



Mobile Manufacturers  
Forum



Botswana Telecommunication Authority Workshop on  
“Human Exposure to Electromagnetic Fields (EMF) from Wireless  
Technologies”

Gaborone, Botswana, 9<sup>th</sup>/10<sup>th</sup> November 2010

# Mobile phones and EMF exposure

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Mobile Manufacturers Forum

# Overview of the MMF

- ➔ International association of radio equipment manufacturers
  - Representing around 80% of global handset sales;
  - The providers of the majority of global network infrastructure.
  
- ➔ Association's focus:
  - Health and safety of wireless telecommunications equipment (technology neutral approach)
  
- ➔ Key areas of activity:
  - research and standards support
  - regulatory harmonisation
  - public communications



# Do mobiles pose a health threat?

- ➔ International exposure limits are in place to **protect all people**.
- ➔ To date, **no adverse health effects** have been established **for mobile phone use**.
- ➔ But: there is an increased risk of road traffic injuries when drivers use mobile phones while driving.

# ITU recommends ICNIRP

The  
**International Telecommunications  
Union**  
recommends:

***“... ICNIRP limits should be used.”***

(ITU-T K.52 (02/00) - Guidance on complying with limits  
for human exposure to electromagnetic fields)

# ICNIRP limits

- ➔ International Commission on Non-Ionizing Radiation Protection (ICNIRP)
- ➔ Guidelines and limits published in 1998
- ➔ In 2009 and 2010: guidelines reaffirmed
  - following a **review of national and international EMF research** and published scientific literature **including the INTERPHONE study** on mobile phone use and brain cancer risk.

# Key Principals in Research

- ➔ It's impossible to prove that something does not cause any effect.
- ➔ One single study can't answer any scientific question definitely.
- ➔ Scientific reviews done by
  - Independent expert panels
  - On a regular basis
- ➔ The weight of scientific evidence counts  
– always rely on the entire body of peer-reviewed scientific evidence as a whole.

# ICNIRP limits

	ICNIRP limits		
Exposure Characteristic	Whole Body averaged <u>S</u> pecific <u>A</u> bsorption <u>R</u> ate	Local SAR averaged over 10 g of tissue	
		Head & Trunk	Limbs
Workers' exposure	0.4 W/kg	10 W/kg	20 W/kg
General Public exposure	0.08 W/kg	2 W/kg	4 W/kg

Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz).” Health Physics, April 1998, vol. 74, number 4, pp. 494-522

# False interpretation of SAR limit

**W  
R  
O  
N  
G  
!**

**SAR limit  
of 2 W/kg  
=  
threshold  
of harm.**

high ↑  
↑ Exposure  
↓  
low

Dangerous!  
Harmful!  
Not healthy!

Safe?

...

Better,  
but safe?

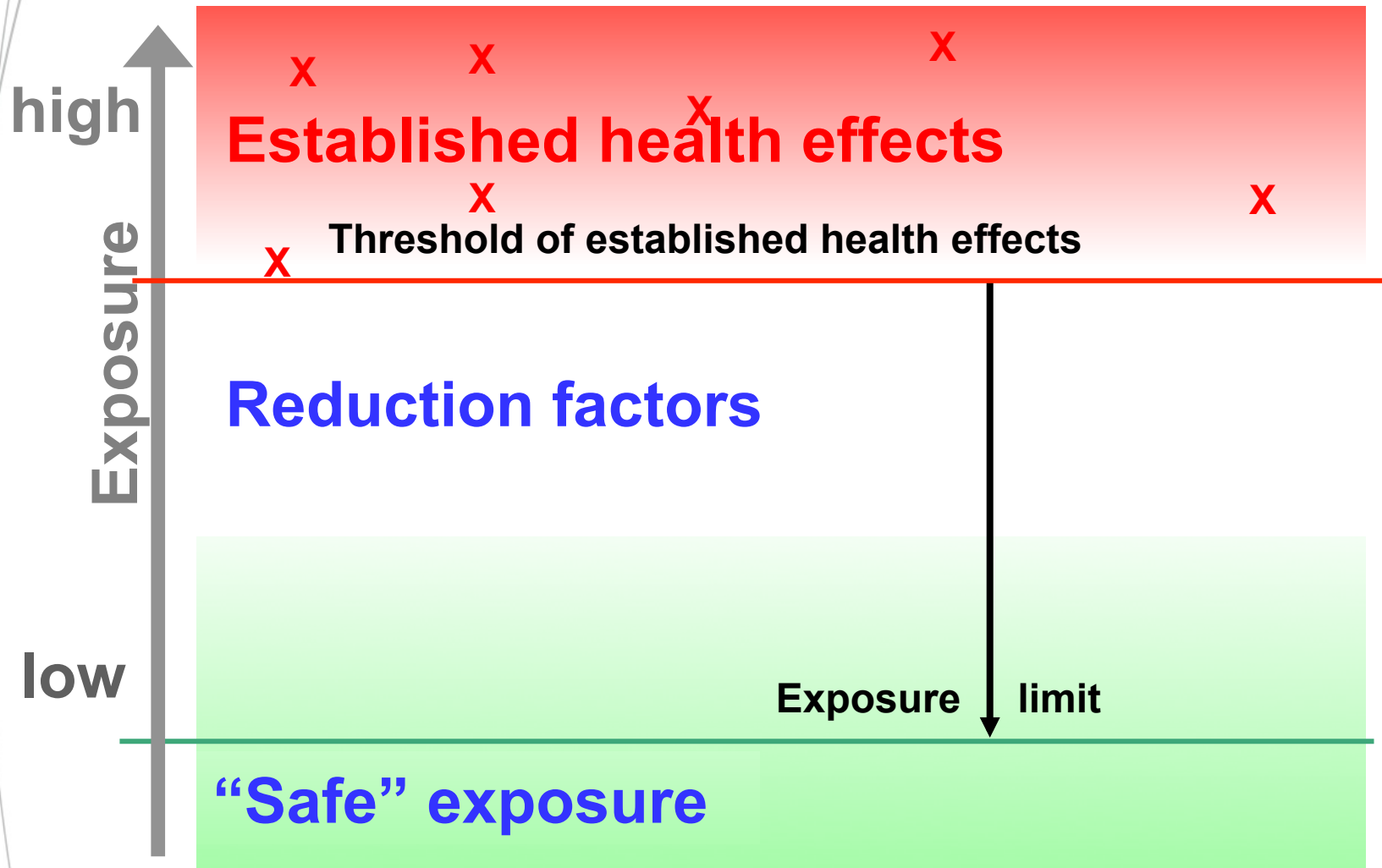
...

Perhaps  
safe!



# SAR limits contain reduction factors.

**R  
I  
G  
H  
T  
!**



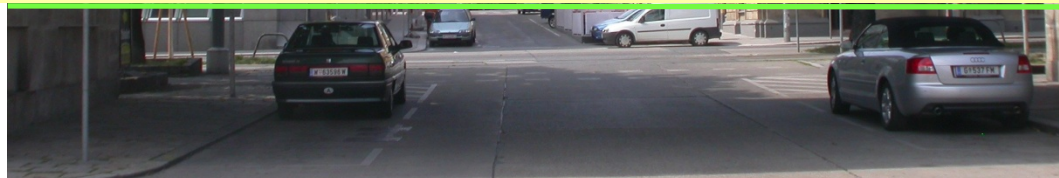
# Explaining SAR: Metaphor 'Bridge'

Clearance = threshold of established  
adverse health effects

Maximum permissible height = SAR limit



...but to show  
the right proportions you will need ...



# Explaining SAR: Metaphor 'Bridge'

Threshold of established adverse health effects

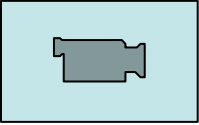
Occupational SAR limit for  
head and trunk: 10 W/kg

Public SAR limit for head  
and trunk: 2 W/kg

**All mobile phones below 2 W/kg are equally safe.**



# Compliance testing

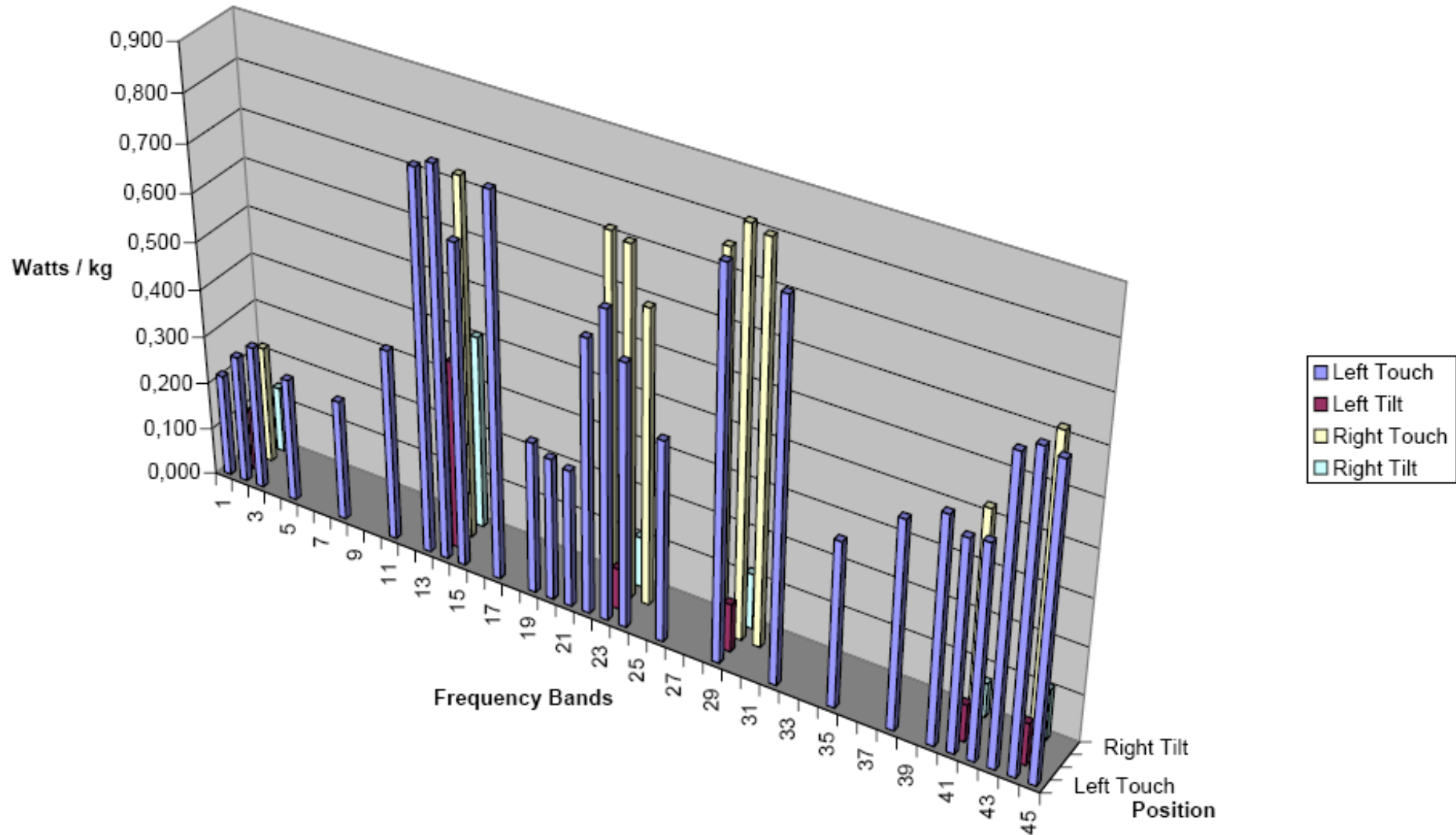
- ➔ Measurement standards in place:
  - IEC 62209-1 and IEEE 1526 (head)
  - IEC 62209-2 (body-worn)
- ➔ Mobile phones are **tested** for compliance **at the highest possible power level.** 
- ➔ Video on SAR testing:
- ➔ Get more detailed information on SAR:  
[www.emfexplained.info/?ID=24898](http://www.emfexplained.info/?ID=24898)



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# Only highest SAR value reported in user manual

SAR values of GPRS multi-band mobile phone



# EMF exposure is further reduced by ...

- ➔ **Adaptive Power Control:**  
mobiles only operate on the minimum power needed to make or maintain a call.



# User preference

- ➔ If people are still concerned about EMF exposure, they can reduce exposure to mobile phone signals by using a hands-free device.
  - Important: The use of a hands-free device is to reduce concerns and it's not about additional or higher safety as **all compliant mobile phones are equally safe.**

# Harmonization benefits

## ➔ Harmonization provides benefits for everyone:

- Industry: a single standard reduces the costs of production as mobiles are:
  - designed once
  - tested once
  - able to be sold globally
- Consumers:
  - access to the services and products available elsewhere around the globe
  - mobile phone prices decrease further
- Public and Politics:
  - high levels of protection for all



# International developments

## ➔ Brazil:

- Since 2002, ICNIRP limits had been in force based on Resolution # 303, issued by Brazilian National Telecommunication Agency ANATEL.
- In May 2009, ICNIRP' s scientific rationale and limits stipulated by federal law #11934/2009.
- The order applies to both network infrastructure and handsets well as all the other radio systems (TV broadcasting, radio broadcasting, two ways radios, etc) ranging from 9 KHz to 300 GHz (public and occupational).

# International developments

## ➔ Russia:

- It's said that Russia had adopted "preventative" limits below ICNIRP recommendations.
- In fact – Russia's current EMF limits were developed before mobile communications was available. At that time the rationale for determining compliance was completely different.
- In December 2008, the Consumer Rights Protection Agency Rospotrebnadzor, endorsed a plan of action designed to harmonize EMF standards with those used internationally.

# International developments

## ➔ India:

- In September 2008, the Telecom Commission of India formally adopted ICNIRP guidelines in India.
- The order applies to both network infrastructure and handsets.
- India is currently in the process of adopting exposure measurement standards and is looking carefully at the existing European and international (IEC) standards.

# International development

## ➔ China:

- Information circulates that China had adopted limits below ICNIRP recommendations as a precautionary measure.
- In fact – China officially adopted ICNIRP based limits in August 2008 for handsets.
- Limits for base stations are currently being prepared but MIIT has stated they see no reason for these limits not to be also based on ICNIRP

# Conclusions

1. We continue to see a strong trend toward the adoption of ICNIRP based limits for mobile communications devices.
2. Those countries have reviewed and accepted the scientific rationale underpinning the ICNIRP approach.
3. Scientifically, we also continue to see strong consistency in authoritative expert reviews and opinions about the lack of any evidence of a health risk associated with the use of, or proximity to, mobile communications equipment and networks.

# Thank you. - Questions? Information needed?

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MMF's Director for Europe, Middle East and Africa and responsible for the co-ordination of the association's activities in the region. Prior to joining the MMF:

- 2000 – 2006: Managing Director, Forum Mobilkommunikation (Austrian mobile communication trade organisation)
- 1990 – 1999: Member of the Austrian Parliament, focused on infrastructure issues, telecommunication and environment
- Master of Laws at the University of Graz, Austria.



# MMF Members

- ➔ Apple
- ➔ Cisco
- ➔ Ericsson
- ➔ Intel
- ➔ LG
- ➔ Motorola
- ➔ Nokia
- ➔ Nokia Siemens Networks
- ➔ Samsung
- ➔ Sony Ericsson
- ➔ TCT Mobile (Alcatel Mobile Phones)



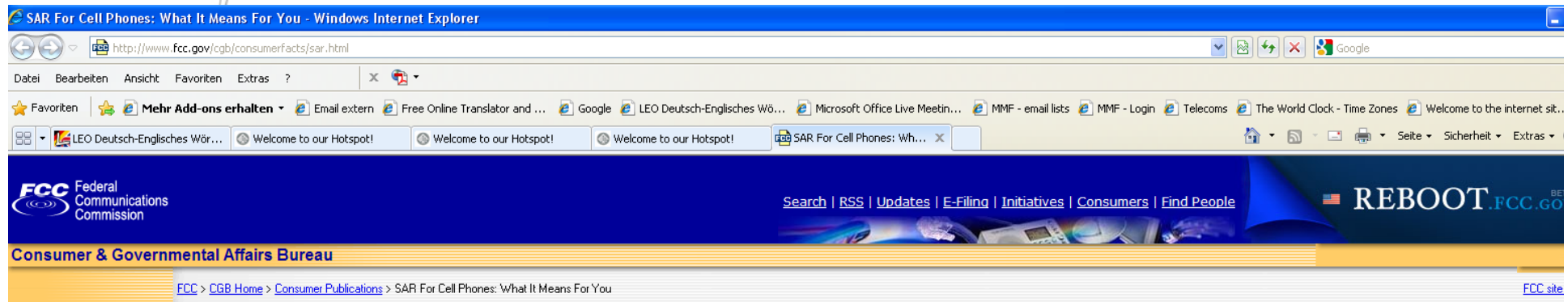
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# Additional information



# FCC Fact Sheet on SAR

<http://www.fcc.gov/cgb/consumerfacts/sar.html>



## SAR For Cell Phones: What It Means For You

## FCC Consumer Facts

There is considerable confusion and misunderstanding about the meaning of the maximum reported "SAR" values for cell phones (and other wireless devices). SAR stands for "specific absorption rate," which is a measure of the rate of RF (radiofrequency) energy absorption by the body from the source being measured – in this case, a cell phone. SAR provides a straightforward means for measuring the RF exposure characteristics of cell phones to ensure that they are within the safety guidelines set by the FCC.

Many people mistakenly assume that using a cell phone with a lower reported SAR value necessarily decreases a user's exposure to RF emissions, or is somehow "safer" than using a cell phone with a high SAR value. While SAR values are an important tool in judging the maximum possible exposure to RF energy from a particular model of cell phone, a single SAR value does not provide sufficient information about the amount of RF exposure under typical usage conditions to reliably compare individual cell phone models. Rather, the SAR values collected by the FCC are intended only to ensure that the cell phone does not exceed the FCC's maximum permissible exposure levels even when operating in conditions which result in the device's highest possible – but not its typical - RF energy absorption for a user.

### SAR Testing

SAR testing uses standardized models of the human head and body that are filled with liquids that simulate the RF absorption characteristics of different human tissues. In order to determine compliance, each cell phone is tested while operating at its highest power level in all the frequency bands in which it operates, and in various specific positions against the dummy head and body, to simulate the way different users' typically hold a cell phone, including to each side of the head. To test cell phones for SAR compliance, the phone is precisely placed in various common positions next to the head and body, and a robotic probe takes a series of measurements of the electric field at specific pinpoint locations in a very precise, grid-like pattern within the dummy head and torso. All data for each phone placement are submitted as a part of the equipment approval test report for final authorization. However, *only the highest SAR values* for each frequency band are included in the final authorization to demonstrate compliance with the FCC's RF guidelines.

### What SAR Shows

The FCC requires that cell phone manufacturers conduct their SAR testing to include the *most severe, worst-case (and highest power) operating conditions for all the frequency bands* used in the USA for that cell phone. The SAR values recorded on the FCC's authorization and in the cell phone manual to demonstrate compliance with Commission rules indicate only the highest single measurement taken for each frequency range that the particular model uses. FCC approval means that the device will never exceed the maximum levels of consumer RF exposure permitted by federal guidelines, but it does not indicate the amount of RF exposure consumers experience during normal use of the device. While only the maximum SAR values are used for FCC approval, all test reports submitted by the manufacturer are available *in full* for public inspection on the Commission's website.

# FCC Fact Sheet on SAR

<http://www.fcc.gov/cgb/consumerfacts/sar.html>

- ➔ ...considerable confusion and misunderstanding about the meaning of the maximum reported “SAR” values for cell phones...
- ➔ Many people mistakenly assume that using a cell phone with a lower reported SAR value necessarily decreases a user’s exposure to RF emissions...
- ➔ ...a single SAR value does not provide sufficient information about the amount of RF exposure under typical usage conditions to reliably compare individual cell phone models.

17.6.2008

## **REPORT**

on the mid-term review of the European Environment and Health Action Plan  
2004-2010  
(2007/2252(INI))

Committee on the Environment, Public Health and Food Safety

Rapporteur: Frédérique Ries

# EP called for review

- ➔ On 2<sup>nd</sup> April 2009 EP non-legislative resolution on 2008/2211 (INI):
  - 1. Urges the Commission to review the scientific basis and adequacy of the EMF limits as laid down in Recommendation 1999/519/EC and report to the Parliament; calls for the review to be undertaken by the Scientific Committee on Emerging and Newly Identified Health Risks;

# SCENIHR concluded

- ➔ It is concluded from three independent lines of evidence (epidemiological, animal and in vitro studies) that exposure to RF fields is unlikely to lead to an increase in cancer in humans. However, as the widespread duration of exposure of humans to RF fields from mobile phones is shorter than the induction time of some cancers, further studies are required to identify whether considerably longer-term (well beyond ten years) human exposure to such phones might pose some cancer risk.

# International Developments - Science

- ➔ In August 2009, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has published two important new papers,
  - the first a review of current epidemiological evidence related to mobile phones and
  - the second reviewing evidence for the full radio-frequency (RF) spectrum.

# International Developments - Science

The first of the ICNIRP 2009 papers (addressing mobile phones), published in *Epidemiology* concludes:

*'...Overall the studies published to date do not demonstrate an increased risk within approximately 10 years of use for any tumor of the brain or any other head tumor...*

*For slow-growing tumors...the absence of association reported thus far is less conclusive because the observation period has been too short.'*

# International Developments - Science

The second ICNIRP paper (on the full RF spectrum) is a major report prepared as an input to both the WHO EMF Project's Environmental Health Criteria (EHC) process as well as for ICNIRP's own review of its exposure guidelines. On the basis of experimental evidence, ICNIRP concludes:

- *“...the plausibility of various non-thermal mechanisms that have been proposed is very low.”*
- *“...recent in vitro and animal genotoxicity and carcinogenicity studies are rather consistent overall and indicate that such effects are unlikely at SAR levels up to 4 W kg.”*
- *“The experimental data do not suggest so far that children are more susceptible than adults to RF radiation, but few relevant studies have been conducted.”*



# International Developments - Science

- ➔ SCENIHR Opinion (February 2009)
  - *“It is concluded from three independent lines of evidence (epidemiological, animal and in vitro studies) that exposure to RF fields is unlikely to lead to an increase in cancer in humans....”*
  
- ➔ Canadian National Collaborating Centre for Environmental Health (September 2008)
  - *“There is insufficient evidence to indicate a causal association between cell phone use and intracranial tumours. There is weak evidence supporting an increase in odds of glioma, acoustic neuroma, and meningioma in adults with regular, ipsilateral use for 10 years or longer. Existing findings are suggestive but preliminary because they are based on few studies with small numbers and potential biases.”*

# International Developments - Science

- ➔ International Agency for Research on Cancer (World Cancer Report 2008)
  - Cancer causation
    - “ The evidence for the carcinogenicity of radio-frequency fields is even less clear. A few epidemiological studies in occupational settings have indicated a possible increase in the risk of leukaemia or brain tumours, while other studies indicated decreases. These studies suffer from a number of limitations. The experimental evidence is also limited, but suggests that radio- frequency fields cannot cause DNA mutations. The lack of reproducibility of findings limits the conclusions that can be drawn.”*
  - Mobile Phone Use and Cancer Risk:
    - “With reference to radio frequency, available data do not show any excess risk of brain cancer and other neoplasms associated with the use of mobile phones”*

# International Developments - Science

## ➔ Australian Centre for Radiofrequency Bioeffects Research (December 2008)

- Review of BioInitiative Report  
*“opinions of a self-selected group of individuals who each have a strong belief that does not accord with that of current scientific consensus.”*

*“The BioInitiative Report (...) conclusions that it reaches would normally be viewed more as views of some of the authors, rather than strong contributions to science.”*

*“Overall we think that the BioInitiative Report does not progress science, and would agree with the Health Council of the Netherlands”*

# International Developments - Science

## ➔ United States Food and Drug Administration (October 2008)

### – Cellphones – Health Issues

*"Over the past 15 years, scientists have conducted hundreds of studies looking at the biological effects of the radiofrequency energy emitted by cell phones. While some researchers have reported biological changes associated with RF energy, these studies have failed to be replicated. The majority of studies published have failed to show an association between exposure to radiofrequency from a cell phone and health problems."*

# International Developments - Science

## ➔ Health Council of the Netherlands (September 2008)

### – Review of BioInitiative Report

*“Upfront, therefore, the reason for writing the report was not to give an objective analysis of the current state of science, that would subsequently lead to recommendations. Instead, the aim was to present information to demonstrate why current standards are inadequate.”*

*“In view of the way the BioInitiative report was compiled, the selective use of scientific data and the other shortcomings mentioned above, the Committee concludes that the BioInitiative report is not an objective and balanced reflection of the current state of scientific knowledge.”*

# International Developments - Science

## ➔ Swedish Radiation Safety Authority (April 2008)

### – Fifth Annual Report

*"The few studies that have been published on health risks among populations living near transmitters have had major methodological shortcomings. However, the exposure to the general population that results from transmitters is very weak and one would not expect such exposure to produce a health risk as discussed in the previous report. Indeed, one would assume that if RF exposure at low levels is associated with a health risk it would be considerably easier to detect it in studies of mobile phone users, or highly exposed occupational groups. The overall conclusion is that exposure from transmitters is unlikely to be a health risk."*