Corporate Infrastructure and Regulatory Services
Scrutiny Committee

# 5G Spotlight Review

September 2020

# 1. Recommendation

The Spotlight Review ask the Corporate Infrastructure and Regulatory Services Scrutiny Committee to consider this report and conclusion and recommend that Cabinet:

**Write to the Parliamentary Digital, Culture, Media and Sport Committee with copies to the Local Government Association, Public Health England and Devon MPs to request that this Select Committee gives consideration to the earnest concerns expressed by some residents of this County and beyond about the health and environmental impacts of 5G and supports this Government to address those concerns by providing greater reassurance and evidence to the general public that the technology is safe. If such reassurance and evidence cannot be provided, then we suggest further research is urgently undertaken.**

This recommendation is made because Devon County Council Scrutiny function is not established to address issues of national concern and does not have the ability to make recommendations that affect planning policy or national guidance.

# 2. Introduction

2.1 This Spotlight Review was established at the end of 2019 following concerns from Councillors about 5G raised by the large interest from members of the public presenting formal questions to public meetings of the Council. Since July 2019, 21 questions relating to 5G have been brought to DCC Full Council meetings from members of the public. Furthermore, in the same time frame, 37 questions relating to 5G have been brought to DCC Cabinet meetings from members of the public.

2.2 The advancement and subsequent roll out of 5G technology is an issue of increasing concern to policy makers. Recently, the concern of the potential involvement of Huawei in the rollout of 5G has been a matter for ongoing discussion in Westminster.[1]

2.3 The Government has stated their "ambition for the UK to be a global leader in the next generation of mobile technology - 5G The UK Government's strategy for future digital infrastructure is set out in the Future Telecoms Infrastructure Review (FTIR)[2], published on 23 July 2018. The focus is to support a "market expansion model" for 5G in the UK. This means supporting a competitive market of mobile network operators and promoting innovation that could deliver new

[1] Russon M, BBC, *Fresh UK Review Into Huawei Role in 5G Networks,* (24/05/2020) https://www.bbc.co.uk/news/business-52792587

[2] Department for Digital, Culture, *Media & Sport, Future Telecoms Infrastructure Review*, (23/07/2018)

solutions to challenges such as rural coverage. The Government has a target that most of the population will be covered by a 5G signal by 2027."[3]

2.4 At the Autumn Statement 2016, the Government announced its intention to invest in a nationally coordinated programme of 5G testbed facilities and trials, as part of over £1bn of funding announced to boost the UK's digital infrastructure.[4] The results of these test beds have yet to be published. The Government also wrote to all Local Authority Chief Executives in support of 5G in November 2019 stating that "local authorities will share collectively an annual £2.35 billion of efficiency savings, from reduced social care costs for the elderly through 5G monitoring, to savings through smarter street lighting" (Appendix 2).

2.5 Recognising the role that scrutiny can have in bringing different agencies together to collectively problem solve, the scope of this Spotlight Review was:

a. To understand the underlying concerns from some members of the public concerning 5G technology.

b. To explore the validity of these concerns.

c. To identify the ways in which DCC should or should not support the rollout of 5G.

2.6 After some initial research it was felt that it would be beneficial to create a light touch survey for interested residents of Devon to shape the direction of the spotlight review and the questions it might ask. As point (a) in the scope. This was entirely to ascertain the underlying concerns with scope to identify any anticipated benefits of the technology based on awareness and viewpoints. This was not consultation nor a proportionally balanced opinion poll of Devon residents.

2.7 To explore these views further, the spotlight review hosted a series of focus group sessions with participants of the survey at County Hall on the 18th November. This was held as multiple concurrent round table discussions at several scheduled sessions throughout the day. It should be highlighted that the survey and group sessions should not be considered as an accurate reflection of all Devon residents but only a small section of them. The survey and group sessions were not undertaken in a truly scientific manner. Nevertheless, they have value of highlighting some views of some residents.

2.8 Following the outbreak of the COVID-19 Pandemic, this piece of work was temporarily put on hold as all scrutiny task groups and Spotlight reviews were. The planned next step of the work would have been to conduct in depth semi-

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[3]Department for Culture, Media and Sport and HM Treasury, *Next Generation Mobile Technologies: A 5G Strategy for the UK,* (March 2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/597421/07.03.17_5G_strategy_-_for_publication.pdf

[4] HM Treasury, *Autumn Statement 2016*, (November 2016) https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016

structured interviews with experts in the fields of concern identified. These witnesses would have been identified and contacted by the scrutiny team in response to the lines of enquiry identified through the survey and focus groups.

2.9 During lockdown there has been significant lobbying and contact from anti-5G protestors, including a YouTube video being made about the scrutiny review. The Leader of the Council responded to e-mails calling for the swift conclusion of the review with an explanation that dealing with covid-19 and vulnerable people have been the highest priority for the entire Council at this time.

2.10 At the same time planning applications for 5G masts are being submitted across Devon. During this period it has become clear that there is no jurisdiction whereby the County Council could reject a 5G mast planning application, even if it was minded to do so. The planning issues around Exeter and other areas in Devon underline the limitations of the County Council's power and influence in this matter.

2.11 Considering these factors, the Spotlight review and the Scrutiny Chairs and Vice Chairs of Scrutiny group have decided to conclude the review in the current stage and publish the results of the survey and focus groups to support the recommendation of this report. This is an unusual step for a scrutiny review to take and reflects the unprecedented times we are in and the limitations in the Council's power under planning legislation. This report contains supporting information intended to be used as a basis for further exploration.

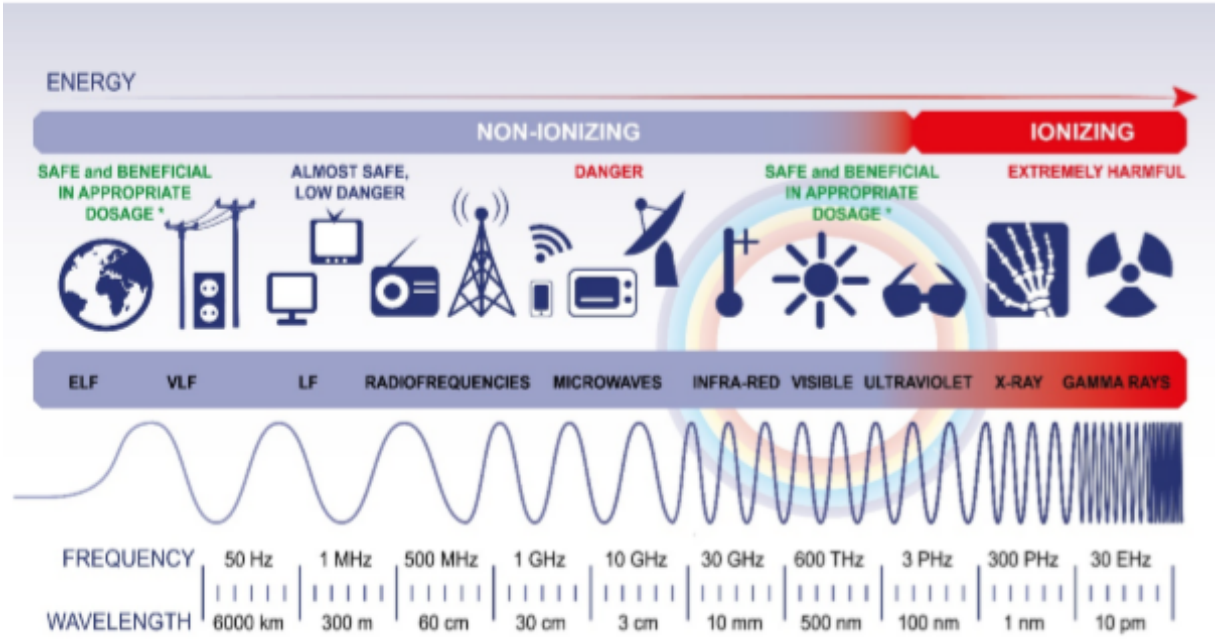
## 3. 5G Technology

3.1 5G is the new generation of wireless technology. It follows on from 4G and 3G before that. All four major UK mobile networks have launched 5G services. Technology firms are also rolling out 5G-ready devices.[5]

| Generation | | |
|---|---|---|
| 2G | Suitable for calls, text messages and very low speed data. | 1992 |
| 3G | Mobile broadband, faster voice, text and data services. | 2003 |
| 4G | Faster data, higher capacity and greater responsiveness. | 2012 |
| 5G | Extremely fast data, higher capacity and almost instantaneous response. | 2019 |

[5] Christie, L, UK Parliament Post, *5G Technology*, (July 2019) https://post.parliament.uk/research-s/post-pb-0032/#fullreport

3.2 5G will utilise a range of frequencies including the millimetre wave part of the spectrum that extends from 30 to 300 GHz. While millimetre waves have not so far been used for cellular communications, they have been used for many other applications, including airport security scanners, anti-collision radar for cars, and to link present-day cellular base stations.




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3.3 Higher frequency waves can carry more data but their correspondingly shorter wavelengths mean that they are more easily blocked by objects such as trees and houses. So 5G technology is effective only over short distance and will require many more, but smaller, new antennas. In addition to a multitude of small 5G base stations, there will be more satellites in space and the "Internet of Things" will involve billions more wireless devices.

3.4 Ultimately, the enormous data capacity, very fast speed and responsiveness of 5G is purported to bring revolutionary applications such as:

- Autonomous cars, able to detect obstacles, interact with smart signs, follow precise maps and communicate with each other. Potentially this may reduce pollution and congestion and improve passenger safety.
- Smart cities: smart cities will rely heavily on connected devices, bringing new modes of public transport, smart buildings that enable businesses to work more efficiently and enabling better use of resources such as electricity.
- Internet of Things: already gaining pace, the introduction of 5G will provide the infrastructure to connect billions more devices to the internet and revolutionise many sectors including manufacturing, agriculture and retail.

[6] European Parliamentary Research Service, Effects of 5G wireless communication on human health, (no date) https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646172/EPRS_BRI(2020)646172_EN.pdf

- Immersive entertainment; using Virtual Reality and Augmented reality.
- Communication and collaboration: streamlining communications and supporting remote working.

3.5 Mobile broadband is the first commercial use of 5G. In May 2019 EE became the first operator to launch 5G in the UK and it is now being rolled out by four private mobile network operators; EE, O2, Vodafone and Three. At present 5G covers 57 major towns and cities, each of which are served by at least one of the four operators. These include Belfast, Liverpool, London, Birmingham and Norwich. In Devon only Plymouth has coverage, currently by Vodaphone but with EE to follow in Summer 2020. 5G will roll out to at least a further 18 major towns and cities during 2020, including Aberdeen, Blackpool Peterborough, Luton and Worcester.

3.6 Council involvement with the roll out of 5G is solely with respect to street furniture (e.g lampposts) to be used for the implementation of 5G infrastructure.

3.7 In April 2020, a parliamentary e-petition was set up calling for a "delay 5G in the UK until there has been an independent investigation", stating the desire to "to see a full independent investigation and report to declare the findings on the 5G network in relation to radio activity and the health implications." This petition had been signed by over 54,000 people at the time of writing. Of this number there are 110 in North Devon, 75 in Torridge and West Devon, 117 in Central Devon, 146 in Exeter, 113 in East Devon, 100 in Newton Abbot, 118 in Torbay, 69 in South West Devon, 51 in Plymouth Moor View, and 91 in Plymouth, Sutton and Devonport. This gives a total of 990 people in Devon, Torbay and Plymouth. Having gained over 10,000 signatures, the petition has garnered enough signatures to have warranted a formal response from the government. This has been summarised as follows

*"In relation to 5G, PHE has said that the exposure to radio waves is expected to remain low relative to international guidelines and, as such, there should be no consequences for public health.".*[7] Full response in Appendix 3

3.8 At the time of initiating the 5G review no 5G masts were planned or existing, to the best knowledge of the spotlight review, in the Local Authority area covered by Devon County Council. However, since the project has been live, several planning applications have been submitted. It is highly likely that these will be agreed as they fall under permitted development.

[7] Department for Digital, Culture, Media & Sport, *Response to: Delay 5G in the UK until there's been an independent investigation petition,* (11/06/2020) https://petition.parliament.uk/petitions/312997

## 4. Planning Policy

4.1 It should be stated that Devon County Council operates within a two-tier council structure. This means that planning applications and local planning policy is mainly within the responsibility of District Councils. Scrutiny has no role in considering individual developments or making policy which affects planning.

There are, however, strict national and local planning frameworks surrounding telecommunication infrastructure, which is as follows:

**The development of certain types of electronic communications apparatus is permitted by Part 16 of the Town and Country Planning (General Permitted Development) (England) Order 2015. There are limitations on the size of apparatus permitted and a requirement that the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to the siting and appearance of the development.**

**The National Planning Framework 2019 (NPPF) sets out the Government's planning policies and how these should be applied in both plan making and the determination of planning applications. Part 10 of the NPPF *Supporting high quality communications* paragraphs 112 to 116 set out the Government's communications infrastructure strategy.**

- Paragraph 112 – Supports the provision of 5G, considering that high quality and reliable communications infrastructure is essential for economic growth and social well-being.
- Paragraph 113 – encourages the use of existing masts and where new sites are required (such as for new 5G networks), equipment should be sympathetically designed and camouflaged where appropriate.
- Paragraph 114 – Provides guidance to local planning authorities on dealing with new electronic communications development.
- Paragraph 115 – Provides guidance on the information that should be provided with applications (including applications for prior approval).
- Paragraph 116 - Local planning authorities must determine applications on planning grounds only. They should not seek to prevent competition between different operators, question the need for an electronic communications system, or set health safeguards different from the International Commission guidelines for public exposure.

## 5. Survey Responses

5.1 The survey ran for just over six weeks between 18th November 2019 and the 1st January 2020, being extended during this time following a public complaint. The survey was publicised through the DCC communications team press release and tweeted through multiple channels. Several local papers picked up on the survey.

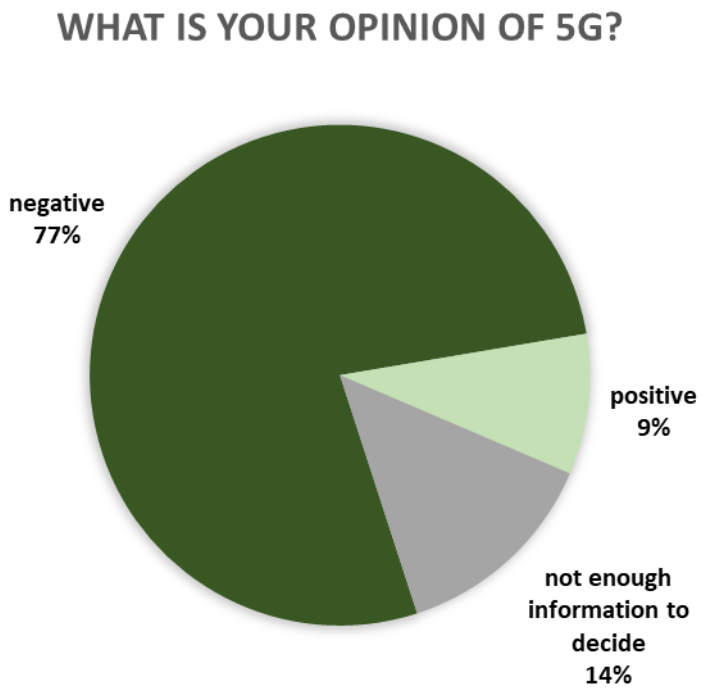
5.2 The survey was intended to be filled out by residents of the Devon County Council geographic footprint; however, respondents were not asked to fill in their post code. There is evidence that people from across the Country completed the survey, with the link being shared on predominantly anti-5G social media, and several respondents saying that they lived outside Devon.

5.3 The survey was not an opinion poll and the data was not collected in a way to enable any conclusions to be drawn about the number of people across Devon who hold the views of the respondents of the survey. In fact, it is highly likely that only those who feel very strongly about the issue of 5G would have responded to the survey request, this was a self-selecting respondent base.

5.4 The results have been correlated and are reflected below:

### Question 1

The first question of the survey asked about the attitude of the respondent to 5G,

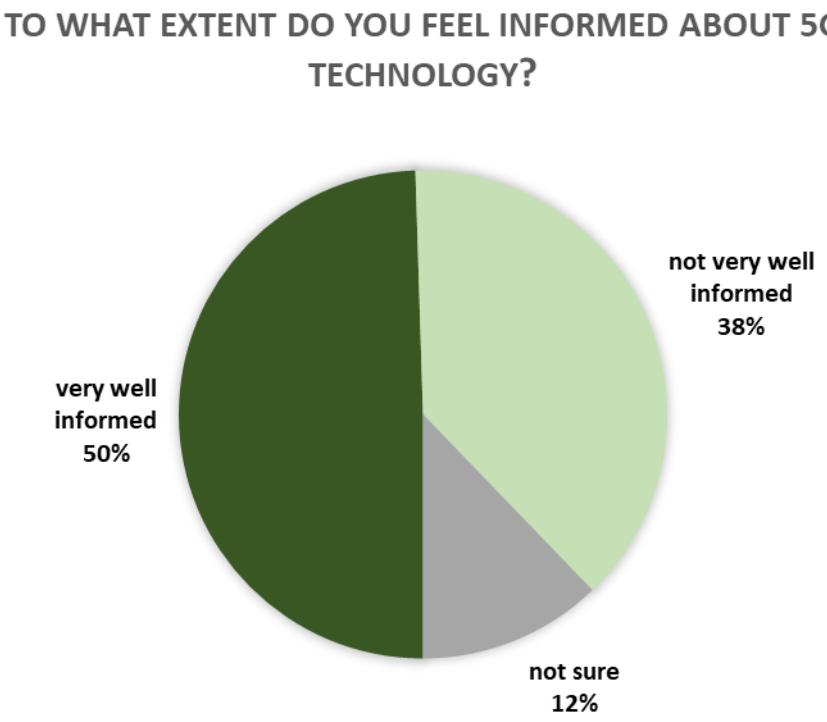



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The overwhelming response was negative, with over 1,000 people reporting this. This was anticipated with people who have strong feelings, particularly negative

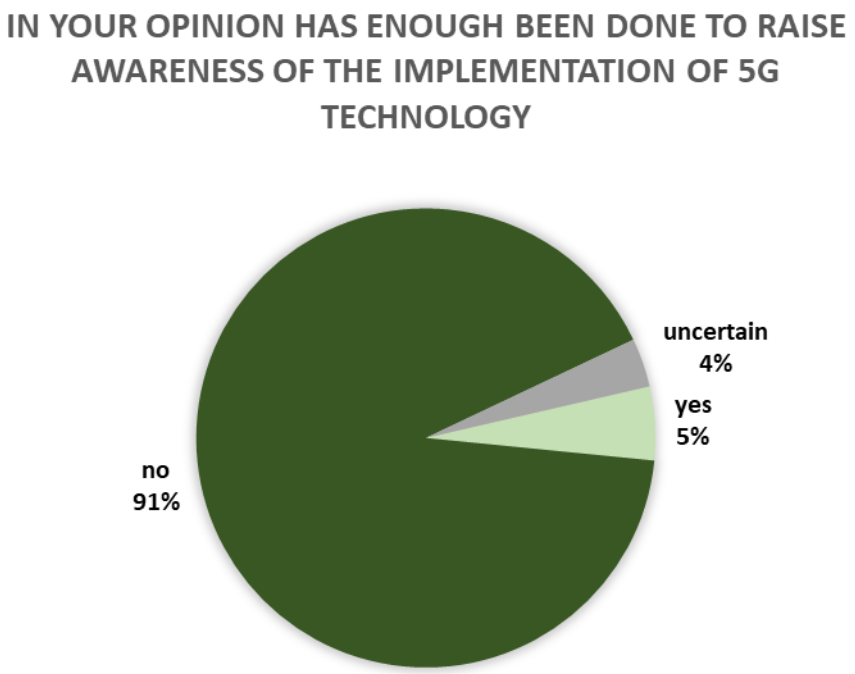
ones being more likely to fill in surveys of this nature. Only 9% of respondents were positive and 14% said that they did not have enough information to decide.

## Question 2&3 information and awareness of 5G




Respondents were split when asked if they felt well informed, with half feeling very well informed, and the rest either not sure (12%) or not very well informed (38%). More significantly on the graph below, nine out of ten people said that not enough had been done to raise awareness of 5G. This is a key finding and demonstrates the need for more reliable information to be shared on this subject.

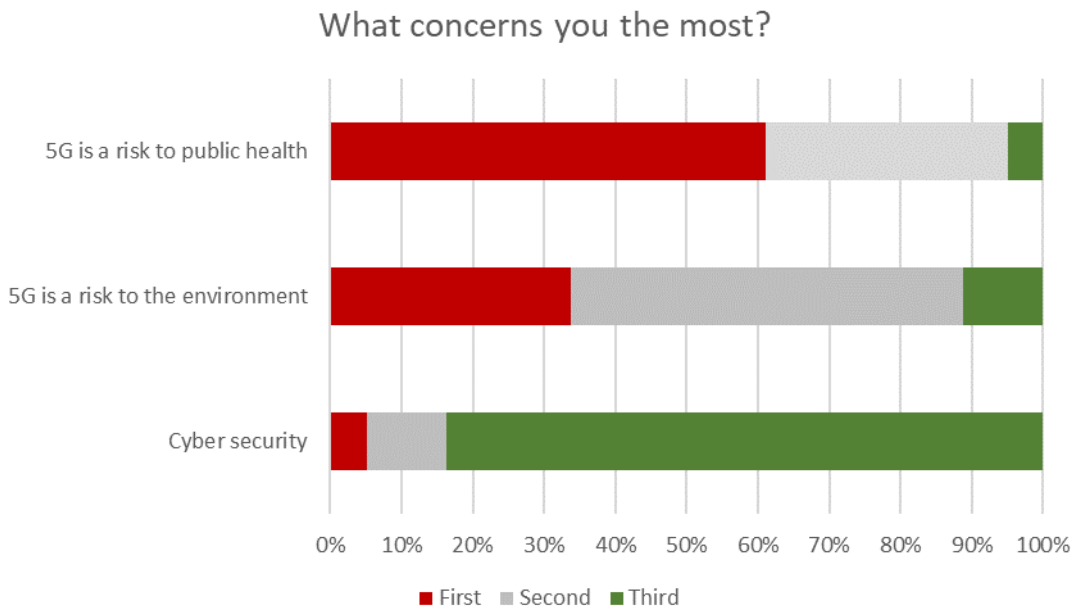
The chart over the page amplifies this finding. When asked, 91% of respondents said that not enough had been done to raise awareness of 5G, with only 5% saying that enough had been done.




## Question 4: 5G Concerns

Initial research undertaken by the scrutiny team suggested that there were three main objections to the roll out of 5G. This question was written to understand the extent to which respondents agreed on the order of priority of concerns, and to ascertain what respondents were most concerned about.

The question in full was: *'If you have concerns about 5G can you order the following statements into what concerns you the most? (skip this question if it does not apply'.*

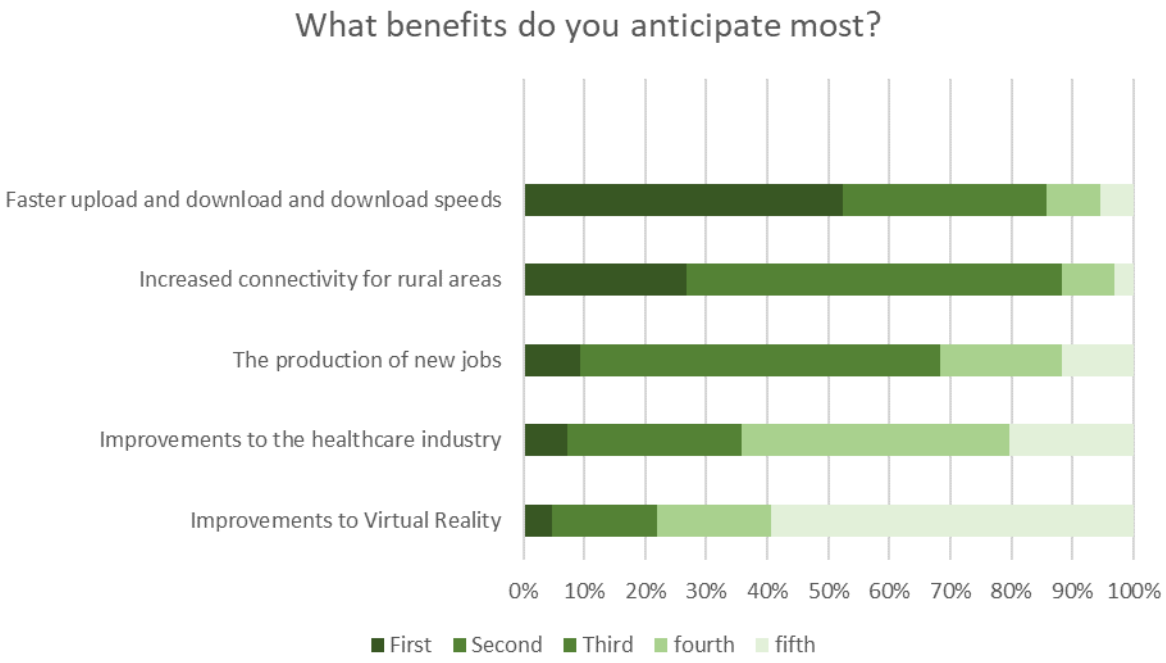


Clearly more people were concerned about public health, and the risk to the environment, with more than 60% of people putting public health as their number one priority and more than 30% putting the environment. Fewer people were concerned about cyber security with less than one in twenty putting it as their first concern.

## Question 5: Benefits

This was a difficult question for some respondents who felt that there was not the option to tick 'no benefits', and many people explained this in the free text box. Whilst this could be borne in mind for similar questions in future, question 4 regarding concerns also did not offer this option. So, for those who only saw positive impacts of 5G the same criticism would apply. Respondents could skip either question.

The question in full was: 'Can you put the following proposed benefits in order of what you anticipate the most? *(skip this question if it does not apply)'*




## Question 6. Can you explain what has led you to your viewpoint? If possible, please provide reference to any evidence and/or information that you believe we should consider.

There were significant anti-5G internet links shared as part of this question that are too numerous to list here.
As is expected with the volume of responses there was significant duplication in evidence cited.

Often mentioned, however, was that in May 2011, the International Agency for Research on Cancer (IARC) classified radiofrequency electromagnetic fields (as emitted by mobile phones) as "possibly carcinogenic to humans".[8] All scientific publications available by May 2011 were evaluated and the human evidence for an association was found to be "limited". This means that some but not all epidemiological studies showed an indication of an increased risk of cancer, but not with enough confidence to assume a causal link. The list of substances in this classification includes items such as pickled vegetables, while common products like processed meat and alcoholic drinks fall in higher categories.

Often mentioned was also the United States National Toxicology Program (NTP), which was a ten-year study to evaluate the effects of exposure to mobile phone emissions on rodent health. Animals were exposed for 10-minute on, 10-minute off increments, totalling just over 9 hours each day. Power levels used started at the highest level permitted today and extended much higher. The report found statistically significant increases in the number of rats and mice with tumours in organs at one or more of the exposure levels studied, including the brain, prostate gland, pituitary gland, adrenal gland, liver and pancreas. However, the researchers determined that these were equivocal findings, meaning it was unclear if any of these tumour increases were related to RF. "The levels and duration of exposure to RFR were much greater than what people experience with even the highest level of cell phone use and exposed the rodents' whole bodies. So, these findings should not be directly extrapolated to human cell phone usage," said John Bucher, Ph.D., NTP senior scientist. "We note, however, that the tumours we saw in these studies are similar to tumours previously reported in some studies of frequent cell phone users."[9]

The responses also often referenced that in December 2018 the journal, The Lancet; Planetary Health published an article entitled "Planetary electromagnetic pollution: it is time to assess its impact". It quoted a recent evaluation of 2266 studies (including in-vitro and in-vivo studies in human, animal, and plant experimental systems and population studies) that found that 68% demonstrated significant biological or health effects associated with exposure to anthropogenic electromagnetic fields. It concludes "This weight of scientific evidence refutes the prominent claim that the deployment of wireless technologies poses no health risks at the currently permitted non-thermal radiofrequency exposure levels. Instead, the evidence supports the International EMF Scientist Appeal by 244 scientists from 41 countries who have published on the subject.[10]

## Question 7: If you would like the Councillors to consider one thing about 5G what would it be?

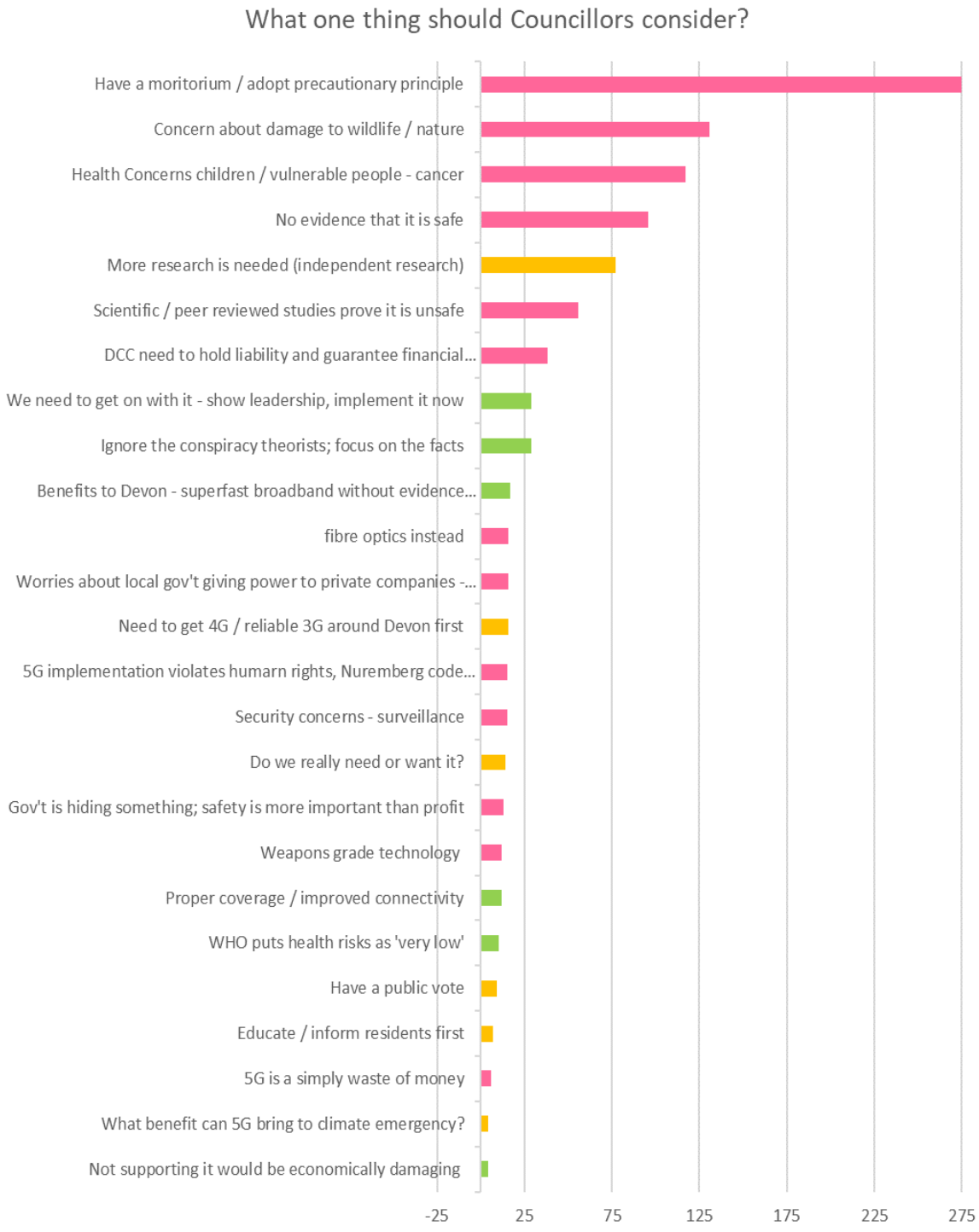
[8] International Agency for Research on Cancer, Press Release no208, *IARC Classifies Radiofrequency Electromagnetic Fields as Possibly Carcinogenic to Humans,* (31/05/2011)
[9] National Toxicology Programme, *Cell Phone Radio Frequency Radiation,* (no date) https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones/index.html
[10] Bandara and Carpenter, Planetary Electromagnetic Pollution: It Is Time to Assess its Impact, *The Lancet Planetary Health*, Volume 2, ISSUE 12, (December 01, 2018)

The responses to this question have been divided by attitudes to 5G by the researchers, using a basic traffic light colouring the free text responses to this question have been divided on the chart below depending upon the attitude expressed in the response, and then collated with similar responses to give a count.

Regarding methodology, each point made was recorded once. Although respondents were asked to make one point to Councillors, many made several, and these were each recorded as one point. For example, if a respondent said; 'have a moratorium, I am concerned about human health' this would be recorded as two separate comments. This means that the total tally will not add up to the number of respondents but is a more accurate way of recording concerns. There are several individual comments that are not represented on the graph below, and were not able to be categorised with other, similar responses.

As is clearly demonstrated the highest repeating comment is to pause or halt the roll out of 5G across the County and to not allow it, this is supported by the three comments below that received large numbers of original responses, highlighting concerns to human health, animals and nature and saying that there is no evidence that 5G is safe. Many of the comments also called for independent research to be carried out by reputable scientists, not linked to mobile technology companies and not financially benefitting from the possible roll out of 5G.

There were some vocal supporters of 5G, who called for it to be in place already.




## Question 8: Public perception of influence

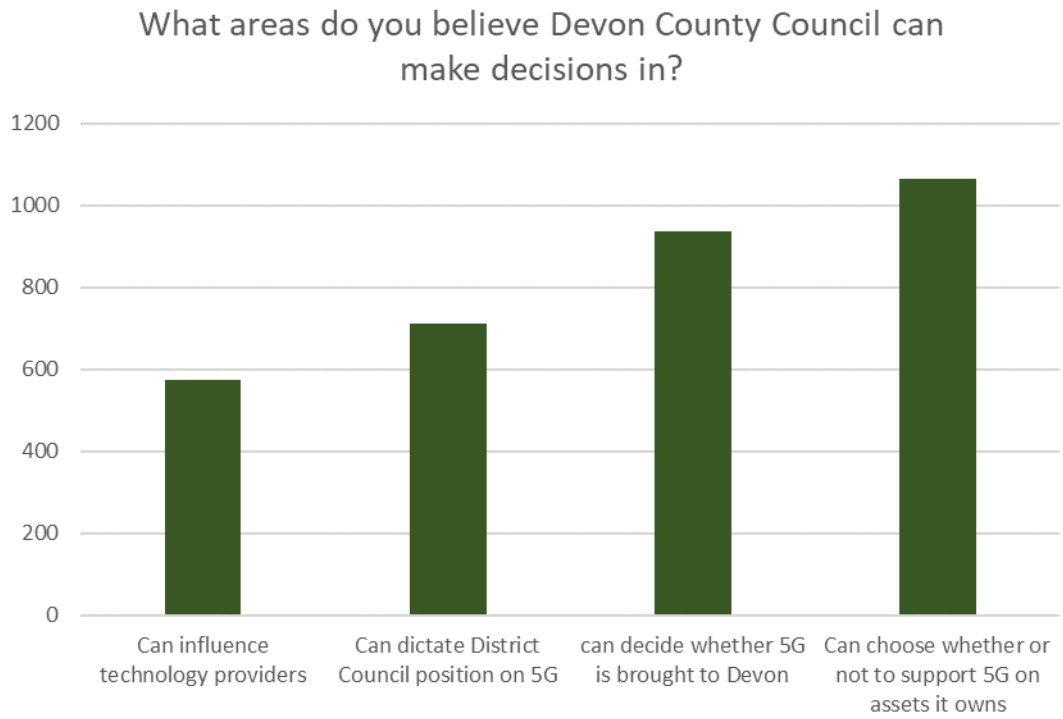
This question was asked to better understand the expectations arising from many of the protestors into the extent that the Council can influence outcomes. Respondents could tick as many boxes as they thought applied.

In some of the free text boxes individuals have reported that the County Council should not use this exercise either as a means to divest itself of power and

responsibilities, or to extend its reach to cover areas that it does not already have power. These suggestions are in no way within the scope of the spotlight review.

Most people believe that Devon County Council can exercise control over it's own assets. The situation is in fact more complicated than this, as demonstrated with reference to part 4 of this report on planning policy.

It is an issue of concern that many hundreds of people believe that Devon County Council can decide whether or not 5G is brought to Devon, and significant numbers also believe that the County Council can dictate District Council position and influence technology providers. Neither of these assertions are correct.




## 6. Focus Groups with survey respondents

6.1 The focus group sessions took the form of five sessions of multiple round table discussions over the course of a day at County Hall. Each table had as many as 10 people engaged in discussion. Each session lasted for one hour. The day was divided into 4 sessions of people with a negative view of 5G and one session of people with a positive view of 5G. There were nearly 150 people at the "negative" sessions and nine people at the "positive session". There was at least one Councillor on each table who lead the session and an officer who acted as a facilitator.

6.2 Those who responded to the initial survey were invited to this event. However, the event was shared widely on many anti-5G social media groups, so reached a larger audience than intended.

6.3 Many of the people who came into the session welcomed the opportunity to have their views heard by local councillors.

**The focus group explored the following questions:**

**Cyber security**

- What is your view on the subject?
- What questions should the spotlight review be asking about this area?

**Environmental concerns including on living things**

**(e.g. trees, bees, birds)**

- What is your view on the subject?
- What questions should the spotlight review be asking about this area?

**Human Health**

- What is your view on the subject?
- What questions should the spotlight review be asking about this area?

**Anything else not covered**

Facilitators were asked to bear in mind:

- Please try to make sure that everyone is heard
- This review has no bias, this should be upheld in the discussion with people
- This series of focus groups are not intended as committee meetings
- It is not the intention of the scrutiny team to name members of the public in their final report.

## 7. Is 5G Safe?

7.1 The spotlight review has not reviewed evidence and has not come to a local determination of safety or security of 5G technology. Local Authorities are guided by Central Government direction, law and policy frameworks. The most pertinent of these for 5G and human or environmental health is The International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Germany-based scientific body that assesses the health risks of radio broadcasts.

7.2 It has stated that 5G is safe, according to the international body in charge of setting limits on exposure to radiation, which has updated its advisory guidelines

for the first time in more than 20 years.[11] Public Health guidance is based upon the guidelines set:

*"It is possible that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or in a new area. However, the overall exposure is expected to remain low relative to guidelines and, as such, there should be no consequences for public health."*[12] Full PHE guidance can be found in Appendix 4

7.3 The Advisory Group on Non-Ionising Radiation (AGNIR) has also carried out reviews of the potential health effects of radio waves, the most recent of which was published in 2012. AGNIR was an independent scientific advisory group that reported to Public Health England until the Group completed its work and came to an end in May 2017. The Group's remit was 'to review work on the biological effects of non-ionising radiation relevant to human health and to advise on research priorities. No evidence of health effects below internationally accepted guidelines was established.[13]

7.4 Cancer Research UK has also found no correlation between mobile phone usage and cancer in this country. It reports that mobile phone ownership in the UK increased by around 500 percent between the 1990s and 2016. The brain tumour incidence rate during that same period increased by around 34 percent, and even that increase is being attributed to better detection and reporting.[14]

7.5 Perhaps the most extensive report came from Australia in 2016. Using 30 years (the time mobile networks have been operating in the country) of comprehensive health data for the entire population, it was found that there was no correlation between mobile phone usage and incidents of brain cancer. Reviewing this study, the UK NHS concluded that the size and quality of the data set used was beyond reproach, although it did not track individual risk patterns (such as the difference between heavy and light mobile users). Nonetheless, the NHS was still able to conclude that "when it comes to other risk factors for cancer, such as smoking, poor diet, drinking too much alcohol and lack of exercise, mobile phone ownership is probably not a significant risk to your health".[15]

7.6 The World Health Organisation does advocate further research:

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[11] Hern A, The Guardian, *5G confirmed safe by radiation watchdog*, (12/03/2020) https://www.theguardian.com/technology/2020/mar/12/5g-safe-radiation-watchdog-health
[12] Public Health England, *5G technologies: radio waves and health*, (03/10/2019) https://www.gov.uk/government/publications/5g-technologies-radio-waves-and-health/5g-technologies-radio-waves-and-health
[13] Health protection Agency, *Health Effects from Radiofrequency Electromagnetic Fields*, (April 2012), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/333080/RCE-20_Health_Effects_RF_Electromagnetic_fields.pdf
[14] Williams, S, *Back in the news – mobile phones and cancer,* (14/05/2014) https://scienceblog.cancerresearchuk.org/2014/05/14/back-in-the-news-mobile-phones-and-cancer/
[15] NHS, *Study finds no link between mobile phones and brain cancer*, (09/05/2016), https://www.nhs.uk/news/cancer/study-finds-no-link-between-mobile-phones-and-brain-cancer/

*'… into the possible long-term health impacts of all aspects of mobile-telecommunications. The Organization identifies and promotes related research priorities. It also develops public information materials and promotes dialogue among scientists, governments, and the public to increase understanding around health and mobile communications.'*[16]

7.7 The Government has taken action on cyber security, banning UK mobile providers from buying Huawei 5G equipment after 31 December 2020. They must also remove the Chinese firm's 5G technology from their networks by 2027. This has been in response to concerns regarding national security due to the potential access to the UK's 5G infrastructure Huawei may grant the Chinese State. "In theory, controlling the tech at the heart of these networks could give Huawei the capacity to spy or disrupt communications during any future dispute."[17]

7.8 Furthermore, as IoT devices connect to 5G networks, they could prove a tempting target for hackers and criminals. *"The sheer number of connected assets and devices heightens security challenges*," [18]

7.9 Regarding the potential environmental impact of 5G, independent research on the effects of non-ionizing radiation on flora and fauna has shown that "no clear dose–effect relationship [can] be discerned." [19] Although most agree that further research would be beneficial in this area.[20]

## 8. Conclusion

This Spotlight Review looked at concerns from Members of the public who expressed an interest in 5G and primarily listened to their concerns regarding the technology. The work undertaken summarises these concerns. These views cannot be said to be representative of the views of all Devon residents.

Whilst advice from National Bodies such as Public Health England is clear that the Technology is safe, concerns endure. Many individuals from different parts of the Country are so concerned that they have invested in different technology or ways to shield themselves from the threat they perceive. Some other Countries have also demonstrated concern, most notably Switzerland halting the roll out of 5G earlier

[16] World Health Organisation https://www.who.int/westernpacific/news/q-a-detail/5g-mobile-networks-and-health accessed Aug 2020
[17] Bowler, T, BBC, *Huawei: Why is it being banned from the UK's 5G network?*, (14/07/2020), https://www.bbc.co.uk/news/newsbeat-47041341
[18] Huber N, The Financial Times, *A hacker's paradise? 5G and cyber security*, (14/10/2019) https://www.ft.com/content/74edc076-ca6f-11e9-af46-b09e8bfe60c0
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this year amid calls for more specificity in health research[21]. This strongly supports the Spotlight Review's recommendation.

The quest for greater understanding of the science behind 5G is not helped by questionable studies and false information abounding upon the internet. This Spotlight Review acknowledges the clear benefits that 5G would bring and feels that the concerns surrounding 5G should be assessed further by national bodies. It is incumbent upon public bodies to provide transparent reassurance, backed by clear evidence in order to roll out technology with the full consent of the people of this country.

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## 10. Spotlight Review Membership

The Group was chaired by Councillor Carol Whitton and membership of the Spotlight Review was as follows:

| Corporate Infrastructure and Regulatory Services | |
|---|---|
| Councillor Carol Whitton (Chair) | Councillor Alistair Dewhirst |
| Councillor Claire Wright | Councillor Richard Scott |
| Councillor Polly Colthorpe | Councillor Jackie Hook |
| Councillor Ian Hall | Councillor Kevin Ball |

The Spotlight review would like to place on record thanks to:

- Charles Hall, work experience student, for initial research and organisation
- Dave Slocombe, Policy Team, for facilitation and research work
- The whole Scrutiny team for facilitation and correspondence responses

## 8. Contact

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Camilla de Bernhardt Lane, Head of Scrutiny Cam.debernhardtlane@devon.gov.uk

# Appendix 1: Concerns and questions resulting from the 18th February focus group sessions with members of the public

This document has been produced following the round table focus group sessions and is a summary of the fifty+ flip chart papers that were recorded on the day. The concerns recorded below are synthesised from the opinions and discussions that took place on the day. In some cases, these concerns were also discussed by the group who were positive about 5G and their responses are also recorded as 'not concerned'. There were 141 people who attended and identified as feeling negative about 5G, and nine people who attended and identified as feeling positive about 5G. This suggests that many people are concerned about 5G but the numbers cannot be used to draw inferences in the general population as individuals' self-selected attendance based upon the initial 5G survey.

The questions are drawn from the concerns and discussions, but in some instances were not voiced on the day and are included to support the Spotlight Review in its next steps.

## Background Questions

1. What is 5G? What frequencies will it use?
2. What is the history of 5G?
3. What are the positive attributes of 5G? Why is it being rolled out across the world?
4. Are the positives worth the risks?
5. What is Devon County Council's role, responsibilities and legal liabilities regarding 5G?
6. Will DCC monetarily benefit from the roll out of 5G?
7. How are other Counties approaching 5G?
8. Is there evidence to prove that it is safe?
9. What is Public Health England's stance on 5G, What is this informed by, and could they be clearer in communication with the public?
10. How independent are the International Commission on Non-Ionising Radiation Protection (ICNIRP)?
11. Is 5G defined as an environmental toxin or pollutant by insurers?
12. What is the precautionary principle, and should the council adopt it?
13. Are individuals basing their concerns on misinformation or partial reporting of scientific studies?
14. What testing has been done on the safety of 5G?

## Cyber security

| |
|---|
| Concern: personal data will be harvested and sold. |
| Concern: 'Smart decisions' will be taken out of the hands of individuals and choice will be decided by the internet of things via big business. |
| Concern: A recording system will be used to code and stratify the population based on their individual behaviour and deny resources based on this – e.g. China social credit system. |
| Concern: Personal surveillance will increase – 'big brother' including facial recognition, baby monitors being hacked, smart meters and scanning of houses. |
| Concern: 5G masts can be weaponised and remotely used to target civilians with microwave radiation for crowd control and murder.<br>Concern: National security, easier for organisations or other States to compromise security (Cambridge Analytica – influencing elections and Huawei links to the Chinese government) |

| |
|---|
| Not concerned: personal data is already collected by many agencies with limited negative effects. In fact, this can even increase safety.<br>Not Concerned: Huawei are already here, and the government is taking action to ensure National Security. |

**Questions:**

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| |
| 15. Who is collecting the data? |
| 16. How is it being used? |
| 17. What are the possible applications/implications of data harvesting? |
| 18. How much information can be recorded on individuals? |
| 19. Will additional data be collected on private individuals? |
| 20. Who/which agency controls or regulates data collection? |
| 21. What are the limits of the technology? |
| 22. What is the relationship between 5G and increased personal surveillance? |
| 23. Does the technology enable remote controlling to a dangerous point? |
| 24. Can the intensity of 5G be used to harm humans? |
| 25. Are there surveillance differences to 4G? |
| 26. At a National scale are we more vulnerable with 5G? |
| 27. Do more points of access equal more vulnerability? |
| 28. What safeguards are in place? |
| 29. Are they sufficient? |

## Environment

| |
|---|
| Concern: 5G will damage all life. |
| Concern: 2G, 3G, 4G have already decimated wildlife in National Parks in Australia |

| |
|---|
| Concern: Pollinators, especially Bees will be significantly harmed by 5G, 40% or 60% of insects have already been wiped out by the introduction of mobile phones. |
| Concern: Migratory birds and some insects navigate using electromagnetic fields, these are significantly disrupted by 5G. |
| Concern: Trees are damaged by 5G. The Woodland Trust are concerned about the damage to tree roots. |
| Concern: 5G produces increases in terpenes and makes trees more flammable. |
| Concern: Trees will be cut down to make way for 5G as they get in the way of masts. (figures 40,000 across Devon). This will contribute to flooding. |
| Concern: The ethos and appeal of Devon is as a large, rural, agricultural County. With the advent of 5G the countryside will be decimated, losing its visual appeal and harming agriculture. |
| Concern: Once 5G is rolled out there will be no way to 'opt out' |
| Concern: We are supposed to be in a climate emergency but the introduction of 5G will require huge amounts of carbon and create an energy tsunami in consumption. |

Not concerned: confusing causation with correlation, and environmental collapse is not caused by wireless technology.
Not concerned about 5G – the loss of insect numbers has not been caused by 5G, and farming has had a bigger impact.
Not concerned: Migratory birds already mange with the current 4G networks.

**Questions:**

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|---|
| 30. What is the impact of 5G radiation on DNA of plants and animals? |
| 31. Is there evidence to suggest a cumulative effect (2G, 3G, 4G + 5G) is more significant? |
| 32. Is oxidative stress attributable to 5G? |
| 33. Have environmental assessments been carried out on 5G? |
| 34. What systematic reviews are available on the effects of this technology on the environment? |
| 35. What impact have mobile networks had on insects, particularly bees? |
| 36. What anticipated effect is expected to be seen in bees with the introduction of 5G networks? |
| 37. How are birds, bats and bees navigation affected by radio waves? |
| 38. What impact will 5G have on natural navigation? |
| 39. How does 5G affect tree growth and plant immune systems? |
| 40. What are the views of the Woodland Trust? |
| 41. What agreements are in place to cut down trees across Devon? |
| 42. How many trees are estimated to need to be cut down with the advent of 5G? |
| 43. If trees are cut down will they be replaced? |
| 44. Are the figures given accurate? |
| 45. In other areas that are rolling out 5G are trees being cut down? |
| 46. Are there work arounds? E.g. in LA masts are disguised as tall palm trees, is this planned or feasible? |
| 47. What is the impact of loss of any trees on carbon reduction and climate change? |

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| 48. What might the impact be on agriculture? |
| 49. Can 'white zones' be created across Dartmoor and parts of Devon? |
| 50. What is the intended roll out across Devon? What might this look like? |
| 51. Is 5G a mostly urban technology? How does it apply in rural locations? |
| 52. How will 5G contribute to carbon emissions and energy consumption? |
| 53. What impact will 5G have on the climate? |
| 54. Will 5G consume more energy? |

## Human Health

| |
|---|
| Concern: The Public Health England guidance is out of date and incorrect. |
| Concern: Other Countries recognise electro hypersensitivity, but the UK currently does not. GPs currently do not have the awareness. People have moved from Plymouth already. |
| Is 5G the thalidomide, asbestos and smoking of our time? (publicised as being safe – but actually not) |
| Concern: 5G poses a significant risk to human health especially in children and young people because it breaks down DNA and cell structures. This includes cancer, brain tumours, neurological conditions including dementia and Parkinson's, diabetes, migraines, male and female fertility, gut bacteria, affecting pacemakers, emotional health and wellbeing including causing ADHD, autism, insomnia and suicide. WiFi also coagulates the blood. |
| Concern: There is no way to object to planning on health grounds. |
| Concern: there is a pressure to bring in 5G technology to replace aspects of the health system. |

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|---|
| Not concerned: There is no harm to people until the frequency of light – that's why its called 'non-ionising'. There is no effect upon the human body. |

**Questions**

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|---|
| 55. What evidence is PHE guidance based upon? |
| 56. How does it take account of non-heating effects of non-ionising radiation? |
| 57. Why do the NHS not recognise electromagnetic hypersensitivity? Are there plans to recognise it, and support it? |
| 58. Will the NHS add electromagnetic hypersensitivity to GP training? |
| 59. Why has there been a rise in electromagnetic hypersensitivity? |
| 60. Will there be a huge pressure on the NHS? |
| 61. What are the effects of 5G on the human body? |
| 62. Which frequencies of radiation are harmful to human health? |
| 63. Why are these conditions recognised in Sweden, but not here? |
| 64. Why are UK exposure limits to non-ionising radiation higher than other countries? |
| 65. Why have Turin, Italy, Belgium, Switzerland halted their 5G roll out plans? |
| 66. What is the role of 5G in the NHS? |

## Technology

| |
|---|
| Concern: there will be 50,000 new satellites in low orbit. |
| Concern: There will be much more dirty energy coming through our cables and into houses. |
| Concern: Beam sending, pulse radiation is more harmful and has a polarising effect on cells. |
| Concern: 5G represents a huge difference in technology, not just a step up from 4G and will have many thousands more masts. |
| Concern: Research on this subject is funded by industry and therefore not reliable, |
| Concern: there have been no independent tests. |
| Concern: The technology is always on. |
| Concern: The technology is uninsurable, and public bodies including the Council will not be insured. |

| |
|---|
| Concern: lack of scientific education and awareness could mean that the Country does not make the most of the technology. Many people are misinformed. |

| **Questions** |
|---|
| 67. How are satellites used in 5G networks? |
| 68. How does this affect the view of the sky at night? |
| 69. What is 'dirty energy'? |
| 70. Are there different types of energy, and what implications does this have? |
| 71. Will the current energy grid cope with the additional 25% requirement? |
| 72. Why aren't we using fibre cabling instead of wireless networks? |
| 73. Are 5G LED streetlights harmful? |
| 74. What is reported in the press on this issue? |
| 75. What are independent agencies saying? |
| 76. What are government agencies saying? |
| 77. What are the results from the government testbed sites across the Country? |
| 78. Can the technology be turned off? |
| 79. What are the distances that 5G affects people? |
| 80. Will the Council's insurance cover 5G, and if not why not? |
| 81. Does the Council need insurance for a service it is not providing? |
| 82. Does the Council have insurance for related things on street furniture it provides? |
| 83. If there were a legal challenge what would be the Council's position? |
| 84. How have other Council's dealt with this? |
| 85. Is the technology unsafe? |
| 86. What information is public opinion based upon? |
| 87. What information should people be listening to? |

Anticipated benefits from the 'positive' session:

- Improved faster communication
- Improvements in application of technology such as driverless cars and medical advances including remote GP appointments.
- Improve aspects of people's lives
- In the study of mice and rats the animals lived longer after being exposed.
- There is no evidence that 5G is harmful.

Department for Digital, Culture, Media & Sport

INT2019/11842/DC
November 2019

Local Authority Chief Executives

**5G - The Next Mobile Generation**

More than any previous generation of mobile networks, 5G has the potential to transform the way we live and improve economic productivity. Networks will have the capacity for millions more devices to be connected at the same time, enabling businesses and communities to operate more efficiently. It will allow cities and communities to manage traffic flow, monitor air quality and control energy usage through real-time management of high volumes of data.

A recent report estimated that local authorities will share collectively an annual £2.35 billion of efficiency savings, from reduced social care costs for the elderly through 5G monitoring, to savings through smarter street lighting.[1] We want the UK to take early advantage of these benefits, so it is good news that all of the four main mobile network operators - EE, O2, Three and Vodafone - have started to deploy 5G networks. We expect 5G to go live in up to 50 cities and towns by the end of 2020. In order to support the deployment of 5G and extend mobile coverage, particularly in rural areas, the Government recently published a consultation on the principle of proposed reforms to permitted development rights, which closes on 4 November.

The National Planning Policy Framework ("the Framework") for England[2] supports the expansion of high quality communications, including next generation mobile technology, such as 5G. The Framework states that planning applications for mobile base stations should include a statement of compliance with international guidelines on limiting exposure to electromagnetic fields known as the International Commission on Non-Ionizing Radiation Protection guidelines ("the ICNIRP guidelines"[3]). It also states: "Local planning authorities must determine applications on planning grounds only. They should not seek to prevent competition between different operators, question the need for an electronic communications system, or set health safeguards different from the International Commission guidelines for public exposure."

Public Health England ("PHE") has recently updated its advice in respect of 5G and states: "It is possible that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or in a new area. However, the overall exposure is expected to remain low relative to guidelines and, as such, there should be no consequences for public health."[4] I understand that PHE colleagues regularly provide

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[1] "The value of 5G for cities and communities", Juniper Research and O2
https://d10wc7q7re41fz.cloudfront.net/wp-content/uploads/2018/03/Smart-Cities-Report.pdf
[2] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[3] https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf
[4] https://www.gov.uk/government/publications/5g-technologies-radio-waves-and-health

advice to your public health officers across a range of health topics.

In compliance with PHE advice, mobile network operators have committed to follow the ICNIRP guidelines. ICNIRP is an independent organisation which is formally recognised by the World Health Organisation. It issues guidelines on human exposure to electro-magnetic fields, based upon the consensus view of a large amount of research carried out over many years. This includes the frequencies used by 5G and all other mobile / wireless technologies. Over the last two decades there have been over 100 expert reports on EMF and health published internationally[5] with well over 3,000 studies[6] informing these reviews and the existing scientific exposure guidelines.

Ofcom will carry out audits of mobile base stations on an ongoing basis to ensure that ICNIRP guidelines are not exceeded and publish the results of these audits on its website.

The Department for Digital, Culture, Media and Sport (DCMS) is working with colleagues in Ofcom, PHE and the network operators to provide some workshops for the benefit of council officials to help them understand the technology and the science relating to these health concerns. DCMS officials are also working with both the Local Government Association and the Association of Directors of Environment, Economy, Planning and Transport to support local authorities in this regard and would welcome any further feedback through those channels or directly.

If you or any of your colleagues have any questions, please contact DCMS at enquiries@culture.gov.uk.



**Matt Warman MP**
Parliamentary Under Secretary of State for
Digital and Broadband

[5] https://www.gsma.com/publicpolicy/consumer-affairs/emf-and-health/expert-reports
[6] https://www.emf-portal.org/en

## Appendix 3 Petition response:

## Delay 5G in the UK until there's been an independent investigation petition government response

Public Health England's (PHE) Centre for Radiation, Chemical and Environmental Hazards (CRCE) takes the lead on public health matters associated with radiofrequency electromagnetic fields, or radio waves, used in telecommunications.

Central to PHE advice is that exposure to radio waves should comply with the guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). In compliance with PHE advice, mobile network operators have committed to follow the ICNIRP guidelines. Therefore we have no plans to hold an investigation.

ICNIRP is an independent organisation which is formally recognised by the World Health Organization. It issues guidelines on human exposure to EMF, based upon the consensus view of a large amount of research carried out over many years. This includes the frequencies used by 5G and all other mobile / wireless technologies.

ICNIRP guidelines apply up to 300 GHz, well beyond the maximum (a few tens of GHz) frequencies under discussion for 5G.

Some 5G technology will use similar frequencies to existing communications systems. Other 5G technology will work at higher frequencies, where the main change would be less penetration of radio waves through materials.

PHE updated its guidance, published in October 2019, in respect of 5G and summarised its guidance as follows:

"It is possible that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or in a new area. However, the overall exposure is expected to remain low relative to the guidelines and, as such, there should be no consequences for public health."

Ofcom undertakes measurements to confirm that transmitter base stations do not exceed the limits set out in the ICNIRP guidelines. Over the last few months, Ofcom has measured 5G sites in 10 UK towns and cities and in all cases, the levels recorded are a small fraction of those in the ICNIRP guidelines.

The maximum measured at any mobile site was approximately 1.5% of those levels – including signals from other mobile technologies such as 3G and 4G. The highest level from 5G signals specifically was 0.039% of the maximum set out in the guidelines.

A summary of PHE advice on 5G can be accessed in the following links:

https://www.gov.uk/government/publications/5g-technologies-radio-waves-and-health/5g-technologies-radio-waves-and-health

https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health

ICNIRP's guidance on 5G can be found here:
https://www.icnirp.org/en/applications/5g/5g.html

APPENDIX 4 PHE Guidance **5G technologies: radio waves and health** Published 3 October 2019

Mobile telecommunications technology has developed through several generations and there are now many 2G, 3G and 4G base stations installed throughout the environment providing services to users of mobile phones and other devices.

**Public exposure**

Over the decades, since the networks were first introduced, there has been a general trend towards increasing numbers of smaller transmitters that individually provide services to smaller geographical areas and have reducing radiated powers.

Against this background, many measurements have been made and these continue to show that exposures of the general public to radio waves are well within the international health-related guideline levels that are used in the UK. These guidelines are from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and underpin health protection policies at UK and European levels.

In relation to the implementation of 5G devices and networks, this technology is at an early stage and reflects the latest evolution in mobile communications technology. Current technical standards that draw on the ICNIRP guidelines will apply to the products that are developed. UK network operators are already committed to complying with the ICNIRP guidelines.

**5G frequencies**

With the increase in the volume of information being transferred, more spectrum is being made available and the highest frequencies being discussed for future use by 5G are around 10 times higher than those used by current network technologies, up to a few tens of gigahertz (GHz).

Their use is not new, and they have been used for point-to-point microwave links and some other types of transmitters that have been present in the environment for many years. ICNIRP guidelines apply up to 300 GHz, well beyond the maximum (few tens of GHz) frequencies proposed for 5G.

**Research studies**

Exposure to radio waves is not new and health-related research has been conducted on this topic over several decades. In particular, a large amount of new scientific evidence has emerged since the year 2000 through dedicated national and international research programmes that have addressed concerns about rapidly proliferating wireless technologies.

The main focus of recent research studies has been on exposure to the types of radio signals used by current communications technologies and at the frequencies they use, up to a few GHz.

Fewer studies have been carried out at higher frequencies but the biophysical mechanisms that govern the interaction between radio waves and body tissues are well understood at higher frequencies and are the basis of the present ICNIRP restrictions. The main change in using higher frequencies is that there is less penetration of radio waves into body tissues

and absorption of the radio energy, and any consequent heating, becomes more confined to the body surface.

**Summary**

It is possible that there may be a small increase in overall exposure to radio waves when 5G is added to an existing network or in a new area. However, the overall exposure is expected to remain low relative to guidelines and, as such, there should be no consequences for public health.

PHE is committed to monitoring the evidence applicable to this and other radio technologies, and to revising its advice, should that be necessary.