Mobile phones and risks

Organiser Litera Japan
Risk Seminar series no.2

Appendix:
1. Radio-radiation protection guidelines of Japan
2. Japan’s contribution to WHO EMF project by ARIB
1. Preface

Professor Ortwin Renn
Department for Sociology of Environment and Technology, University of Stuttgart

The use of mobile phones has proliferated over the last three decades. The number of mobile phones that are operated in the world amounts to around 6 billion rapidly approaching the figures for the world population. It has become the most attractive electric device in the world topping such popular items as transistor radios or washing machines. Benefits from mobile communication are now widely distributed, and mobile phones have become objects of mass consumption. At the same time, however, the risk of electromagnetic fields (EMF) associated with mobile phones has been a major concern of many citizens worldwide and led to protest movements and social opposition to siting transmitter stations in many countries.

Social mobilizations against base station transmitters began in the late 1990s and have remarkably increased in number and intensity from 2000 to 2007. After 2007 the protest movement declined yet it is still present in many countries, in particular when new local transmitter stations are being planned or constructed. Protest is organized by different types of groups: a) preexisting associations, groups and committees already active against power lines or electromagnetic fields in general; b) newly constituted groups or associations, both at the local and national level; c) environmental groups and neighborhood organizations. The evolution of mobilization has been discontinuous. Protest began only several years after the appearance of base station transmitters and it increased after the promulgation of national regulations on electromagnetic emissions.

Citizens who protest against the proliferation of the base station transmitters are mostly concerned about possible health effects. They strongly resent the lack of information and consultation and often accuse public authorities of being unable or unwilling to resist the pressure of manufacturers and to contrast their strategies in the name of social interests and needs.

The risk field EMF is indeed characterized by uncertainty and ambiguity in at least four spheres of collective life: Science; Society; Politics; and Law. Scientific uncertainty is basically due to the difficulty of drawing ultimate conclusions about the health effects of the electromagnetic waves on the human body. The potential health impacts, if there are any, are hidden within the background noise of cancer occurrences and cannot be proven statistically. It is impossible to prove that EMF have no effect but there is also no conclusive evidence that there is a measurable risk to human health. Scientific uncertainty derives also from the application of different research methods, namely laboratory studies and epidemiological studies. Societal uncertainty is related to the behavior of the (public and private) actors engaged in activities concerning mobile telecommunication and its risks. It is severe when respect for government agencies is low, individualism prevails and there is little or no integration of publics and institutions. Institutional uncertainty derives from a lack of collaboration and/or trust among institutions. While rapid and consistent communication is important, the necessary channels of understanding and confidence are absent. Last but not least, there is a legal or juridical uncertainty. Matters of uncertainty are related to the territorial distribution of regulatory competences, the overlap between health, land use and commercial aspects, and the adoption of the precautionary principle.

The challenge for the diffusion of mobile communication therefore consists in the different point of views of the relevant actors. Central governments and local administrations have acknowledged the attractiveness of the technological devices for the vast majority of people but feel also pressured by (opposing) requests from citizens and mobile phone companies. Their institutional task is to enforce regulation whilst in the meantime their political interest is to reduce conflict. The distribution of risks is unequal, as only part of the population is exposed to electromagnetic emissions from transmitters, i.e. people whose houses or workplaces are close to the base station transmitters.
As a means to deal with these conflicts, participatory processes have evolved in different ways in various countries, ranging from risk communication programs directed towards local residents to establishing platforms for citizens to co-design stations or to voice their preferences for siting facilities. Usually, there is no legal obligation to devise inclusive policy procedures, but experience has shown that an honest effort to include local citizens has been successful in aligning the technical infrastructure needs with the local residents’ concerns for a safe environment.

The proceedings of this seminar show the need to engage in more dialogue and risk communication even if the victory path for mobile phones continues world-wide. The use of phones do not invalidate the efforts of many actors such as regulatory agencies, city councils, phone providers and others for dealing prudently with local residents when siting new transmitter stations or enhancing the mobile phone net. Different from other areas of risk protests such a nuclear energy or waste incinerators, most of these efforts to include concerned citizens in planning, designing and locating transmitter stations, have been successful and rewarding for all actors involved. Successful communication includes an honest review of health impacts, a clear distinction between hazard and risk, and the flexibility to move stations away from very sensitive areas. Truthful information combined with respect for concerned citizens are the most important ingredients to gain acceptance for a continuous diffusion of mobile communication in the world.
2. Public participation in the siting of mobile phone base stations

Dr. rer. nat. Evi Vogel
Bavarian State Ministry of the Environment and Consumer Protection
Munich / Germany

Despite the fact that nowadays the use of mobile phones is ubiquitous and emission levels around base stations usually are well below the limit values recommended by the World Health Organisation (WHO), public debates about base stations are continuing in many countries. As forecasts show, mobile data traffic will increase significantly over the next years whereas the capacity of base stations will develop much slower, therefore the number of base stations has to increase and consequently the debates will remain. There are several reasons for such debates: primarily negative health effects are feared, but also a value depreciation of property and the disruption of the landscape by the base stations. Additionally, there is the jealousy towards those who earn money by allowing mobile phone antennas on their houses or grounds to be built and the lacking possibility of the general population to have a say in the siting of the base stations. Therefore scientific research concerning possible health effects has to be complemented with information campaigns, measurement data and policies allowing the public to participate in finding sites for new base stations.

The WHO recognized the need for guidance of dialogue processes accompanying the siting of base stations and approached this subject already in conferences in 1997 and 1998. Subsequently a WHO handbook on “Establishing a dialogue on risks from electromagnetic fields” was published and can be found on their internet site http://www.who.int/peh-emf/publications/risk_hand/en/.

In the following the example of the Bavarian “Mobilfunkpakt” is described to illustrate an option of how the public can participate in the siting of mobile phone base stations.

**Framework for the Pact: Legal requirements for base stations in Germany**

Already in December 1996 a federal ordinance was passed to regulate non-ionizing radiation, adopting ICNIRP (International Commission on Non-Ionising Radiation Protection) and WHO recommendations for the protection of the public. This ordinance was amended in August 2013, using the latest international recommendations and including more precautionary measures than before (http://www.gesetze-im-internet.de/bimschv_26/index.html). In the frequency range of mobile telephony, the amendment now also decrees a participation of the communities in the siting of mobile phone base stations. In the high frequency range the compliance with the limit values of the ordinance is controlled by the Federal Network Agency („Bundesnetzagentur “ www.bnetza.de). For each base station to be built they calculate the so called safety distance, the distance where the field strength falls below the limit value. Then they issue a certificate containing the antenna data and the safety distance to be kept which has to be handed in to the appropriate district authorities before the base station goes into operation. The Federal Network Agency each year runs a large number of sample measurements throughout Germany to test compliance with this certificate. Additionally, each base station to be built has to fulfill the building laws, which slightly differ within the different German states. In Bavaria only base stations higher than 10 meters need a building permit, smaller ones may be erected without such a permit; the building permit has to be requested from the respective community.

Therefore many of mobile phone base stations in Bavaria have been built without the knowledge of the communities, because they did not need a building permit. Thus when the construction machines arrived, neither the community nor the citizens knew what for. So especially at the height of the base station roll out, around the year 2000, this missing information lead to a lot of unpleasant situations and press campaigns, particularly so in Southern Germany.

**Development of the Bavarian “ Mobilfunkpakt”**

Consequently in Bavaria a first contract between
mobile phone providers and the Bavarian Environmental Ministry was signed in 1999. According to the providers had to organize regional conferences on a year in order to inform about new plans for siting mobile phone base stations in general and they had to share larger masts (with fixed percentages). On the other hand, information campaigns for different stakeholders were organized by the Bavarian Environmental Ministry. In 2001 another contract was signed between the providers and the Bavarian Environmental Ministry, this time it was a pilot project including 60 smaller communities and 6 bigger cities which took part in testing the possibilities of how to include the communities in the siting of mobile phone base stations.

At about the same time the mobile phone providers signed a contract on a federal level, allowing for more information and research. However, it contained no framework for participation in the siting of mobile phone base stations. Meanwhile the evaluation of the Bavarian pilot project was used as a basis for the Bavarian “Mobilfunkpakt II”. It was signed in 2002 by the mobile phone providers, the Council of the Bavarian Communities and the Bavarian Environmental Ministry. This pact has been prolonged several times and still is in operation. (http://www.stmuv.bayern.de/umwelt/strahlenschutz/elektromagnetische_felder/mobilfunkpakt/index.htm).

Contents of the Bavarian “Mobilfunkpakt II”
The pact contains a detailed framework for the participation of communities in the siting of mobile phone base stations:
For communities larger than 50 000 inhabitants the setup of round tables with the relevant stakeholders is suggested which then have a constant dialogue process about the roll out of base stations and inform the public on a regular basis.

In smaller communities, with less than 50 000 inhabitants, the community can signal its will to participate in the siting process within 30 days after the provider informs about new plans. They then have 2 months to suggest up to three sites which the provider then has to check for eligibility. If one of the suggestion of the community qualifies, it has to be adopted by the provider. In any case a final discussion about the siting has to be held in the community.

Additionally, commitments of the State of Bavaria are included in the pact, such as a measurement programme for the communities. A community can apply for it whenever a new site is planned and 33% of the costs for the measurements are paid by the Environmental Ministry, 57% by the mobile phone providers and 10% by the respective community. Meanwhile such measurements were done in more than 600 communities. Furthermore, there is a simplified process when base stations are to be built on state properties (e.g. buildings or forests) and the Bavarian Environmental Ministry consented to and regularly conducts training for their environmental engineers and the public health service, information campaigns and EMF monitoring. All these measures are summed up in a yearly report.

Since the introduction of the pact the protest wave has been pacified continually. Already in 2007 a poll among the 2000 communities in Bavaria with a response rate of about 50% showed that about 80% wanted the pact to continue and only in 13% of the communities severe problems with mobile phone base stations existed.

Further development
The amendment of the federal ordinance mentioned above contains a short paragraph stating that as of August 2013 the community in whose territory a new high frequency antenna is to be built has to be informed by the provider. Then it has the possibility to give a written comment and discuss this comment with the provider; the result has to be considered.
However, under scrutiny this legal obligation is much weaker than the requirements laid down in the “Mobilfunkpakt II”. Therefore - for the time being - it was decided to continue with the pact, which exceeds the legal obligation, because the process of the “Mobilfunkpakt” is well known and observed in Bavaria and objectifies heated local discussions.
As the pact expires end of 2015, the signatories will meet in spring to discuss the conditions for its prolongation.

**Dr. Evi Vogel**

Evi Vogel received her diploma in physics with a minor in physiology and her PhD in theoretical radiation biophysics from the University Erlangen, Germany. After post-doctoral research she started working for the German Federal Office of Radiation Hygiene in 1994. Her main subjects were non-ionising radiation, its application to medicine and medical ultrasound. In 1998 she transferred to the Bavarian State Ministry of the Environment and Consumer Protection. She is head of the unit “Noise, Non-Ionising Radiation and Sustainable Mobility”. Her main tasks are the design of communication programmes and measurement campaigns as well as the engagement of the public in decision making. She was seconded to WHO/Geneva from 10/2000 to 3/2001, where she worked for the International EMF Project and is co-author of the WHO book on “Establishing a dialogue on risks from electromagnetic fields”. From 3/2011 to 7/2011 she was seconded to the Permanent Representation of Bavaria in Brussels. She worked in several national and international working groups on EMF.

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ドイツバイエルン州環境消費者保護局
騒音・非電離放射線担当責任者。
3. How to interpret health risks

Dr. Mariko Nishizawa
Risk communication expert. Director of Litera Japan.
Associated member of Japan Science Council and member of the advisory panel to the Japanese Ministry of General Affairs on mobile phone and radiation.

How to interpret health risks

Risk and hazard are often mixed and misunderstood.

1. Risk and hazard differ (risk and hazard)

2. Risk assessment's procedure (Risk assessment)

3. How to interpret health risks

Dr. Mariko Nishizawa
Risk communication expert. Director of Litera Japan.
IARCの報告は
その物質の発がん性の科学的根拠
の強さで定性的「ハザード評価」。
定量的「リスク評価」でない。

ELF(2B)の評価時の提示
(優先順位順)
1. Further research should be conducted.
2. Risk communication is encouraged.
3. Low-cost ways of reducing exposures may be explored.

携帯電話のリスク評価も同じ？

3. リスコミがなぜ必要か

4. 携帯電話のハザード同定(2B)時の中渋 (IARC 2011)

- Mobile EMF users warned over cancer link (The Independent).
- Mobiles may cause brain cancer (BBC).

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will meet in spring to discuss the conditions for its end of 2015, the signatories observed in Bavaria and objectifies heated local processes of the “Mobilfunkpakt” is well known and which exceeds the legal obligation, because the much weaker than the requirements laid down in the legal obligation is under scrutiny this legal obligation is.

After having earned her PhD degree in Risk Communication and Policy from Imperial College London, she joined the Centre for Technology Assessment in Baden-Württemberg, University of Stuttgart led by Professor Ortwin Renn. During her research in Europe between 1996-2005, she has widely worked in risk communication-related fields such as EMF, global warming, genetic technology, BSE and future energy.

She currently serves as Associated Member of Science Council of Japan, Adjunct Professor University of Tokyo and gives policy advices to ministries such as Ministry of Health (MHLW), Ministry of Education (MEXT), Ministry of General Affairs and Tokyo Fire Department.

Dr. Mariko Nishizawa
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4. How risks of mobile phones are discussed

Daniel Storch, PhD.
Head of Section.
Radiological Protection / Section Non-Ionising Radiation and Dosimetry.
Federal Office of Public Health FOPH.
Federal Departement of Home Affairs FDHA.

How risks of mobile phones are discussed

4. February 2015, Warwick Geneva Hotel
Danil Storch
Federal Office of Public Health

Introduction Risk Communication at FOPH

In the context of uncertainty in the field of EMF, information of the public is an important issue. A well informed public is able to act in a self-responsible way and apply precautionary measures.

The internet has been chosen by the FOPH as the main medium for the direct information of the general public about EMF.

The access to the internet is widely spread in Switzerland; already in 2005 70% of the population older than 14 years used the internet as a medium for information.

2014 Factsheet about induction hobs had more than 1’000’000 clicks
Factsheets in 3 country specific languages (German, French, Italian) and English.

Factsheets

<table>
<thead>
<tr>
<th>Household</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Energy-saving lamps</td>
<td>(68’681 clicks/yr)</td>
</tr>
<tr>
<td>Induction hobs</td>
<td>(1’039’253 clicks/yr)</td>
</tr>
<tr>
<td>Microwave ovens</td>
<td></td>
</tr>
<tr>
<td>Waterbeds</td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td></td>
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<tr>
<td>Magnetic mattress pads</td>
<td></td>
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Factsheets II

<table>
<thead>
<tr>
<th>Telecommunication</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mobile phones</td>
<td>(141’256 clicks/yr)</td>
</tr>
<tr>
<td>Cordless (DECT)</td>
<td>phone</td>
</tr>
<tr>
<td>WLAN</td>
<td>(138’002 clicks/yr)</td>
</tr>
<tr>
<td>Bluetooth</td>
<td></td>
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<tr>
<td>Baby monitors</td>
<td></td>
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Factsheets III

<table>
<thead>
<tr>
<th>Traffic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars, hybrid cars</td>
<td></td>
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<td></td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Heating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric floor heating system</td>
<td></td>
</tr>
<tr>
<td>Electric water heater</td>
<td></td>
</tr>
<tr>
<td>Electrical radiators</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

Layout of the factsheets

Part 1 - Summary of relevant health aspects
- Risk assessment
- (Simple) advice

Part 2 - detailed information
- technical aspects
- health aspects
- limits (law, technical, ...)
- health assessment
- regulatory framework
- references
Advice

To minimize the exposure, our advice is:

- Use a wireless hands-free system (e.g., Bluetooth) with a low-power Bluetooth sender to reduce radiation to the head.
- Often keep your cell phone or send a text message (SMS) instead.
- When laying a wireless phone, make sure it has a base unit.
- Whenever possible, only use your phone when the signal quality is good.

Further advice:

- Never use a phone while you are driving a vehicle, not even with a hands-free kit.
- Be wary of radiation data, and other such protective devices that are claimed to limit exposure to radiation. They may reduce the connection quality and therefore increase the exposure to radiation.
- People with active medical implants should keep their mobile phone at least 35 cm away from the implant at all times.

Conclusion

- high interest to the factsheets
- Systematic review for health effects
- actual contents – including new technologies – new worries

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1999 MSc in Chemistry and Economics of the University of Basle
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## 1 Overview of Radio-Radiation Protection Guidelines

Radio waves cause the following effects:

1. **Stimulation effect**
2. **Thermal effect**

**Strength of radio waves causing these effects (threshold level)**

- Sufficient safety factor (approx. 50 times)

Guidelines on the strength of radio waves with no adverse effect on the human body.

**Radio-Radiation Protection Guidelines**

(enacted in 1990, revised in 1997, 2011)

## 2 Composition of the Guidelines

**Basic Guidelines**

Guidelines to evaluate safety on EMF exposure based on biological effects:
Whole body average SAR 0.4 W/kg, etc.

**Administrative Guidelines**

Guidelines for practical exposure assessment to determine whether basic guidelines are fulfilled.

- **EMF Strength Guidelines**
  - For radio stations such as cellular base stations and broadcasting stations
- **Partial Body Absorption Guidelines**
  - For radio devices such as mobile handsets.
3 EMF Strength Guidelines

EMF Strength Guidelines
Applicable when the whole body is evenly exposed to radio.

Guideline for EMF strength under general environment (Average time: 6 minutes)

<table>
<thead>
<tr>
<th>Frequency f</th>
<th>Electrical field strength E (V/m)</th>
<th>Magnetic field strength H(A/m)</th>
<th>Power flux Density S(mW/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10kHz - 30kHz</td>
<td>275</td>
<td>72.8</td>
<td>0.2</td>
</tr>
<tr>
<td>30kHz - 3MHz</td>
<td>275</td>
<td>2.18f¹</td>
<td>f/1500</td>
</tr>
<tr>
<td>3MHz - 30MHz</td>
<td>824f¹</td>
<td>0.0728</td>
<td>1</td>
</tr>
<tr>
<td>30MHz - 300MHz</td>
<td>27.5</td>
<td>f²/237.8</td>
<td></td>
</tr>
<tr>
<td>300MHz - 1.5GHz</td>
<td>1.585f²</td>
<td>0.163</td>
<td></td>
</tr>
<tr>
<td>1.5GHz - 300GHz</td>
<td>61.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* f means frequency expressed in unit of MHz.

4 Partial-Body Absorption Guidelines


<table>
<thead>
<tr>
<th></th>
<th>Management environment</th>
<th>General environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole-Body Average SAR</td>
<td>0.4 W/kg</td>
<td>0.08 W/kg</td>
</tr>
<tr>
<td>Local SAR</td>
<td>For any 10g of tissue :</td>
<td>For any 10g of tissue :</td>
</tr>
<tr>
<td></td>
<td>10 W/kg</td>
<td>2 W/kg</td>
</tr>
<tr>
<td></td>
<td>20W/kg (the limbs)</td>
<td>4 W/kg (the limbs)</td>
</tr>
<tr>
<td>Contact Current</td>
<td>When contact hazard is not prevented :</td>
<td>When contact hazard is not prevented :</td>
</tr>
<tr>
<td></td>
<td>100mA (Frequency range of 100kHz to 100MHz)</td>
<td>45mA (Frequency range of 100kHz to 100MHz)</td>
</tr>
</tbody>
</table>

(Average time: 6 minutes)
5 Enactment of the Guidelines

1. Safety facilities against RF-EMF exposure

Obligation to install safety facilities to prevent the general public from entering sites where EMF strength exceeds the limit values.

(October 1999)

2. Limit of energy absorbed by the human head

Limit of Specific Absorption Rate (SAR) of RF energy absorbed into human head (2W/kg), defined as mandatory standard.

Subject: Mobile phone, Satellite cellular phone and Broadband Wireless Access

(June 2002)

3. Limit of energy absorbed by the human body

Limit of Specific Absorption Rate (SAR) of RF energy absorbed by human body (2W/kg (4W/kg for arms and legs)), defined as mandatory standard.

Subject: Mobile phone, Satellite cellular phone and Broadband Wireless Access

(April 1st, 2014)
Appendix-2
Japan’s contribution to WHO EMF project by ARIB

電波の健康影響に関するWHOのリスク評価について

世界保健機関（WHO）は2014年9月30日、無線周波（RF）電磁界を含むによる健康影響に関する公式のリスク評価を含む「環境保健ガイドライン（EHC）**1**」の専門家向けのコンサルテーション（コメント）用草案を公表しました**2**。

今回公表されたEHC草案は、2012年12月までに発表された査読付き論文**3**に基づいています（2013年12月までの事例も含みます）。今回のEHC草案には、電磁環境委員会が20年以上にわたり、我が国の研究者に委託して実施した数々の研究も多数掲載しています（別紙をご参照下さい）。

今後、WHOは2014年12月15日までに提出されたコメントを集約後、2015年秋にRF電磁波の健康リスクに関する各分野の専門家で構成されるタスクグループ会合を招集し、最終草案を作成します。この最終草案には、今回のEHC草案にはない「第1章 要約」、『第13章 健康リスク評価』、及び『第14章 防護措置』の各章も盛り込まれることになっています。その後、編集作業等を経て正式版を2016年に公表予定です。

今回のEHC草案の公表に伴い、WHOはファクトシートNo.193「電磁界と公衆衛生：携帯電話」を改訂しました**4**。その結論は従来と同じく、「携帯電話が潜在的な健康リスクをもたらすかどうかを評価するために、これまで20年以上にわたって多数の研究が行われてきました。今日まで、携帯電話使用が原因とするいかなる健康影響も確立されていません」というものです。

電磁環境委員会は今後も電波の健康影響に関する研究を継続し、事実を正確に公表する等の活動を通じ、日本国内のみならず国際的にもこの分野で貢献していこう所存です。

以上

本件に関するお問合せ先：
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*1 世界保健機関(WHO)、国際労働機関(ILO)及び国連環境計画(UNEP)が共同で実施している国際化学物質安全性評価(IPCS)の活動のひとつで、短波長帯における電磁波の健康影響についての専門家による評価をまとめたものです。

*2 http://www.who.int/peh-emf/research/ff_ehc_page/en/

*3 同じ分野の研究者による匿名の審査を経て、学術専門誌に掲載された論文を組みます。

*4 http://www.who.int/mediacentre/factsheets/fs193/en/
今回のEHC草案で採用されているARIB委託研究

【携帯電話電波の脳細胞に及ぼす影響についての研究】
（「8章 神経変性疾患」、「10章 免疫系及び血液学」、「12章 がん」で引用）

【携帯電話電波の生殖器に与える影響についての研究】
（「11章 生殖能、生殖及び子どもの発達」で引用）

【携帯電話電波の脳血流に与える影響に関する再現実験】
（「5章 脳の生理学及び機能」で引用）

【携帯電話の電波による脳の血液脳関門の機能への影響の調査】
（「5章 脳の生理学及び機能」で引用）

【携帯電話使用中の聴性脳幹反応の変化に対する研究】
（「6章 聴覚、前庭及び眼の機能」で引用）

【携帯電話の側頭葉抑制性介在ニューロンへの影響】
（「6章 聴覚、前庭及び眼の機能」で引用）

【近傍電磁界ばく露による幼少ラットの脳機能に及ぼす影響】
（「5章 脳の生理学及び機能」で引用）

AppendJapan's contribution to WHO EMF project by ARIB Appendix 2-2
【携帯電話によるとト聴覚野への影響】

【高周波電磁波の発がんに及ぼす影響】
1. ラット中期肝発がん性試験による電波（900 MHz、1.5 GHz）の影響
2. マウス皮膚の発がんにおける電波（1.5 GHz）の影響

【携帯電話電磁場のヒト中枢神経への影響に関する研究】

【携帯電話からの高周波影響に関する細胞生物学的影響調査】

以上
WHO released draft of health risk assessment on RF fields

On September 30, 2014, the World Health Organization (WHO) released draft of “Environmental Health Criteria Monograph (EHC)” on radiofrequency (RF) fields, which is formal risk assessment in regard to all health effects of RF exposure, for expert consultation.*2

The draft of EHC is based on peer-reviewed papers*3 published by December 2012 (in a few instance to December 2013). Many studies conducted by Japanese researchers, to which the Electromagnetic Environment Committee had commissioned for more than 20 years, contributed to the draft (see Attachment).

WHO will consider all comments submitted by December 15, 2014, then convene Task Group meeting consisted of experts in each fields related to health risk of RF in Autumn of 2015, and prepare final draft of EHC. Unpublished chapters “1: Summary and recommendations for further study”, “13: Health risk assessment” and “14: Protective measures” will also be included in the final draft. After editing and other procedures, WHO is expected to publish official version of EHC in 2016.

Along with the release of the draft of EHC, WHO revised “Fact sheet No.193: Electromagnetic fields and public health: mobile phones” in October 2014.*4 The conclusion was not changed: “A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use.”

The Electromagnetic Environment Committee will continue research on health effects of RF and contribute to the field, via activities such as publishing facts correctly, not only in Japan but also worldwide.

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*1 One of the activities of the International Programme on Chemical Safety (IPCS), a cooperative programme of the United Nations Environment Programme (UNEP), the International Labour Organization (ILO) and WHO. EHC documents provide international, critical reviews on the effects of chemicals or combinations of chemicals and physical and biological agents on human health and the environment. http://www.who.int/ipcs/publications/ehc/en/

*2 http://www.who.int/peh-emf/research/rf_ehc_page/en/

*3 Papers published on scientific journals via critical review by the anonymous experts of the same fields.

*4 http://www.who.int/mediacentre/factsheets/fs193/en/
ARIB-commissioned studies referenced by the draft of EHC

[Effects of mobile phone RF on brain cells]

[Effects of mobile phone RF on reproductive organ]

[Replication experiment related to effects of mobile phone RF on cerebral blood flow]

[Effects of mobile phone RF on blood-brain barrier function]

[Change of auditory brainstem response during mobile phone use]

[Effects of mobile phone on temporal lobe inhibitory interneurons]

[Effects of near-field electromagnetic field exposure on brain function of young rats]
[Effects of mobile phone on human visual cortex]

[Effects of high-frequency RF on carcinogenesis]
1. Effect of radio wave (900 MHz, 1.5 GHz) by medium-term liver carcinogenesis test in rats
- Imaida K, Taki M, Watanabe S, Kamimura Y, Ito T, Yamaguchi T, Ito N, Shirai T. The 1.5 GHz electromagnetic near-field used for cellular phones does not promote rat liver carcinogenesis in a medium-term liver bioassay. Jpn J Cancer Res. 1998 Oct;89(10):995-1002. (referenced in Chapter 7: Neuroendocrine system; Chapter 12: Cancer)
2. Effects of RF (1.5 GHz) on skin carcinogenesis of mice

[Effect of mobile phone electromagnetic fields on human central nervous]

[Cellular biological effects related to high-frequency exposure from mobile phone]

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