

Radiofrequency Fields

TV and radio transmitters

Cellphones

Cellsites

Cordless phones

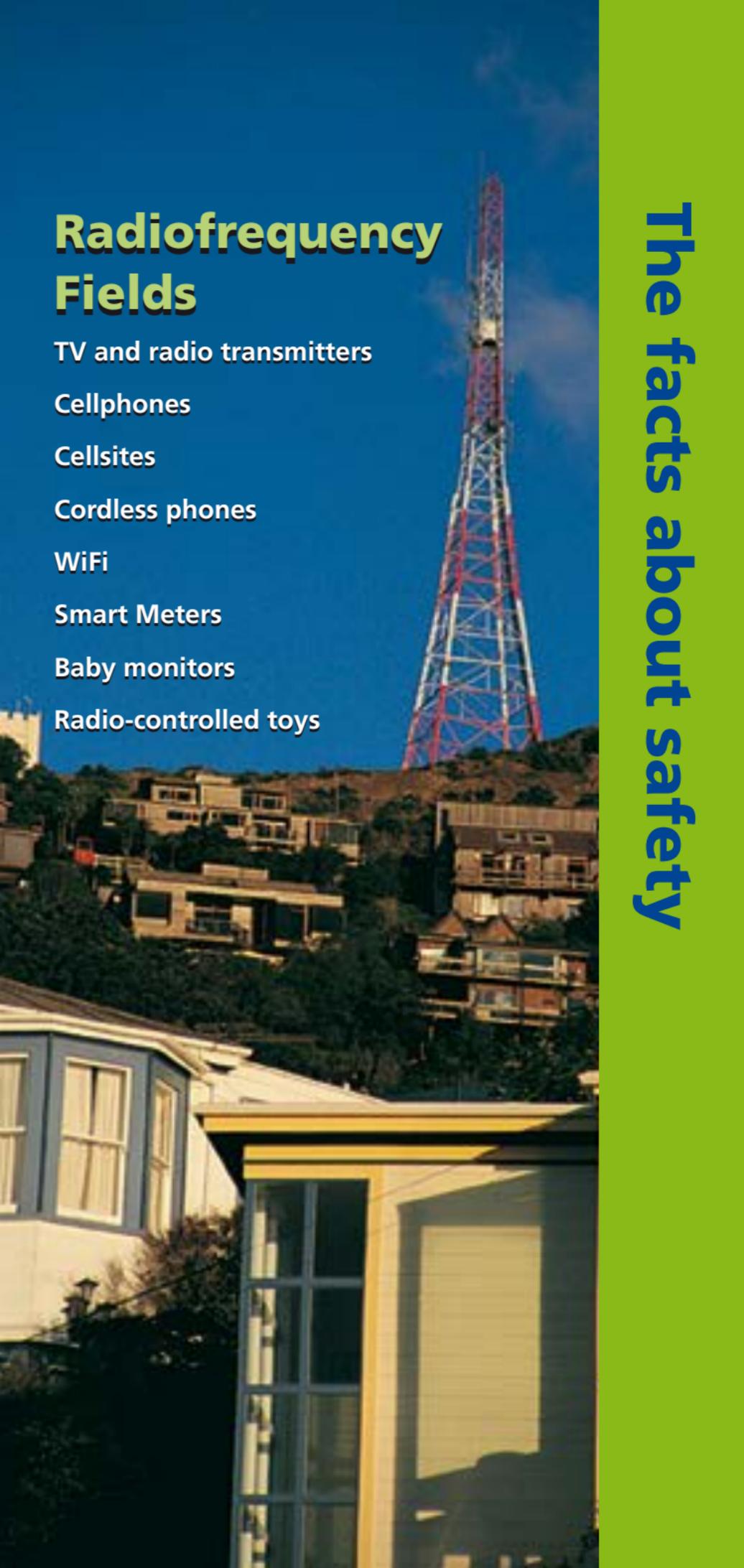
WiFi

Smart Meters

Baby monitors

Radio-controlled toys

The facts about safety



In recent years the explosion of new technologies has made our lives easier, more exciting, and in many ways, safer.

Many everyday items use radio and microwave signals to operate. That includes such things as cellphones, cordless phones, WiFi, radio-controlled toys, some baby monitors and microwave ovens.

However, along with these new technologies have come some concerns about the possible harmful effects they may have. Examples include fear about the number of cellphone transmitter sites, and the use of WiFi in schools.

This leaflet tells you what researchers currently know about possible effects, what is being done in New Zealand to safeguard your health, and where you can go to get more information.

What are radiofrequency (RF) fields?

Radiofrequency (RF) fields (or radio waves) come from the towers and antennas that produce and transmit radio and telecommunication signals.

The RF fields make up the electromagnetic wave, or radiation, which is the radio signal. This is non-ionising radiation. It is quite different to the ionising radiation from x-rays and radioactive materials.

RF fields are also different from the low frequency magnetic fields found around power lines and electrical appliances. Any possible effects on

health from electromagnetic fields from these sources should not be confused with the effects of RF fields.



How are we exposed to them?

RF fields are all around us. Fields from natural sources are very weak.

RF field sources in the home include microwave ovens, cordless phones, baby monitors and radio-controlled toys.

Outside the home, people who work in the broadcasting, transport and communications industries can have higher exposure when they

work close to RF transmitting antennas and radar systems.

Some industrial processes also use RF fields, such as in the use of dielectric heaters for wood lamination and the sealing of plastics.

What are the effects of exposure to RF fields?

A lot of research has been done over the past 60 years into the possible health effects of RF fields.

Above certain exposure levels, subtle changes in the behaviour of experimental animals have been observed. These are believed to be related to slight heating produced by RF fields. While a lot of research has looked for effects at lower levels, none has been found.

Analysis of studies of the health of people who have had long-term exposures does not add up to cause for concern. No clear, consistent effects have shown up in studies of long-term exposures. What the studies do show is that, if there are any risks, they must be very small.

What protections are there?

Many people are naturally concerned about RF exposure.

New Zealand has developed a Standard (NZS2772.1:1999) with guidelines to control levels of exposure to RF fields. This has been based on international recommendations, which



are supported by the WHO. The Standard is designed to protect both adults and children.

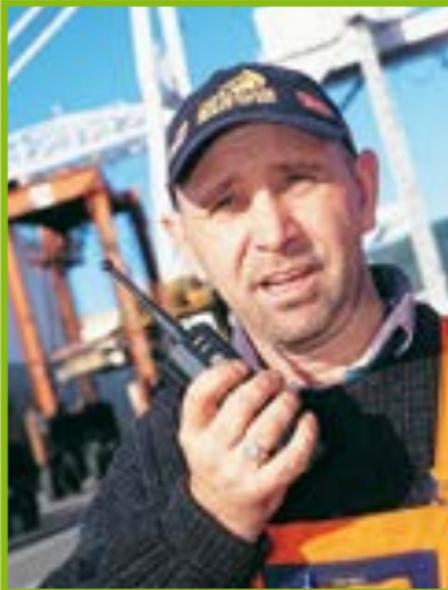
Exposure limits have been set at least 50 times lower than the level where they might start to affect health.

As an example of what is considered a safe level of exposure, people who live near, or go past, cellphone sites and telecommunications antennas are exposed to less than one percent of the limit set by the New Zealand Standard. In a very few cases, the levels may reach five or ten percent of the Standard.

The Standard also includes a requirement that, regardless of the recommended limits, exposures should be kept at the lowest level possible.

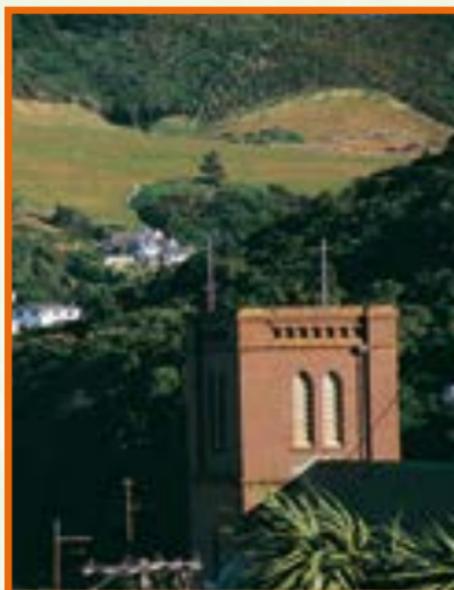
According to World Health Organization (WHO) figures, overall, the level of RF field exposure from household appliances is low. This has been confirmed by measurements made in New Zealand.

Workplaces are required to develop health and safety plans to ensure that exposures are within acceptable limits.



Recent reviews by health bodies around the world have concluded that there is no clear evidence of ill health caused by exposures which comply with the limits.

How safe are cellphones and their transmitter sites?



Cellphones have rocketed in popularity in recent years as they have become a cheap and easy way to keep in touch while on the move.

The demand for more phones and increased services has created a need for more transmitter sites to provide good coverage and capacity.

The siting of radio transmitters, including cellphone sites, is governed by the Resource Management Act 1991. Regulations introduced in 2008 under the Resource Management Act require that cellsites and other commercial transmitters must be planned and operated in accordance with the New Zealand RF field exposure Standard.

Cellphone site antennas are usually mounted well above the ground, either on a building or a mast.

They transmit a fan shaped beam of RF waves roughly parallel to the ground. This means the RF levels beneath them on the ground are low and well within the international guidelines. Where the sites are mounted on buildings, the beam is directed outward, so people inside are not highly exposed.

Although the number of cellphone sites is increasing, many of the new sites are designed to cover a small area. This means that they can operate at lower power.

Ministry of Health staff and others have measured exposures to radio transmissions near many cellsites throughout New Zealand.

The highest exposure is normally less than one hundredth of the maximum allowed in the Standard.

Cellphones are weak transmitters. The exposure Standard applies to exposure from phones (and other hand-held transmitters) as well as the base stations. The major telecommunication networks only allow phones which comply with the Standard to connect to their networks.

Some studies suggest there could be a link between talking on cellphones a lot and brain tumours. But the researchers said that this result could have been due to biases in the way the studies were carried out.

For this reason, RF fields have been classed as a 'possible' cause of cancer by the International Agency for Research on Cancer. This doesn't mean that they definitely cause cancer, but also that we can't completely rule it out.

Brain tumour rates haven't changed since cellphones were first used. And laboratory research does not suggest that radiofrequency radiation could affect cancer development.



User tips

If you are concerned about possible risks, there are some simple things you can do to reduce your exposure:

- Limit the length of your calls.
- Use a speakerphone or hands-free kit.
- Use one of the newer XT or 3G (UMTS) technology phones. These generally transmit at much lower power than other phones.

What is the Ministry of Health doing?

The Ministry of Health regularly monitors new research on this subject. It is also contributing to an international project coordinated by the WHO to provide greater certainty in our understanding.

Where to go for more information

If you would like more information about RF fields, or want to keep up to date with developments, you can check the Ministry's website www.health.govt.nz (search for "RF Fields").

The latest information from the WHO project can be found on their website at www.who.int/peh-emf



New Zealand Government