

- Victor Leach (App Physics RMIT, MSC Melb. Uni.)
- 48 years Radiation Protection Experience (1972-2020)

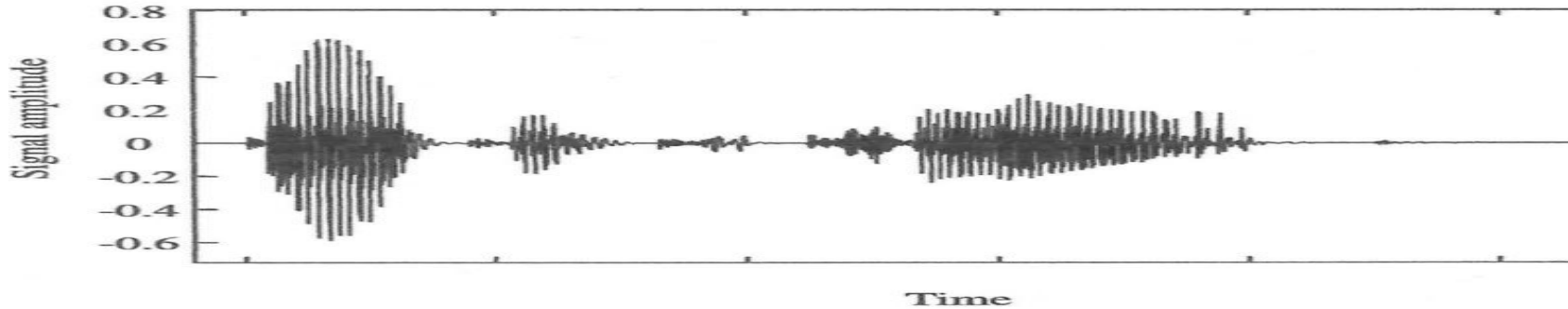
Mr. Victor (Vic) Leach App. Physics (RMIT), MSc (Melbourne. Uni) has worked as a radiation health physicist and atmospheric scientist for the past 40 years in both the private sector (uranium & coal mining) and public sector with a number of Commonwealth (Australian Radiation Laboratory now ARPANSA) and State Government Health Departments (QLD & NT). He has been a founding member of Australasian Radiation Protection Society (ARPS) since its inauguration in 1975, where he has been a past treasurer and is currently on the organising committee for conferences in Melbourne, Sydney, Brisbane, Cairns and Darwin. Vic has been involved in many occupational and environmental aspects of mining and non-mining projects at both the planning and operational stage. He has published in refereed scientific and engineering journals on subjects of dust and radioactivity exposure and the inhalation effects on health of workers and members of the public. He was University Radiation Advisor (RPA) at both the Queensland University of Technology (QUT) and the University of Queensland (UQ). In the last two years before retirement, Vic assisted in obtaining all the radiation health approvals for the 18 Mev cyclotron. Since last taking up the Role as RPA at QUT in 2006, Vic has been developing an increased interest in the standards setting for non-ionising radiation compared ionising radiation

EVALUATING THE STRENGTH OF EVIDENCE

- **Many disciplines** are involved
- **ORSAA database** - analytical tool to evaluate the strength of evidence
 - https://n432.fmphost.com/fmi/webd#Research_Review_V4
- **Over 3,815 papers** objectively assessed and categorised
 - 2801 peer-reviewed experimental papers, 1014 in other categories reviews/measurement papers etc.

[ORSAA.org](https://www.orsaa.org/) (<https://www.orsaa.org/>)

SIMULATED vs REAL MOBILE PHONES SIGNAL



Research Categories	Real Mobile Phone used in Experiments			Simulated Mobile Phone Signals used in Experiments		
Wave form	Pulsed			Pulsed		
Outcome	#Effect	#No Effect	#Uncertain Effect	#Effect	#No Effect	#Uncertain Effect
<i>in vivo</i>	120	18	11	69	49	8
<i>in vitro</i>	28	8	1	60	63	7

WHAT WE HAVE FOUND



Oceania Radiofrequency
Scientific Advisory Association

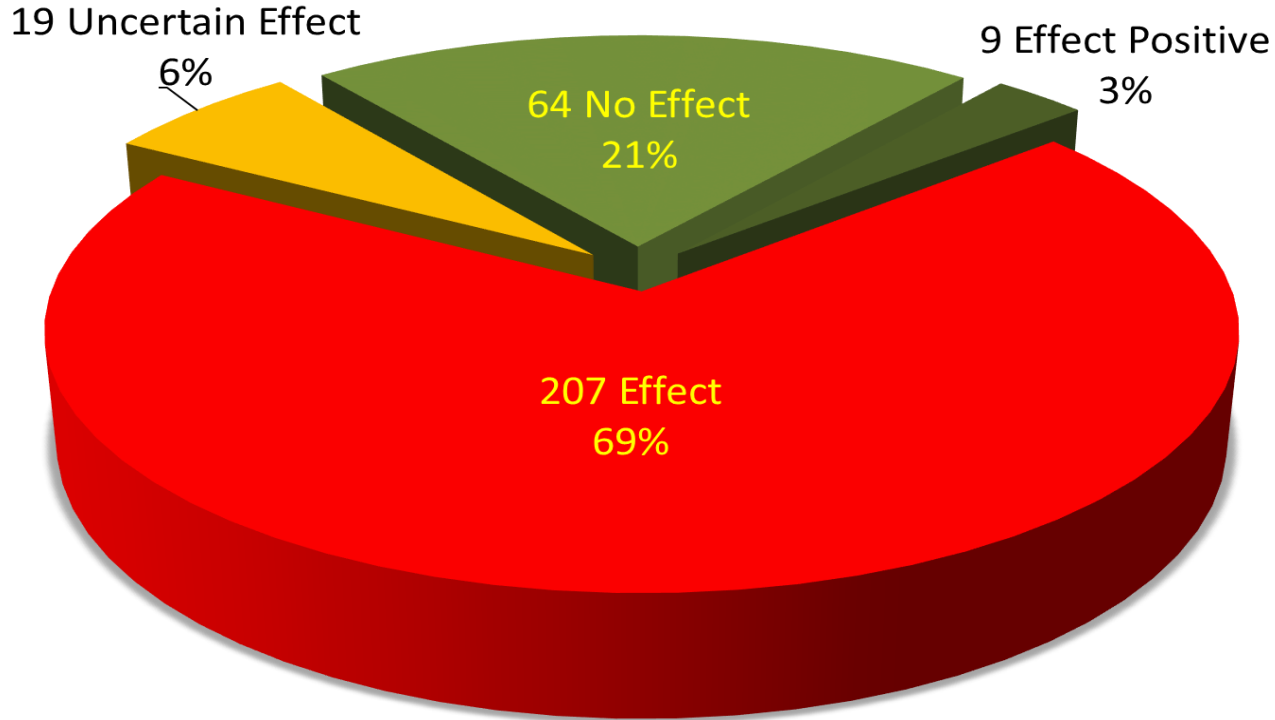
Find Search Summary Totals					
Peer Reviewed Studies Showing Biological Effects		Number of records used : 2003 of 3602			
Auditory Dysfunction / Hearing loss / Tinnitus	34	Apoptosis (Programmed Cell Death)	101	Brain Tumours	52
Blood Brain Barrier Permeability Changes	15	Breast Cancer	6	Cellular Stress	63
Brain Development / Neuro Degeneration	55	Biochemical Changes	220	EEG changes / Brain Waves	112
Neuro Behavioural Effect / Cognitive Effects	194	Cell Irregularities/ Damage/ Morphological Changes	201	Effects on Mitochondria	42
Calcium Influx / Efflux	24	Fatigue	38	Altered Enzyme Activity / Protein Levels / Protein Damage	381
Circadian Rhythm Disruption	15	Altered Gene Expression	160	Headaches/Migraines	66
DNA Damage / Mutagenic / Genotoxic	157	Altered Glucose Level / Glucose Metabolism	19	Inflammation	25
Endocrine / Hormone Effects	72	Cardiovascular/Vascular Effects	63	Hepatic Effects (Liver)	25
Miscarriage / Spontaneous Abortion / Foetus Resorption	5	Immune System Effects	65	Impaired / Reduced Healing/ Bone Density Changes	7
Memory Impairment	61	Oxidative Stress / ROS/ Free Radicals	256	Speech Impairment	3
Sperm /Testicular Effects	94	Sleep Effects	62	Haematological Effects	54
Tumour Promotion	47	Neurotransmitter Effects	35	Synergistic/Combinative Effects	60
Thyroid Effects	15	Visual Disturbances/ Ocular Effects	40	Autism	8
Leukemia	9	Parotid Gland Malignancy	4	Neoplasia/ Hyperplasia (Abnormal Tissue Growth)	7
Depression	23	Induced Adaptive Response	51	Dizziness / Vertigo / Vestibular Effects	23

HEALTH AND BIOLOGICAL EFFECTS OF EMF/EMR

- Structural and functional changes of the brain
- Increased oxidative stress
- Neurodegeneration (brain cell loss)
- Altered neurotransmitter levels
- Blood brain barrier (BBB) breaches
- Cognitive function impairment
- Developmental impacts
- Mitochondrial dysfunction
- Increases in blood glucose levels
- DNA damage
- Damage to Sperm
- Tumour initiation and promotion
- Cardiovascular disease
- Hormonal changes
- Immune system dysfunction
- Hearing impairment/loss
- Other wellbeing effects (headaches, fatigue etc.)

All effects of RF “non-ionising” radiation

NON-THERMAL EFFECTS EXPOSURES: *IN VIVO* ANIMAL STUDIES ≤ SAR 2 W/KG – SAR- SPECIFIC ABSORPTION RATE (W/KG)

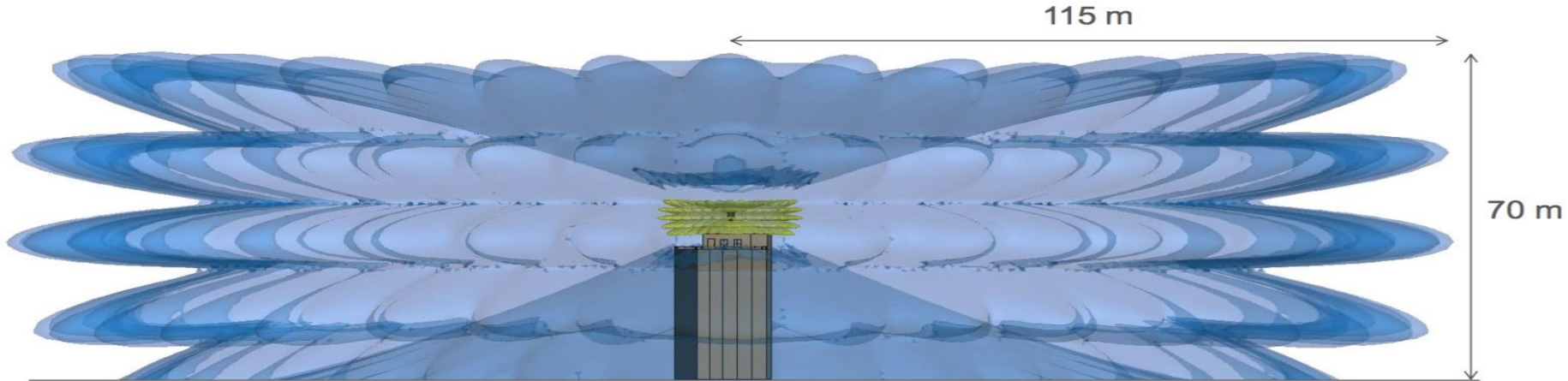


Source : ORSAA database

COUNTRIES AND CITIES WITH A LOWER STANDARD WILL BE IMPACTED

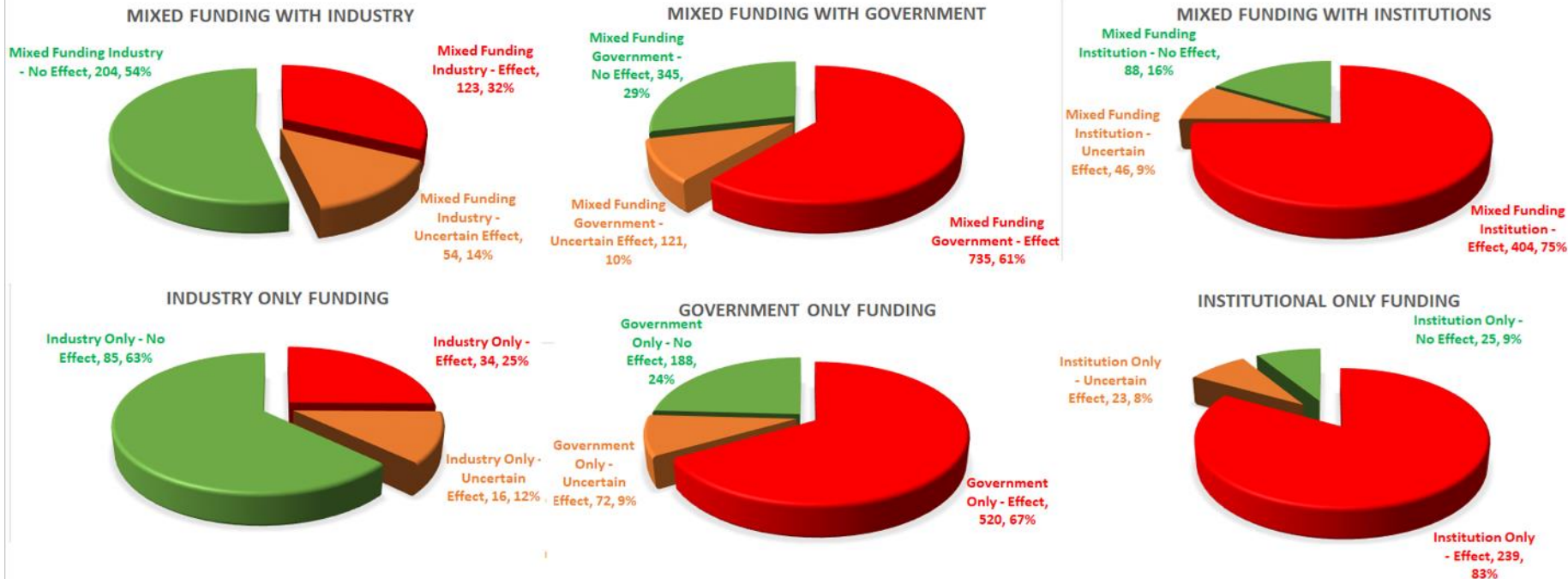
China, India, Poland, Russia, Italy and Switzerland, regions of Belgium or cities such as Paris and Rome.

Impact of lower national EMF limits 1/100 of ICNIRP limit



Size of exclusion zone
makes 5G network roll-out
a major problem or impossible

Funding Source and Outcomes



Source: ORSAA Database as of Nov 2019