

# RADIO WAVES AND HEALTH

BASE STATIONS

Ericsson is a world-leading provider of telecommunications equipment. Over 1,000 networks in more than 175 countries utilize our network equipment and 40 percent of all mobile calls go through our systems. We deliver a new radio base station every 90 seconds.

Communication is a basic human need and modern communications technologies are an essential part of a sustainable future. We consider your safety when using these technologies to be an important priority.

Radio base stations in mobile communication networks communicate with mobile telephones, or other mobile devices, using radio waves. The base station antennas are installed in such a way that radio wave exposure in public areas is well below the established safety limits.





### **Base stations enable mobile communications**

Mobile phones require a network of base stations in order to function. The base station antennas transmit and receive RF (radio frequency) signals, or radio waves, to and from mobile phones near the base station. Without these radio waves mobile communications would not be possible. Radio waves have been used for communication for more than 100 years. Radio and television broadcasting are well-known examples.

### **Antennas are placed in various locations**

The base station antennas are usually placed on rooftops, in masts or on building walls. Antennas are sometimes also installed in shopping malls, airports, offices, and other places with many mobile phone users. Indoor antennas are usually placed on walls or on ceilings.

### **More mobile phones require more base stations**

Each base station can only serve a limited amount of mobile phones at a time. As the number of mobile phone users in a community grows, more base stations are therefore needed. For that reason, more antennas are needed in crowded locations like a shopping mall where there are many mobile phone users. However, the shorter the distance between base station antennas, the lower the output power of each antenna.

### **Base station output power is low**

The antenna output power level is typically between 10 and 40 watts for an outdoor base station. Television transmitters, by comparison, usually have a thousand times higher output power than outdoor base stations. Antennas mounted indoors have about the same power as mobile phones.

### **Exposure limits are set by independent organizations**

Independent expert organizations have established exposure limits for radio waves based on many years of research. These limits include large safety margins. The World Health Organization (WHO), among others, recommends exposure limits which are adopted by national authorities.

### **Exposure levels are much lower than the limits**

Base station antennas direct the radio signals away from the building or mast to obtain coverage in a certain area. The intensity of the radio waves is drastically reduced with increasing distance from the base station antenna. On the ground, in houses, and other places where people reside, the exposure levels from radio base stations are normally below 1% of the limits.

### **Public access is restricted where needed**

Only in the close vicinity of the antennas can the exposure limits sometimes be exceeded. The size of this area varies from a few centimeters for small in-building antennas up to some meters for antennas mounted in masts and on rooftops. The antennas are installed in such a way that unauthorized people do not have access to the area where the limits may be exceeded. This is irrespective of whether the base station is part of a 2G (GSM), a 3G, or a 4G (LTE) network.

### **No adverse health effects according to the WHO**

WHO states: *"From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations."* (WHO fact sheet 304)

For more information, visit [www.ericsson.com/health](http://www.ericsson.com/health)