

Learnings from Five Years of 5G EMF

After five years of rapid rollout of commercial 5G, measurements in 35 countries demonstrate that typical electromagnetic field (EMF) levels across all frequency bands are similar to those of other wireless technologies. Importantly, they remain a small fraction of international limits. By adopting the latest international limits and testing methods countries can ensure protection for all persons from all potential health hazards while at the same time maximising the benefits of 5G connectivity.

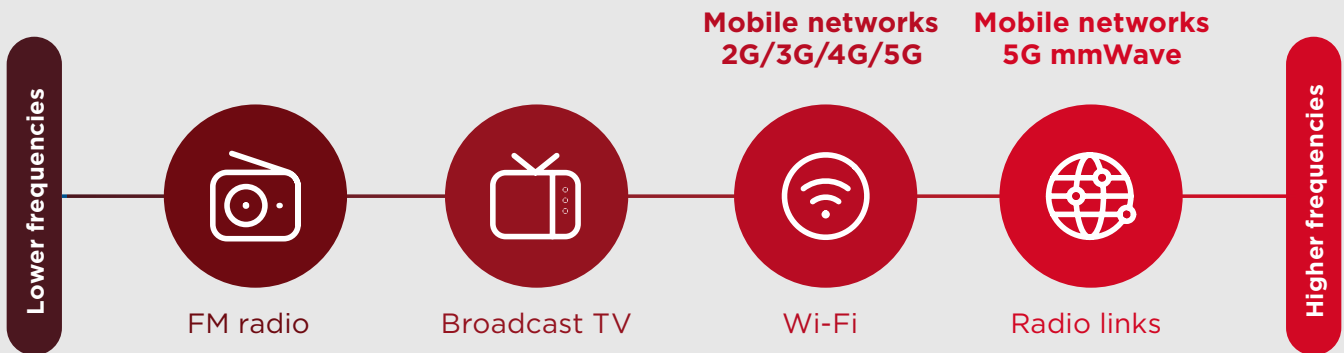
5G rollout

- Rapid user adoption with capabilities still unfolding
- Use of existing and new radio frequency bands
- Forecast to be **56%** of connections by **2030**

5G is designed to support new applications through higher data speeds, faster response times and higher reliability, and a larger number of connected devices, thus expanding the Internet of Things (IoT).

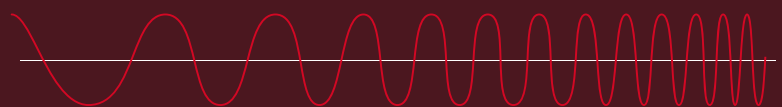
2009 4G launch | **2014 7%** of connections

2019 5G launch | **2024 23%** of connections



International EMF guidelines

- ICNIRP guidelines updated in 2020 incorporated **20+ years** of more research and feedback from **120 organisations**
- **Protect all persons** against all potential adverse health effects
- Adoption momentum building



2G/3G/4G/5G EMF limits similar for mobile networks and devices

Below
6 GHz

Updates for

6 GHz+

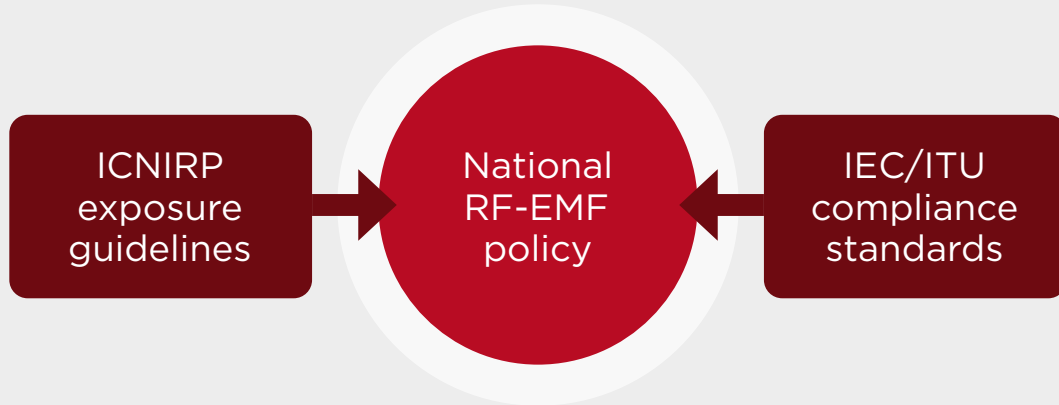
Improved scientific accuracy

Evolution of EMF assessments

Active antennas use
RF-EMF more
efficiently

IEC and ITU standards
provide **accurate**
assessment methods

Implementation
underway
globally



Low EMF levels:



Data for **>20** years shows that everyday mobile network levels remain low



Technology evolution has **not significantly** changed levels



Results from **61** surveys across **35** countries show that 5G levels are similar to other wireless technologies

Experts identify no health risks

- *'The ICNIRP 2020 RF EMF guidelines protect against all potential adverse health effects relating to exposure to RF EMF, including from 5G technologies.'* - ICNIRP¹
- ICNIRP conclusions supported by **national experts** from countries around the world
- Over **4,300** studies specific to mobile communications

5G maximum EMF levels
typically less than 1%
of international public limit

“Provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated.”

The World Health Organization²

All data and further analysis found at: www.gsma.com/emf

October 2024

1. <https://www.icnirp.org/en/applications/5g/index.html>

2. <https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health>