Mobile Towers and their high Radio Frequency are a hidden risk factor for Cancer

Dr. Rahi Shoaib, MD The Author is a Freelance Journo covers articles on Health & Science. Working on “The Pain & Palliative Care" Medical Officer in Government of J&K-UT, Department of Health & Medical Education email:  [drrahism@gmail.com](mailto:drrahism@gmail.com)   Twitter: @MOJKHME

**ABSTRACT**

Mobile Towers are the primary source of mobile operations which came into existence long ago for 30 years in India but the gross saturation came into existence in 2014 which has given a huge transformation in mobile Technology from the 3rd generation to the 5th generation. The growth is so large and is proportional to increasing radio frequency day by day. The myth is whether the frequency in mobile towers is being checked by authorities or not. There is a protocol of a frequency set up for a mobile tower which shouldn’t be exceeded in figures to threaten a living organism. This radio frequency is not simple but it has been seen for years many theories came into existence but there is a lot of confusion in them. A frequency which exceeds limits vanishes every living thing on horizontal scale even birds and other flying species and gives birth to mutations with the highest risk. Close concerns and facts posed are especially regarding carcinogenesis and other health-related effects of mobile radiation exposure over the last eight years, the Indian Telecom Tower industry has grown significantly by 65%. Many theses and studies like cohort studies and cross-control studies have considerably failed to establish causal associations primarily owing to potential biases and errors in their conduct and analysis. The WHO/International Agency for Research on Cancer (IARC) has classified radiofrequency electromagnetic fields as possibly carcinogenic to humans (Group 2B), based on an increased risk for glioma, a malignant type of brain cancer, and associated with wireless phone use. There are several evident reports of Cancer incidents across Indian states including Jammu Kashmir where some people have given land for installing and operating Mobile Towers near their residential houses accusing unchecked high radio frequencies as a reason and sued mobile companies for health relating issues. Many cases have been given a nod by the court of Law to stop operating Towers of these Claimants who are claiming association of Cancer incidents & tragedies in affected families. These mobile Towers of claimant are non-functional since then. Moreover in Lolab of Jammu and Kashmir a field survey was done during the survey period, a total of 17 species of birds were recorded at the selected sites. The number of birds recorded within a 200 m radius of mobile tower radiation was comparatively less than that found outside a 200 m radius which reveals that these birds are affected more within this range as the number and effect of electromagnetic radiations emitted by mobile towers is inversely proportional to the distance from the tower as per ICNIRP (International Commission on Non-Ionizing Radiation Protection)

**INTRODUCTION**

Technologically mediated communication remains grounded in human bodies residing in local places. Humans can be understood as the first degree of media who’s communicative and per formative reach has been extended in time and space by historically shifting technologies. Mobile media may speed up both communication and action. They facilitate more action at a distance, but also more reflection before the act. The balance between reflection and action is a matter of both empirical research and sustained theory development regarding the kinds of social relations that mobile communication may maintain in the future. Approximately 4.9 billion people – or 63 per cent of the world’s population – are using the Internet in 2021. This represents an increase of 17 per cent since 2019, with 782 million people estimated to have come online during that period. However, this leaves 2.9 billion people still offline. Since 1994, the Internet has developed from a collaboration network for academics to an indispensable tool for work, communication, education, entertainment and more. For most people, it is hard to imagine life without the Internet. The COVID-19 pandemic has highlighted how important it is to have access to fast and affordable Internet. Indeed, in the first year of the pandemic, growth in the percentage of Internet users was the highest in a decade. In 2021, an estimated 2.9 billion people were still offline. The bulk of the global offline population, 1.7 billion people, lives in Asia-Pacific and was concentrated in China and India, followed by Africa with 738 million people offline. The combined offline population in the other four regions was 470 million people. In percentage terms, Africa was the least connected region in 2020, with 67 per cent of the population offline, followed by Asia-Pacific (39 per cent) and the Arab States (34 per cent) **[1].** Several countries have specified their radiation levels keeping in view the environmental and physiological factors. In India, the prescribed reference level at 1800 MHz is 0.92 Watt/ m2 and at 900 MHz is 0.45 Watt/m2 as shown in the Table below (Revised EMF radiation norms for mobile towers (BTS) in India.)

|  |  |  |
| --- | --- | --- |
| Frequency | ICNIRP Radiation norms | Revised DoT Norms effective from 01.09.2012 |
| 900 MHz | 4.5 Watt/ sq.m | 0.45 Watt/sq.m |
| 1800 MHz | 9 Watt/ sq.m | 0.9 Watt/sq.m |
| 2100 MHz | 10.5 Watt/ sq.m | 1.05 Watt/sq.m |

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| --- | --- | --- | --- | --- | --- |
| **Features** | **1G** | **2G** | **3G** | **4G** | **5G** |
| **Start/Development** | 1970/1984 | 1980/1999 | 1990/2002 | 2000/2010/2014 | 2014/2019/2022 |
| **Technology** | AMPS,NMT,TACS | GSM | WCDMA | LTE, Wi Max | MIMO, mm Waves |
| **Frequency** | 30KHz | 1.8 Ghz | 1.6-2 GHz | 2-8 GHz | 3-30 Ghz |
| **Bandwidth** | 2 kbps | 14.4-64 kbps | 2 Mbps | 2000 Mbps to 1Gbps | 1Gbps and higher |
| **Access System** | FDMA | TDMA/CDMA | CDMA | CDMA | OFDM/BDMA |
| **Core Network** | PSTN | PSTN | Packet Network | Internet | Internet |

There have been several studies suggesting either the presence or absence of risk to human beings from EMF radiation. Some experts describe the short-term health disorders caused by this kind of radiation as “microwave sickness” or “radiofrequency syndrome” which includes headache, fatigue, irritability, sleeping disorders etc. The main areas of concern are the radiation emitted by the base transceiver stations (BTS) and mobile handsets. Concerns have also been raised that continuous exposure to EMF radiation emanating from telecom towers causes harmful thermal and non-thermal health effects. The effects of exposure to EMF have created an active scientific debate among research agencies across the globe. With effect from 1st Sept. 2012, the SAR values for mobile phones have been revised to 1.6 W/kg averaged over 1 gram of human tissue **[2].** The number of mobile towers increased from 400,000 in 2014 to 660,000 in 2021. Similarly, the number of Mobile Base Transceiver Stations has grown rapidly by 187% and increased from 800,000 in 2014 to 2.3 mn in 2021. It is also estimated that 5G technology will contribute approximately $450 bn to the Indian Economy in the period 2023-2040 **[3].** While you are connected to the internet, the speed of your internet depends upon the signal strength that has been shown in alphabets like 2G, 3G and 4G etc. right next to the signal bar on your home screen. The "G" stands for "GENERATION". Each Generation is defined as a set of telephone network standards, which detail the technological implementation of a particular mobile phone system. The speed increases and the technology used to achieve that speed also changes. An introductory chart of Mobile frequency can be clearly seen as follows **[4].**

For instance, International Agency for Research on Cancer (IARC) has classified RF fields as “possibly carcinogenic to humans,” based on limited evidence that highlights a possible increase in the risk of[brain tumours](https://www.maxhealthcare.in/our-specialities/neurology/conditions-treatments/brain-tumor-surgery)among cell phone users. The values were also compared with the international exposure limits set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The highest measured power density was 11.48 mW/m (2) which is 1,148% of the biological limit. The results indicated that the exposure levels in the city were below the ICNIRP limit, but much above the biological limit. Mobile phones communicate by transmitting radio frequency waves through a network of fixed antennas known as base stations. Such radiations are produced by mobile phones and other household devices such as Wi-Fi, television (TV), radio transmitters etc. Radiofrequency waves are electromagnetic fields, and unlike ionizing radiation such as X-rays or gamma rays, can neither break chemical bonds nor are powerful enough to damage our deoxyribonucleic acid (DNA). However, they are likely to be absorbed by tissues closest to the device exposure site and produce a mild local thermal effect. Among studies conducted to assess exposures to mobile phone radiation, a study near schools and hospitals in Chandigarh, Punjab found the highest density of 11.48 mW / mm, which is 1,148% of the biological limit. The study concluded that exposure levels in the city were much above the biological safety limit above which the biological system of humans and animals starts getting affected **[5].** Cell phone towers and their radiation exposure are often associated with the increased risk of [cancer](https://www.maxhealthcare.in/our-specialities/cancer-care-oncology) and other health issues. Though there is diminutive evidence to prove this theory; there are reports that suggest that cell phone towers may have a relation to cancer **[6].** A field survey was conducted in different sites of Mobile towers located in Lolab Valley, Kupwara, Jammu and Kashmir to examine and analyse the effect of mobile tower radiation on birds. During the survey period, a total of 17 species of birds were recorded at the selected sites. The number of birds recorded within a 200 m radius of mobile tower radiation was comparatively less than that found outside a 200 m radius which reveals that these birds are affected more within this range as the number and effect of electromagnetic radiations emitted by mobile towers is inversely proportional to the distance from the tower as per ICNIRP (International Commission on Non-Ionizing Radiation Protection). It can be stated that the invisible electromagnetic radiations emitted from cell phone towers affect the physiological and behavioural activities of birds. Hence future research is essential to explore more possible connections between electromagnetic radiations and their hazardous effects on avian fauna **[7].** Studies in other parts of Jammu Kashmir conducted over the last few years have found a wide variety of bio-effects, including permanent DNA damage. The radiation can affect DNA, metabolism, and hormones and trigger headaches, memory loss, birth defects and heart complications **[8].** Many published newspapers by noted researchers have quoted “There is the number of studies showing RF radio frequency microwave radiation to be harmful to human health. Thousands of studies conducted over the last 8 years have found a wide variety of bio-effects, including permanent DNA damage”. He further added that “EMF Exposure Health Effects like Enzymes, DNA Metabolism, Genes, Hormones, Headaches, Memory loss, Cancer, birth defects, Heart conditions and much more” There are set guidelines for Installation of the Mobile Towers which allegedly the mobile companies are not following properly in parts of Jammu Kashmir also **[9].** In 2011, the [International Agency for Research on Cancer (IARC)](http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf) [Exit Disclaimer](https://www.cancer.gov/policies/linking), a component of the World Health Organization, appointed an expert working group to review all available evidence on the use of cell phones. The working group classified cell phone use as “possibly carcinogenic to humans,” based on limited evidence from human studies, limited evidence from studies of radiofrequency radiation and cancer in rodents, and inconsistent evidence from mechanistic studies **[10].**

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