

Part 1, Supplement 1
Environmental EMF measurements from around the world

Locations of measurements	Type of RFR	Level ($\mu\text{W}/\text{cm}^2$)	Reference
Australia	870-1200 MHz	0.8	Henderson and Bangay (2006)
Australia and Belgium	In various public places	Australia : 0.15-4.97 (0.75-4.33 V/m) ; Belgium : 0.2-1.008 (0.90-1.95 V/m)	Bhatt et al. (2016)
Australia (Melbourne kindergartens)	88 MHz – 5.8 GHz	0.0017 (total all bands) (0.179 V/m)	Bhatt et al. (2017)
Belgium	FM, GSM900, GSM1800 and UMTS	0.07	Joseph et al. (2008)
Belgium, Switzerland, Slovenia, Hungary, the Netherlands	Several fréquency bands	outdoor urban fields: 0.021-0.057	Joseph et al. (2010)
Brazil	Cell tower	0.04 - 40.78 (0.4-12.4 V/m)	Dode et al. (2011)
Denmark, the Netherlands, Slovenia, Switzerland, and Spain (children)	16 frequency bands including DECT, radio and TV, mobile phone, mobile phone base stations, and WiFi,	Median total field 0.00755 Outdoor : 0.0157-0.0171 Home/in school: 0.0033-0.00351	Birks et al. (2018)
France	12 bands: FM to mobile phone	0.6	Viel et al. (2009)
Germany (Cities of Bamberg and Hallstadt)	Mobile phone base station	0.001-1.69	Waldmann-Salsam et al. (2016)
Ghana	900-1800 MHz	0.001	Amoako et al. (2009)

Ghana	GSM 900, 1800 and UMTS 2100 (61.1-25.7 m from a basestation)	0.00717-0.0895	Deatanyah et al (2018)
Greece	62 primary and secondary schools in Athens (2- MHz – 3 GHz)	Average 0.049 (0.4292 v/m)	Aris et al. (2020)
Hungary	9 bands between 80-2200 MHz	0.025	Thuroczy et al. (2006)
India	10 MHz-8 GHz	1.148	Dhami (2012)
Korea	CDMA800 and CDMA1800	0.6	Kim et al. (2010)
Southern Spain	100 KHz – 6 GHz	0.0286	Calvente et al.(2015)
Sweden	30 MHz- 3 GHz	rural area 0.0016; urban area 0.027; city area 0.24	Estenberg and Augustsson (2014)
Sweden (Stockholm Central Railway Station)	88-5850 MHz	0.092 (median) 0.2817 -0.4891(mean total)	Hardell et al. (2016)
Sweden (Stockholm Old Town)	87-5850 MHz	0.0404 – 2.43	Hardell et al. (2017)
Switzerland	12 different bands from FM (88 MHz-108 MHz) to W-LAN (2.4-2.5 GHz)	0.013 (0.0014- 0.0881)	Frei et al. (2009)
Switzerland (Basel) and the Netherlands (Amsterdam)	Base stations	downtown: 0.024-0.0745 residential areas: 0.0021- 0.0445	Urbinello et al. (2014)
Switzerland, Ethiopia, Nepal, South Africa, Australia, USA	Public RFR emitting devices	Outdoor: 0.014-0.91 Public transport vehicles: 0.027-0.49	Sagar et al. (2018)
Turkey	GSM9 00 MHz	3	Firlarer et al. (2003)

USA (cities of Spokane, WA and Raleigh, NC)	VHF-FM-UHF-mobile phone	0.11- 0.00028	Tell and Kavet (2014)
West Bank-Palestine major cities, outdoor levels	FM and TV broadcasting stations and mobile phone base stations	Average 0.37 Maximum 3.86	Lahham and Hammash (2012)
West Bank-Palestine, City of Hebron, indoor levels	FM and TV broadcasting stations, mobile phone base stations, cordless phone (DECT) and WLAN	Average 0.08 Maximum 2.3	Lahham et al. (2015)
West Bank-Palestine	WLENS (Wi-Fi), 1 meter from access points, 75 MHz – 3 GHz	0.12 (0.001-1.9)	Lahham et al. (2017)

The above table shows a large variation in levels, ranging from 0.002 to 41 $\mu\text{W}/\text{cm}^2$ (median = 0.18 $\mu\text{W}/\text{cm}^2$). The variation could most likely be due to the extent of deployment of wireless systems in different areas. Since each study measured only a section of the RF-spectrum, the total levels summing emissions in all parts of the spectrum are expected to be higher. These levels also are bound to increase with time given the constant deployment of new wireless communication devices and infrastructure. Some of the above are old measurements that probably are now higher as the wireless communication systems proliferated. For other relevant studies, readers should also read the review by Sagar et al. (2017)

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