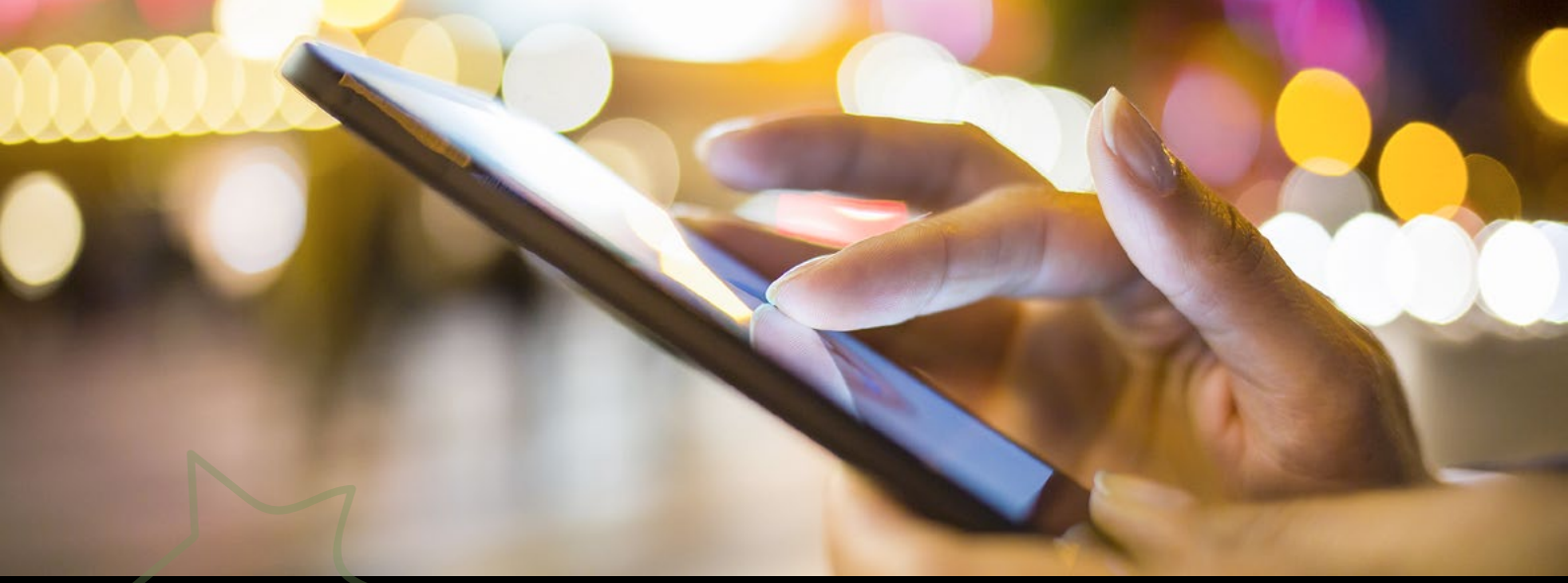
MWF
Mobile & Wireless Forum

annual report 2018



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introduction

The MWF is an international association of companies with an interest in mobile and wireless communications including the evolution to 5G and the Internet of Things. Its members include Alcatel OneTouch (TCT Mobile), Apple, Cisco, Ericsson, Huawei, Intel, LG, Motorola Mobility (Lenovo), Motorola Solutions, Qualcomm, Samsung and Sony.

The association is incorporated as a not for profit body with scientific purpose and continues an active research program that helps address identified research needs for expert bodies and standards committees. The association focuses its efforts in four main areas:

- EMF & Health
- Device compliance
- Mobile accessibility
- Device integrity and security

Thanks to the MWF's long-term commitment and continuous advancements in these areas, the association has positioned itself as a proactive and reliable partner in promoting mobile accessibility, raising awareness about the issue and dangers of counterfeit devices and helping to address questions about the health and safety of wireless devices.

In 2018, the MWF was active in 56 countries around the world, engaged with regional organizations on six continents and worked in collaboration with a wide network of associations, standardization bodies, research institutions and regulatory bodies.

EMF & Health

In 2018, the global debate around the health aspects of wireless communications centered around several key issues, including the proposed update to ICNIRP's exposure guidelines for the high-frequency range, countries with arbitrarily low exposure limits struggling to prepare for 5G, and the publication of the NTP study results.

In a number of countries, articles on health and safety concerns around wireless devices and 5G are published on an almost weekly basis. These countries include France, Germany, the United States and India, where the number of articles on these issues is particularly high. In France, it is mostly anti-EMF associations that keep the topic alive with regular press releases and warnings against exposure to EMFs. In India, a number of self-proclaimed experts attract media attention with alarmist claims made without any scientific support, while in Germany adverse media coverage is spurred by the yearly publication of a 'SAR ranking' of mobile phones by the Federal Office for Radiation Protection, which includes the misguided advice to consumers to opt for 'low-SAR value' devices.

The release of the NTP study results was reported on a truly global level with a first wave of articles in mainstream media reporting the results in a rather balanced way, followed by a second and third wave of articles that were often biased and alarmist. Two more studies gathering a lot of media attention were the study on '*Brain Tumours: Rise in Glioblastoma Multiforme incidence in England 1995 –2015 suggests an adverse environmental or lifestyle factor*[1]' and the partial outcomes of the GERONIMO project. All these studies found their way into the headlines of mainstream media in a good number of countries around the world.

1 Brain Tumours: Rise in Glioblastoma Multiforme incidence in England 1995 –2015 suggests an adverse environmental or lifestyle factor Alasdair Philips, Denis L. Henshaw, Graham Lamburn, and Michael O'Carroll Received 19 December 2017; Revised 14 March 2018; Accepted 21 March 2018Academic Editor: Riccardo Buccolieri

Europe

In Europe, countries with arbitrarily lower exposure limits had to face the fact that these low limits are becoming a barrier to the introduction of 5G. Affected countries include Poland, Belgium and Switzerland. Poland moved ahead and changed their regulations while a proposed increase in exposure limits is under discussion in the region of Brussels. In Switzerland however, the Swiss Council of States rejected for the 2nd time in two years a change of exposure limits and Swiss network operators worry that this will seriously impede the rollout of 5G in Switzerland.

This worry is substantiated by an ITU report from July 2018 which explored *'The impact of RF-EMF Exposure Limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G Mobile Network Deployment'*. Countries effected by this problem include China, India, Poland, Russia, Italy and Switzerland, as well as regions like Brussels and cities like Paris. The report builds on an analysis by the Boston Consulting Group of the unfavourable effects of different EMF exposure limits which in most cases do not allow mobile network operators to fully leverage new antenna technologies, such as Massive MIMO and beamforming, or small cells - key elements of future 5G mobile networks.

Discussions about whether to limit the use of ICT devices by children have also continued. In France, a ban of mobile phones in schools outside of pedagogical activities has already entered into force and other countries such as Luxemburg advocate precautionary measures to limit exposure of children to Wi-Fi in schools.

Also in 2018, French health authority ANSES published a report on electro-hypersensitivity. While no solid proof for a cause-effect relationship between EHS and exposure to EMF could be found, ANSES did underline the need to

MWF: 20 years of research

People around the world have adopted mobile phones like few other products in human history, yet with the technology constantly evolving at such a rapid pace, it is important to acknowledge that not everyone has been entirely happy about these developments. For example, public concern has existed about whether the radio signals from mobile phones and other wireless devices have any impact on our health. For those living near base stations, there are many who have welcomed the greater connectivity and speed that such developments allow, although there are some who have also been concerned about the constant exposure to yet another radiofrequency source in their environment.

The Mobile & Wireless Forum's role in this area is to support independent quality scientific research for the benefit of health agencies and expert committees to review and to help contribute to the development of standards for the industry to use to ensure compliance of our products and services. As part of the 20th anniversary of the association, we summarized our research efforts in a new publication which detailed the substantial body of research supported over the years as well as outlined the work currently underway on new compliance methodologies for future 5G devices and the development of new technical standards.

The MWF's '20 years of research' booklet is available at: http://www.mwfai.org/docs/eng/2018_05_MWF_20YearsofResearch.pdf

take EHS patients seriously and identified a need to educate medical and social professionals on this condition. Studies are ongoing on developing means for diagnosing and treating EHS.

Meanwhile on the other side of discussion, the Swedish Radiation Safety Authority's (SSM) Scientific Council on Electromagnetic Fields published their 12TH Report from SSM'S scientific council on electromagnetic fields, in which no 'new health risks have been identified.'

Middle East

In the beginning of the year, several Israeli newspapers reported on a study by the Health Ministry's National Cancer Registry which did not find any increase in the number of malignant brain tumors among all population groups in Israel over the past two decades, even though their use of mobile phones has multiplied many times. Prof. Lital Keinan Boker, deputy director of the ministry's Center for Disease Control and head of the registry underlined that 'there is no evidence to date that the use of cellphones causes cancer in the head, to which the phone is held very close'.

Other countries in the Middle East, such as Oman, are introducing systems to monitor emissions from cell towers and to ensure that these comply with ICNIRP guidelines.

Asia-Pacific

A $2.5m Australian Dollar grant over five years was awarded to the Australian Centre for Electromagnetic Bioeffects Research (ACEBR) to continue its investigation into possible health risks of exposure to radiofrequency (RF) electromagnetic energy. Centre Director Professor Rodney Croft from the University of Wollongong's School of Psychology and the Illawarra Health and Medical Research Institute, said that their research would have a particular emphasis on RF from new and emerging technologies, such as 5th Generation networks.

The Indian Council of Medical Research (ICMR) has also embarked on an ambitious five-year study to measure the effect of radiation from cellphones and cellphone towers on human health and has asked for healthy volunteers in the age group 18-45 years. ICMR said exposure to EMF emitted from mobile phones has increased tremendously due to the increased number of mobile phone users, thus justifying the need for the study. Furthermore, ICMR stated that as the guidelines followed in India are 'based on data generated from Western countries', the government wants to learn more about how the Indian population living in Indian climatic condition respond in order to develop safety standards.

Africa

Throughout the year, the Nigerian Communications Commission (NCC) publicly responded to claims that the use of mobile phones would pose a serious health risk in the country, emphasizing that research to date does

not suggest any consistent evidence of adverse health effects from exposure to radiofrequency fields at levels below those that cause tissue heating. Nigerian media often take up alarmist articles about supposedly negative effects of EMFs from the US, UK and French news outlets.

Resistance to base station sitings and worries about exposure to RF EMF from cell towers and mobile phones is also reported on a regular basis in a number of African countries such as South Africa and Rwanda.

North America

The activist group Environmental Health Trust continues its attack against 5G and accuses 'the wireless communications industry to be rushing to blanket the nation with next-generation networks whose health effects are unknown'. Another activist group called Cellular Phone Task Force published a manifesto against 5G in which they talk about 'phased arrays' and a 'blanket of radiation'. Several cities and municipalities are objecting to new regulations which would facilitate the rollout of new networks because of fears around increased exposure to EMF.

The safety discussion made its way also into the Senate, where the FCC Chairman, when explaining the FCC's plans to accelerate wireless broadband deployment by removing barriers to infrastructure investment, was asked about RF health risks from 5G. He responded that FCC consults on such matters with the FDA and that FDA continues to find the RF standards are appropriate for public safety.

Latin America

In several Latin American countries, there have been efforts to implement in-country SAR testing requirements before handsets can be approved for the national market, in particular in Argentina and Brazil. The MWF expressed our concerns to the relevant regulatory authorities about the lack of certified labs in the countries and the expected delay for entering these markets from a requirement for re-testing the devices when entering the country.

Several countries, including Argentina, Brazil, Colombia and Mexico, updated their EMF related regulations, mostly aligning with ICNIRP guidelines, and introducing new antenna siting regulations aimed at facilitating the rollout of new networks.

Another issue recurring in countries such as Brazil and Mexico, are demands by regulators to provide broadcasting FM radio chips in all mobile phones marketed in the country. Brazil furthermore has announced the start of a disaster alert system via mobile lines, whereby users may voluntarily register in the system to receive natural disaster alerts sent via SMS.

The MWF remains fully engaged with regional organisations and national authorities, providing information on technical developments and the latest scientific findings in order to prevent misinformation and to promote consistent regulations and harmonised standards.

RF Monitor

RF Monitoring Service – latest developments at a glance

The MWF monitors the publication of scientific reviews with regards to EMF & Health by national and international health authorities and provides members with regular updates on new journal articles via the summary publication RF Abstracts and the more detailed summary of key papers via RF Monitor.

The RF Monitor is a service that allows subscribers to maintain awareness of new developments in radiofrequency (RF) science related to RF exposure and health. It provides a listing of new peer reviewed scientific publications each month based on a systematic literature search. The listing includes a brief summary of the papers' abstracts to give subscribers an initial overview of the nature of new studies that have been published. This is supplemented by an extended summary and review of two of the more interesting or important papers per month. RF Monitor also covers two major scientific conferences per year including the annual BioEM scientific conference. Members receive summaries of the platform presentations and the posters presented during the conferences.

technical research

Consistent with the MWF's purpose, the association continues to support a range of scientific research on radio-frequency (RF) exposure, dosimetry and measurement methodologies. The results have contributed substantially to the development of numerous standards over the years and this continued in 2018, particularly with research relating to the use of higher frequencies.

As an example, the work conducted by Dr. Andreas Christ showed that the decay of the reactive field within the first few millimeters from the antenna at higher frequencies is significant and its impact on the temperature increase is minimal, confirming that incident power density is a relevant metric to assess exposure in the mmW frequency bands. Prof. Mats Gustafsson and his group at Lund University have developed and implemented an 'inverse-source' methodology to measure power density in close vicinity of devices operating above 6 GHz. By means of this technique, power density was successfully reconstructed at distances as close as 1 mm for array antennas operating at 28 GHz and 60 GHz. While the study at RF Test Labs at New York University has been significantly delayed, the project has now received the necessary approvals and the project will proceed in 2019 but at no cost to the MWF. The project will be investigating the correlation between power density and temperature increase using Magnetic Resonance Thermal Imaging and it will make an important contribution to the future development of exposure standards since it will allow theassessment of the temperature rise associated with the use of higher frequencies on humans other than by calculation.

In addition, a new research contract was signed with the University of Ghent to develop methodologies for in-situ assessment of exposure in the case of 5G base stations including Massive MIMO products. And 2018 also saw the publication of the results of the small cell study undertaken by Alphawave in three countries – South Africa, the Netherlands and Italy and involving measurements at 98 sites covering a variety of installation types. We also saw the publication of a number of papers by Dr. Ken Foster arising from work that he has undertaken on modeling tissue heating from RF exposure at higher frequencies.

The MWF's research on exposure and compliance aspects in frequencies above 6 GHz is still ongoing, with several concrete benefits already derived:

- MWF research projects lead to additional scientific publications on key issues that have been used and are referenced by IEEE/ICNIRP in their recently published drafts;
- The knowledge obtained through the projects allowed the MWF to provide science-based comments as part of the IEEE and ICNIRP consultation processes;
- Knowledge from the projects helped MWF members to answer questions from regulators and stakeholders;
- Significantly added to the measurement standards that will be used to demonstrate the compliance of devices above 6 GHz; and
- The results of these projects have been instrumental in finalizing IEC TR 63170 and supporting the standardization work in IEC/IEEE JWG11/JWG12.

international standardization and harmonization

International standards are the basis for developing global products and are crucial for the mobile industry. The MWF and its member companies closely work with the international standardization bodies, namely ICES, IEEE, CENELEC, ICNIRP, ITU, WHO as well as regional and national regulatory authorities, contributing technical expertise and global experience as well as promoting information exchange on latest scientific findings.

In 2018, ITU-T SG5 published Supplement 14 to the ITU-T K-series of Recommendations on '*The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment*'. The summary states that RF-EMF exposure limits have become a critical concern for further deployment of wireless networks in particular in countries, regions and cities with limits lower than ICNIRP or IEEE guidelines. The report provides the example of a simulation of the impact of the low RF-EMF limits in Poland which shows that the lower limits severely constrain the buildout of the networks (both 4G and 5G) and might make the addressing of growing data traffic demand or the launch of new services on the networks impossible.

Further topics discussed in ITU-T SG5 and relevant to the mobile industry included compliance assessment methods for 5G radio stations, evaluation methods for EMF around base stations and in public transport, and monitoring systems for the EMF levels around base stations.

The IEC TC106 AHG10 finalized a technical report providing guidance on EMF compliance assessments for devices operating at frequencies above 6 GHz of relevance for 5G NR and WiGig. The document is expected to be the reference guidance for EMF testing of 'early' products operating at the mmW. Two new IEEE/IEC Joint Working groups (JWG 11 and JWG12) have been established to continue the work initiated by AHG10 with the goal to approve two international standards (covering measurements and computational methods for EMF compliance testing above 6 GHz) by the end of 2020.

A Joint Working Group (JWG) 13 between IEEE TC34 and IEC TC106 was established to formalize the publication of a unified SAR assessment standard. This unified standards is unique in the sense that not only IEC and IEEE fully harmonize their standards through the dual logo publication but an identical version of the text is also contained in the ITU K-guide. It becomes hence a globally harmonized SAR standard.

Within IEC MT1 an ad-hoc team was created to develop a technical report concerning SAR time averaging and analyzing the impact of software version updates on the measured SAR.

The MWF continued its contribution to the revision of the IEEE C95.1 standard, focusing in particular on the difficulty of the half wavelength requirement, the averaging area in the frequency range from 6 GHz to 300 GHz, as well as the consideration of exposure limits for limbs and pinnae.

In February and March 2018, the European Commission published a list of pending harmonized standards for the Radio Equipment Directive (RED).

In June, the European Commission and its Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) published the 'Memorandum on weight of evidence and uncertainties, revision 2018'[2]. The Memorandum explains how the SCHEER applies the weight of evidence approach (WoE) and how it deals with analysis and description of uncertainties when conducting

2 https://ec.europa.eu/health/sites/health/files/scientific_committees/scheer/docs/scheer_o_014.pdf

SAR-Tick and Power Density Compliance (PDC)

SAR Tick is part of an effort by members within the Mobile & Wireless Forum (MWF) to help consumers learn more about the issue of the Specific Absorption Rate (SAR) for their wireless devices.

As we move closer to the deployment of devices using frequencies above 6 GHz where SAR is replaced by Power Density, the MWF established a taskforce to consider how members could report the SAR & PDC of their devices.

The recommendations of the taskforce serve as a guide for members. Each company remains responsible for determining what and how they will communicate the compliance of their devices, but the recommendations provide a template which has traditionally been widely used by members.

risk assessments of stressors to which humans and/or the environment might be exposed. The MWF uses this and other documents from respected sources to promote a science-based approach in the global debate on EMF.

In July, the final version of EN62209-3 on 'Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 3: Vector probe systems (Frequency range of 100 MHz to 6 GHz)' was circulated at national level for comments. The MWF and its members encouraged a positive voting in the national committees.

IEC MT3 started work on the base station standard IEC 62232, which will influence the assessment methodology for 5G. MT3 is also working on a technical report, including case studies showing how to use this standard, including statistical studies for Massive MIMO.

Throughout the year, the MWF participated in Working Group 20 (WG20) of CENELEC's TC106x committee, charged with developing a definition for 'reasonably foreseeable conditions of use', a concept introduced with the RED two years ago.

In September, TC 106x was also charged with revising EN 50401, the product standard to demonstrate the compliance of base station equipment with radiofrequency electromagnetic field exposure limits (110 MHz - 100 GHz), when put into service. The current version of the standard refers to the ICNIRP guidelines for the exposure of humans to electromagnetic fields, however there are several CENELEC member states that have established deviating exposure guidelines for the operation of base stations on their territory or that have established alternative compliance processes. The MWF is actively contributing to this work.

In its capacity as the representative industry body for wireless technology companies, the MWF's technical expertise is recognized by regulatory and standardization bodies worldwide. In 2018, the MWF continued its active contribution to the work of the European Commission, the Telecommunication Conformity Assessment and Market Surveillance Committee Working Group (TCAM WG), the Administrative Cooperation Group RED (ADCO RED) and the Radio Equipment Directive Compliance Association (REDCA) on technical questions related to mobile and wireless devices. One focus this year were our contributions to the drafting of the Technical Guidance Note (TGN) on risk assessment within the REDCA.

Changes in international regulations effecting MWF members

One of the MWF's objectives is to promote global harmonization of standards and regulations relating to RF exposure globally. Consistent with this, the MWF monitors notifications made under the World Trade Organization's Committee on Technical Barriers to Trade and TRIS which is the EU's tool for information, prevention and dialogue in the field of technical regulations on products and Information Society services.

In 2018, the MWF monitored the following notifications:

- China: Notification G/TBT/N/TPKM/ G 282
- China: Notification G/TBT/N/CHN/1222
- UK: Notification 2018/315/UK
- Germany: Notification 2018/260/D
- Germany: Notification 2018/263/D
- Mexico: Notification G/TBT/N/MEX/363
- Mexico: Notification G/TBT/N/MEX/426
- Canada: Notification G/TBT/N/CAN/554
- Taiwan: Notification G/TBT/N/TPKM/318
- Taiwan: Notification G/TBT/N/TPKM/317
- European Commission: Notification G/TBT/N/EU/567
- European Commission: Notification G/TBT/N/EU/589
- Canada: Notification G/TBT/N/CAN/542
- Canada: Notification G/TBT/N/CAN/549
- Canada: Notification G/TBT/N/CAN/566
- Japan: Notification G/TBT/N/JPN/595
- Japan: Notification G/TBT/N/JPN/600
- Switzerland: Notification G/TBT/N/CHE/230
- Thailand: Notification G/TBT/N/THA/516
- Thailand: Notification G/TBT/N/THA/517
- Thailand: Notification G/TBT/N/THA/518
- Korea: Notification G/TBT/N/KOR/783

As well as:

- Belgium: Notification on 'Radio Interfaces B01 (09, 19, 35, 37 And 38), B04-15, B06-24, B07-04, B16-01 And B17 (04 And 05)'.
- European Commission: Notification about Framework For Market Surveillance - draft Regulation COM (2017) 795.
- France: Notification on the Order amending the Order of 8 October 2003 on consumer information regarding radio terminal equipment issued pursuant to Article R20-10 of the Postal and Telecommunications Code, the Order of 8 October 2003 setting out the technical specifications applicable to radio terminal equipment and the Order of 12 October 2010 on displaying the specific absorption rate of radio terminal equipment.
- Slovakia: Notification on PMR/PAMR Land Mobile Service Devices in Frequency Ranges as per Recommendation T/R 25-08.
- Ukraine: Radio-Electronic Equipment Technical Regulation (Decree No. 355 of 24 May 2017 on the Adoption of Technical Regulation on Radio Equipment).

key issues for the mobile industry

There are number of issues of particular interest to the mobile and wireless sector from a regulatory, technical and strategic perspective. The MWF monitors these issues on an ongoing basis and works towards their international harmonization on a long-term basis. These key issues include:

Reasonably foreseeable conditions of use

In 2016, the new Radio Equipment Directive (RED) introduced an entirely new concept, namely the notion of 'reasonably foreseeable conditions of use'. Since then, standardization bodies, national regulatory bodies, European institutions and industry have struggled to agree on a common interpretation of what can be considered 'reasonably foreseeable conditions of use' and how to cover them in compliance testing of new devices.

The MWF participated in WG20 of CENELEC's TC 106x committee which worked on a technical report to define reasonable foreseeable conditions of use. The report was accepted at the last plenary meeting of TC 106x and sent to the national committees for voting.

Time-averaging

The MWF continued to promote a 'source-based' approach to time averaging. In 2018, the FCC's Office of Engineering and Technology (OET) announced plans to permit time averaging based on 100 seconds but to scale down the time period as the frequency increases.

Based on the FCC's position, the MWF initiated additional research on energy absorption and thermal increases during time averaging. The Paper by Prof. Ken Foster on 'Modeling Tissue Heating from Exposure to Radiofrequency Energy and Relevance of Tissue Heating to Exposure Limits: Heating Factor' was published in the August edition of Health Physics (Health Phys. 115(2):295–307; 2018).

Averaging area and maximum permissible exposure (MPE)

The MWF was in regular exchange with the FCC to discuss the maximum permissible exposure (MPE) and advocated to expand the averaging area for devices operating at 6 GHz and above as well as to expand the averaging area to 4 sq. cm on an interim basis. Indeed, the OET indicated that there were plans to increase the averaging area to 4 sq. cm up to 30 GHz, with related KDBs still pending.

Testing liquids

Currently, there are two different body tissue simulant liquids in use for the testing of Body SAR: one as recommended by standard IEC 62209-2, which is the same as the IEC head tissue simulant, and which is used in most parts of the world; and one as recommended by the FCC Bulletin 65 Supplement C, which is a particular body tissue simulant.

Having different liquids for Head and Body SAR testing plus the duplication of Body SAR testing with two different liquids for the same frequency bands, leads to increasing testing time and effort in compliance assessment. Furthermore, comparison studies looking into the degree of conservativeness of the IEC Head tissue simulant when used for body SAR assessment, and the difference in conservativeness between the IEC and FCC tissue simulants found the IEC liquid typically more conservative than the FCC liquid. The MWF has advocated for the reduction to one tissue simulant liquid for all compliance testing and we recently learnt that the FCC has finally agreed to adopt this.

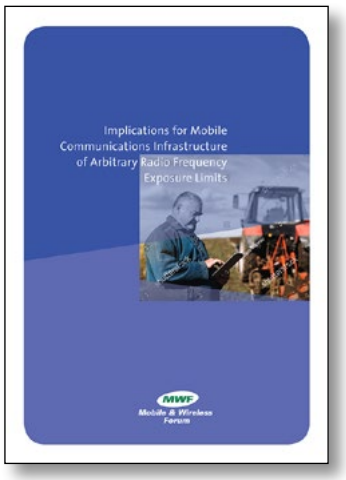
SAR reporting / SAR compliance

In an effort to educate consumers on the technical aspects of SAR that are often misconstrued by the media, the MWF created the SAR-Tick initiative which serves to address common questions about the issue.

In view of the introduction of 5G and the use of higher frequencies, the MWF has decided to update the SAR-Tick and provide a common approach for providing exposure information at 6 GHz and above where SAR is replaced by Power Density.

Exposure limits

The MWF closely monitors the development of exposure standards worldwide and in particular in regards to frequencies into which new technologies evolve.



In 2018, there have been several discussions around the fact that overly restrictive limits (i.e. limits below ICNIRP) are likely to hamper the rollout of 5G networks which requires a higher number of smaller antennas. In the EU, this impacts a number of countries, namely Belgium, the Netherlands, Slovenia, Bulgaria, Lithuania and Italy, all of whom have limits below the ICNIRP values. Poland, who had lower limits has recently updated their exposure limits to ICNIRP levels. The MWF updated its publication *Implications for Mobile Communications Infrastructure of Arbitrary Radio Frequency Exposure Limits* which also now covers the impact of these lower limits on 5G deployments.

In the US, the latest IEEE C95.1 RF exposure standard has been finalized and will shortly be publicly available.

In-country SAR testing

Since 2015, several Latin American countries envisage to introduce compulsory in-country tests before granting the homologation of new handset models to be launched. Argentina and Mexico have been on the forefront of these discussions. The MWF is working with the local governments, explaining the negative impact and expected long delay such obligations for in-country SAR testing would have on bringing new devices to market in these countries.

In India, as per the new Telegraph (Amendment) Rules 2017, all manufacturers need to undergo certification and testing in India for all types of telecom equipment to be sold in India or to be connected to Indian telecom cellular network. The MWF worked with the India Cellular Association (ICA) to express the industry's concerns about the in-country testing capacity for the expected number of devices entering the country, and raised awareness among the European Commission and the US Trade Representative about this regulation becoming a possible barrier to trade.

Network deployment

The degree of network rollout at any given time has a significant impact on the level of public concern about EMF exposure. With 5G deployments starting those concerns are already being voiced in many countries, and the MWF monitors these concerns and helps address questions where ever possible. Contrary to concerns though about increasing exposure levels, one measurement campaign and two studies in 2018 have shown that public exposure remains low. ANFR published the results of 3,000 measurements that had been carried out in 2016 on French territory. The results show that in 90% of cases exposure was below 1.4 V/m, the average centering around 0.38 V/m, and no measurements exceeding the exposure limits.

A comparison of the exposure levels in Basel, Switzerland's third most populous city, showed that between 2010 and 2017 public exposure levels have remained far below the limits of 28 V/m. And a study led by the Barcelona Institute of Global Health (ISGlobal) concluded that children in Europe are exposed to higher levels of radiofrequency electromagnetic fields (RF-EMF) in cities, but the total average exposure remains well below the limit reference values. The study was carried out with 529 children, aged 8-18 years, from Denmark, the Netherlands, Slovenia, Switzerland and Spain.

e-Labelling

Together with DigitalEurope, the MWF commissioned two studies in 2018, exploring e-Labelling schemes outside of the EU (Australia, Singapore, USA) and a cost-benefit analysis on the introduction of e-Labelling in the EU.

E-Labelling would be beneficial for the European market since EU legislation requires a wide range of devices/equipment to carry markings that are affixed to the devices. These markings have to be etched into the devices and create an operational burden and an environmental cost. At least 11 countries around the world

already allow e-labelling as an alternative and its introduction in Europe would not just ease the burden on manufacturers but could also bring additional benefits such as easier updates and better accessibility.

The two studies were presented at the European Parliament during a breakfast meeting hosted by MEP Anneleen von Bossuyt. The studies also prompted MEP Andrejs Mamikins to submit a written parliamentary question on whether the European Commission intends to implement e-Labelling in Europe since there seem to be virtually no downsides but a number of benefits in providing compliance information for devices in electronic format. The studies also served as basis for an amendment (#251) proposed by MEP Daniel Dalton to the Compliance and Enforcement regulation under negotiation in the European Parliament.

In Egypt, the National Telecom Regulatory Authority (NTRA) showed interest in the MWF's Industry Code on Electronic Compliance Labelling. The MWF has had a number of discussions with the NTRA to further progress this.

Library of expert opinions

In our advocacy work for harmonized exposure limits around the globe, the MWF relies on the assessment of the World Health Organization and national health authorities with regards to the safety of these limits and public exposure to electromagnetic fields emitted from wireless devices.

In this vein, the MWF monitors all new publications in this area and has created a library of expert opinions, which is continuously updated and shared with MWF members.

Updates in 2018 included the 12TH Report from the Swedish Radiation Safety Authority's (SSM) Scientific Council on Electromagnetic Fields, in which they concluded that 'no new health risks have been identified'.

MWF members were also updated on general discussions such as the work of the Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) on the issue of the 'weight of evidence and uncertainties' and the American Council on Science and Health's publication on separating legitimate science from less reputable science.

MWF submissions and open regulatory issues

In 2018, the MWF worked on a wide range of regulatory issues and submitted comments to the following public consultations:

Implementation Decrees for the 2015 French EMF law

Since its adoption in February 2015, the MWF has closely followed the implementation of the French EMF law and has on several occasions exchanged with the French government and ANFR on the status of the implementation decrees. The first drafts of these decrees contained many aspects of concern including issues with the timeline, persisting unclarity whether professional devices are covered by the law, uncertainty about which devices are specifically covered and uncertainty about which SAR values to communicate. The pending draft implementation decrees were finally notified and published for public consultation in the beginning of 2018, however the inconsistencies had not been resolved. The MWF submitted comments both on a European and national level to address the issues of concern.

IPv6 requirement in France

Article 42 of Law n° 2016-1321 from 7 Oct 2016 about the Digital Republic prescribes that from 1 Jan 2018 onwards, all new terminal equipment according to the definition in L.32 of the Postal and Electronic Communications Code and intended for sale or rent on French territory has to be compatible with IPV6. The MWF has verified that Article 42 has not been notified in TRIS and therefore considers this provision not enforceable.

French public consultation on 5G

The French Ministry of Economic Affairs and Finance, together with the State Secretary for the Digital Economy is creating a roadmap for the development of 5G in France. The roadmap is intended to propose measures to create a favorable environment for the rollout of 5G in France and the MWF submitted comments.

Italian law on Digital Broadcasting Radio Antennas

The Italian Ministry of Economic Development published a new regulation on 'Digital broadcasting radio antennas', which prescribes that as of 1 June 2019 all radio receiving equipment will need to be capable of receiving also the DAB+ (Digital Audio Broadcasting) signal. The regulation has not been notified so far, and the MWF reached out to the Ministry directly to express the industry's concerns on this matter.

ICNIRP: Public Consultation on draft Guidelines on Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (100 kHz to 300 GHz)

In July, the draft ICNIRP Guidelines on Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (100 kHz to 300 GHz) were presented online for public consultation. The MWF prepared and submitted comments to the public consultation.

Kenya: Public consultation on minimum features and technical specifications for mobile cellular devices

The Communication Authority of Kenya (CA) is the regulatory authority for the ICT industry in Kenya responsible for managing the country's numbering and frequency spectrum resources as well as safeguarding the interests of users of ICT services. Stakeholders were invited to submit comments on the minimum features and technical specifications that mobile devices must meet and the MWF submitted comments promoting a flexible approach regarding the use of a physical or electronic user manual for mobile devices, including SAR information.

Canada: Public consultation on General Requirements for Compliance of Radio Apparatus

The Department of Innovation, Science and Economic Development Canada sought comments on the consultation of RSS-GEN Issue 5 'General Requirements for Compliance of Radio Apparatus'. This standard sets out general and certification requirements for licensed and license-exempt radio apparatus used for radio communication other than broadcasting.

India: New testing requirements

In India, as per the new Telegraph (Amendment) Rules 2017, all manufacturers need to undergo certification and testing in India for all types of telecom equipment to be sold in India or to be connected to Indian telecom cellular network after the date of coming into force. The MWF wrote to the Minister for Communications and senior departmental officials expressing the industry's concerns regarding the new testing and certification regime and its proposed date of entering into force. The MWF requested the government to consider allowing test reports from other ILAC certified laboratories to TEC as part of the certification process beyond 1 April 2019 to assist with the volumes of products coming into country as well as that from the domestic Indian market. The MWF also encouraged the government to consider the adoption of only those Essential Requirements (ER) that labs can actually test to and to limit the scope of IoT ER's to two product categories - one for M2M and the other for Personal Devices. Finally, the MWF also encouraged the government to allow for the e-labelling of the required marks in line with practices in other countries.

Radio Equipment Directive

The European Commission published a Guide on the Radio Equipment Directive 2014/53/EU (RED). The Guide is not binding in the sense of a legal act adopted by any of the EU institutions, even if the word 'shall' is used in many parts of the Guide. In the event of any inconsistency between the provisions of the RED and the Guide, the provisions of the RED prevail. The Guide is also subject to other more specific guidance or documents which might be issued by the Commission services, TCAM or ADCO RED providing guidance or information on specific issues or items. The MWF actively contributed to the drafting of the RED Guide.

counterfeit and security

2018 saw continued focus on cybersecurity, anti-counterfeit and privacy – with regards to a growing recognition that these are often intermingled, especially with regards to the privacy and security risks posed by counterfeit ICT products. Cybersecurity continued to be a topic of considerable attention in many countries with the poor product security in IoT devices being a central concern – and one that is driving new regulation. Finally, privacy has been a major focus within Europe with the GDPR coming into force and the ePR entering into force in 2019.

International

The Inter-American Telecommunication Committee, published the 'Declaration of Buenos Aires', which aims to improve regional cooperation to reduce the theft of mobile devices and increase the safety of users. The MWF participated in CITEL meetings during the year and presented the manufacturers' point of view on counterfeit devices to the Committee.

In July, the MWF also contributed to the ITU's Workshop on Global Approaches on Combating Counterfeiting and Stolen ICT Devices. The MWF presented the results obtained in Colombia from CRC's efforts to block non-registered IMEIs including duplicate, incomplete and fake IMEIs. The results highlight that such schemes can be very effective in addressing the issue.

In October, the MWF presented at the ITU-D SG2 Q4/2 Session on combating counterfeit ICT devices. The MWF's presentation centred on the key elements required for national frameworks to address the counterfeit challenge.

Europe

In 2018, the European Union continued its focus on cybersecurity and piracy. There were talks about the need for an European 'FBI for customs' that would unify the fragmented customs arrangements of the member states and work was started on a 'Counterfeit and Piracy Watch-List' identifying the countries and online marketplaces that are the biggest source of fake goods and piracy coming into Europe.

In February, the European Commission convened the first meeting of its TCAM Working Group Subgroup on Cybersecurity. The discussion on data protection was initially prompted by ANEC, according to their website 'the European consumer voice in standardisation', who tested connected toys and found them lacking safeguards against being hacked. The NGO claimed that this lack of sufficient safeguards was a violation of the essential requirements laid down in Article 3 of the RED. In 2017, the consumer protection groups tested connected accessories and smartwatches and claimed similar threats to consumer rights and data protection.

The Commission asked stakeholders to provide a list of identified risks (e.g. data protection issues, device vulnerabilities and general cybersecurity-related concerns) that could be tackled by delegated acts based on Article 3 of the RED and of radio products which might be affected by these risks (e.g. connected medical devices, routers, feature phones, smartphones, smartwatches, sensors, connected home appliances, connected toys). The aim is also to identify legislative or regulatory gaps related to particular RED-relevant risks, products or surveillance issues that are linked to cybersecurity issues.

In June, the European Commission distributed a report about security by design. In Chapter 4 of the report, the authors propose a Code of Practice to be implemented by industry. This Code of Practice is designed to improve the security of consumer IoT products and associated services. Many cybersecurity issues stem from poor design of product security. Suggestions include that all IoT device passwords should be unique and not resettable to any universal factory default value, all companies that provide internet-connected devices and services should provide a public point of contact as part of a vulnerability disclosure policy so that security researchers and others are able to report issues and all software components in internet-connected devices should be securely updateable.

Also in June, the Council agreed that the European Union is to enhance its cyber-resilience by setting up an EU-wide certification framework for information and communication technology (ICT) products, services and processes. The industry could use the new mechanism to certify products such as connected cars and smart medical devices. The Member States agreed their common position on the proposal, known as the *Cybersecurity Act*. The proposal will also see an upgrade to the current European Union Agency for Network and Information Security (ENISA) into a permanent EU agency for cybersecurity.

In July 2018, the Council of the European Union published a draft of revisions to the proposed ePrivacy Regulation (ePR). The ePR is likely to come into force in 2019. The ePR will repeal and replace the Privacy and Electronic Communications Directive 2002/58/EC. The ePR will align Europe's ePrivacy regime more closely with the privacy regimes set out in the General Data Protection Regulation (GDPR). The GDPR took effect on 25 May 2018. The ePR focuses on the confidentiality of users' electronic communications.

It will also regulate activities such as: direct marketing, website audience measurement, the transmission of communications across devices and browsers, and cookies set on users' machines. According to ePR Recital 2, it intends to 'complement' the provisions for personal data laid down by the GDPR by 'translating its principles into specific rules'.

North America

The **US** state of California proposed a law (Senate Bill No. 327) to ensure a minimum level of security for internet-connected devices by requiring manufacturers to either create a different default password for every gadget they sell—or prompt users to change a common default password before they use a device for the first time.

Africa

In **Kenya**, the Communications Authority issued new rules to ensure that Kenyans are sold quality mobile phones. The Communications Authority felt the need to act since 30-40% of mobile phones on the Kenyan market are believed to be counterfeit. One of the new requirements is for mobile phone vendors to provide at least one-year's warranty for their customers and ensure the availability of after-sales support for a further two-year period for each mobile phone they sell. The identification mark and model need to be printed on the device in indelible ink, readily visible and legible. Devices need to be assigned a unique International Mobile Equipment Identity (IMEI), which has to be printed on the device and should be retrievable electronically by dialling *#06#.

In 2018, **Nigeria**'s Minister of Communications Adebayo Shittu described the influx of substandard and fake mobile phones as a major problem for Nigeria requiring urgent attention to reverse the trend. In September, the Computer Telecommunication Engineers Association of Nigeria (COMTEAN) called on the federal government to introduce measures to control the importation of substandard phones into the country. Towards the end of the year, the Nigerian Communications Commission formed an alliance with other regional bodies, including the African Telecommunications Union and the West African Telecommunications Regulatory Association, to more effectively proceed against the issue of substandard, counterfeit or non-type approved handsets.

Asia-Pacific

The MWF participated in a workshop in **China** with government agencies including MIIT (Ministry of Industry and Information Technology of the People's Republic of China), CAC (Cyberspace Administration of China), China Customs and China Information Technology Security Evaluation Center. The workshop centered on discussing the problems of counterfeit mobile devices and provided an opportunity to detail the revenue, security and

consumer threats posed by these devices. It was also an opportunity to discuss developments in other countries intended to block such devices on networks, and to encourage the Chinese authorities to insist and enforce the use of unique IMEIs on all devices leaving the country.

In May 2018, **Pakistan** launched the Device Identification, Registration and Blocking System (DIRBS). Phase-I included the mapping and identification of IMEIs with the blocking of stolen/lost devices completed in August. In Phase II, all non-compliant devices that are not PTA type approved are being blocked in the network. Pakistan hopes to curb illegal imports with this system.

In September, **India's** Department of Telecom (DoT) issued a clarification on the import of mobile phones under the IMEI Cloning Detection and Restriction (ICDR) system, which states that the import of mobile phones with duplicate, fake and non-genuine international mobile equipment identity is banned in India.

Authorities reporting on actions to fight counterfeit mobile devices in 2018 include the **Hong Kong SAR Customs Authority, Singapore, Myanmar** and **Korea**, where the government launched an investigation into counterfeit smartphones that use forged parts and components.

Latin America

In **Argentina,** the government announced the intention to adopt a national system to block illicit devices on the national networks very similar to the schemes adopted in Brazil and Colombia.

In a first step, the government will start using the IMEI database of existing phones and block those that are not in the database. Travelers will have to declare mobiles purchased abroad to enable registration in the system and devices that have already entered the country will not be affected by the new measure. It is estimated that about 7,700 irregular mobiles arrive every day and so, by decision of the government and starting 2018, those not declared and registered will be blocked and can no longer be used. Many of these mobiles are actually original smartphones though, purchased abroad to avoid local taxes which can result in a 50% saving to those bought locally.

In **Brazil**, a country with 213 million inhabitants and about 237 million mobile network connections in operation, ANATEL, the National Telecommunication Agency, detected the entry of approximately 13 million new counterfeit and/or substandard devices onto the mobile networks during 2016, with similar figures estimated for 2018. During the same period, the market analysts say that a total of 48.4 million new regular devices (90% were smartphones) were added to mobile networks, giving irregular devices a market share of around 21%.

For this reason, ANATEL developed the SIGA Project which entered its final phase of implementation in 2018. Users of irregular devices first connecting to the network are being informed that their mobile phones will be blocked

75 days after notification if their devices are non-approved, showing cloned numbers or are at odds with the IMEI positive and negative lists. No immediate action is taken against the non-compliant models already existing in the network, assuming that they will drop off over the next two years. These devices will be blocked if the owner tries to change the current SIM card.

Colombia has been working on a program to fight counterfeit mobile devices since 2015. Requirements include that operators have to validate, verify and control handsets operating in the national networks based on their IMEI numbers, as well as to upload the data to a centralized system, developed by the operators under supervision of the Colombian Regulatory Commission (CRC). Once the system was completely implemented, the users of non-compliant handsets are required to provide justification or have the device blocked.

Other countries interested in proceeding against illicit devices include **Cuba**, where telecommunications company ETECSA announced in 2018 that based on Resolution 12/2016 of the Ministry of Communications, mobile phones with duplicated IMEIs will be blocked, and **Mexico**, where the Federal Institute of Telecommunication (IFT) is looking at introducing legislation similar to Brazil and Colombia. Mexico faces a particular situation in that local laws demand that all devices entering into the telecommunication network should be homologated by IFT, but, due to the proximity of the US, there is a large and growing number of handsets in the network which are legally bought in the US but not homologated locally. Also, as per the consumer law, these handsets cannot just be blocked.

In **Uruguay**, a 2018 Bill of law seeks to obligate network operators to block irregular devices that do not have a valid IMEI number.

In **Paraguay**, the national network operators have agreed to be connected to the global IMEI database and to exchange identification numbers of stolen or lost devices, trying to prevent their improper use. As per an agreement with CONATEL, the National Telecommunications Commission of Paraguay, the users will be able to consult a list of stolen/lost devices before going ahead and purchasing a device.

In **Peru**, OSIPTEL, the Peruvian Telecommunication Regulator and the Ministry of Interior instructed network operators to start blocking devices with invalid IMEI numbers. Text messages are being sent to users of such devices, advising that within two business days after receiving the message, the device will be blocked and the service will be suspended until the device is presented to the operator for regularization. Around one million devices were expected to be effected.

DIRBS: An open source system for identifying and blocking irregular devices in the networks

In September 2018, Qualcomm made their Device Identification, Registration and Blocking System (DIRBS) software and related documentation available under free open-source licenses. DIRBS aims to leverage each device's unique identifier to help mobile industry participants and governments alike combat reported stolen and counterfeit phones, which otherwise can bypass laws and certification requirements.

The DIRBS platform is used to create a country-specific database that interfaces at different levels of detail with operators, local manufacturers, importers, consumers, customs, law enforcement and the global GSMA IMEI database. The DIRBS analysis engine identifies fraudulent devices with an unauthorized IMEI and generates lists of these devices, which can be provided to operators so appropriate action can be taken per the country-specific regulations.

Device Validation Beta Project

One of the projects pursued within the Counterfeit and Security Working Group (CSWG). has been a project with Dublin-based Afilias to develop a new device validation service for use on websites. The beta version is now deployed on the Spotafakephone.com website and encourages visitors to visit the site on their mobile device at which point the service can interrogate the device's characteristics and compare these to those expected to be seen on a legitimate device. In the case of a counterfeit device, this may mean a smaller screen size or outdated software than what would typically be expected of the legitimate device. The project also involves an app that can be downloaded which provides even more detail about the device and its characteristics.

accessibility

While the accessibility requirements for information and communication technology (ICT) in the US federal sector covered by Section 508 of the Rehabilitation Act had already been adopted and released in the beginning of 2017, 2018 saw the discussion shift to their real-life impact and how the FCC wants to see them implemented. In particular, with the VPAT 2.1, the FCC moved away from a simple checklist to requiring companies to explain what and how they tested for accessibility in their products and services.

But not only companies face difficulties with the new updated guidelines. One recurring theme heard from country representatives throughout the year was that policy changes are slow moving and that even small steps like updating the reference from old to new standards can take a long time. All agreed though on the importance of public procurement to drive the accessibility of products and services and following from that the need for certified professionals in accessibility.

Other legislative projects discussed on the international level included the draft European Accessibility Act, the European Web Accessibility Directive and efforts in the US to make video conferencing services like Skype and Facetime interoperable. It was also mentioned that international harmonization is certainly a goal but that it is a huge challenge to get the information right on which standards have been adopted by which countries and what the level of adoption is.

In terms of technology, a key topic in the past two years was speech as a user interface and how this might inadvertently become an exclusion factor for the deaf and hard-of-hearing community, while the most discussed new technology for accessibility was certainly Artificial Intelligence (AI).

Towards the end of 2018, the European Disability Forum (EDF) organised a two-day conference in Vienna, Austria, dedicated to 'AI and Accessibility'. At this occasion, Carine Marzin presented a short survey that EDF had carried out in preparation of their planned report on emerging technologies. The answers from 50 people with a variety of disabilities provided some interesting insights. In regards to risks and concerns persons with disabilities have in relation to emerging technologies, they named the following:

- 88% were concerned about how accessible the technology will be;
- 60% the lack of standardisation;
- 56% the degree of interoperability with assistive technology they already use;
- 50% of discrimination;
- 42% security;
- 40% of privacy; and
- 20% listed other concerns including usability, affordability, and the digital skills needed to use the technology.

Overall, there was a clear demand for more information about what these new technologies can do to help people with disabilities.

GARI's mission – as relevant today as it was 10 years ago

The above clearly shows that GARI's mission – to inform consumers about existing accessibility solutions in the market today – is still very relevant. The MWF created the Global Accessibility Reporting Initiative (GARI) in 2008 to help people identify devices with features that best fit their individual needs. This includes mobile phones with built-in screen readers,

'simple access' for persons who find today's user interfaces overwhelming, wearables with haptic feedback, smart TVs that allow voice recognition for accessing features, or mobile apps that have been developed specifically to help find accessible locations.

Throughout 2018 during the many meetings and events related to accessibility that the MWF participated in, the need for better information on available solutions, greater education of users and digital capacity building for persons with disabilities and older users was a recurring theme. It highlighted the continuing need for a central source of information on accessible devices like GARI.

In 2018, the MWF participated in and presented GARI at a number of events worldwide:

- mEnabling Summit, Washington (US)
- Zero Project Conference, Vienna (AT)
- EKTG's eHealth Symposium, London (UK)
- AAATE Workshop, Linz (AT)
- A-Tag, Vienna (AT)
- Symposium on Celebrating Human Rights of Older Persons. ITU Accessible Americas, Vienna (AT)
- EDF Side Event on Artificial Intelligence, Vienna (AT)
- mEnabling Forum, Düsseldorf (DE)
- EDF Conference on Statistics and Data Collection on Disability, Vienna (AT)
- ITU Accessible Europe, Vienna (AT)
- Events around the European Accessibility Act, Brussels (BE)
- International Expert-Conference on Human Rights of older Persons, Vienna (AT)
- Open event of the Disability Intergroup in the European Parliament, Brussels (BE)

In 2018, three new manufacturers joined the GARI project increasing the number of participating companies to 25.

Reporting against international standards

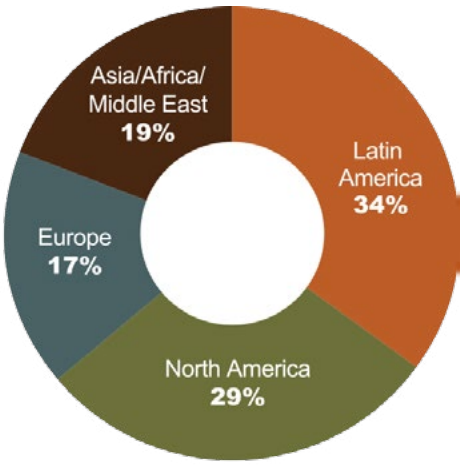
The accessibility features listed in the GARI database have been developed in collaboration with accessibility experts, organisations of persons with disabilities, consumer groups, telecom regulators and industry through regular feature reviews. 2019 will see the 5th GARI feature review launched.

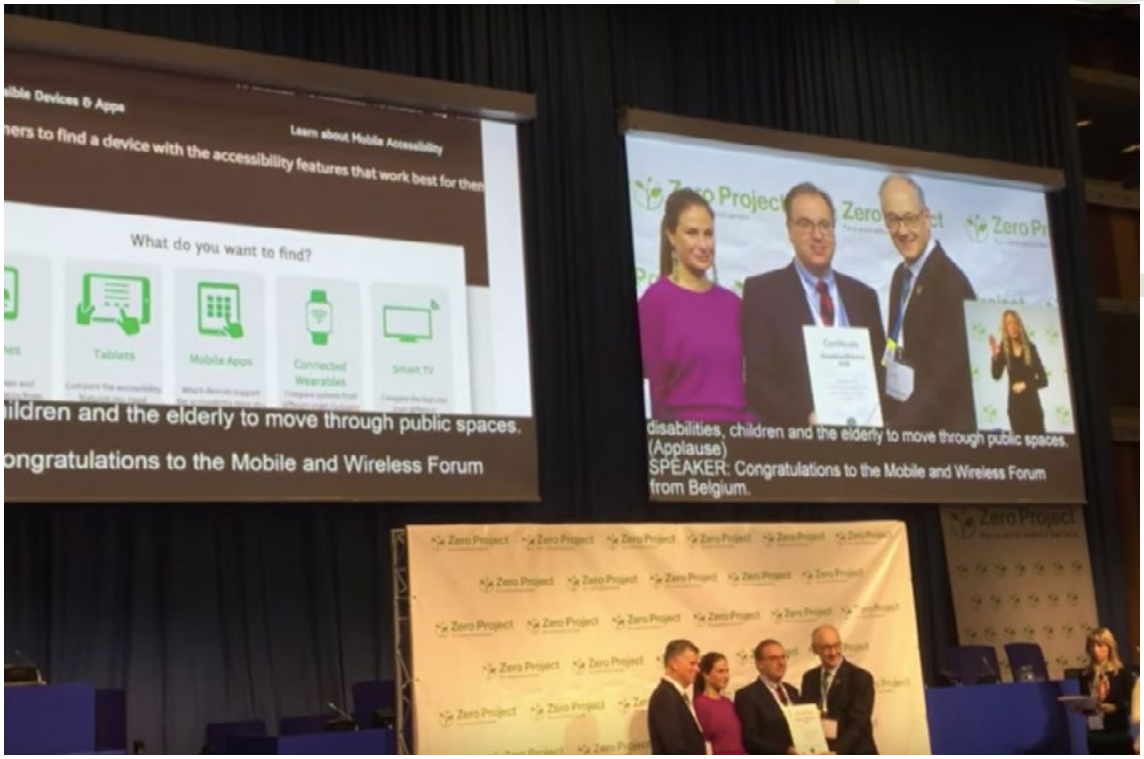
The MWF also took care to match the features in the database against international standards such as Section 508 in the US and EN 301 549 in Europe, as well as Australia's Telephone Equipment Industry Code C625 in order to support companies in reporting on the compliance of their devices.

By the end of 2018, the GARI database is being used by governments, regulators, non-Government organisations, universities and industry bodies in 26 countries around the world.

The GARI website was designed to be usable with screen-readers and includes a collection of American sign-language videos that explain how to use the site. In addition, the GARI site has been translated into 18 languages allowing consumers to search the database in their preferred language irrespective of where they reside. Languages currently supported on the site include English, Arabic, Danish, German, Spanish, Swedish, Finnish, French, Hungarian, Italian, Korean, Dutch, Norwegian, Polish, Portuguese, Romanian, Japanese and Chinese.

Latin America remained the region using the GARI website most intensively with 34.09% of searches via the web interface, followed by North America with 29.50% and Europe with 17.37% of searches. The remaining visitors to the site came from Asia, Africa and the Middle East.





Innovative Practice for Accessible ICT 2018 – GARI rewarded by Zero Project

In 2018, the GARI project was recognized as an 'Innovative Practice for Accessible ICT' at the Essl Foundation's Zero Project Conference in Vienna, Austria. The Innovative Practices of the Zero Project are projects, programmes, products and services, that have a proven and measurable impact and that serve as a model that can be transferred across countries or regions. Most importantly they aid the process of implementing the United Nations Convention on the Rights of Persons with Disabilities (UN CRPD). In this context, the MWF was very pleased to see the work on GARI recognized and is looking forward to further expanding GARI's reach and uptake in more countries.


Certificate

Innovative Practice 2018

THE ZERO PROJECT IS PROUD TO CERTIFY, THAT

Mobile & Wireless Forum

was selected as one of 68 Innovative Practices by the Zero Project's selection committee of renowned disability and accessibility experts. Exemplary in the areas of innovation, impact, chances of long-term growth and success, and scalability,

Global Accessibility Reporting Initiative

is outstanding in providing a practical solution to improve accessibility for persons with disabilities.

Martin Essl
Founder of the Essl Foundation

Michael Fembek
Programme Director Essl Foundation

Over 100 accessibility features – how to know where to look first?

Following on from the clearly expressed need for more information and education on accessibility features – both among the users who need these features as well as among the people who support and work with them – the MWF tried to simplify the information on accessibility features in mobile devices by creating a GARI Feature Guide, explaining which features exist in today's devices and what situation they might be helpful in and presenting this in user friendly tables.

Regulatory developments in accessibility

Europe – the European Accessibility Act

In 2018, discussions on the proposed European Accessibility Act (EAA) were finalized with the new directive provisionally agreed by Parliament and Council negotiators in November 2018. The EAA aims at making key products and services more accessible to persons with disabilities. These include:

- Phones, computers, payment terminals or self-service terminals for buying passenger transport ticket;
- Consumer banking services;
- Electronic communications services, including for example phone and Internet services;
- The 112 emergency number service;
- Access to audio-visual media services;
- e-books; and
- e-commerce.

Also included are common accessibility requirements on the user interface and functionality design of products. Packaging, installation instructions and other product information for products covered by the directive will have to be accessible as well.

The European Accessibility Act joins three other European Directives that directly promote accessibility in Europe:

Directive 2014/24/EU on public procurement and Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors

Accessibility must be included as a Technical Specification (mandatory requirement) in ALL procurements.

Directive 2016/2102/EU on Web Accessibility

On October 26, 2016, EU Directive 2016/2102 was approved with the goal to increase web and mobile accessibility. In order to accomplish this, EU Directive 2016/2102 set forth standards for member nations of the European Union regarding the accessibility of websites and mobile applications of public sector bodies.

Directive 2010/13/EU on Audiovisual Media Services

Sets out the legal obligation for Member States to ensure, that public and commercial TV channels, as well as video on-demand platforms make their services continuously and progressively more accessible to persons with disabilities through proportionate measures.

Revised EN 301 549 and WCAG 2.1 in Europe

As the EAA was being finalised an updated version of EN 301 549 being the standard for 'Accessibility requirements for ICT products and services' was published. This revised version of EN 301 549 adopts W3C's 'Web Content Accessibility Guidelines (WCAG) 2.1' for web content, electronic documents, and non-web software, such as native mobile applications and was published in June 2018.

EN 301 549 is intended to provide a presumption of conformity to the Directive on the accessibility of the websites and mobile applications of public sector bodies and will also be important in the implementation of the European Accessibility Act.

ITU H.870 - Guidelines for safe listening devices/systems

Another standard published in 2018 is the ITU H.870 on guidelines for safe listening devices/systems. It was developed by the ITU expert group for multimedia in close collaboration with the World Health Organization (WHO). The standard encourages manufacturers to provide information and messages on safe listening to the user. It also states that 'information regarding various listening parameters defining the users' listening habits shall be accessible to users in order to allow them to keep track of their exposure to sound through the device'. The device 'shall provide the user with warnings and cues for action'. The 'information on what is safe listening and its benefits, as well as the risks posed by unsafe listening, shall be displayed on the screen'. The standard is being co-promoted with the campaign *Make Listening Safe* by the WHO.

North America

United States – HAC and more

In 2018, the US Federal Communications Commission (FCC) adopted rules to update the volume control standard for wireline telephones, extend wireline HAC Requirements to cover telephones used with advanced communications services, adopt a volume control rule for wireless handsets, and delete from the Commission's Rules an obsolete wireless HAC Standard.

In the beginning of the year, the FCC voted to improve the geographic targeting of Wireless Emergency Alerts (WEA), which serves to deliver critical warnings and information to the public on their wireless phones. The new rules require wireless service providers to deliver WEA alerts to an entire geographic area designated by government officials that overlaps with their coverage networks. They are also restricted from sending alerts more than 0.1 miles outside that area. The enhanced geo-targeting requirement will go into effect on 30 November 2019. Furthermore, alert messages will have to remain available in a consumer-accessible format on wireless devices for 24 hours after receipt, or until the consumer chooses to delete the message, and will have to be available also in Spanish by 1 May 2019.

In September, the FCC reported on the state of industry compliance with accessibility provisions of the Twenty-First Century Communications and Video Accessibility Act (CVAA), noting areas where progress has been made, as well as indicating where work needs to be done. Regarding the latter, the accessibility of new and emerging technologies was deemed promising, but design considerations will have to carefully consider people with disabilities to fulfil the promise.

Canada – the Accessible Canada Act

Just before the summer of 2018, the Canadian government introduced a proposal for an Accessible Canada Act into parliament (Bill C-81). The objective of the Act would be to 'identify, remove and prevent' accessibility barriers in areas that fall under federal jurisdiction, and which were identified in an 8 month public consultation in 2016, in which the MWF also participated. Some of the barriers on the list include built environments, federally run programs and services, banking, telecommunications and transportation that crosses provincial lines. The Act defines a barrier as anything 'architectural, physical, technological or attitudinal' that 'hinders the full participation in society of persons with a physical, mental, intellectual, learning, communication or sensory impairment'.

In July 2018, the Department of Innovation, Science and Economic Development Canada launched a public consultation on RSS-HAC, Issue 1, 'Hearing Aid Compatibility and Volume Control', a standard that sets out the compliance requirements for hearing aid compatibility and volume control features for specific radio apparatus. The consultation has closed but the results have not yet been published.

At the end of the year, the Canadian Radio-television and Telecommunications Commission's (CRTC) introduced new quality standards to enhance the user experience of message relay services (MRS). These new standards require service providers to provide MRS users faster response times and increased accuracy of the services, as well as accessible internet protocol (IP) relay interfaces. 80 percent of all calls each

month will need to be responded to by a live MRS operator within 20 seconds, increasing to 85 percent and 10 seconds in 12 months.

Asia-Pacific

At the end of 2017, the Telecom Regulatory Authority of **India** (TRAI) issued a consultation paper on making telecom and broadcasting services accessible for persons with disabilities across the country. Stakeholders, including the MWF, were requested to provide their comments by the end of January 2018 on what additional measures could be taken or which technologies could be deployed by service providers or equipment manufactures to assist users with disabilities. The MWF proposed encouraging greater awareness of existing features amongst devices and highlighted data from GARI to support the case that existing devices have an extensive range of accessibility features which many consumers are still unaware of and are not sure where to obtain the information. Following the MWF's submission to the consultation, the MWF was invited to an Open House Discussion on the topic. The MWF's submission was very much welcomed by the Indian NGO BarrierBreak as it highlighted that a lot could be done to address the information shortfall without it having to be a burden on operators.

In July 2018, TRAI released the recommendations coming out of the public consultation process. These included for example, that the government should mandate the device manufacturers/ importers not to curtail the accessibility features available in popular operating systems in any manner from their devices (manufactured or imported in India), as well as the development of specific accessibility standards for mobile phones, landline phones and set-top boxes. TRAI also suggested that by the end of 2020, all mobile handset manufacturers producing five or more different models should provide at least one mobile handset satisfying accessibility criteria for users with disabilities.

Australia

In September 2018, the Australian Communications Consumer Action Network (ACCAN), Australia's peak telecom consumer organisation, with the support of the National Disability Insurance Agency, developed and implemented a nation-wide disability telecommunications information and referral service. The service will provide up-to-date, independent information about both mainstream and assistive telecommunications suitable for people with disability. ACCAN approached the MWF about including information from the GARI database into this service.

New Zealand

In September 2018, accessibility campaigners assembled at the New Zealand Parliament to present their personal stories to the Minister for Disability Issues, Carmel Sepuloni. Supporters of the Access Matters campaign gathered at parliament to present a booklet of stories of kiwis living with disabilities, highlighting the range of systemic barriers that New Zealanders with disabilities face in everyday areas such as transport, public services, websites, buildings, workplaces, and events. The campaign was coordinated by the Access Alliance, a group of 12 organisations in the disability sector, and was aimed at convincing the government to propose an Accessibility Act that would enable people with disabilities to more actively participate in society.

Latin America

Mexico – accessibility guidelines for 'free air' TV broadcasters

IFT, the Federal Telecommunication Institute of Mexico, issued rules establishing guidelines for 'free air' TV in regards to subtitling and interpretation into Mexican Sign Language. The objective of the guidelines is to allow equal access to the content of commercial TV to persons with hearing impairments.

MWF workshops, publications and communications

In 2018, the MWF continued its series of workshops held in conjunction with the BioEM conference. The aim of these workshops is to facilitate exchange and discussion between technical experts, standardization bodies and regulatory authorities.

The first 5G Workshop organized by the Mobile & Wireless Forum (MWF) back in 2016 posed a number of questions related to exposures and compliance assessments above 6GHz. One of the aims of the 2018 Workshop 'EMF Exposure from 5G equipment – the state of art research and standardization' was to follow-up those questions in light of the research work that has been carried out over the intervening period.

Eleven speakers, ranging from the chairmen of IEC TC 106 and IEEE/ICES TC95 to researchers from the University of Pennsylvania and the Japanese National Institute of Information and Communications Technology (NICT), gave an overview of EMF exposure standards, discussed skin physiology, thermal responses of the skin and ocular studies, moving onto discussions related to averaging times, and absorption mechanisms and finally specific challenges related to compliance standards and compliance assessments of devices and networks.

The MWF sponsored this Workshop to promote an understanding of the research and standards for 5G and the views expressed were those of the speakers alone. Some of the research projects presented in the workshop were sponsored by the MWF and GSMA and the presentations of the workshop can all be found on the MWF's website[3].

As part of the association's 20th anniversary in 2018, the MWF put together a new publication that provided an overview of the various research projects and programs supported since its inception.

The booklet also provided details on the projects currently supported concerning new compliance methodologies for 5G devices and the development of new technical standards. It concludes with a summary of where we are in terms of knowledge and understanding after 20 years of EMF research, and the lessons learned ranging from the societal impact to the public understanding of scientific research.

The research booklet can be download from the MWF website[4].

In 2018, the MWF also supported an update to the Latin America Science Review which was presented in the course of two events:

- The International Workshop on Radiofrequency Electromagnetic Fields Measurements, Research Studies and Standards Development; and

3 https://www.mwfai.org/publications.cfm
4 http://www.mwfai.org/docs/eng/2018_05_MWF_20YearsofResearch.pdf

- An International Forum - Latin American Review Update on Radiofrequency Electromagnetic Fields from Telecommunications: New Developments, Measurements and Human Health.

Scientists and regulators from Peru, Argentina, Bolivia, Brazil, Colombia, Australia and Italy, as well as representatives of the MWF, ITU, GSMA, ICNIRP and WHO participated in these events and discussed scientific, technical and practical aspects of the EMF/Health issue, either from the regional or global perspective.

Throughout the year, the MWF published a variety of viewpoints, brochures, infographics and blog articles on EMF and health related issues including background information on technical aspects around 5G, information on mobile accessibility as well as the risks posed by counterfeit devices. The publications included the following:

The Mobile & Wireless Forum - 20 years of research and standards development
January 2018 | MWF Blog[5]

Fakes and Counterfeits - what do you get for your money?
January 2018 | Spotafake Blog[6]

Milestones in Mobile Accessibility: the Tenth Anniversary of GARI
January 2018 | Mobile Accessibility Blog[7]

US National Toxicology Program Animal Study
February 2018 | Viewpoint

US National Toxicology Program (NTP) publishes 2 year cell phone study
February 2018 | MWF Blog

GARI awarded as Innovative Practice 2018 on Accessible ICT
February 2018 | Mobile Accessibility Blog

How does GARI fit into mHealth?
February 2018 | Mobile Accessibility Blog

ITU Forum: ICT Accessibility a Requisite Towards an Inclusive Digital Society
March 2018 | Mobile Accessibility Blog

Accessibility of information - online and offline
March 2018 | Mobile Accessibility Blog

#ZeroCon18: Advancing ICT Accessibility - some policy updates on where we are and where we are headed
March 2018 | Mobile Accessibility Blog

MWF: 20 years of Research
May 2018 | Research Briefing

EMF Explained: 5G
May 2018 | Brochure

Accessibility Features in GARI - list view - for screen reader users
May 2018 | Brochure

Accessibility features GARI at a glance - table view
May 2018 | Brochure

Over 100 accessibility features in my phone – how do I know what helps me?
May 2018 | Mobile Accessibility Blog

e-Labelling: Moving compliance into the digital age
June 2018 | Press Release

Trends in mobile accessibility : artificial intelligence and smart cities
June 2018 | Mobile Accessibility Blog

Regional changes impact Top 10 of accessibility features - GARI Annual Report 2017
July 2018 | Mobile Accessibility Blog

5G – the miracle solution for accessibility?
July 2018 | Mobile Accessibility Blog

MWF 5G Workshop at BioEM 2018: state of the art research and standardization
July 2018 | MWF Blog

GARI Annual Report 2017 + audio version
August 2018 | Report

Why Europe should allow e-Labelling
August 2018 | Infographic

What is 5G?
August 2018 | MWF Blog

e-Labeling: Moving compliance into the digital age
August 2018 | MWF Blog

The MWF's 20 Years of Research
August 2018 | MWF Blog

Crowd-sourcing information on accessible products and services
August 2018 | Mobile Accessibility Blog

GARI feature guide: Over 100 accessibility features in my phone – how do I know what helps me?
September 2018 | Brochure

GARI: Accessibility features at a glance
September 2018 | Brochure

5 http://mobile-wireless-forum.blogspot.com
6 http://spotafakephone.blogspot.com
7 http://blog.gari.info

Exposure to electromagnetic fields (EMF) – Biological effects vs health effects
September 2018 | MWF Blog

EMF Research and the Weight of Scientific Evidence
September 2018 | MWF Blog

Latin American Countries taking action against Counterfeit and Stolen mobile phones
October 2018 | Spotafake Blog

Fighting counterfeits: An open source system for identifying and blocking irregular devices in the networks
October 2018 | Spotafake Blog

'Don't take technology too seriously - it is people who are using the technology and need to make sense out of it'
October 2018 | Mobile Accessibility Blog

What do CSS, standards and 'easy' sign language have in common?
October 2018 | Mobile Accessibility Blog

US National Toxicology Program Animal Study – Final Report
November 2018 | Viewpoint

Another year in mobile accessibility – what has changed and what is the same?
December 2018 | Mobile Accessibility Blog

Accessible Americas V: Five years of promoting mobile accessibility
December 2018 | Mobile Accessibility Blog

outlook 2019-2020

The next few years will be an important time for the association in a number of key areas including:

Launch of New EMF Research Agenda

In 2019, we expect to see the completion of all of the remaining research projects funded as part of our 5G Phase II program as well as launch a number of new projects currently under discussion within our research and standards working group. The expectation is that these projects will all make valuable contributions to IEEE, CENELEC and IEC in the development of the various compliance assessment standards for 5G devices.

Updated ICNIRP and IEEE RF Exposure Standards

2019 will see the publication of the latest IEEE C95.1 RF exposure standard and possibly the publication of the revised ICNIRP guidelines. These will be significant for the industry as it plans its way towards the deployment of 5G technologies. The ICNIRP guidelines were first published in 1998 and while there have been a number of restatements of the guidelines since then, we expect the 2019 revision to be a significant one.

Promotion of Time Averaging

The concept of averaging SAR measurements over a 6 minute time period is one of the three key elements of the existing RF exposure standards (the other two being the limit value and the averaging mass). The irony is that despite its existence in the standards, no regulator has implemented the 6 minutes into national regulations in a way that can allow its deployment in today's devices. The MWF has formed a task group to develop an industry proposal to take to regulators and standards bodies that would provide a consistent framework for the implementation of time averaging.

Promoting the adoption of e-Labelling

The MWF will continue to promote the adoption of e-labelling and the MWF's *Industry Code of the Use of Electronic Compliance Labeling*. We are working to address the remaining concerns of the European Commission with regards to its adoption as well as continuing to promote it internationally.

Global harmonization in accessibility requirements

The MWF will continue to work with regional and national regulators with an interest in promoting mobile accessibility and offers GARI as a ready resource to highlight available features.

Raising awareness about the dangers of counterfeits

The MWF remains committed to continuing to raise awareness among governments in Africa, Latin America and Asia about the dangers posed by counterfeit and fake devices. We share best practices in the fight against counterfeit and case studies on how other countries are tackling the issue.

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appendix: research publications

The MWF's support of scientific research has resulted in the following peer-reviewed publications:

2018

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Thermal Analysis of Averaging Times in Radio-frequency Exposure Limits Above 1 GHz. Foster, Kenneth & C. Ziskin, Marvin & Balzano, Q & Hirata, Akimasa. (2018). IEEE Access

Theoretical and numerical assessment of maximally allowable power-density averaging area for conservative electromagnetic exposure assessment above 6 GHz: Maximally Allowable Power-Density Averaging Area. Neufeld, Esra & Carrasco, Eduardo & Murbach, Manuel & Balzano, Q & Christ, Andreas & Kuster, Niels. (2018). Bioelectromagnetics. 39.

Exposure Assessment of Portable Wireless Deviuces Above 6 Ghz, Eduardo Carrasco, Davide Colombi, Kenneth R Foster, Marvin Ziskin, Quirino Balzano, Radiation Protection Dosimetry, ncy177.

2017

Thermal Modelling for the Next generation of Radiofrequency Exposure Limits: Commentary, Foster, *et al.* Health Physics, vol.13, no.1, 2017

Near-field Measurement Systems for Compliance Testing of Transmitters Operating between 10-110 GHz, Pokovic *et al.*

Novel Total Field Reconstruction in the Near-Field Using Psudo-Vector E-Field Measurements, Pokovic *et al.*

2016

The intracranial distribution of gliomas in relation to exposure from mobile phones: Analyses from the INTERPHONE study. Grell K., Frederiksen K., Schuz J., Cardis E., Feychting M., *et al., Am J Epidemiol.*,Vol. 184, Pg. 818 - 828, 2016.

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Large Scale Study On The Variation of RF Energy Absorption in the Head & Brain Regions of Adults and Children and Evaluation of the Sam Phantom Conservativeness. J Keshvari1, M., *et al.,* Institute of Physics and Engineering in Medicine, January 2016.

Thermal Response of Human Skin to Microwave Energy: A Critical Review. Foster *et al., Health Phys.,* 2016.

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Exposure Assessment of Portable Wireless Devices above 6GHz. Carrasco, *et al.,* 2016.

Evaluation of the Absorption in the Skin at Frequencies above 6GHz. Christ, A, *et al.,* 2016.

Skin Modelling at Millimetre Wave, Ziskin, *et al.,* Bioelectromagnetics, 2016.

2015

SAR Induced by Low and High Directivity Antenna Apertures at Distances Greaterthan 25 mm from the Body. Md. Anas B.*et al. Applied Computational Electromagnetic Society (ACES) Journal*, Vol. 30, No. 9, pp. 940-951, September 2015.

Pituitary tumor risk in relation to mobile phone use: A case-control study. Shrestha M., *et al., Acta Oncol.,* Vol. 54, Pg. 1159 - 1165, 2015.

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