

# Health and safety research

## Mobile phone base stations and health research

### Scientific research

The consensus of opinion among independent scientists is that mobile communications masts and mobile phones do not pose a threat to human health. But many studies have concluded that more research needs to be done. The World Health Organisation has itself said: "None of the recent reviews have concluded that exposure to RF fields from mobile phones or their base stations causes any adverse health consequences. However, there are gaps in knowledge that have been identified for further research to better assess health risks."

### O<sub>2</sub> research policy

O<sub>2</sub> has a responsibility to ensure that its activities do not adversely affect the health of the public and its employees. The need for good quality ongoing research is actively supported by O<sub>2</sub>. O<sub>2</sub> policy is only to fund scientific research that meets the following criteria:

- Addresses the World Health Organisation research agenda
- Is shown to be unique globally unless replication is a specific justification
- Judged as being of good quality by an expert panel
- Subject to peer review
- Is intended to be published in reputable journals
- Independent of industry influence



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## The World Health Organisation – international EMF project

In response to public and occupational health concerns, the World Health Organisation established the International EMF Project to conduct further research into electromagnetic radiation. The Project commenced in 1996 and will end in 2005. It has been designed to enable improved health risk assessments to be made, and to monitor any environmental impacts resulting from exposure to EMF (Electromagnetic Fields) radiation. The Project is collaborating with eight international organisations, seven professional institutions and over 40 national authorities.

The World Health Organisation International EMF Project maintains an EMF Research Database, which currently lists a total of 764 RF studies, of which 379 are specific to cellular telephone signal exposure.

## EU programme

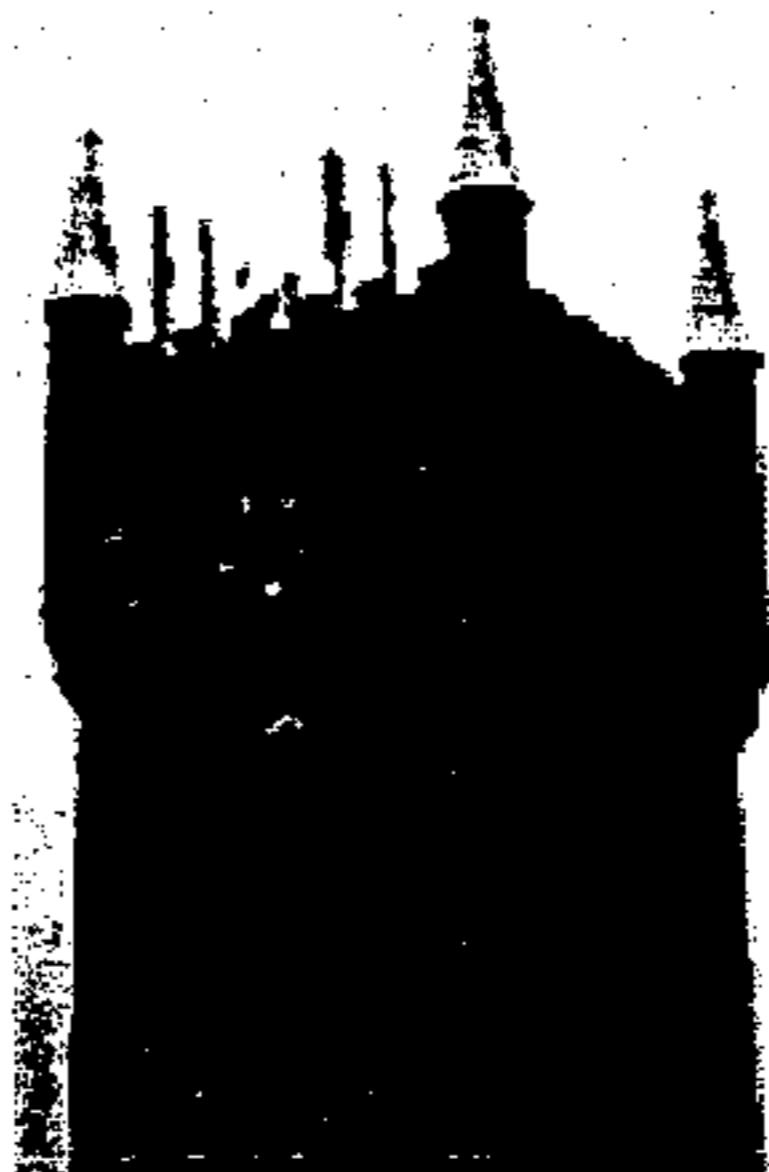
Supporting the WHO International EMF project, the European Commission undertakes an annual review of internal radio frequency fields research priorities and sets new objectives through EU supported programs.

## UK mobile telecommunications and health research programme

In 1999 the Government established the Independent Expert Group on Mobile Phones, chaired by Sir William Stewart. One of the recommendations of its report was the creation of a UK based research programme in mobile communications and health. The House of Commons Science and Technology Committee report on mobile phones and health also recommended the setting up of a UK based research programme.

A programme of collaborative research is underway to meet these recommendations. The research is focussing on biology, epidemiology, and dosimetry relevant to current and future mobile telecommunications systems, and also the perception of risk, and risk communication, related to such systems.

Funds of around £7 million have been allocated to the programme by the mobile industry and Government, with 50% being funded by the mobile industry and 50% by Government. The programme is completely independent from industry apart from funding.



An example of an O<sub>2</sub> Mobile Communications base station on Southbourne water tower.

## Further information

O <sub>2</sub> Public Enquiry line	01133 886780
World Health Organisation	<a href="http://www.who.int/peh-emf/">www.who.int/peh-emf/</a>
European Union	<a href="http://europa.eu.int/comm/health/ph/programmes/pollution/ph_fields_index.html">http://europa.eu.int/comm/health/ph/programmes/pollution/ph_fields_index.html</a>
COST 281	<a href="http://www.cost281.org">http://www.cost281.org</a>
MTHR	<a href="http://www.mthr.org.uk">www.mthr.org.uk</a>

**www.o2.co.uk**

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An example of an O<sub>2</sub> Mobile Communications base station on Southbourne water tower.

### Further information

Further information can be obtained from:

O<sub>2</sub> Public Enquiry line

01133 886780

National Radiological Protection Board

[www.nrpb.org.uk](http://www.nrpb.org.uk)

Independent Expert Group on Mobile Phones

[www.iegmp.org.uk](http://www.iegmp.org.uk)

Department of Health

[www.doh.gov.uk/mobile.htm](http://www.doh.gov.uk/mobile.htm)

Radiocommunications Agency

[www.radio.gov.uk](http://www.radio.gov.uk)

International Commission on  
Non-ionizing Radiation Protection

[www.icnirp.de](http://www.icnirp.de)

European Union

[http://europa.eu.int/comm/health/ph/programmes/pollution/ph\\_fields\\_index.html](http://europa.eu.int/comm/health/ph/programmes/pollution/ph_fields_index.html)

World Health Organisation

[www.who.int/peh-emf/](http://www.who.int/peh-emf/)

**[www.o2.co.uk](http://www.o2.co.uk)**

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# Health and safety



# Mobile phone base stations and health

## Introduction

In little over 17 years, the mobile phone has become an essential communications tool. It enables individuals, businesses, public organisations and the emergency services to be more efficient, productive and effective. For all of us, it has helped to make life easier, safer and more enjoyable.

Mobile communications is here to stay. At the time of publication, more than 75% of the population rely on their mobile phones to help them manage their busy working and social lives – a figure that's still rising.

No longer simply a means of 'keeping in touch', the mobile phone is now used to send and receive voice calls, text messages, data and faxes. What's more, it can provide links to business systems that make companies more productive and efficient, and access to the Internet – and a growing range of personal information services – while on the move. Not only here in the UK, but also worldwide.

However, there has been some speculation about the health issues surrounding the location of mobile phone radio base stations. This leaflet is part of a series which address these concerns.

## O<sub>2</sub> health and safety

The health and safety of our staff, our customers and members of the public is of paramount concern to us.

The consensus of opinion among independent scientists is that mobile communications masts and mobile phones do not pose a threat to human health. But many studies have concluded that more research needs to be done. The World Health Organisation has itself said: "None of the recent reviews have concluded that exposure to RF fields from mobile phones or their base stations causes any adverse health consequences. However, there are gaps in knowledge that have been identified for further research to better assess health risks."

We recognise and support the need for continuing, relevant and high quality research, to ensure this issue is subject to the most up to date and rigorous scientific scrutiny.

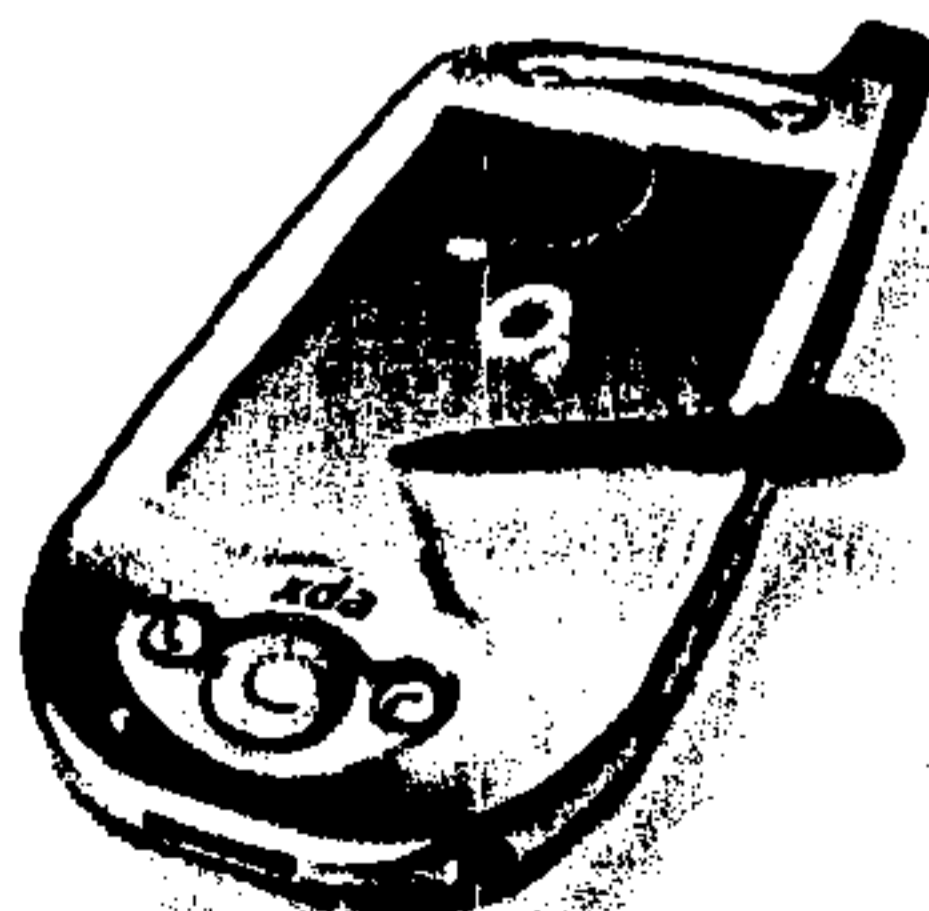
## How mobile phone networks work

Mobile phones convert voice, text or multi-media calls into radio waves, like any other two-way radio. Mobile phone radio base stations enable these calls to be transmitted to and from the mobile phones so that they can be connected to other mobile phones and networks.

In order to provide mobile phone service across the country, the UK is divided into thousands of individual areas or cells, each requiring a radio base station (also known as a cell site or mast). The area of coverage needed and the number of calls each cell needs to carry govern the size of each cell.

When a mobile phone user is on the move, calls are 'handed over' from one base station to the next, so that there is no break in the call. To achieve call handover without a break, the coverage from individual base stations must overlap, and this is one of the factors in determining their location. If they are positioned too far away from each other, calls cannot be handed over and will be interrupted or 'dropped'.

Base stations are located where radio coverage is required. The antennas which transmit and receive the radio waves at the base stations have to be mounted at a suitable height because, like light waves, radio waves travel in straight lines and can be stopped or reflected by obstructions. To cover large areas, antennas are often mounted high up on masts or, wherever possible, on existing buildings. However these structures play no part in transmitting the radio wave; they merely provide physical support for the antennas. If it is only necessary to cover a small area, for example business premises or shopping centres, smaller antennas are often used which can be mounted on the wall of the building or on lampposts.



## Radio waves

Radio waves are an everyday part of modern life and a type of electromagnetic radiation. There are many sources of electromagnetic radiation in our lives – including light, heat, television and remote controls. Current mobile phone systems in the UK operate at radio wave frequencies of 900 MHz or 1800 MHz; future systems will operate at frequencies of approximately 2100 MHz.

It is important not to confuse radio wave fields with ionising radiation, such as X-rays or gamma rays. Radio waves are not radioactive and unlike ionising radiation, radio wave fields cannot cause ionisation or radioactivity in the body. Because of this, radio wave fields are called non-ionising and unlike X-rays or gamma rays, they are much too weak to break the bonds that hold molecules in cells together.

## Working within international exposure guidelines for the general public

In the UK, the National Radiological Protection Board (NRPB) advises on guidelines for limiting the exposure of both the general public and workers to radio waves. These guidelines are based on research that has been conducted throughout the world over the past forty years.

O<sub>2</sub> base station sites are designed in full compliance with the exposure guidelines advised by the NRPB. These guidelines, which were recommended by the Independent Expert Group on Mobile Phones established by the Government, are the radio frequency (RF) public exposure guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), as expressed in European Union Council recommendation of 12 July 1999 (1999/519/EC) "on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)".

## Complying with exposure guidelines at base station sites

Compliance with exposure guidelines is determined by worst-case mathematical calculation and also takes into account the emissions from any other cellular operators on the site. Members of the public cannot unknowingly enter areas around antennas where the guideline levels may be exceeded. Wherever possible, antennas are deliberately sited so that people cannot stand immediately in front of them – on the edge of a rooftop, for example.

Safety signs at access points to base stations and masts make clear that people should not approach the antennas. Access restrictions and/or barriers are implemented where required and procedures are established with landlords to ensure that people are warned of areas where exposure guidelines may be exceeded.

Measurements carried out by the NRPB and the Radiocommunications Agency have confirmed that exposure levels from our base stations are many hundreds and even thousands of times below safety limits where the general public has access.

When access is required close to an antenna, O<sub>2</sub> always employs safe working practices – switching off transmitters, if necessary, so that no one is at risk.

The masts themselves play no part in the transmission of the radio waves – they are needed simply to raise antennas to a height at which they can satisfactorily send and receive radio waves. The perimeter fence around these support structures is there solely to protect O<sub>2</sub>'s equipment and should not be confused with the exclusion zones around the antennas.

## Scientific research

We fully support calls for further research, believing it is vital that this issue is subject to rigorous and up-to-date research and analysis.

O<sub>2</sub> does not conduct its own scientific research but supports and funds independent high quality, peer-reviewed research administered and organised through respected bodies such as the World Health Organisation, the European Union and the UK Mobile Telecommunications and Health Research (MTHR) programme.

