic hypersensitive (EHS) persons from the point of view of socio-demographic characteristics and psychological personality traits. . In the third part the project examined the societal conditions of EHS-perception. On the basis of these findings, recommendations were developed for improving communication with EHS persons. This project focused on the subjective point of view, irrespective of the question if EHS is an empirically detectable phenomenon or not.

The study used quantitative and qualitative methods to gain information on the innate character and information requirements of this group of persons. First, a representative telephone survey (2,406 people) provided prevalence information (6% among the total population of Germany) through a combination of quantitative socio-demographic psychometric and qualitative psychological data collection. With respect to socio-demographic characteristics, EHS people do not differ considerably from the total population in their age, sex, the size of their households or the distribution between East and West Germany. There are, however, differences between EHS people and the total population with respect to their education (higher than the average population) and their regional distribution (higher in South-western part of Germany). Roughly half of the EHS persons interviewed reported health problems in the past (not presently), while the other half reported current health problems.

In-depth interviews with 40 EHS were performed to determine psychological ways of coping with the phenomenon of “EMF hypersensitivity”. In general, the interviewed sample of EHS people can be clearly divided into two groups, distinguished by the importance of EHS in their personal way of life and the extent to which everyday life was organized around EHS. In general, most people wanted more information/communication, provided that it does not increase their anxiety concerning ‘radiation’ and equips them with pragmatic advice for everyday life.

Patterns of interpretation and factors influencing their formation were related to the societal framework. Sensations of powerlessness and threat – among others, based on the strong symbolic power of the metaphors ‘electromagnetic pollution’ and ’radiation’ and their combination with the perception of the debates on the new uncertainties of the risks of modern technologies – are some of the components which build the layer on which EHS cope with their complaints.

Based on this knowledge, suggestions for improvements in the communication with EHS people were identified revolving around "relevance for everyday life" and "trust". Recommendations have been elaborated around individual communication as well as political and institutional requirements.

Discussion

The definition of EHS was disputed based on the critical comment that EMF hypersensitives in this study are described as persons who know about exposure in a “qualitative” way, who assume a positive dose-effect-relationship in order to explain the symptoms they are suffering from, and who are aware of possible actions to reduce exposure. It was noted, that from a scientific point of view, there is perhaps no exposure, and that the levels of action necessary to reduce exposure are very different for example for radio clock, mobile phones or high voltage lines. Mr Ulmer pointed out that the definition in this work was derived from a definition given by Rainer Frentzel-Beyme and was harmonized with other definitions of international studies. The objective of the study was to express how EMF hypersensitives, and those who think they are, perceive risks and want to have their information organized. Therefore the definition used was found to be applicable for this objective, because the communication needs of the interviewees are derived from their subjective points of view. The definition was not explained to the interviewees but was used to identify the hypersensitive persons in the screening interviews.

A question was asked regarding the representativeness of the sample, and how the 40 people were recruited. Mr Ulmer explained that the first step was a representative 3 minute telephone survey to 2406 people. This was designed to identify EHS people according to the project definition of EHS and to receive information about the prevalence of EHS in the society. Then a 19 minute interview with 167 identified persons was conducted to learn how they dealt with complaints, what their EMF sources were, and what their information level was. At the end of the interview, the interviewees were asked if they knew the term EHS and - independently from the answer - if they were willing to attend an in-depth interview. Out of at least 80 volunteers, 40 of them were further questioned in the in-depth-interviews.

A question was asked as to the impact of such a selection, i.e. whether there was a strategy to find a representative sample out of such a small number of 167 interviews. Mr Ulmer and Ms Belz (from the cooperating infas-institute) described the way in which the sample was representative. In the first step the prevalence, the socio-demographic and some psychographic data were filtered out in a statistically representative way. The second part was a psychological market study to describe typical EHS-types (as abstract prototypes), their special communication perceptions and needs. Unlike quantitative statistics, the results of this qualitative method are not improved by increasing the number of interviews. According to the experience of the Rheingold-institute responsible for that part of the study, a higher number of interviews would not have led to a new type of information need or psychological way of coping with EMF hypersensitivity. It is possible to derive from that kind of interviews ideal types of EMF hypersensitives. While the approach here does not provide a statistically solid result, it was really designed to provide information on communication needs from a qualitative and subjective basis. It was remarked that two projects within the DMF dealt with persons who regard themselves as EMF hypersensitives. The results of these projects will be discussed at the next workshop. Also the point was made that it is very difficult to draw a representative sample of EHS, because of their small number and – in addition – highly different cases. The first part of the study was designed as a random population survey, and, like in any other study of this kind, there is an inherent selection bias in the fact that higher educated people may more readily come to attend the short and in-depth interviews. The study followed a transparent process with clear steps.

There were questions regarding the list of demands from EHS people in terms of communication needs: did it represent the interviewees own opinion or were they presented with examples, and how many wanted each of the different demands. Mr Ulmer explained that the people interviewed made comments on their perception of the information material, which was then integrated in a final report available on the Internet.

1.4) Panel Discussion

Based on the results presented in the three projects in this session, Gunde Ziegelberger asked how to transfer this information on risk perception to the next step of risk communication. She invited representatives from other countries to share their approaches and experiences with regard to risk communication.

The example of Italy was brought up where little coordinated research is done on the social and communication aspects, as opposed to work performed in France and Germany. It was pointed out that, through surveys as described here, people get introduced to the concept of electromagnetic hypersensitivity and get more worried about EMF. Ten years ago, a working group commissioned by the European Commission investigated the prevalence of EHS, and found that the problem was then mostly confined to Scandinavia. It is now more geographically widespread. It was intimated that by posing the question of EHS in a survey, one would influence the answer and distort the situation.

As for Belgium, the prevalence of EHS is not as high as in Germany. In terms of risk perception, base stations are seen as much more of a concern compared to mobile phones. Thus, it was surmised that information related to base stations (the "not in my backyard" situations) should be handled differently from that for controllable devices (phones). Information is often too complicated for the lay person, and several other factors (e.g. election time, mass-media hype and disinformation) add to the complexity.

It was noted that all three presentations in the session reflected a need to provide different types of targeted information to special groups. Another common point was the lack of trust in the information system. The question was how to tackle this phenomenon so that people do not turn to pseudo- scientific organizations (such as the ones selling shielding equipment for mobile phones) that provide information through personal contact. The possibility was raised to make a

joint venture with consumer associations, since a federal office like BfS cannot provide such personalized service.

The point was made that trust is also built with clear messages to help people make choices. Most people are not interested in a technical solution but rather merely want to be assured that the technology is safe. The example of SAR was brought up: is it really necessary for people to know about SAR values since all handsets comply with the limits? It was noted that there was a need for concrete examples on the content of the information for the different subpopulations.

Transparency was seen as a key element for trust-building, along with the development of pro-active information (i.e. before concern grows) to show that the appropriate organizations (e.g. BfS, consumer associations, scientists) have already questioned the potential health effects and can provide useful information in an active way.

The question was raised whether there was really a need for special strategies for particular groups, such as EHS people. It was noted that, while EHS may be debatable, the fact is that it is a special communication group in society at present (as Roosli in CH).

Session 2
Information and Communication Measures

Anne Dehos of BfS chaired this session during which there were two presentations followed by a panel discussion.

2.1) Examination of the knowledge and effects of information activities in the field of mobile telecommunications and determination of further approaches to improve information of different population groups

Uwe Pfenning, Dialogik gGmbH

The subject of this research project was to examine the knowledge and effects of information activities in the field of Mobile Telephone Systems and to develop further approaches to improve information to different sections of the population.

The research project was essentially divided into two steps. The first step was an analysis of the quantitative and qualitative studies available on the perception and public opinion of mobile telecommunications. This preparatory research was the basis for elaborating the questionnaire and moderating the focus groups in the second step of the project.

Several investigations were carried out, including a qualitative survey using focus groups with citizens and experts, representing the German public. As a result, three “target groups” were identified. The first group of unworried persons classified the mobile phone radiation as rather harmless (*Unworried*, 32% of the population). A second group was composed of insecure people who have either not yet formed any opinion on the topic or who are still irresolute (*Unsure*, 47%). The third group consisted of persons who expressed concern about EMF radiation (*Worried*, 21%). Further, two expert focus groups were assembled, one comprising politicians, media representatives and scientists, while the other group was made up of representatives from the mobile communications industry and citizens’ initiatives/environmental groups. All five groups evaluated concrete information materials developed by authorities (e.g. BfS), scientists, the mobile communications industry and citizens’ initiatives/environmental groups (print materials, internet pages). The evaluations performed by the three citizens’ focus groups and the expert focus groups showed similarities and differences of opinion.

A quantitative survey was also performed through mail and telephone interviews with a total of 814 randomly selected German speaking members of the German population (20% return = 347 mail survey and 467 telephone survey) performed in summer 2005. The survey was based on a written questionnaire followed by a telephone survey, designed to make representative statements about the risk perception, status of information, informational behaviour, risk acceptance and the assessment of different communication strategies. The analysis of the survey showed that the target groups have to be addressed in specific ways and by specific channels. The group of the *Unworried* can best be reached with short, concise and catchy messages. The appropriate channels for this type of information are the mass media (in particular print media) and product information, such as labels on mobile phones. A completely different strategy is needed to reach the *Worried* who are generally suspicious of the industry, the state and the scientific world. One-way communication is in most cases not appropriate for this group. Only by way of dialogues and involvement can these people be motivated to learn. Local information events or panel discussions are appropriate channels to establish open contact with the worried, in particular when it comes to siting conflicts. For the group of the *Unsure*, information must be presented in a well-balanced, simple and convincing style and scientific uncertainties must be addressed in a comprehensive way. The unsure can be reached, like the unworried, via the mass media and product information. These groups accept practical hints with respect to precautions and health protection.

2.2) EMF-Portal: Internet Information System and Literature Database on Biomedical Effects of Electromagnetic Fields

Roman Wienert, RWTH Aachen University

The internet information system *EMF-Portal* (http://www.emf-portal.org) has been developed to provide unbiased scientific information to different stakeholders, including scientists, as well as policy makers and non-expert audiences who seek understandable scientific information from which they can draw their own conclusions irrespective of the media.

This web-based system, accessible free of charge, provides a database of over 10,000 publications, mainly from peer-reviewed scientific journals. One of the main features is the provision of detailed summaries of about 1,600 experimental medical/biological and epidemiological studies. The EMF-Portal includes several tools to help in the search and interpretation of the scientific data, including an interdisciplinary glossary, a database of every day's exposure sources and a section on underlying physical principles and mechanisms of biomedical action of EMF.

Since its launch in July 2005, the EMF-Portal has reached the 1 million page hits for the month of August 2006. Nearly 60% of users are from the US and 24% from Germany. The user profile includes 30% EMF-related occupations, 18% scientists, 17% informed laymen, and 14% novices in EMF.

The database of publications is continuously updated; with new summaries provided on a weekly basis. The EMF-Portal has a multi-lingual design: English and German are currently implemented, and other languages can be added. Future objectives include the implementation of additional languages, international collaboration. For the system to be kept active, continuous funding will be required.

2.3) Panel Discussion for Session 2

In the interest of keeping with the schedule, the presentations in this session were discussed at this stage.

Several comments and questions were raised regarding the first talk in this session. One of the attendees, who had actually attended one of the expert groups, did not feel there was a great gap between the operators and NGOs. Apart from the obvious gap between interest groups and providers, NGOs and consumer associations tried to communicate with both sides. The consumer protection groups and NGOs (e.g. Greenpeace) have a very important role in shaping the subjective perception of the population, as they are seen as impartial and objective, rather like scientists.

The point was reasserted that there is a clear distinction between the people who consider unacceptable the base stations and the mobile phones. However, a worrisome fact is that 50% of the public considers unacceptable the use of mobile phones while 100% of them use these devices. From a health protection point of view, this situation seems unacceptable in terms of quality of life and it should be the task of WHO, or other public health entities, to further analyse such social and psychological aspects of health. It was mentioned that, unlike the morning presentation on informed multi users, the Group of *Unworried* did not include the people active in getting information and reassured by their results. It was further noted that the groups presented so far were developed for different purposes.

There was a discussion on the need to distinguish between 3 types of risk comparison: (i) the risk vs. no risks description often used for laypersons, (ii) the more quantitative risk estimate used by scientists, introducing limit values and discussing acceptance below some level of risk, (iii) the risks vs. benefits comparison.

A question was raised regarding the first talk in the morning, where concern is described for transmitters within a radius of 5 km. What was the reason for choosing this distance, and what would be the exposure at such distance? The recollection was that this particular distance may have arisen from the pilot survey on the perception of how close a transmitter is from one's home.

It was pointed out that the awareness of people depends on personal concern and varies with time. Therefore a plethora of information needs to be generated with different levels of details.

Regarding the Dialogik presentation, a question was raised on the method used to derive the type of information to be used for the different groups, i.e. whether it was through a survey or through specific questions. Dr. Pfenning mentioned that there were special questions inside the survey, but pointed out that more research on strategies to reach people needs to be performed. The results were analysed by means of a factor analysis, and three factors emerged. At the beginning of the study they opted to follow the known operationalisation of Peter Wiedemann to gather results that would be compatible with other studies. However, not all survey results can be sorted in the factor analysis, leaving about 25% of the people not sorted with respect to the factors. But this disadvantage was accepted in order to have more compatible results. Moreover they attempted to perform a meta-analysis for which studies should have a common protocol to make them more compatible. At the beginning of the study only 3 or 4 studies could be used, which is not enough. However, by now there would be 11 or 12 studies that could be used for a meta-analysis.

Regarding the EMF-Portal, a question was raised whether there was any information regarding the type of lay persons visiting the website, e.g. unworried, worried or EHS people. The point was made that everyone who consults the site has some interest or a question, but it was difficult to classify the audience further. The feedback on the site was described as very positive but rare (on the site, visitors are not specifically alerted to the possibility of feedback).

The chairperson, Dr. Dehos, prompted the audience for their opinion on how to apply all this research data to improve information systems, and asked for feedback on the strong and weak points of the current information tools developed by BfS. One of the attendees argued that it was crucial for BfS to hold a clear line of reasoning to gain public trust. The example of a confusing message was BfS recommending the cautious use of mobile phone for children, while the official

position stated that exposure levels below international limits were safe for all populations, including children. It was argued that the public could not be expected to trust both positions and that BfS should provide a clear confession to uncertainty.

It was mentioned that, even though most people do not want to accept uncertainty, some do want a quantitative estimation. Only after the scientific uncertainty is clearly explained, can one mention that there is no risk from base stations. It would help especially with respect to trust in the authorities providing the information.

It was also proposed that information should convey both risks and benefits, an easier task for mobile phones than for base stations. The need for clear and easy-to-understand educational material, especially for children, was stressed. One should compare EMF risks to those of other agents (e.g. UV, pollution, etc), and could use nature programmes on television to explain EMF.

The experience from the Centre for Disease Control (Atlanta, USA) was brought up which showed that both trust and credibility are important. Credibility relates to the accuracy and completeness of information as well as to the speed of information release. This latter point is one of the problems with new technologies, since health information is generally lagging the uptake of the technology and only provided in response to a conflict. This framework was discussed in the Anthrax debate showing increased public conflict when these elements were not included.

It was remarked further that the information may also reflect a political decision. With the public mostly interested in a black or white (i.e. safe or dangerous) answer, some national authorities have chosen to unambiguously state in their leaflets that base stations do not pose any health risk, a statement that is scientifically unproven. Other information sources have opted for a more nuanced approach stating that there is no evidence that exposure below limits could be responsible for any known established effects. This is based on the fact that it is impossible to predict what will happen 30 years from now. It is up to individuals to decide whether or not to adopt recommendations (e.g. the use of earphones which, by and large, is not even taken up by the EMF scientific community). Recommendations are often misinterpreted by the public and media, one of the most famous one being the recommendation in the Stewart report regarding the use of mobile phones by children. And therefore it could be postulated that "information is a good argument to get worried".

Dr. Dehos mentioned that the term "Risikomündigkeit", or "risk majority" and its impact on risk perception and risk communication is part of the discussions since 2003, when it was defined in Germany by the so called "Risk Commission". People want clear answers and cannot handle uncertainty. This point was further argued, as it was felt that people are able to accept a small risk and would welcome an estimation of the possible risk, if set in the context of other well-known risks that are being taken in everyday life, such as driving or smoking.

The issue of trust was further elaborated on. From a socio-psychology point of view, it is a substitute for knowledge or competence, and is used when one does not know about an issue. To reach trust for an institution is senseless, as we cannot predict who will trust us. However, one may thrive to develop and provide credible information.

Session 3
Site Acquisition in Germany - Risk Communication in Local Settings

Rüdiger Matthes of BfS chaired this session during which there were two presentations to set the scene, followed by a discussion. Three research projects were then given dealing with conflict situation when siting transmitters.

3.1) Introduction: Site acquisition process in Germany – Framework, Regulation, Practice

Dietmar Gerhardt, E-Plus Mobilfunk GmbH & Co. KG

Mobile telephony networks are handled in Germany by 4 operators (T-Mobile, Vodafone, O2 and E-Plus). These networks need continuous roll-out and adjustments to meet market demand and deployment of new technologies like UMTS. To realize these objectives, it is necessary to install new base stations and refurbish existing ones.

The site acquisition and realization contain the following steps. First, the radio planning unit of the network operator locates areas where a base station must be build. A canvasser then searches for suitable buildings or areas for pylons. Once a contract is concluded with the site owner, the legislative requirements regarding EMF values need to be fulfilled, based on the *26th Ordinance Implementing the Federal Immission Control Act* (26th BImSchV). A site certificate is required that determines safety distances. The network operators then inform the appropriate authority, the Federal Network Agency and the municipalities when putting the equipment into service.

The search for new sites in Germany has provoked concern and criticism from citizens, a situation that is taken seriously by the network operators. Therefore the process in site acquisition was supplemented by an "Agreement on the Exchange of Information and the participation of Municipalities and Rural Communities in Mobile Radio Network Development", put in place in July 2001. This inter-association agreement between local authority associations and network operators was supplemented by a voluntary "Self Commitment" of network operators to the Federal Government in 2001. These voluntary measures involve, among other things, the municipalities in the choice of sites and improved information to the citizens. One of the objectives is to find amicable site solutions with the municipalities.

An annual review of the voluntary Self Commitment, performed by an independent body (see Talk 3.2 for more details), monitors its success. So far, these voluntary measures accommodate the requirements of all parties, improve the process of the site acquisition and are a successful part of risk communication.

Discussion

A question was raised on the process of getting a site certificate in the case where an existing site is further developed by adding new antennas (for different operators or for new technologies). The total safety distance is calculated by the Federal Agency for all the antennas on the roof, including all mobile base stations as well as other RF sources (e.g. police and rescuer companies). A site certificate is given only if the safety zone (where exposure levels are below legal limit values) is within the operator's controllable area (i.e. with no public access).

The topic of EMF monitoring system was discussed as a risk communication tool. Within the 16 Federal States in Germany, there was a demand for monitoring the temporal trend in EMF exposure. Data collected continuously to build up a database would be available to the public (as for example in Italy). These long term measurements will be added to an existing database of the Federal Network Agency for public access to locate base stations and other fixed radio stations and their safety distances. The location of these measurements is decided by the Federal Agency and the Federal States as well as the local community.

3.2) Realization of the self commitment of mobile network operators

A. Seidel-Schulze, German Institute of Urban Affairs (Difu), Berlin

This presentation described the goals, methodology and results of the voluntary Self Commitment taken by the four German mobile network operators in December 2001. The main targets of the Self Commitment were: (i) improved communication and participation regarding sites, (ii) consumer protection and consumer information about mobile phones, (iii) support of research into

health, mobile phones and other relevant issues, and (iv) monitoring as part of risk management. Efforts to reach these aims were to be reported in an annual monitoring.

In 2002 Difu (German Institute of Urban Affairs) began to conduct the annual monitoring of the Self Commitment (set up with relevant authorities in the Federal Government) and the "Agreement about exchange of information and the participation of communities in the building of mobile phone networks" (set up with the three national associations of municipalities). This monitoring process was commissioned by IZMF (Information centre of mobile phone technology). Four monitoring reports have been produced so far, in cooperation with other institutes and partners.

The monitoring was performed using qualitative and quantitative surveys with local authorities, and shop assistants, assessment of available information literature and websites and desk research.

Until now, monitoring shows that the Self Commitment has eased tension between communities and the mobile network operators. There is a strong willingness to find consensus on both sides. Nevertheless communication and cooperation with communities and further efforts to create transparency remain significant.

Discussion

Regarding the assessment of consumer information, it was deemed surprising that there would be attention to SAR values of individual mobile phones. It was noted that the SAR value was included in the survey because it is the only exposure estimate that is provided to the consumer. Therefore, the provision of this data by the mobile phone operator was monitored at points of sale. From the point of view of Difu as an urban institute, one attendee felt that the focus should be on the design of an efficient network which mostly drives the exposure levels. There is increased evidence, from research in several countries, that phones currently operate 50% of the time at maximum power, a far cry from an efficient use of adaptive control. This situation is due to poor network design from both a location and capacity point of view.

The point made during the presentation that conflicts are rare (15% of 70,000 sites) was questioned, as this would be quite a large actual number. Ms Seidel-Schulze responded that there are different concepts of how to define a conflict. It is not that 15 percent of sites are running through court proceedings but rather 15 percent of sites are built "without municipality approval". That rate seemed quite low, especially when taking into account how emotionally charged the debate about mobile network technology sometimes is.

3.3) Discussion

R. Matthes opened the discussion and asked for feedback on the German approach and on related experiences in other countries.

Dr. Vecchia mentioned his opinion and experience with exposure monitoring as a communication tool in Italy. There, measurements are performed on every base station, giving the perception that they are all different (although in reality very standardized). He questioned the cost-effectiveness of such measures and the inherent message ("actions are more important than words") that such continuous monitoring is needed as it may change over time. From a perception and communication point of view, such monitoring measures work well at the local level, as exemplified in the United Kingdom, where a sampling of base stations is only done in locations where people are most concerned.

The German example was further described. Around 10 measurement systems are under development to be set up in specific locations for a few days, and then moved to another location. One of the positive points about this programme is that the measurements are made by an independent third party who can provide specific quantitative data if need be. Further

clarifications were asked of the Italian system as to the number of measurement units (over a 100) and the length of monitoring (about 2 weeks in a specific location). Over 1 thousand base stations have already been measured, and a very large amount of data collected to date that can be viewed on a website.

The EMF database of the Federal Network Agency in Germany was criticized as providing very little emission-relevant data compared to the Swiss example that is updated daily. Dr. Gerhardt explained that in Germany; only the safety distance of base stations, calculated by the Federal Network Agency, is reported to the public. This is because safety distance, antenna height and antenna direction and not further technical parameters are deemed to be of general public interest and represent no confidential radio planning information for the operators.

The example of Belgium was described where operators are required to perform measurements only on sites where emissions are expected to be above 1/10 of the Belgian norms (¼ of ICNIRP limit values). Therefore operators will prefer sites where they do not have to do measurements, and will not necessarily opt for consolidated sites with many antennas. They have to provide the authorities with prospective emission data, but have no obligation to update information in case they later change the power levels. The provision of a certificate provided by the relevant authorities has averted a number of conflicts. Building permits are not required when the antennas are not visible (e.g. in church steeples), which has solved the conflict in a number of municipalities where the aesthetic argument has been used regarding property devaluation. The opposite situation has been faced in Germany where suspicion arises if antennas are hidden.

3.4) Support of the co-operation between the mobile telecommunication actors by the local agenda 21

A. Hoffmann, agenda-transfer Agency for Sustainability, Bonn

The objective of this research project is to evaluate whether the experience gained from Local Agenda 21 processes can be transferred to the co-operation between the mobile telecommunications players (i.e. local authorities, network operators and citizen's initiatives). Some of the main outcomes of this project are the recommendations to improve the communication process at a local level for siting mobile phone transmitters and to optimize public participation in the choice of sites. The Agenda 21 process, derived from the Rio conference (1992), provides practical experience on the organization of "Round Tables", the rapprochement of parties with diverging interests and the process of finding a consensus.

Investigation was carried out in 8 cities of various sizes, and interviews were conducted with 37 local representatives and 6 network operators. Surveys performed over one year, have shown that it is possible to adopt the experiences from Agenda 21 processes to the co-operation of mobile communications players with respect to both the "hard" and the "soft" factors of process management. The "hard" factors include the development and organization of structures for the dialogue process and the organization of work within these structures. The "soft" factors comprise the composition of Round Tables, rules for the dialogue, definition of roles, co-ordination and decision-making processes as well as ways to find solutions and a consensus.

The presentation included a description of the roles and self-conception of the players. Using the Local Agenda 21 process, a procedure was designed for a transparent dialogue with rules to be set up in case of conflicts. As a result of regional workshops, it was decided that the local authority should be responsible for drafting procedural regulations and that, in the beginning, a hot line between the local authority and the network operators is needed. Roundtables are useful for a successful dialogue between the local authority and citizens‘ initiatives. Measurements were also deemed helpful to objectify the debate about sites.

Discussion

One of the participants asked what makes roundtables successful and whether there were examples of failures. Mr Hoffmann mentioned that there indeed were a number of negative

examples, but the goal of the project was to bring Agenda 21 process into the mobile arena. Experience showed that roundtable discussions require much preparation and discussion on different topics (e.g. health issues, fear, hazards) prior to discussing site selection, so as to education the panel and reduce the potential of a conflict.

There is often a lack of technical and legal expertise in small communities to deal with siting issues. Unfortunately, exchange of experience between local authorities was rare and this situation was flagged as an impediment to the deployment of mobile telephony networks. The local representative often attempts to get information from Federal authorities, a time-consuming task.

The option of a hot line was discussed that would be handled by the local authorities to inform the operator what the citizen's initiatives are. Usually, the operator is trained to be proactive, but this is not a habit for local authorities.

A question was posed regarding who should moderate the roundtable since local authorities are often seen as an opponent to the citizen's initiatives. Several roundtables have been moderated by either the mayor or its representative, or the moderating agency. A list of the cities was requested where roundtables had been held. It was clarified that roundtables should only be used as a tool when conflict occurs.

Another attendee mentioned that communication is key in a conflict situation to dissolve the crisis, and that in certain parts of Germany, communication between towns often functions very well thanks to close contact between mayors.

3.5) Development of an online manual for successful siting processes and risk communication in the field of mobile phone conflicts

Ortwin Renn, Dialogik gGmbH

This project focuses on procedures and mechanisms to improve information and communication between the different parties involved in the installation of mobile phone antennas. There are three main steps: (i) a review of existing guidebooks and manuals for risk communication in this field, (ii) qualitative interviews with local authorities responsible for the siting process, representatives of providers and representatives of the affected public (citizens' initiatives), and (iii) the development of criteria for applying the traffic light model.

On the basis of the cumulative three-level-model (inspired by the "Traffic Light Rating Model", which is used in the UK), conflicts related to the siting of mobile phone transmitters are described as a process with three levels of escalation. Their cause, development and the general situation is analysed. For each of the three levels of conflict, the most important aim is to identify the salient characteristics of the conflicts and the parties involved, the controversial subjects, interests and the ranges of available options. One objective of this exercise is to compare the action taken by different members of the community in an actual conflict situation with the advice given in existing handbooks. A second objective is to derive valid criteria for characterizing conflicts and facilitating the categorization according to the three escalation levels.

Based on the results of this comparison, recommendations are presented in the form of a modular internet based guidebook designed for local officials. The manual will provide hands-on recommendations to facilitate the choice of the appropriate communication and participation instruments for each of the three levels of conflict escalation. In addition, it will include background information on legal, technical and health aspects of mobile phone base stations.

Discussion

There was a question on the necessity to use the traffic light model (which involves choosing indicators to measure the level of conflict), as opposed to just providing different types of tools for local authorities. Dr. Renn acknowledged that the advisory committee had discussed the use of

the simple traffic-light model but had come to the conclusion that this model proved to be intuitively clear, yet complex enough to give assistance in choosing the right communication tools.

An industry representative asked whether a distribution of the cases within the traffic light model was available for their own antenna sites. It was noted that most of the cases recorded were either red or amber, and that operator information was not included in the analysis.

Another question was whether there was a strategy to evaluate the usefulness/success of the document and what the parameters to measure success would be. Dr. Renn said that success is a very subjective notion, and that there were two options: feedback and evaluation by the people that use the manual, and objective comparison between those who use the manual and those who do not.

A suggestion was to provide a check list to help the local authorities to discern which scenario they were facing. The goal was not to measure the degree of conflict (in that case it would be too late), but rather to foresee the likelihood of future conflicts under certain conditions (e.g. planned sites near kindergarten, near active citizen's groups).

While the tool can be used both in the planning or siting process, it was asked if it had also been tested backward, i.e., for a certain conflict situation, if it would have been possible to use the checklist to mitigate the conflict. Dr. Renn mentioned that they had been tempted to do so. However, he felt that evaluation through retroactive fitting was methodologically not sound as situations always can be fitted to meet one's own model in hindsight. Instead, they asked for feedback from users who had to deal with conflicts, and found that mismanagement of issues usually occurred due to partial information of a situation or because of diverging and multiple responses from administrators or politicians.

The critical factors when dealing with different levels of conflict were highlighted as being the issues of transparency, public participation and risk evaluation. How can one achieve consensus if there is no agreement on these different issues? Dr. Renn agreed with the factors mentioned: transparency is a necessary condition, although some proprietary information cannot be legally disclosed. Participation is important if there is a clear and intense conflict, but is not recommended otherwise. The third point, risk estimation, is most important: as a mediator or public official, one should never try to find a consensus on the health impact, but rather acknowledge that there are always different opinions on the health impacts but that local officials were legally required to make sure the governmental standards are not surpassed. It is not up to local officials to question or second-guess the national standards. It is important for people, however, to understand the main rationale and the current scientific agreement on health impacts but this information should be communicated by qualified experts. It is also important to emphasize the benefits of mobile telephony coverage and to place much effort in achieving a fair procedure.

3.6) Mediation as a possible alternative dispute resolution in the site acquisition process

Klaus Winkler, Sumbiosis GmbH

This practical project was sponsored in 2002–2003 by the Federal Ministry of Economics and Technology, and was not part of the DMF research programme. In this work, mediation was tested as an alternative dispute resolution method in the site acquisition process. The basic premise on using mediation in negotiations is that the process of negotiation is at least as important as the subject under negotiation.

To achieve a principled negotiation, a functioning working relationship needs to be built up by clarifying the respective points of view and exploring the underlying interests. This theory was tested on a situation involving the siting on a mobile phone antenna across from an elementary school. The objective of the project was to help the parties involved (a group of mothers

representing the parents' councils of a boarding school and a kindergarten, a mobile phone company and the local environmental protection authorities) develop jointly and by mutual agreement a realistic solution. The negotiations were held over 7 weeks, and had a successful outcome in the sense that the result was seen as win-win by all involved. They very successfully overcame the barriers to dialog which usually hinder constructive joint problem solving in such cases.

For cost reasons in particular, mediation cannot be applied in every single conflictual site acquisition project. Numerous disputes could however be prevented and resolved if the knowledge gained from test cases like the one above would be incorporated by the actors representing mobile phone companies and public authorities in their negotiation strategies - i.e. learning from the mediation experience how to manage negotiation processes in a principled way.

Discussion

A question was asked regarding the location of the site and the acceptance as a win-win solution by other constituents. Dr. Winkler explained that the final decision was a fallback solution (not the best solution), but it was improved with a small addition. In a way, it was a win-win solution in the sense that the different constituents never gave negative feedback to their representatives on the mediation panel regarding their choice. The main drawback was the very long delay (over a year) in implementing the solution.

Dr. Winkler was asked whether there were representative results showing that this experience could be transferred. He explained that, unfortunately, there are few documented cases, but that the approach should be seen as an element of a toolbox that includes mediation, negotiation and moderation. Another question related to the size of the group: to keep it to a manageable size, interested parties were created and informed of the progress of the discussion. Focus was placed on making sure that the group members were authorized by their constituents to represent their positions. It was argued that the sustainability of the solution can only be experienced over time if it remains the best solution. Dr. Winkler responded that, from a mediator view point, what matters is that the group is satisfied with the results. As for the long term, the constituents are still happy with this solution, but if they were to do it today, they may come up with a different outcome.

There was further enquiry into the fallback site location, and whether in hindsight it was felt that the solution had an impact on other communities which should have been part of the process. Dr. Winkler explained that the fallback location had been chosen because the group could not make contact with the owners of the favoured site. The main goal was to make sure that the EMF radiation was reduced in sensitive areas, which was achieved with the base station finally being located near a highway where no other community was affected.

On the criteria for choosing Munich for the mediation process, Dr. Winkler explained that several locations had been selected but only in Munich could they get people to agree to join the mediation. Given that the mediation project was part of a survey (2002-03), the question of a bias in the findings was raised, since the participants knew of the survey and may have been more open minded to negotiate the problem. The speaker acknowledged that there may have been several biases, including his own as a mediator, the self-selection of participants, and the fact that the participants did not have to pay consulting fees for solving their problem (since it was paid by the Ministry of Economics).

A similar experience of successful mediation was described for a different subject matter (polluted area), with several hundred people involved. It was noted that it is important to provide the participants with necessary scientific facts from a trustworthy source.

The speaker was asked whether the risk perception of the people was really changed by changing the location of the base station. In his opinion, the participants' reality was adjusted to their risk perception. The participants became more knowledgeable of the overall issue, and thus may have understood the perception of the other parties, but the own perception of risk was not

necessarily changed. Therefore one result of the process is that problems can be solved without changing the risk perception.

It was recognized that, during the course of discussions, some people may also change their opinions. However, in the case of conflicts, what would be the alternatives besides negotiation when a law exists that allows erection? In the mediation process, the discussion was based on the premise that there was a need for an antenna and for defining an optimum location for it with minimum exposure.

Final Discussion

Dr. Wolfgang Weiss, head of Department of Radiation Protection and Health of BfS, chaired the final discussion and thanked the participants for their input. Through his long experience in discussing radiation and health issues with the German Parliament, he set in perspective the varied topics of concern to politicians. These range from well-documented health threats such as ultraviolet radiation and radon exposure (both of which account for a sizeable cancer burden every year) to mobile telephony (where uncertainty on health effects currently prevails) and waste disposal. He mentioned the role of scientists in helping decision-makers set policies but warned that, if researchers did not provide useful results, politicians would have to make decisions on their own. The Parliament allocates money, and expects a successful outcome, which translates into satisfied citizens. In that light, the current research programme represents an opportunity to help decision-makers in their stance on mobile telephony, but also a challenge as the expectation is very high.

At the beginning of the programme, it was decided to include the topics of risk perception, information and communication. The goal was to develop tools and guidance for understanding and measuring perception of mobile telephony, and to evaluate if such tools are practical and effective in changing the risk perception.

Now, at the final stages of this research programme, Dr. Weiss asked pointed questions to the audience on the success of the work: were the needed tools to deal with these questions developed? If not, what is missing and why was it not successful? Is the proportion of people worried still the same? Is the uncertainty the same? Is asking science to deal with the question the right strategy, or should other tools be used, such as promotion (e.g. the car industry which promotes the safety of cars while causing 7000 deaths every year)?

Dr. Weiss presented the four over-arching questions that were being used in discussions in all five seminars concluding this research programme.

- What has been achieved by the projects? What are the lessons learned?
- Where do we still have gaps?
- What impact do the findings have for practice in the field of information and risk communication?
- Are there lessons learned that could be transferred to similar situations in future?

The first question relates to the achievements of the specific projects described during the workshop. It was agreed that the presented projects provide a sound knowledge base for acting and communicating with people, analyse what the information needs are and define different

groups requiring varied information. There was a sense of common ground in terms of possible instruments and information measures for target groups.

In terms of remaining gaps in research, this broader question applies to both scientists and to practitioners whether there are other methodologies that have not yet been tested. More generally, gaps remain in defining and measuring success, and in the time scale and the procedures to fill those gaps.

Several projects had provided useful information about techniques and tools of participation in conflict situations, but this knowledge needs to be transferred to local authorities, especially those that are not able to get rid of conflicts at an early stage. On the topic of providing knowledge to medical doctors, this was deemed to be an important sub-group to whom knowledge should be provided as they would often be queried on health effects by their patients.

It was noted that the discussion had mainly be focused on the local level and that the position of the legislation nationwide needed to be clearer in order to help local authorities. It was argued that Federal states insist on their responsibility.

The four studies on target groups were not harmonized, making it difficult for BfS to draw conclusions and communication strategies. The tools discussed so far have not been verified in terms of their effectiveness and it may be useful to develop a synopsis to accompany the results to date.

Dr. Weiss felt that the issue of communicating uncertainty had not been discussed in depth. It is clear that politicians and the public would rather have a clear (black or white) answer. Therefore the way that scientists communicate this uncertainty is key to risk perception. It was further noted that this area is characterized by this scientific uncertainty and discussing it openly and honestly is crucial to gain public trust, since it is clear that even BfS does not know what will happen in 10 years.

An assessment programme of existing tools was recommended, which would evaluate the effectiveness of the different measures presented in the workshop. For example, it was felt that roundtables are interesting measures, but in practice communities may not want such complicated instruments. The example of monitoring exposure through measurement campaigns in interested communities was also given. The outcome of such measure on the public should be scientifically studied and could provide clues to other gaps.

Dr. Weiss again offered to consider strategies used in other industries to approach the perception problem. Rather than mentioning that the use of mobile phones is safe because EMF exposure limits have not been attained, communicating the successes achieved (e.g. over the 10 past years, have lowered exposure because it was technically feasible) may have more impact. Active promotion of the safety of the technology may be one module of a larger strategy

In closing, Dr. Weiss described the process to be followed. Participants provided input to the general questions posed in the panel discussion, which he would be asked at the end of the programme. Upon collecting their preliminary ideas, a draft would be sent to the audience over the next few weeks. Their feedback would help shape the final document to be presented together with Rapporteur's reports at the final workshop in late 2007 or early 2008. Dr. Weiss thanked all the participants and closed the meeting at 16:02.

Emilie van Deventer
Geneva, December 2006