

Is living within close proximity to a BTS safe?

No adverse health effects have been observed to afflict persons living with close to a base transmitter station. While some individuals have reported the manifestation of non-specific symptoms as a result of exposure to the radiofrequency electromagnetic energy fields emanating from BTS the existence of exposure to the radiofrequency electromagnetic energy has not been proven to be the cause of such symptoms. BTS antennae (typically mounted buildings or towers at a height of 15 to 50 metres above ground) emit a fan-shaped transmission beam, which is typically vertically narrow and horizontally broad and which decreases in intensity in direct proportion to the distance of the mobile phone user from the BTS. The point at which the beam comes into contact with the ground is also sufficiently low as to render its strength significantly lower than that of the recommended maximum radiation limits.

What regulations cover the installation of radio communication equipment?

The Communications Authority of Kenya, working in cooperation with all other relevant parties, is currently in the process of establishing a 'Code of Practice for the Setting-up of Base Transmitter Stations', which will address any specific concerns raised by those living in proximity to a BTS. Although scientific research has revealed that all such radiation is emitted within safe limits, this code will address such issues as; the balance of coverage by the various networks and the need for sensitivity in the location of BTS.

For more information about RF/EME and human health, see the following:

1. World Health Organization website: www.who.int
2. The ICNIRP Guidelines: [www.icnirp.de/documents.emfgdl.pdf](http://www.icnirp.de/documents/emfgdl.pdf)
3. 'Mobile Phones Your Health and Regulation of Radiofrequency Electromagnetic Energy'. Available on the ACMA website: www.acma.gov.au
4. Evaluation Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields available from the Federal Communications Commission (Bullet No. 65): www.fcc.gov/oet/rfsafety/

Need to know more?

For further information on the above topic or any other aspect of health and safety with regard to communication equipment, please contact:

Disclaimer: While every attempt has been made to ensure that the information included in this document is accurate, it is intended ONLY as a guideline towards the safe operation of communications equipment and should not be regarded as (or used in lieu of) legal advice. The Communications Authority of Kenya will not, therefore, accept any liability for the consequences of any actions taken, or decisions made upon the information offered.

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Electromagnetic Energy and Human Health



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This brochure has been developed as part of the **consumer Education Programme** of the **Communications Authority of Kenya**. It was compiled as a result of a review of material from various sources and presents the current perception of the information available on the effects of the electromagnetic energy on human health.

Introduction

Mobile phone use in Kenya has increased substantially, the number of subscribers having reached **31.8 million by March 2014**. As a result, there has been a corresponding rise in the public interest expressed with regard to the health issues allied to the exposure of humans to the electromagnetic energy fields (EMF)

What is radio frequency electromagnetic energy (RF/ EME)

Both mobile-phones and their Base Transmitter Stations ((BTS) commonly known as 'base stations') emit radiofrequency (RF) electromagnetic energy (EME), which is a form of radiation technically referred to as non-ionizing radiation (NIR) - due to the fact that it is incapable of changing molecular structure. Ionizing radiation (such as x-rays and Gamma Rays), on the other hand, is capable both of causing ionization (radioactivity) and production molecular changes, some of which can damage biological tissue.

Man-made sources of radiofrequency electromagnetic energy include:

- Mobile-phones and Base Transmitter Stations (BTS)
- Remote controls
- Broadcast transmitters
- Electric and electronic devices

The amount of exposure to RF/EME to which a mobile phone user is exposed depends on: the number and duration of calls made, the amount of cellular telephone traffic at any given time, the distance of the user from the nearest BTS, the quality of the transmission, how far the antenna is extended, and the size of the handset. The main source of RF/EME in a mobile phone is in its antenna, which is contained within the handset. Since the handset is typically held against the side of the head while the phone is in use, the closer the antenna is to the head, the greater the exposure to radiofrequency electromagnetic energy.

Extensive research is currently being conducted with the intention of assessing the potential risks inherent in human exposure to RF/EME. Studies conducted by the international scientific community so far have, however, revealed that while prolonged exposure to RF/EME can, under certain circumstances, cause high tissue temperature, shocks and burns from conductive objects and nerve and muscle stimulation, the levels of exposure to which the general public is currently exposed falls far below the levels required to produce adverse health effects (approximately 100 times below).

Which body regulates - RF/ EME?

Emissions of ionizing radiation are regulated in Kenya by the Radiation Protection Board (RPB). At the present time, the Board has no mandate to similarly regulate the emissions of RF/EME. However, a parliamentary bill is now underway, which will grant such mandates.

What standards are in place to protect consumers against the known effects of- RF/ EME?

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has developed a set of guidelines, which define the standards, restrictions and reference level that are required to ensure the protection of the general public against the possible ill-effects of non-ionizing radiation (Kenya is also currently finalizing her own guidelines).

What radiation levels are associated with mobile phones and what is SAR?

The rate at which the electromagnetic radiation emitted by a cell-phone is absorbed by the body is measured in terms of its Specific Energy Absorption Rates (SAR) value. An average mobile phone has a SAR of 1.6w/kg, but some have a value as high as 2.0w/kg, which is the maximum recommended SAR value accorded to a cell-phone.

The maximum permitted exposure levels as defined by the ICNIRP are:

- 0.4W/Kg for occupational use (use by adults whose exposure is defined under known conditions and controlled by appropriate precautionary measures);
- 0.08 W/Kg for the general public (dependent upon age and health status and not subject to the same constraints as above)

What radiation levels are associated with BTS?

Due to the ever- increasing mobile - phone usage in Kenya, increasing numbers of Base Transmitters Stations are being erected to the support the growing network coverage. Other wireless networks, such as those that facilitate high - speed internet access (such as WLANs) are also on the increase.

A recent survey by the World Health Organization (WHO) has shown that the RF/EME exposure occasioned by BTS ranges from 0.002% to 0.2% in relation to the permitted international level of maximum exposure. Such exposure, which is also dependent upon the proximity of the human being to them BTS and other such relevant environmental factors, is compared to the RF/EME exposure caused by radio or Television - Broadcast transmitters and is, therefore so low (approximately 1000 times lower than permitted maximum exposure levels) as to pose no threat to human health

Note: the strength of the RF/EME field is at its greatest in immediate proximity to its source and diminishes quickly in the direct relation to distance. Network access in immediate proximity to a BTS is also often restricted due to the fact that the radio frequency signal may exceed the permitted exposure limits.

Are mobile phones safe?

Current scientific research has not revealed any substantial evidence to suggest that the use of a mobile phone (within the limits set by international standards) can have an adverse effect on human health - even in the event of long-term exposure.

More information on SAR level?

Users wishing to obtain specific information on the specific information on the SAR levels of the Existing range of mobile phones should contact the Mobile Manufactures Forum (MMF): www.mmfai.org. an international non-profit organization founded in 1998 by a number of leading manufacturers of mobile radio equipment (including Alcatel, Erikson, Mitsubishi Electric, Motorola, Nokia, Panasonic, Philips, Sagem, Samsung, Siemens, Sony Erikson and TCL & Alcatel), the Mobile Manufacturers Forum offers funding for research into mobile phone use and human health, cooperation/ Coordination on standards and regulatory issues (specifically with the WHO Electromagnetic Fields Project), and acts as a forum for communication with the general public.