

5G mmWave Safety

A closer look at electromagnetic field (EMF) health related science and research



Millimetre wave (mmWave) spectrum will maximise 5G's potential. The range provides fibre-like connectivity to suburban and rural areas as well as hot-spot capacity in dense areas, like manufacturing plants, stadia and travel hubs. National and international safety guidelines already include mmWaves protecting people against all established health hazards.

Recommendations for policymakers

The following recommendations will support efficient deployment of 5G mmWave based services.

Adopt international RF-EMF limits and compliance methods:

Countries should adopt the ICNIRP (2020) limits and use international technical standards for RF-EMF compliance assessment.

Update RF-EMF deployment rules:

Streamline deployment rules to support greater densification of antennas, especially in urban centres.

Practice effective EMF communication:

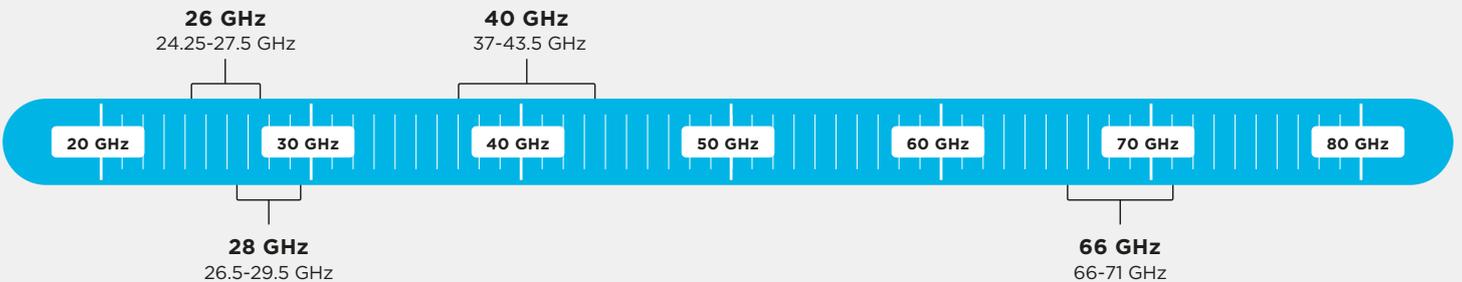
National authorities should take the lead role in efforts to inform the public and address misinformation about RF-EMF.

Prepare for interest during mmWave licensing:

There may be submissions questioning safety and it is important to prepare responses based on the consensus of health agencies.

5G mmWave frequencies

Note: 5G Frequency Range 2: 24.5 to 71 GHz

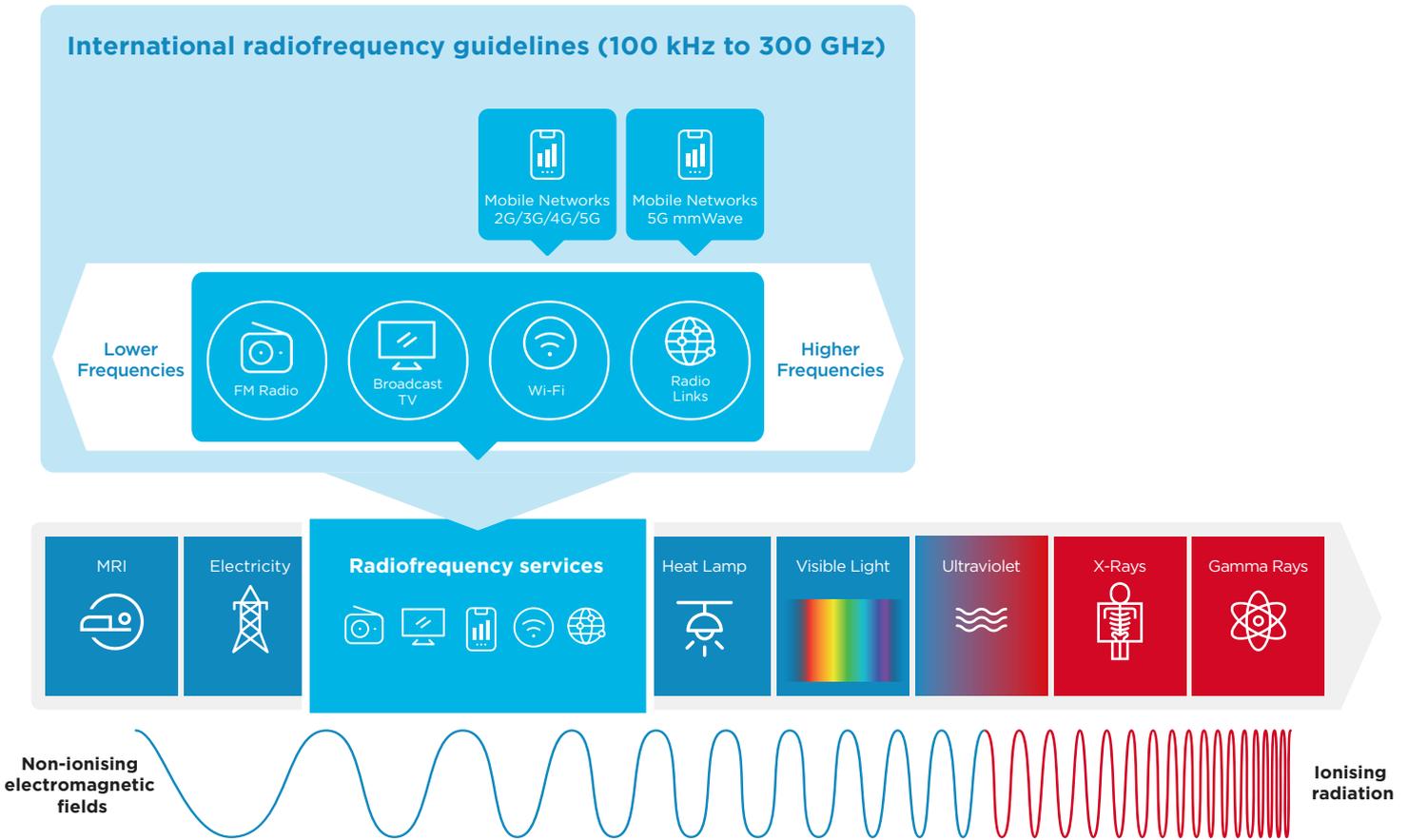


Use cases for mmWave spectrum

Train/subway station commute	School or university	Work in office, enterprise, factory	Shopping mall and high street	Fixed Wireless Access
Enjoying streaming Downloading video	Hybrid classes: physical + virtual Immersive XR learning	Cloud-based and virtual desktop applications Wire-free production equipment	AR-assisted navigation and shopping Digital signage	FWA using mmWave can provide fibre-like speeds without the environmental impacts of installing fibre.

Figure 1

Radio signals within the electromagnetic spectrum



What are the experts saying?



The ICNIRP RF EMF guidelines have taken the above considerations into account and protect against all potential adverse health effects relating to exposure to RF EMFs from 5G technologies. This includes potential differences in the effect of RF EMFs as a function of age, health status, and depth of penetration, the effect of both acute and chronic exposures, and it includes all substantiated effects regardless of mechanism.

International Commission on Non-Ionizing Radiation Protection (ICNIRP)



As the frequency increases, there is less penetration into the body tissues and absorption of the energy becomes more confined to the surface of the body (skin and eye). Provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated.

World Health Organization (WHO)



COMAR concludes that while we acknowledge gaps in the scientific literature, particularly for exposures at millimeter wave frequencies, the likelihood of yet unknown health hazards at exposure levels within current exposure limits is considered to be very low, if they exist at all.

IEEE Committee on Man and Radiation (COMAR)