

Towards the end of June, I organised a public meeting in St Mark's Church to discuss concerns about 5G. Local officials attended including councillor Tobin Byers, Merton's cabinet member for adult social care, health and environment. What surprised and delighted me was the level of public attendance (it was a full-house) and attentiveness. To me it indicated the latent concern within the community.

There is a lot of confusion about 5G which is not helped by poor reporting on the topic, so I thought I'd take this opportunity to answer questions people may have.

What is it?

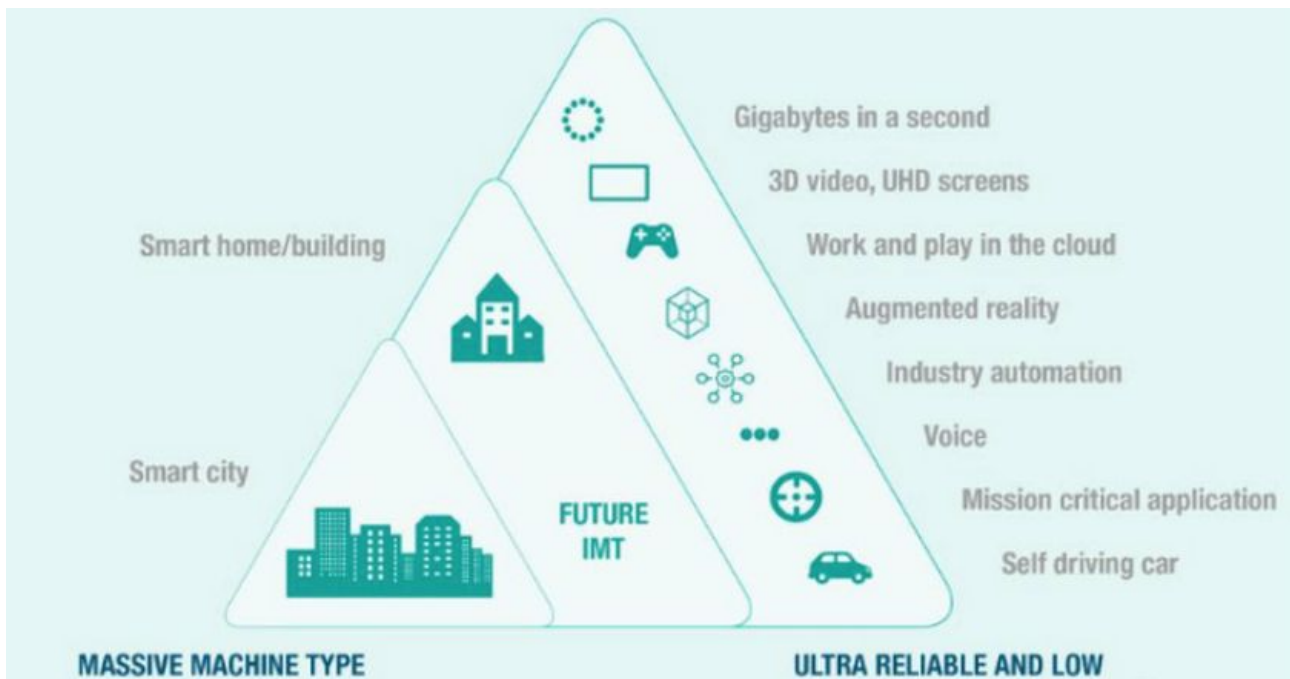
5G encompasses previous generations 3G, 4G, 4G LTE as well as the 5G layer. It differs from the previous generations of network in these main ways:

- **Quicker response time to user input; for example when playing games**
- **Faster download speeds**
- **Smaller cellular networks, and therefore many more transmitters**
- **The ability to direct and focus signals**
- **It will make use of millimetre wave portion of the radio frequency spectrum**

Why is government and industry so keen to have 5G?

5G roll-out is a plank of the government's industrial strategy. It has initiated the road to 5G and is working to encourage industry to push it forward by creating favourable market conditions. Much of the R & D (the risky part) is being funded by government/tax-payers. The government is keen on 5G because it says:

- **5G provides the performance to support AI for example**
- **Keeping Britain in the technology race**
- **It will benefit the economy**
- **It will deliver the following vision:**



Source: DCMS - Next Generation Mobile Technologies: An update to the 5G strategy for the UK

As you can see, the government's vision for 5G touches all aspects of our lives going far beyond the mobile phone and computer. Money will be made by auctioning off the spectrum for 5G. Its planned pervasiveness in our lives means it's important to understand what it means for us and our future generations.

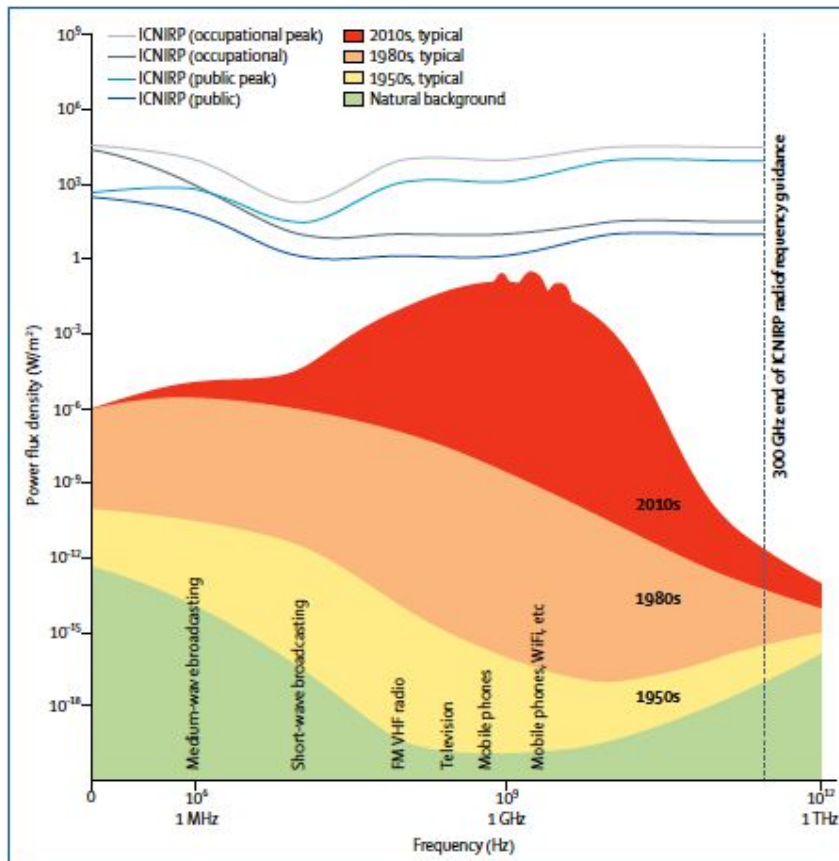
What are some of the concerns?

They centre around health, privacy and democratic choice. This article focuses on health.

1. Huge leap in man-made electromagnetic radiation emissions

As mentioned before, there will be far smaller cells which means many more transmitters. For 5G the transmitters will be placed every 3-5 houses and they will be mounted on our lamp posts, close to homes, schools, hospitals and workplaces.

5G will allow data transmission of the internet of things, 'IoT', or smart devices such as energy meters, fridges as well as automated cars. The profusion of various smart devices will be emitting pulsed radiation too. This will have an impact on the health of all living things.



Growth in exposure over time to various man-made radio-frequency radiation, prior to 5G roll out

2. No Biological testing has been done on the safety of 5G

Initially my main concern about 5G was deletion of privacy, but I was spurred to look at its health impacts as well after watching the Senate hearing conducted by Richard Blumenthal in February. No biological safety testing has been done on 5G, a technology which includes use of millimetre wave frequency and focused beam signals both of which have not been used in the public sphere.

3. Our safeguards are out of date and based on flawed assumptions

Non-ionising radiation includes 5G, mobile phone signals, WiFi, and bluetooth amongst others. In the UK as in most other countries our non-ionising radiation safety levels have been set with reference to ICNIRP guidelines which date from 1996. These guidelines are subject to much criticism because of how they were arrived at. Here are a few:

- Pulsed, directed and mm wave EMRs like 5G was not looked at
- Non-ionising radiation which did not produce heating of tissue was assumed safe; this assumption is now unsafe to say the least
- Did not look at different biological effects on different cells when exposed to the same radiation.

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The evidence

Much research has been done on the biological effects of mobile phone

radiation since 1996. The largest of these studies was conducted in the U.S. by the National Toxicology Program. It lasted 16 years and cost \$30 million and fully reported its findings in 2018. Dr. Ronald Melnick, the senior NIH toxicologist who designed the study states: “The NTP studies were conducted to test the widely-held assumption that cell phone radio-frequency radiation could not cause cancers or other adverse health effects (other than by tissue heating) because this type of radiation (non-ionizing) did not have sufficient energy to break chemical bonds. The NTP findings that cell phone radiation caused cancers in the heart and brain, DNA damage in brain cells, heart muscle disease and reduced birth weights clearly demonstrate that the assumption that non-ionizing radiation cannot cause cancer or other health effects is wrong.”

Other studies found results consistent with the NTP study, which is considered the gold standard. The Ramazzini Institute (RI) study in 2017 also found an increase in the incidence of very rare highly malignant tumours - schwannomas of the heart. It also reported a decrease in litter weights in the RFR exposed groups.

The weight of evidence approach is used to assess scientific findings which produce regulations. Several independent expert groups using this approach have analysed peer-reviewed studies covering humans, animals, plants and populations. They found that 70% of the studies demonstrated significant biological or health effects. The largest collection of studies was analysed by the Oceania Radiofrequency Scientific Advisory Association.

Professor Anthony Miller, an advisor to WHO which works with the ICNIRP, acknowledges that new science has emerged since 2011 when radio frequency radiation was classified as a 2b - a possible carcinogen like lead and DDT. Miller says: “if the International Agency for Research on Cancer (IARC) re-evaluate Radio frequency radiation it would be placed in Class 1 - a human carcinogen and governments could not possibly ignore that”. An advisory committee to the IARC has recommended said radio frequency be re-evaluated with high priority.

The Precautionary Principle

The “precautionary principle” holds that society doesn’t need absolute proof of hazard to place limits on a given technology.

If the evidence is sufficiently solid and the risks sufficiently great, the precautionary principle calls for delaying the deployment of that technology until further research clarifies its impacts.

No scientist can say with certainty how many wireless-technology users are likely to contract cancer, but that is precisely the point; we simply don't know. Nevertheless, we are proceeding as if we do know the risk, and that the risk is vanishingly small. There's no opt-out from default of this step-change in radio frequency radiation and the technology that emits it.

The Council for Europe, a separate entity from the EU, is a body which agrees minimum legal standards across Europe and beyond. It's up to states to decide whether they incorporate them. They do not accept the ICNIRP/PHE guidelines and in resolution 1815 state:

“The Assembly regrets that, despite calls for the respect of the precautionary principle and despite all the recommendations, declarations and a number of statutory and legislative advances, there is still a lack of reaction to known or emerging environmental and health risks and virtually systematic delays in adopting and implementing effective preventive measures. Waiting for high levels of scientific and clinical proof before taking action to prevent well-known risks can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco.”