

Junior Minister for Public Health Confirms Corporate Takeover of UK Health Policy on Wireless Technology

For more than two decades the telecommunications industry has been orchestrating a global PR campaign aimed at misleading journalists, consumers and policymakers about the safety of wireless radiation. Barely three months into the job of Parliamentary Under Secretary for Public Health and Primary Care, Seema Kennedy (now Minister of State for Immigration) was already at home with industry-influenced spin. This was her response to Gower MP Tonia Antoniazzi's concerns over the health effects of electromagnetic fields (Debate, 25 June 2019, Westminster Hall¹). For the reader's benefit, missing scientific information, serious conflicts of interest within health agencies and general comments on the junior minister's insubstantial, industry-friendly response are shown on the right alongside highlighted areas of text from her speech.

Seema Kennedy: 'It is a pleasure to serve under your chairmanship, Mr Hollobone. I thank the hon. Member for Gower (Tonia Antoniazzi) for securing the debate and giving us the opportunity to discuss this important subject.

'People are exposed to radio waves in the home, at work and throughout their daily lives. As the hon. Member for Gower mentioned, people have been talking about the issues for about 100 years, since early in the last century, but the numbers of devices and transmitters have increased rapidly, and the pace of change in how this technology becomes part of our lives can be very unsettling to some.

Stroud MP Dr David Drew attended and contributed to this debate. As of 31 July 2019 he has asked 11 questions² in Parliament relating to the impact of wireless technology on health and the environment, none of which have received satisfactory answers.

The term 'radio waves' rather than electromagnetic radiation (EMR) or microwave radiation is intentionally used here to allay concern and strengthen the association with radios (considered harmless) rather than microwave ovens and radiation (recognised as potentially hazardous).

Scientists have been *studying* man-made, pulsed microwave radiation for this length of time too, and historical military, NASA and other reports describe a raft of harmful non-thermal effects. See, for example, reviews of clinical and subjective effects of exposure to EMR^{3,4} and studies of long- and short-term effects from occupational exposure, including cancer in Korean war Navy technicians⁵ and chronic debilitation in Soviet workers exposed to pulsed microwaves - commercially repackaged for today's telecoms⁶.

This is a condescending attempt to portray legitimate health concerns as an irrational fear or psychological issue.

People ask whether radio wave exposure levels are increasing and whether there could be health consequences, and I want to put on record right at the beginning that, very importantly, radio waves are non-ionising radiation. That means that the packets of energy that form the radiation are too small to break chemical bonds: the radiation cannot damage cells and cause cancer in the same way as ionising radiation.

Even so, there are concerns that this type of radiation could have health effects, and a great deal of research has been done in the United Kingdom and around the world to clarify the matter, which is something the Government take very seriously.

A non-sequitur with a standard line intended, again, to minimise concerns. The fact that radio waves are non-ionising does NOT mean they are harmless – see below.

The minister seems to be leaving open the possibility that cancer *can* be caused by non-ionising radiation, just not in the same way as ionising radiation. Cancer Research UK parrots a variant of this artful statement⁷. Only around 35% of DNA damage is produced by the *direct* breakage of chemical bonds during low-level exposure to ionising radiation⁸. The higher proportion is due to the generation of free radicals, a significant mechanism by which *non-ionising* EMR causes harm to cellular components such as proteins, cell membranes and DNA⁹. The highly sensitive comet test assay confirms that prolonged exposure to EMR from a mobile phone can cause genetic damage similar to that caused by ionising radiation (see Figure 1 below¹⁰). Prolonged exposure is now the norm when it comes to mobile phones and microwave-emitting devices.

Historic studies carried out as part of the Mobile Telecommunications and Health Research Programme (MTHR) were co-funded by the mobile phone industry and the UK government. The first MTHR report (hastily published, incomplete, in August 2007¹¹) confidently reported that '*none of the research supported by the Programme and published so far demonstrates that biological or adverse health effects are produced by radiofrequency exposure from mobile phones*'. (The report was less forthcoming about base stations - an integral part of mobile communications technology - and suggested further studies.) The BioInitiative Report¹², however (published just 12 days earlier and authored by 14 international EMR and health experts) reached a very different conclusion

(‘preventative actions for RF [EMR] are warranted... to reduce exposures and inform the public of the potential for increased risk), as did earlier research by, amongst others, the ECOLOG group (see below) and the \$28.5m Wireless Technology Research study that raised ‘serious questions’ about phone safety¹³. Last year the 10-year, \$25m US National Toxicology Programme (NTP) concluded that exposure to EMR associated with 2G and 3G phones was the ‘likely cause’ of unusual heart and brain tumours in animals – the kind seen in epidemiological studies of mobile phone users^{14,15}. The NTP findings were replicated by the Ramazzini Institute in its large-scale study on the carcinogenic effects of mobile phone radiation¹⁶ (results being ‘...consistent with and reinforce the results of the NTP study’).

Within the global (independent) scientific community the matter *has* been clarified and conditions for applying the precautionary principle met many times over. Thousands of studies now demonstrate both biological and health effects at EMR levels well below existing UK ‘safety guidelines’^{17,18,19}. Growing numbers of studies are also reporting adverse effects on plants and animals^{20,21} and predicting massive energy demands from the production and running of wireless IoT products, gadgets and platforms^{22,23}.

A comment not borne out in practice - see, for example, the UK Government's dismissal of the ECOLOG Report (below) in 2005 and more recently of the NTP final reports. Given the historic and ever-growing evidence base for harm the UK Government would have acted already to protect public health if it took the matter ‘very seriously’. Instead, ministers invest their time and energy in denying health risks associated with wireless technology, and UK health agencies tasked with protecting public health play fast and loose with the science.

A number of issues, both for my Department and for colleagues in others, have been raised during the debate, and I will try to address them. I will also pass them on to colleagues.

Health concerns about electromagnetic fields have been raised in relation to each successive wave of new communications services, from 2G to 3G and 4G mobile

phone networks, and with wi-fi, smart meters and now 5G. I have certainly noticed the growing number of letters I have received from parliamentary colleagues, passing on their constituents' concerns, and I am grateful for the opportunity to address some of them today.

Concerns about telecommunications networks first came to the fore in the late 1990s. A report containing an evidence review and recommendations was prepared for Government by the independent expert group on mobile phones, under the chairmanship of Sir William Stewart.

This is just the tip of the iceberg. As more and more people connect their ongoing ill health to EMR exposure and become aware of harmful effects in the wider environment, elected representatives charged with protecting public health will need to explain why they continue to ignore independent scientific evidence and postpone taking precautionary action.

This group wasn't quite as independent as the minister makes out - two of its ten members having close ties with the telecoms industry through membership of ICNIRP (see below). Vital research was kept from Stewart's committee by the National Radiological Protection Board²⁴ (now within Public Health England (PHE)), so that most of the evidence reviewed related to analogue signals rather than the pulsed, digital signals used in 2G and successive generation telecoms systems²⁵. The Stewart Report²⁶, perhaps unsurprisingly, concluded that microwave radiation below the recently established international safety guidelines would not adversely affect the general population - but conceded a precautionary approach with regard to exposure, particularly for children. (This latter conclusion was downplayed by the mobile phone industry and ignored by government.) Around the same time, authors of the ECOLOG Report (2000)²⁷ on the potential health risks of typical telecommunications systems - commissioned by T-Mobile and Deutsche Telecom MobilNet GmbH in Germany - described adverse effects on the immune, central nervous, cardiovascular, hormonal and reproductive systems as well as on cellular processes and DNA. The research group called for the existing upper safety limit to be reduced **by a factor of 1000** in order to protect public health. Their findings were released before T-Mobile and Deutsche Telecom were able to suppress them, which prompted T-Mobile to hastily commission three smaller studies to undermine the ECOLOG findings and deflect (successfully) the initial impact of the study²⁵. Five years later it was translated and sent to the then British Office of the Deputy Prime Minister - where it was dismissed. The story was published in the *Sunday Times* in April 2007, but only a few copies carried the full account: overnight it was reduced to a few lines of text²⁵.

A major research programme was undertaken and the international exposure guidelines were adopted, with a commitment from industry that they would be followed.

Although many new services and technologies have been launched, the basic way they are delivered—by radio—has not changed, and the science of how radio waves affect the body does not change when a new technology is launched.

International exposure guidelines were established in 1998 by the International Commission on Non-Ionizing Radiation (ICNIRP), a self-elected organisation with historical (and ongoing) ties with the mobile phone industry, TV operators and the military. Many observers regard ICNIRP as simply a front for the demands of these bodies and consider it neither independent nor fit to provide safety advice. Many countries have chosen not to follow the 20 year-old 'international guidelines' to which the minister repeatedly refers and instead have set more stringent and precautionary maximum public exposure levels for chronic (i.e. long-term) involuntary exposure. Russia, China, Poland, Switzerland and Luxembourg, for example, have opted for safety limits **100 times lower** than ICNIRP limits. Even these, however, are considered insufficient to protect health by leading independent experts in the field¹⁷.

It would be very hard for the telecoms industry to fall foul of ICNIRP guidelines given their staggering leniency.

This statement has as its starting point the assumption that neither the delivery system nor the radio waves in question pose a risk to health - and ignores the dramatic rise in background levels of EMR that has accompanied the proliferation of wireless technology. The 1990s saw a surge in mobile phone usage and a transition from the use of smooth, long wave analog (1G) signals that required infrastructure eight to ten miles apart to pulsed (digitised) signals with higher frequencies and shorter wavelengths requiring infrastructure every one to three miles. Each successive generation of mobile telephony has seen the introduction of new frequencies, adding to the invisible cocktail of EMR in the environment. Over the past 100 years, average levels of ambient EMR have increased in urban areas 1,000,000,000,000-fold²⁸. People are now exposed to man-made digital signals from mobile phones, mobile phone masts and base stations, DECT house phones, cordless baby monitors, Fitbits, WiFi routers, games consoles (Wii systems, Playstation 3 etc), laptops, tablets and many other devices capable of connecting remotely. They are about to be exposed to wavelengths in the extremely high frequency millimetre (MM) wave spectrum (30 – 300 GHz) currently planned for use, together with lower- and mid-range frequencies, in 5G broadband technology. 5G base stations will be just metres apart as MM waves are only able to travel a short distance. This

However, the Government take people's health concerns about electromagnetic fields very seriously. They have committed, and continue to commit, significant resources to supporting research and analysis on the topic, and policies are in place to ensure the exposure guidelines are followed.

Public Health England monitors the health-related evidence and collaborates internationally to ensure that any important new evidence is identified and responded to.

I think the hon. Lady talked about accurate information, and about honesty concerning the information put out by Public Health England.

means millions of base stations creating electrosmog everywhere, every hour of every day. None of this technology has been tested for safety, and harmful effects evident from existing 2, 3 and 4G technologies have been swept under the carpet by public servants charged with protecting public health.

In the interests of transparency, the Government should make publicly available the funding details of any research in which it is involved, along with any conflicts of interest relating to its scientific experts and advisers.

As previously noted it would be very hard for industry to fall foul of these guidelines given their staggering leniency. The tobacco industry also promoted the use of arbitrary safety thresholds higher than those at which adverse effects (from second hand smoke) had already been found^{25,29}. The telecoms industry seems to have taken a leaf out of their handbook.

The Head of the Physical Dosimetry Department at Public Health England (PHE), Simon Mann, provides advice on the safety of non-ionising radiation. He is not medically qualified. He is, however, a member of ICNIRP's Scientific Expert Group and has received research funding from the GSM Association (a trade body that represents the interests of mobile network operators worldwide), the Mobile Manufacturers Forum and MTHR³⁰. As a 'captured' agency, PHE cannot be counted on to respond to any evidence of harm, either new or existing. While finding the results of the landmark US government NTP study 'interesting', for example, PHE did not consider them sufficient evidence to prompt a shift in position on the safety of mobile phone technology³¹. It is unclear what evidence - other than a Class 1 (known carcinogen) classification for EMR (see below) - would prompt PHE to change its entrenched position.

PHE bases much of its safety advice on a report produced in 2012 by the Advisory Group on Non-Ionising Radiation (AGNIR)³². An independent scientist who carefully reviewed this report revealed 'incorrect and misleading statements... omissions and conflict of interest, which make it unsuitable for health risk assessment'³³. AGNIR's Chair, Anthony Swerdlow, and two of its members (Maria Feychting and Zenon Sienkiewicz) were also members of ICNIRP when the report was written. (Swerdlow was in fact both chair of AGNIR and chair of ICNIRP's standing

committee on epidemiology in 2012. His shares in wireless and telecommunications companies (and those of his wife) were not disclosed in AGNIR's report³⁴). Given such conflict of interest how could AGNIR possibly conclude that existing evidence showed harmful effects below the safety guidelines, when some of its members, including the chair, were responsible for setting those guidelines? AGNIR was hastily disbanded just months after the reviewer's report was published. The reviewer wants the report to be retracted and is now calling for mechanisms to be put in place whereby incorrect Government information can be challenged, corrected or retracted³⁵.

Public Health England conducts extremely rigorous research, all based on the best available international evidence and on monitoring assessments of expert reviews. Some of those things will, of course, be in the public domain, and others will not. I will happily write to the hon. Lady with all the evidence that is available in the public domain.

The Committee on Medical Aspects of Radiation in the Environment has a watching brief on non-ionising radiation. It assesses all the available data to give health advice. Many scientific studies have been done over several decades, and a wide range of health topics have been

Highly debatable – see above.

An author of the AGNIR report [Simon Mann], who is also a member of ICNIRP, is now responsible for letting COMARE know when they need to look at the evidence. So the conflict of interest, and control, continues³⁵.

investigated, including cancer, reproduction, cognitive effects and electrical hypersensitivity.

The hon. Lady is talking about risks and hazards. *[Interruption.]* Yes, we are talking about two different sorts of radio wave, but she said that I would not want to go in a microwave oven. I am not suggesting that I would put myself or anyone else in a microwave oven, so we are talking about hazards and risks. The best scientific evidence given to Government is that the radiation is safe, and I was going to go on to talk about the evidence that Government have used before addressing some of the points that the hon. Member for Gower raised. I apologise if I have not quite understood the point made by the hon. Member for Glasgow North West (Carol Monaghan); I will happily discuss it with her later.

Expert groups in the UK and around the world have examined the evidence and

Unclear what is meant here, but both waves referred to will be microwaves, whether emitted by a microwave oven or not.

Associated with microwave radiation....

A shocking statement, demonstrating the extent to which powerful corporations control science, governments and health institutions.

published many comprehensive reports. In the UK, the advisory group on non-ionising radiation produced reports in 2003 and 2012. The Government have played their role in the international effort to learn more about the health effects of radio-wave exposure. They supported the dedicated mobile telecommunications and health research programme that ran from 2001 to 2012 and they continue to fund research.

A challenge in understanding the evidence is that some studies report effects, while others do not. Sophisticated analyses are needed to draw studies together, considering their strengths and weaknesses and working out what they mean collectively, which is the role of expert groups. Simply counting or listing studies that have found effects is not an adequate way of assessing where the overall evidence lies.

See comment above regarding AGNIR's advice.

Co-funded by the mobile telecommunications industry (see above), so hardly likely to flag up any adverse effects. The MTHR's second report³⁶ was dated 2012 but embargoed until 11 February 2014 – perhaps to provide some 'breathing space' for two other UK reports also making dismissive claims about the health risks of radiofrequency EMR (ICNIRP member Anthony Swerdlow's *'Mobile phones, brain tumors and the Interphone study: Where are we now?'*³⁷ and AGNIR's 2012 report, chaired by Swerdlow). Ongoing EMF studies in which the UK has some involvement are the Airwave Health Monitoring Study (TETRA), COSMOS, Mobi-Kids, GERONIMO, and SCAMP. All these initiatives are opaque, and updates or conclusions are rarely published. No research has been carried out on the potential health and environmental effects of 5G, now rolling out across the country.

Researchers have confirmed that industry-funded studies are significantly less likely to report harmful effects³⁸.

The AGNIR report provides a sophisticated masterclass in how to cherry-pick studies and data to arrive at a pre-determined conclusion. A member of the IARC panel that classified EMR as a Class 2B carcinogen described reading the report as *'surreal'*³⁹. Amongst many other sleights of hand, AGNIR set a cut-off date of 30 December 2010 for research to be considered in its report, allowing it to exclude reference to the classification of radiofrequency EMR as a Class 2B carcinogen by IARC (published May 2011) and a paper by the IARC Monograph Working Group published in *The Lancet* in July 2011³⁴. The cut-off date did not apply to a paper co-authored by one of AGNIR's members, however (Maria Feychting, vice-chair of ICNIRP) which was included in the report despite its publication in August 2011. This paper concluded that there was no causal association between mobile phone use and brain tumours in children and adolescents³⁴.

An expert group reporting to the European Commission delivered a review in 2015, and the World Health Organisation is currently carrying out a major review on radio waves and health, which will include studies performed over the past 25 years. Overall, those expert groups have not found any clear evidence of adverse health effects occurring if the International Commission on Non-Ionizing Radiation Protection exposure guidelines are followed.

The ICNIRP exposure restrictions have been incorporated into a 1999 European Council recommendation on limiting public exposures to electromagnetic fields. The

It should not be possible to dismiss decades of peer-reviewed, independently funded research, replicated findings and a substantial evidence base for harm in this way, but as history has shown in numerous scandals of the past, it is.

ICNIRP effectively controls the WHO International Electromagnetic Fields Project. The Core Group responsible for preparing the WHO Environmental Health Criteria Monograph on Radiofrequency Fields is indistinguishable from ICNIRP in its membership⁴⁰. Five of its six members are affiliated with the organisation including the head of the project, Emilie van Deventer - a microwave engineer with no health or biomedical qualifications, who allegedly commented: *'Industry doesn't care about your health. They just want the network to work properly.'*⁴¹

Evidence aplenty, but not – in their view – 'clear' evidence. This delaying tactic was adopted by the tobacco industry from the 1950s to the 1990s when countering public health concerns over a link between smoking and lung cancer²⁹. Scientific research is characterised by uncertainty – the condition under which the precautionary principle* comes into play; but such uncertainty has been ruthlessly exploited by corporate interest groups over the years to generate doubt and controversy which slows or prevents regulation of a product. A precautionary approach to asbestos in the 1930s to 1950s - and tobacco from the 1930s onwards - would have saved many lives, but painful lessons from the past are not being applied to EMR.

**'In cases of serious or irreversible threats to the health of humans or ecosystems, acknowledged scientific uncertainty should not be used as a reason to postpone preventive measures.'* World Health Organisation, 2004⁴²

It is now 2019. Since 1999 the number of households with mobile phones has almost quadrupled⁴³, two further generations of mobile technology have been introduced and another, 5G, is in the process of being rolled out. An overhaul of EMR safety guidelines is long overdue.

United Kingdom and Public Health England support that recommendation.

Since 1996, the World Health Organisation has been running an international electromagnetic field project that provides a forum for countries to gather together, discuss and share knowledge on this topic. The WHO's main conclusion is that electromagnetic field exposures below the limits recommended in the International Commission on Non-Ionizing Radiation Protection guidelines do not appear to have any known consequence for health. However, as the hon. Member for Gower and other Members have mentioned, that does not mean that people who have electrical hypersensitivity do not have symptoms. Those symptoms are real and can be very debilitating, and the Department's guidance is that those people should seek medical advice, so that their personal situation can be

See comment above.

i.e. ICNIRP's main conclusion...

Times have changed considerably since 1973 when the WHO held an international symposium, attended by 60 leading researchers in the field, on the biologic effects and health hazards of microwave radiation - both well recognised by this time⁴⁴. Today, heavily influenced by ICNIRP, the WHO maintains that heating is the main effect of EMR on the body, and that *'to date, no adverse health effects from low level, long-term exposure to radiofrequency or power frequency fields have been confirmed...'*⁴⁵ It attributes reports of headaches, anxiety, suicide and depression to *'noise or other factors in the environment, or by anxiety related to the presence of new technologies'*. Thermal or heating effects – rather than biological effects such as changes in brain function or damage to cell membranes and DNA - form the basis for ICNIRP's safety guidelines which the WHO is actively encouraging all countries to adopt in order to 'harmonise' standards.

According to the NHS: *'...the only known effect of radio waves on the human body is a very small rise in temperature of up to 0.2C'⁴⁶, and *'...it's unlikely that radio waves from mobile phones or base stations increase the risk of any health problems'*⁴⁷. PHE, citing AGNIR (2012), maintains that *'radio wave exposures below guideline levels do not cause symptoms and cannot be detected by people, even by those who consider themselves sensitive to radio waves'*⁴⁸. Given this wall of disinformation and denial what hope does a person suffering from electrosensitivity – aka microwave*

taken into account and the best possible treatments found.

I will also address the points raised by many hon. Members about the effects of screen time on the mental health of children; as any parent can attest, there are some effects. The shadow Minister, the hon. Member for Washington and Sunderland West (Mrs Hodgson), referred to SCAMP, and the Government conduct research that looks at the effects of technologies on schoolchildren.

Exposure levels reduce very rapidly with increasing distance from transmitting antennae, which means that

sickness - have of receiving appropriate care? What hope, indeed, does a person living in the UK have of even being diagnosed with this condition? Now that hospitals (including Intensive Care Units), doctor's surgeries and even hospices are fitted with microwave-emitting WiFi routers, where can the estimated 435,500⁴⁹ severely electrosensitive people in the UK go for medical help of any description? European scientists and medical experts have formulated guidelines for the prevention, diagnosis and treatment of EMR-related illnesses⁵⁰, but due to misleading and inaccurate NHS advice most doctors in the UK are not even aware these – or the symptoms and sequelae of microwave sickness – exist. Those that are aware are doing their best to educate colleagues^{51,52}, but until politicians and health protection bodies stop paying lip-service to environmental illness, provide correct information to health service providers and instate fit-for-purpose exposure limits, the hidden, marginalised group currently paying the cost of our digitised lifestyle will continue to grow and suffer.

Treat the cause, not the symptoms. Electrosensitive individuals are the canaries in the coalmine – all members of the population are at risk from long-term exposure to wireless technology.

A study launched in 2014, co-funded by the government and the mobile phone industry. See comment above.

being in immediate proximity to the transmitting antenna of a mobile phone handset held next to the head is different from living near a base station.

There is long-standing precautionary advice from Public Health England and the NHS for mobile phone users, and research is continuing. We are continually looking at the evidence and updating our advice.

Public Health England takes its role very seriously, and is always monitoring the evidence. Since perhaps 10 years ago, there has been a lot of research into having mobile phones next to one's ear.

Of course, the way we use our phones is changing, but Public Health England is always looking at this issue and reviewing the best available evidence.

There has been a general

This statement makes no sense. Is the minister now implying that living near a base station is safe but using a mobile phone is not? Whatever the intended meaning, most of the UK's urban population, in addition to using mobile phones held next to the head on a daily basis, will be living within metres of a base station when 5G technology is fully rolled out and exposed to high levels of microwave radiation 24 hours a day.

They could hardly NOT provide such advice, given that even mobile phone manufacturers warn users, in the small print, to keep devices away from the head - their insurance policy against litigation. (In 2013 the world's second largest reinsurer warned that *'if a direct link between EMF and human health problems were established, it would open doors for new claims and could ultimately lead to large losses under product liability covers. Liability rates would likely rise.'*⁵³)

In representing industry interests, perhaps, but not its role in protecting public health. *'When PHE provide factually incorrect information about the safety of wireless signals it is extremely difficult for local authorities, schools, decision makers and parents to access evidence-based, accurate information and almost impossible for parents to challenge involuntary exposures of their children and to protect them from harm. So many policy decisions by UK Governments, local authorities, by schools, businesses etc have been made based on the factually incorrect information provided by PHE and AGNIR.'*³³ PHE continues to cite the discredited AGNIR report and 20 year-old ICNIRP guidelines that recognise only heating effects in the body. The NHS repeats PHE's standard response to concerns about risk.

In what way, other than becoming more and more interwoven into public life - with tacit Government approval?

trend from 2G through to 5G for transmitters to become smaller, to be mounted nearer to the ground, and to use less transmitted power. The hon. Member for Stroud (Dr Drew) raised a point about the electronic communications code, which I think is a matter for colleagues in the Ministry of Housing, Communities and Local Government. The hon. Member for Swansea West (Geraint Davies) has left, but I do not think we are cutting down trees; in fact, I am sure that the Government have committed to planting more trees. I know that the Secretary of State is very keen on them, so I will write to him on that issue.

To answer the questions that were asked about radio frequency fields and cancer, a working group of the International Agency for Research on Cancer reviewed the health effects of exposure to RF fields and concluded

Around 29 billion wirelessly connected devices are predicted by 2022, of which around 18 billion will be related to the Internet of Things (IoT) (e.g. connected cars, machines, meters, sensors, point-of-sale terminals, consumer electronics and 'wearables')⁵⁴. 5G systems designed to support the IoT will involve the installation of millions of base stations, making any reductions in transmitted power irrelevant.

London Councils removed 49,000 trees between 2013 and 2017⁵⁵, 20% more compared to the period 2003-7. Sheffield felled around 10% of its street tree population between 2012 and 2017⁵⁶. Network Rail's accelerated felling programme prompted a review of tree cutting alongside railway tracks and a suspension of felling during the nesting period⁵⁷. Alongside this, from the Department for Digital, Culture, Media and Sport: *'...regardless of the season, small items of vegetation greater than a width of 12cm with substantial foliage will cause disruption to propagation above 6GHz'*⁵⁸. Given the breakneck speed of the 5G rollout, the lack of transparency over the process, the lack of public consultation, the lack of safety testing, the lack of intelligent response to questions relating to safety and the consequent lack of trust in politicians on this issue it is less than surprising that a potential link between tree loss and 5G infrastructure rollout has been made.

that such exposures are possibly carcinogenic to humans—group 2B, based on IARC’s classification scheme. There was a minority opinion in the working group that current evidence for humans was inadequate, and therefore there was no conclusion about a causal association. In terms of the different classes of carcinogens, there is a statement on the PHE website that responds to the IARC classification. PHE has summary advice statements that it sends to inquirers with a full explanation of different carcinogens; there is a broad spectrum, including petrol engine exhausts, bracken fern and talc-based body powder.

Since 2001, the Office of Communications has been carrying out an audit of the emissions from mobile phone

Should such a classification not be ringing alarm bells?

Neither the writer nor the member for Gower have been able to locate this statement.

A clumsy attempt at downplaying risk, i.e. referring to benign-sounding substances that share radiofrequency EMR’s 2B (possible) carcinogen classification. (The minister did not mention that DDT and lead share EMR’s 2B classification - and perhaps is not aware that some talcum powder is naturally contaminated with asbestos.) Unlike EMR, however, 25,000 scientific papers⁵⁹ have not been written on the health effects of bracken or talcum powder over the past 30 years, and the evidence base for cancer risks from EMR grows year on year. In view of the many significant studies completed since 2011 when the 2B classification was made, IARC recently gave high priority to reviewing radiofrequency EMR⁶⁰, making it reasonable to expect an upgrade to either a Class 2A (probable) or Class 1 (known) classification within the next few years. In the meantime authorities responsible for risk management have sufficient evidence of threat to human health to invoke the precautionary principle – a principle the UK government has committed to enact⁶¹.

base stations. The Advisory Group on Non-Ionising Radiation's 2012 report contained a summary of over 3,000 measurements made at over 500 sites by Ofcom. The maximum exposure found at any location was hundreds of times below the international guideline levels, and typical exposures were much lower still. Public Health England advises that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or a new area, but that is expected to remain low relative to guidelines.

I hope I have demonstrated that the Government take seriously the potential health effects of the introduction of 5G, and that Public Health England is well placed to identify and respond to any important new evidence that may emerge. I reiterate that the public's levels of exposure to electromagnetic fields from telecommunications networks

Despite calls for a retraction of this report the minister continues to cite it – and unsafe international guidelines - to justify involuntary, continuous and widespread public exposure to EMR in schools, hospitals, workplaces, homes and public spaces in the UK.

How, precisely, can Simon Mann and other PHE employees make such a baseless assurance?^{62,63} As no risk assessment whatsoever has been carried out for 5G no one knows what levels of radiation the UK population will be exposed to. 5G is a global experiment on humanity that violates at least eleven international laws⁶⁴. Its deployment will involve tens of millions of base stations with phased array antennas and around 20,000 satellites emitting pulsed, polarised, extremely high frequency radiation to all corners of the globe. The health and environmental effects are predicted to be significant⁶⁵. As early as 1977, a Russian study on the effects of MM wave radiation on animals and humans confirmed high biological activity and harm to metabolism, skin and internal organs, bone marrow and blood and other body systems⁶⁶. As one leading biomedical science professor recently commented, the deployment of 5G is 'the stupidest idea anyone has had in the history of the world'⁶⁷.

Nothing has been demonstrated here other than a corporate takeover of science, elected representatives and government policy.

A complaint against PHE for providing inaccurate and unsafe advice on the potential risks of non-ionising EMR has been with the Parliamentary and Health Service Ombudsman for the past six years⁶⁸. A final decision is expected within the next few weeks.

are currently very low in relation to the international guideline levels, and are expected to stay that way after the deployment of 5G.

According to a report commissioned by the European Parliament Committee on Industry, Research and Energy (ITRE) 'increased exposure [to EMR] may result not only from the use of much higher frequencies in 5G but also from the potential for the aggregation of different signals, their dynamic nature, and the complex interference effects that may result, especially in dense urban areas'⁶⁹.

‘Public health and the well-being of other species in the natural world cannot be protected when evidence of harm, no matter how inconvenient, is covered up.’

Dr Sarah Starkey, 2016³³

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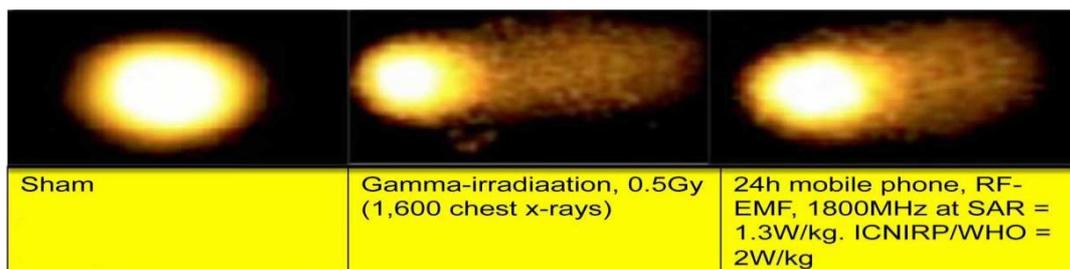


Figure 1. DNA strand breaks in HL-60 cells after exposure to γ irradiation and to high-frequency electromagnetic fields. The longer and brighter the tail, the greater the DNA-strand break.

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