

ITU Regional Training Workshop on "Human exposure to Electromagnetic Fields (EMF) & Specific Absorption Rate (SAR)" in the Arab Region, 2-3 Dec. 2019, Amman, Jordan

WHO EMF PROJECT

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WHO CORE ACTIVITIES

- 1. Articulate ethical and evidence-based policy positions**
- 2. Setting norms and standards, and promoting and monitoring their implementation**
- 3. Shaping the research agenda, and stimulating the generation, translation and dissemination of valuable knowledge**
- 4. Providing technical support, catalysing change and developing sustainable institutional capacity**
- 5. Monitoring the health situation and assessing health trends**
- 6. Providing leadership on matters critical to health and engaging in partnerships where joint action is needed**

WHO'S SUSTAINABLE DEVELOPMENT GOALS





SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



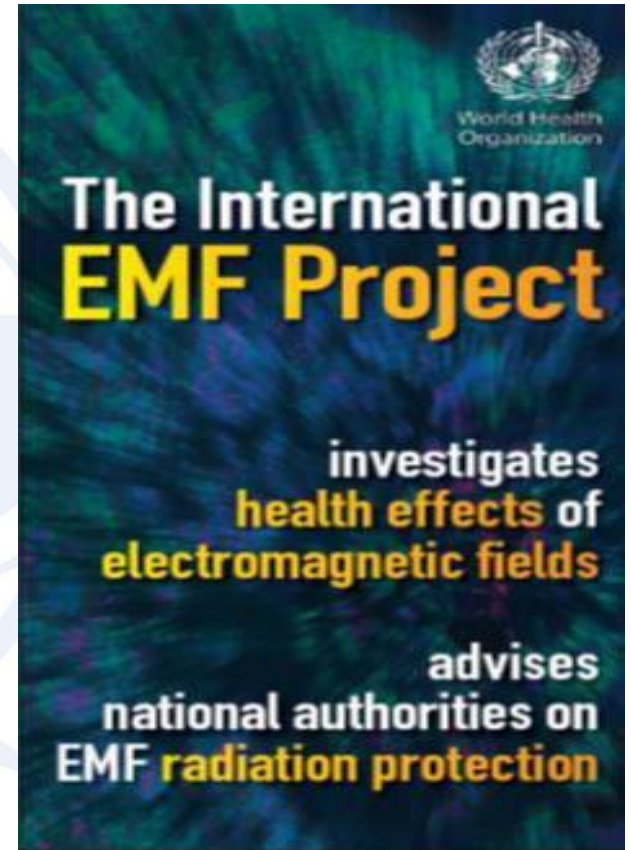
- **WHO EMF PROJECT**

Established in 1996

- Open to any WHO Member State government department or representatives of national institutions concerned with radiation protection

- Objectives

- Review the scientific literature on health effects of EMF exposure and formally assess health risks;
- Promote a focused agenda of high quality EMF research;
- Encourage internationally acceptable harmonized standards;
- Provide information on risk perception, risk communication, risk management



International Stakeholder Seminar on Radiofrequency Policies

5 June 2013, ANSES, Maisons-Alfort, France

LIST OF PARTICIPANTS

Surname	First Name	Country	Organization
SKVARCA	Jorge	Argentina	World Health Organization PAHO/AMRO (representative)
MARTIN	Lindsay	Australia	ARPANSA
MASON	Alan	Australia	ARPANSA
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LOBNIG	Sabine	Belgium	Mobile Manufacturers Forum
DOMINGUES	Luís	Brazil	Centro de Pesquisas de Energia Elétrica
BULCAO	Jose	Brazil	Ministry of Mines and Energy (representative)
ISRAEL	Michel	Bulgaria	Ministry of Health
JOHANSEN	Christoffer	Denmark	Danish National Board of Health
HIETANEN	Maila	Finland	Finnish Institute of Occupational Health



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MATHIEU	Peggy	France	Direction Générale du Travail
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ZMIROU	Denis	France	EHESP School of Public Health
GABAY	Catherine	France	Free



ELKON	Stéphane	France	Gitep TICS
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MADORE	Madeleine	France	Le Lien
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THALMANN	Andrea	Germany	Deutsche Telekom Technik GmbH
WIEBUSCH	Dagmar	Germany	Informationszentrum Mobilfunk e.V.
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BHATNAGAR	Rakesh Kumar	India	Department of Telecom (representative)
SHARMA	Radhey	India	Institute of Medical Sciences



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SADETZKI	Siegal	Israel	Ministry of Health
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OHKUBO	Chiyoji	Japan	Japan EMF Information Center
MIYAGI	Hiroaki	Japan	MIC
PODNIENCE	Zinta	Luxembourg	European Commission DG EMPLOYMENT
MERONI	Donata	Luxembourg	European Commission DG SANCO
MOHD	Yunus	Malaysia	Malaysian Communications and Multimedia Commission
OTHMAN	Mohammed Hakim	Malaysia	Malaysian Communications and Multimedia Commission
MUTHUVELU	Vany	Malaysia	Ministry of Health
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VAN RONGEN	Eric	Netherlands	Health Council of the Netherlands
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MAINA	Abubakar	Nigeria	Nigerian Communications Commission
NWOKONNEYA	Ephraim	Nigeria	Nigerian Communications Commission
PYARRAP	Victor	Nigeria	Nigerian Communications Commission



HALMOY	Sissel	Norway	Chairperson of IEMFA
HANNEVIK	Merete	Norway	Norwegian Radiation Protection Agency
OFTEDAL	Gunnhild	Norway	Sør-Trøndelag University College
AL HATTALI	Saima	Oman	Ministry of Health
AL HOSNI	Shamsa	Oman	Ministry of Health
LAHHAM	Adnan	Palestinian Authority	Al-Quds University
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GOZON	Alejandro	Philippines	Globe Telecom
ROZYCKI	Stefan	Poland	Polish Chamber of Commerce for Electronics and Telecommunications
GRIGORIEV	Oleg	Russia	Federal Medical Biological Agency of Russia
TORUBAROV	Felix	Russia	Federal Medical Biological Agency of Russia
KISLOVA	Olga	Russia	Moscow Government
ALEKSEEVA	Viktoria	Russia	Russian National Committee on Non-Ionizing Radiation Protection
AL AMRI	Tariq	Saudi Arabia	Communications and Information Technology Commission (CITC)
BLECIC	Marija	Serbia	Ministry of Energy, Development and Environmental Protection
GAJSEK	Peter	Slovenia	Institute of Non-Ionizing Radiation (INIS)
DU TOIT	Léon	South Africa	Department of Health
DE LA FLOR	Irina	Spain	Fundacion Vivo Sano

FEYCHTING	Maria	Sweden	Karolinska Intitutet
TONDEL	Martin	Sweden	National Board of Health and Welfare
STENBERG	Kerstin	Sweden	Swedish Association for the Electrohypersensitives
TINGUELY	Gilberte	Switzerland	Federal Office of Environment
NEIRA	Maria	Switzerland	World Health Organization
PERENZIN	Pablo	Switzerland	World Health Organization
VAN DEVENTER	Emilie	Switzerland	World Health Organization
EL HANI	Mohamed Wassim	Tunisia	ANCSEP
BEN JEMAA	Zouhair	Tunisia	Chair of Consumer Association« 20 millions de consommateurs"
HACIKAMILOGLU	Ezgi	Turkey	Ministry of Health
JAMIESON	Isaac	United Kingdom	Biosustainable Design
CONNEY	Stuart	United Kingdom	Department of Health
BARRETT	Arwel	United Kingdom	Health and Safety Executive
MANN	Simon	United Kingdom	Public Health England
O'CONNOR	Eileen	United Kingdom	UK Radiation Research Trust charity (RRT)
WYLIE	Sarah	United Kingdom	Vodafone



WHO Environmental Health Criteria Radiofrequency Fields

Development of a first draft

- Set search criteria and quality criteria, include several languages
- Published peer-reviewed literature since 1993 (> 1000 refs)

Expert consultation (Fall 2014)

- Over 700 comments

WHO feedback based on evolving internal processes

“although the types of questions that are being examined and the statements that will be issued are not typical ones related to interventions, they will have global impact and must be based on a systematic review of the evidence and transparent, explicit processes that minimize bias. Thus the basic principles for guideline development apply”.

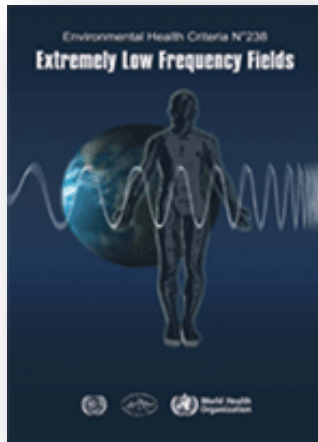
- Systematic reviews, risk of bias analysis, GRADE process

Over the past 2 years

- Enlisted help of a contracted methodologist
- Risk-of-bias analysis on a subset of cancer data (pilot with NIEHS using OHAT approach)



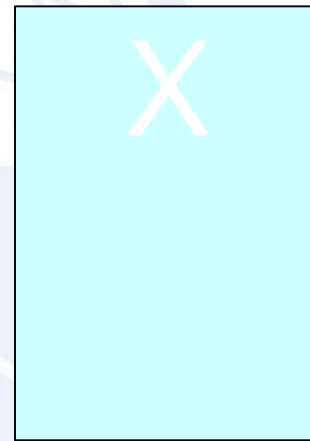
Non Ionizing Radiation landscape



Scientific basis
Effects, risks, sources, levels, trends. Many international reviews



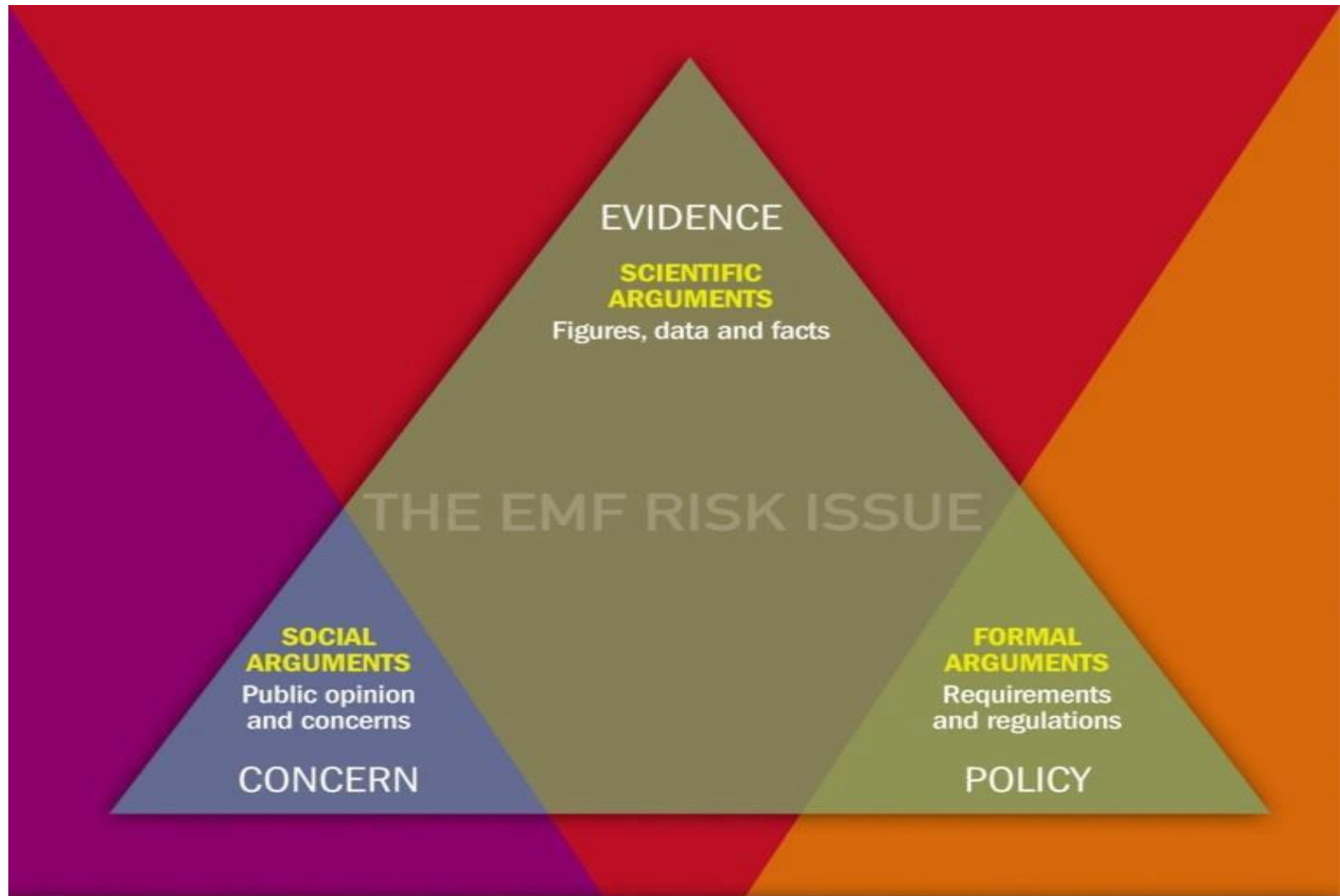
Recommendations
System of RP (philosophy, principles, limits). Other bodies CIE, ICES



Standards
(safety requirements, regulatory language,..)



National regulations





5G

<http://www.satpnews.com/2017/09/11/global-5g-technology-and-solutions-for-iot-market-forecasts-to-2022-and-analysis/>

Countries in WHO and Existence of Radiation Standards

Country	Year	Static	Static	Low-frequency	Low-frequency	Radiofrequency	Radiofrequency
		Public	Workers	Public	Workers	Public	Workers
Argentina	2017	No	Yes	Yes	Yes	Yes	Yes
Australia	2017	In preparation	In preparation	Yes	Yes	Yes	Yes
Austria	2017	Yes	Yes	Yes	Yes	Yes	Yes
Bahrain	2017	Yes	Yes	Yes	Yes	Yes	Yes
Bangladesh	2017	No	No	In preparation	In preparation	In preparation	In preparation
Belgium	2017	No	Yes	Subnational	Yes	Subnational	Yes
Brazil	2017	No	No	Yes	Yes	Yes	Yes
Bulgaria	2017	No	Yes	No	Yes	Yes	No
Canada	2017	No	No	Subnational	Subnational	Yes	Subnational
Chile	2017	No	No	No	No	Yes	Yes
Croatia	2018		Yes		Yes		Yes
Cuba	2017	No	No	No	No	Yes	No
Cyprus	2017	Yes	Yes	Yes	Yes	Yes	Yes
Denmark	2018		Yes		Yes		Yes
Finland	2017	Yes	Yes	Yes	Yes	Yes	Yes
France	2017	No	Yes	Yes	Yes	Yes	Yes
Germany	2017	Yes	Yes	Yes	Yes	Yes	Yes
Greece	2017	Yes	Yes	Yes	Yes	Yes	Yes
Hungary	2018		Yes		Yes		Yes
Iran (Islamic Republic of)	2017	Yes	Yes	Yes	Yes	Yes	Yes
Ireland	2018		Yes		Yes		Yes
Israel	2017	Yes	Yes	Yes	Yes	Yes	Yes



Italy	2017	No	Yes	Yes	Yes	Yes	Yes
Japan	2017	No	No	Yes	No	Yes	No
Malaysia	2017	No	No	No	No	Yes	Yes
Netherlands	2017	Yes	Yes	Yes	Yes	Yes	Yes
New Zealand	2017	Yes	Yes	Yes	Yes	Yes	Yes
Norway	2017	Yes	Yes	Yes	Yes	Yes	Yes
Peru	2017	No	No	Yes	No	Yes	Yes
Philippines	2017	No	No	Yes	Yes	Yes	Yes
Republic of Korea	2017	Yes	Yes	Yes	Yes	Yes	Yes
Russian Federation	2017	Yes	Yes	Yes	Yes	Yes	Yes
Saudi Arabia	2017	No	No	In preparation	In preparation	Yes	Yes
Singapore	2018		Yes		Yes		Yes
Slovenia	2018		Yes		Yes		Yes
South Africa	2017	No	No	No	No	Yes	Yes
Sweden	2017	Yes	Yes	Yes	Yes	Yes	Yes
Switzerland	2017	Yes	Yes	Yes	Yes	Yes	Yes
Thailand	2017	In preparation	No	No	No	No	No
Tunisia	2017	No	No	No	No	Yes	No
Turkey	2017	In preparation	In preparation	Yes	In preparation	Yes	In preparation
United Kingdom of Great Britain and Northern Ireland	2017	Yes	Yes	Yes	Yes	Yes	Yes
United States of America	2017	Subnational	Yes	Subnational	Yes	Yes	Yes
Zambia	2017	No	No	No	No	Yes	Yes



EMF STANDARDS DATA FOR PUBLIC EXPOSURE

Radio Frequency		Electric field (V/ m)	Electric field (V/ m)	Power density (W/ m ²)	Power density (W/ m ²)	Specific absorption rate (SAR) (W/ kg)	Specific absorption rate (SAR) (W/ kg)	Specific absorption rate (SAR) (W/ kg)
Country	Year	900 MHz	1800 MHz	900 MHz	1800 MHz	Whole body	Head and trunk	Limbs
Argentina	2017	41.25	58.36	4.5	9	0.08	2	4
Australia	2017	41.1	58.1	4.5	9	0.08	2	4
Austria	2017	41.25	58.34	4.5	9	0.08	2	4
Bahrain	2017	41	58	4.5	9	0.08	2	4
Belgium	2017							
Brazil	2017	41.25	58.34	4.5	9	0.08	2	4
Bulgaria	2017	6.14	6.14	0.1	0.1			
Canada	2017	32.1	40.07	2.74	4.4	0.08	1.6	4
Chile	2017			0.1/ 1.0	0.1/ 1.0	1.6/ 2	1.6/ 2	1.6/ 2
Cuba	2017						0.8/ 1.6	
Cyprus	2017	41	58	4.5	9	[0.08]	[2]	[4]
Finland	2017	41.4	58.55	4.5	9	0.08	2	4
France	2017	41	58	4.5	9	0.08	2	4
Germany	2017	41.25	58	4.5	9	0.08	2	4
Greece	2017	31.9/ 34.5	45.1/ 48.8	2.7/ 3.15	5.4/ 6.3	0.048/ 0.056/ 0.08	1.2/ 1.4/ 2.0	2.4/ 2.8/ 4.0
Iran (Islamic Republic of)	2017	41.25	58.34	4.5	9			
Israel	2017	[13.0]	[18.0]	[0.45]	[0.9]	[0.08]	[2]	[4]



Israel	2017	[13.0]	[18.0]	[0.45]	[0.9]	[0.08]	[2]	[4]
Italy	2017	20-Jun	20-Jun	0.1/ 1.0	0.1/ 1.0	0.08	2	4
Japan	2017	47.55	61.4	6	10	0.08	2	4
Malaysia	2017	41.25	58.34	4.5	9		2	
Netherlands	2017	41.25	58.34	4.5	9	0.08	2	4
New Zealand	2017	41.25	58.34	4.5	9	0.08	2	4
Norway	2017	41.25	58.34	4.5	9	0.08	2	4
Peru	2017	41.25	58.34	4.5	9	0.08	2	4
Philippines	2017	41.25	58.34	4.5	9	0.08	2	4
Republic of Korea	2017	41.25	58.34	4.5	9	0.08	2	4
Russian Federation	2017			1	1			
Saudi Arabia	2017	41.25	58.34	4.5	9	0.08	2	4
South Africa	2017	[41.0]	[58.0]	[4.5]	[9.0]	[0.08]	[2]	[4]
Sweden	2017	[41.25]	[58.33]	[4.5]	[9]	[0.08]	[2]	[4]
Switzerland	2017	4/ 41.25	6/ 58.34					
Tunisia	2017	41	58	4.5	9	0.08	2	4
Turkey	2017	3/ 10.23/ 41.0	3/ 14.5/ 58	0.27	0.55		2	
United Kingdom of Great Britain and Northern Ireland	2017	[41.25]	[58.34]	[4.5]	[9.0]	[0.08]	[2]	[4]
United States of America	2017	47.6	61.4	6	10	0.08	1.6	4
Zambia	2017	41	58	4.5	9	0.08	2	4



EMF STANDARDS DATA FOR WORKERS EXPOSURE

Radio Frequency		Electric field (V/ m)	Electric field (V/ m)	Power density (W/ m ²)	Power density (W/ m ²)	Specific absorption rate (SAR) (W/ kg)	Specific absorption rate (SAR) (W/ kg)	Specific absorption rate (SAR) (W/ kg)
Country	Year	900 MHz	1800 MHz	900 MHz	1800 MHz	Whole body	Head and trunk	Limbs
Argentina	2017	106.35	150.4	30	60	0.4		
Australia	2017	92.1	130	22.5	45	0.4	10	20
Austria	2017	90	127.3			0.4	10	20
Bahrain	2017	90	127.3	22.5	45	0.4	10	20
Belgium	2017	90	127.3			0.4	10	20
Brazil	2017	90	127.3	22.5	45	0.4	10	20
Bulgaria	2017	90	127.3			0.4	10	20
Canada	2017	85.44	101.61	19.36	27.39	0.4	8	
Chile	2017			100	100			
Cyprus	2017	90	127.3			0.4	10	20
Finland	2017	90	127.3			0.4	10	20
France	2017	90	127.3			0.4	10	20
Germany	2017	90	127.3			0.4	10	20
Greece	2017	90	127.3			0.4	10	20
Iran (Islamic Republic of)	2017	90	127.3	22.5	45			



Israel	2017	92	130	22.5	45	0.4	10	20
Italy	2017	90	127.3			0.4	10	20
Malaysia	2017	90	127.3	22.5	45	0.4	10	20
Netherlands	2017	90	127.3			0.4	10	20
New Zealand	2017	[90]	[127.3]	[22.5]	[45]	[0.4]	[10]	[20]
Norway	2017	90	127.3			0.4	10	20
Peru	2017	90	127.3	22.5	45	0.4	10	20
Philippines	2017	90	127.3	22.5	45	0.4	10	20
Republic of Korea	2017	[90]	[127.2]	[22.5]	[45]	[0.4]	[10]	[20]
Saudi Arabia	2017	92.1	130.3	22.5	45	0.4	10	20
South Africa	2017	[90]	[127.3]	[22.5]	[45]	[0.4]	[10]	[20]
Sweden	2017	90	127.3			0.4	10	20
Switzerland	2017	90	127.3	22.5	45	0.4	10	20
United Kingdom of Great Britain and Northern Ireland	2017	90	127.3			0.4	10	20
United States of America	2017	106	137	30	50	0.4	8	20
Zambia	2017	[92.1]	[130.5]	[22.5]	[45]	[0.4]	[10]	[20]



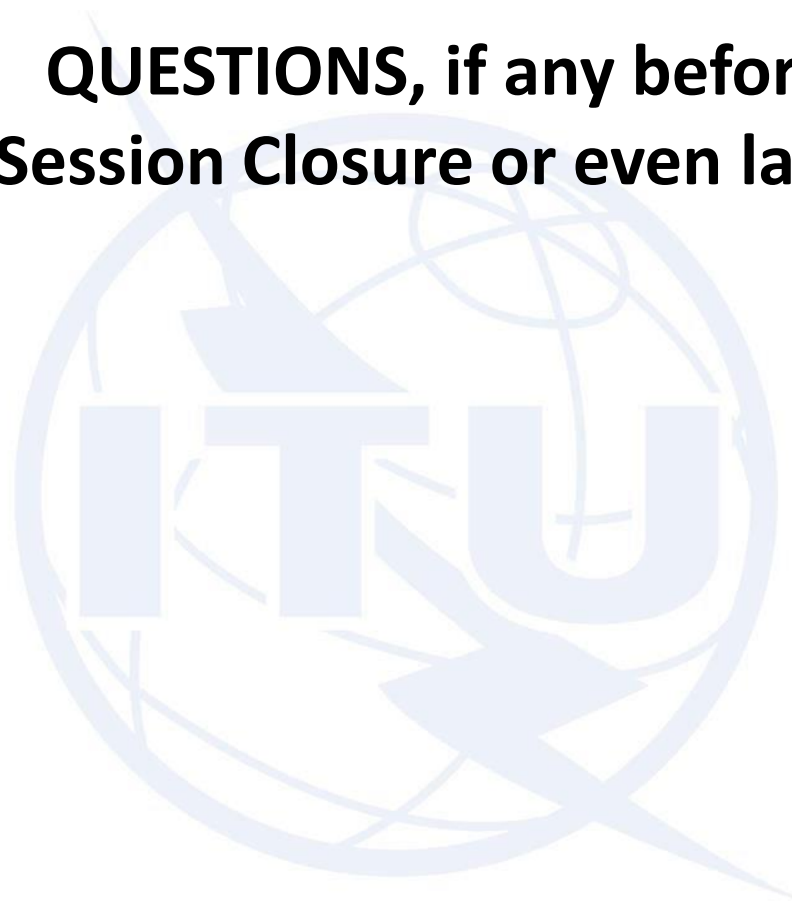
Should not all 22 Arab Countries

- ❖ **POLICY MAKERS,**
- ❖ **REGULATORS and**
- ❖ **SERVICE PROVIDERS**

be part of WHO's EMF PROJECT?



**QUESTIONS, if any before
Session Closure or even later**



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