Analysis and proposals on the ANSES report entitled "Exposures to electromagnetic fields related to the deployment of "5G" communication technology and possible associated health effects".

28 May 2021

Preamble

The following work was produced following the publication on 20 April 2021 of the ANSES opinion and report on 5G exposures. It is the result of a collaborative work of the signatory organizations, Alerte Phone Gate and Robin des Toits, members of the ANSES dialogue committee. It has been submitted for approval to the scientific committee of Alerte Phonegate[1] to whom we have sent an English translation of the report.

It is based on the expertise of Dr Marc Arazi, who was at the origin of the revelations of the Phonegate scandal and author of Phonegate, which [2]was released in France at the end of 2020. Our response also takes into account the work of the ECERI research group [3]led by Prof. Dominique Belpomme and is also based on the contributions of CRIIREM[4] and Mr. Pierre Le Ruz, as well as those of the SERA association.

It is also important to remember that, at its request, a report[5], drafted with surprising speed, was submitted to the government in September 2020. Entitled "*Deployment of 5G in France and around the world: technical and health aspects",* it was drafted on behalf of the General Council for the Environment and Sustainable Development, the General Inspectorate for Social Affairs, the General Inspectorate for Finance and the General Council for the Economy, Industry, Energy and Technology, thus bypassing the Anses report in order to allow **the allocation of frequencies by ARCEP** and, therefore, the deployment of 5G to proceed **without delay.**

This could not be clearer, as the authors have no health qualifications in the issue at hand.

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[1] Members of the International Scientific Committee of Phonegate Alert
[2] Phonegate, all overexposed, all deceived, all endangered by our mobile phones (Massoteditions)
[3] ECERI : European Cancer and Environment Research Insitute-eceri-institute.org
[4] Centre for Independent Research and Information on Non-Ionising Electromagnetic Radiation
[5] https://www.igas.gouv.fr/IMG/pdf/deploiement_5g_france_et_monde_aspects_techniques_et_sanitaires.pdf

Even more problematic, in terms of conflicts of interest, among the signatories of this report is Philippe Distler, former Director General and member appointed by the President of the Republic (2013-2018) of the French regulatory authority for electronic communications, posts and press distribution (ARCEP) [1]. Agency, itself in charge for the State of the implementation and sale of 5G frequencies as mentioned above.

However, the recommendations of this report concerning ANSES and ANFR are the following:

"→Make public the documents contributing to the work of the dialogue and consultation committees of ANSES and ANFR;
→ organise a formal consultation following the publication of the ANSES work on the health effects associated with the deployment of 5G;
→ Strengthen ANSES's assessment and research resources on the health effects of electromagnetic waves, particularly in the frequency bands around 26 GHz and the protocols for measuring exposure;
→ Carry out electromagnetic field measurements before/after the installation of antennas deploying 5G technology at a significant number of representative sites;
→ to study the interest and modalities of developing an individual measuring device capable of identifying the overall level of exposure per individual.

We therefore have the right to expect clear positions from the agency, just as we have the right to expect real answers about the health effects.

We also expressly request that the studies cited in the annex be taken into account and included in the report.

The purpose of this document is both to analyse the ANSES report and to set out the proposals and expectations of the signatory organisations.

[1] https://fr.wikipedia.org/wiki/Autorit%C3%A9_de_r%C3%A9gulation_des_communications_%C3%A9lectroniques,_des_postes_et_de_la_distribution_de_la_presse

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Summary

- **The various requests for a moratorium before the implementation of 5G, including the one signed in 2017 by more than 170 international experts and doctors including Prof. Dominique Belpomme and Dr. Marc Arazi, already justified by the lack of scientific studies specific to these new frequencies, are fully validated by this report by ANSES. However, although the agency acknowledges the lack of scientific data throughout the 241 pages, it does not draw the necessary conclusions. By acting in this way, ANSES, but also ANFR, which was involved in the work, is clearly and deliberately putting both the people living near relay antennas and mobile phone users at risk, relegating them to the status of guinea pigs.**

We recall the need for a moratorium at national and European level

- **This report demonstrates a total disproportion between the resources allocated to scientific studies on 5G and the hundreds of billions spent by manufacturers and operators to market these new frequencies. In France, we see the same imbalance between the sale of frequencies for nearly 3 billion euros to operators and a few hundred thousand euros reallocated by the public authorities to the protection of the population. This is even more obvious at European level through the European Commission's funding.**

The resources allocated by the State to independent scientific studies must be increased in line with public health issues.

- **The choice of ANSES to align itself without any reservations with the ICNIRP recommendations corresponds, in our opinion, to a political takeover of the agency by the supervisory ministries under the influence of the mobile phone industry lobby. Thus this report marks a very notable departure from its own previous, rather courageous reports of 2016 and 2019 (totally absent here) which allowed the Phonegate scandal to be revealed and thus highlighted certain elements of the overexposure of users to the waves of their mobile phones due to the serious failings of the ICNIRP standards in terms of protecting users' health.**

ANSES must have the independence to critically review ICNIRP's recommendations and the conflicts of interest surrounding them.

- **One of the fundamental consequences of this alignment with the ICNIRP is to recognise only the thermal effects of waves. This completely ignores all the independent scientific studies reporting non-thermal effects. The fact that at this stage there is no official consensus does not mean that ANSES should not take these possible health effects into account.**

In a context of scientific doubt, ANSES must ask the public authorities to apply the precautionary principle.

- **Considering the thermal effects of waves and their scientific consensus, ANSES, turning its back on its own recommendations (2016, 2019) concerning the poor quality of the SAR (Specific Absorption Rate) indicator for measuring the real exposure of mobile phone users, never took into account in this report their non-application by the French and European public authorities. The agency merely recalled on numerous occasions the need to stay below the regulatory limit values.**

ANSES must bring this report into line with its previous recommendations and report on health risks beyond regulatory values

- **Even more worrying, ANSES tells us that there are almost no studies measuring local exposure and absorption levels to waves from the new mobile phones. This is also the case for the ANFR, which has not published anything to date on exposure measurements for 5G mobile phones. Moreover, neither agency mentions the current impossibility of accurately measuring SAR levels resulting from the simultaneous emission of several antennas of different frequencies included in the new 5G mobile phones. This is even more true for the upcoming cohabitation of SAR and power density indicators in true 5G (24-26 GHz) smartphones.**

ANSES and ANFR must clarify these points as soon as possible in full transparency and hold the public authorities accountable

- **Concerning exposure in frequencies above 24 GHz, neither ANFR nor ANSES have really taken into account future developments concerning the need to increase in a localized manner (for example in a stadium, an office, a street) the number of micro antennas in proximity with the consequence of overexposure of people but also of all living things. This report gives a series of information about the exposure levels of the population that do not correspond to reality, with the sole purpose of underestimating them and reassuring to allow the deployment of 5G. It does not address the issue of Electrohypersensitivity, thereby forgetting its 2018 report.**

There is therefore an urgent need to be able to measure these new sources of exposure that are located at the border between near and distant sources and for which no reliable method is known

- **The ANSES referral letter (2019) did not take into account the possible environmental damage linked to general exposure to 5G, and this concerns plants, insects, and living organisms as a whole. And this report says almost nothing about this, just as it does not take into account the associated risks or the co-factors potentiating the deleterious**

effects of radiofrequencies on humans and nature or the consequences on global warming.

ANSES, and through it the public authorities, has a responsibility to protect nature and prevent risks to biodiversity and the climate.

- **The choices made in the selection of articles or studies in the bibliography and their interpretation by the members of the expert committee demonstrate, in our opinion, a political rather than a scientific approach in order to allow the government to continue the development of 5G. In doing so, ANSES has turned its back on science. It has deliberately eliminated from its demonstration all the scientific and medical work showing the effects of millimetre waves, either on health (pain treatment, cardiovascular disorders, diabetes, dermatitis, gastric ulcers, bronchial asthma, infantile cerebral diplegia, cancer, etc.) or on their use in a military context as non-lethal or lethal weapons.**

ANSES must review its entire work on the health consequences of 5G waves, in order to take into account our remarks, those of the ECERI working group and the various contributions that will certainly raise these points

Discussion

1. Prerequisite: letter of referral

This referral letter, sent to ANSES on 14 January 2019 by the Director General of Health, the Director General of Risk Prevention and the Director General of Enterprise, states in several places:

"One of the objectives of this project is to examine exposure to electromagnetic waves due to these new technological developments and to assess their possible health impact during the experimentation phase and then in the context of the first commercial deployments. It is indeed essential that an assessment be carried out from the outset in order to adapt the exposure control framework (measurement protocol) and to assess the public exposure associated with these new uses. "

In this same letter, we note with regret that the terms "mobile phone", or "mobile phone", or "Smartphone", or even "terminals", are never mentioned! This is despite the fact that mobile phones are the main source of exposure to mobile phone waves, including in the context of the development of 5G and the development of connected objects.

From the referral phase onwards, it is clear that there is a political will to try to bias the work of ANSES. This is also what emerges very clearly from the said report, which is hardly interested in the assessment of exposure to mobile phones, its potential health consequences, and the

adaptation of the exposure control framework.

This is all the more incomprehensible as the Director of Health and Risk Prevention also referred the matter to ANSES[1] on 30 October 2017:

The DGPR and the DGS ask ANSES, taking into account its recommendation of July 2016, to "... develop an indicator representative of the real exposure of mobile phone users ... you will identify the work to be carried out in order to respond to this recommendation by specifying the method and the timetable. If necessary, these elements could be brought to European level. This work must be completed by the end of 2018.
Furthermore, ANSES is asked "...to indicate whether these exceedances of SAR (Specific Absorption Rate) values as recorded by ANFR between 2012 and 2016 are likely to cause health effects..." and to study in particular the consequences for children: "...it appears that children may be more exposed than adults..."

The ANSES report entitled "Mobile phones worn close to the body and health", [2]published in October 2019, is completely absent from the report on 5G. However, the issue of overexposure to waves from our mobile phones has still not been resolved; SAR remains a poor indicator of health protection; the work to propose a new indicator has been entrusted to a pro-industry expert, Joe Wiart, known for multiple conflicts of interest. This led us to write to the Director General of ANSES on 24 March 2021[3] to challenge the recent and repeated ethical and scientific abuses of ANSES.

It should be noted that the public authorities have not taken any serious measures to inform users of the potential risks to their health, any more than the measures recommended by the ANSES in its report, which we briefly recall here:

Indeed, here is the conclusion of the report, signed by the Director General of ANSES, Roger Genet:

"The Anses repeats the conclusions and recommendations of its specialised expert committee. The mobile phones placed on the market until 13 June 2016, and potentially until 12 June 2017, were marketed under conditions of use "provided by the manufacturer" (i.e. providing for a minimum distance of use of the device ranging from 0 to 25 mm from the body, excluding the head). The majority of the phones tested by ANFR had trunk SAR values measured in contact with the body greater than 2 W/kg. As the average period of use of a phone is a few years (3-5 years), a certain number of these phones are probably still in use today. Thus, given that a significant proportion of phones placed on the market under the previous European directive (R&TTE) exceed the SAR limit value (2 W/kg) when used in the same way as they were in the past, it is likely that a number of these phones are still in use.TTE) when used in contact with the trunk, the evolution of practices which leads to an increasing proportion of use close to the body (very small distance or even zero between the device and the body), and the uncertainties on various long-term

[1] https://www.phonegatealert.org/wp-content/uploads/2018/07/Lettre-de-mission-DGS-DPR-%C3%A0-lANSES-30-10-17.pdf
[2] ANSES report 2019
[3] Letter to Mr Roger Genet, Director General of ANSES

health effects, the ***Agency recommends that measures be taken so that users are no longer exposed to SARs exceeding 2 W/kg emitted by phones certified under the R&TTE directive (placed on the market until 13 June 2016 or even until 12 June 2017). To this end, the Agency considers that measures taken by manufacturers similar to those taken for phones placed on the market after 13 June 2016 and appearing to be non-compliant following ANFR inspections in 2017 would make it possible to achieve this objective: software updates, phone recalls, etc.*** *Pending the implementation of such measures, the Agency invites users of these devices to comply with the instructions for use (distance) mentioned by the manufacturers in the manuals, when they are placed close to the body.*

Finally, ***the Agency recommends that the normative provisions on the distance of radio devices that can be placed close to the body should be changed so that SAR compliance measurements are carried out at contact (0mm)****.* »

2. 5G deployment and associated public controversy (p19-58)

We consider that this entire chapter has no place in a scientific report. In our opinion, it does not provide any scientific element that would justify its retention in the final report. Worse, it dilutes the content in an attempt to give it weight. Even more worrying is the content of the report: it completely overlooks the predominant weight of the mobile phone industry in the shareholding of a majority of media in France and its direct consequences on an editorial policy dictated by the weight of industry.

Furthermore, we strongly criticise the choice of The Conversation, which is known to be a pro-mobile phone industry site that exclusively conveys information and language that promotes a total denial of risk.

Finally, and most seriously, the authors of the study, David Demortain and Aurélien Feron, who interviewed the members of our organisations, totally failed to faithfully convey the meaning of our interviews. Thus, in the midst of the Phonegate scandal, not a single reference is made to this deception by manufacturers on the levels of exposure to mobile phone waves, nor to its consequences in the development of 5G.

Similarly, the report on the hearings of other associations such as Robin des Toits remains extremely reductive and does not allow us to present the arguments and the amount of scientific and technical information developed, which a simple consultation of the site could have given a small idea of.

We have therefore written to David Demortain by email to ask him about these and other points and you will find our exchanges in the annex.

We therefore call for its removal from the final report. We also wish to see the removal of the title The conversation from the annexes of the report, which clearly shows a bias factor in its drafting. Moreover, for Mr. Demortain*: "Concerning The Conversation, it does not seem to me that we put forward this source. I can't even find any mention of the site in our reports-but it*

would be a mistake to do so. »

To conclude this section, we do not appreciate the instrumentalization of the associations and their leaders by the authors of the report. We would like to refute the unfounded assertion that Phonegate Alert (PA) is a split from Priartem. AP has an international vocation and its objective since its creation three years ago (2018) is to work with organisations, scientists and health professionals in some fifty countries, including France.

3. Terminological aspects

ANSES, under the pretext of popularisation, continues to use inappropriate physical terms:

- The translation of the term radiofrequency is not "radiofrequency" but "radio frequency".
"Great care must be taken when reading the bibliography, as in the Anglo-Saxon literature the term "radiofrequency" refers to all radio waves and therefore includes radiofrequency and microwave radiation. This can lead to misinterpretation of the available literature. [1]

- In the same document, millimetre and centimetre waves are clearly differentiated (p. 17) :

Tableau 2
Champs ELF et ondes radioélectromagnétiques

Gamme du spectre	Sigles*	Longueurs d'onde	Fréquences
Extrêmes basses fréquences	ELF	> 30 km	> 0 Hz à 10 kHz
Radiofréquences	VLF LF MF HF VHF	10 km à 30 km 1 à 10 km 100 m à 1 000 m 10 à 100 m 1 à 10 m	10 kHz à 30 kHz 30 kHz à 300 kHz 300 kHz à 3 MHz 3 MHz à 30 MHz 30 MHz à 300 MHz
Hyperfréquences	UHF SHF EHF	1 dm à 1 m 1 cm à 1 dm 1 mm à 1 cm	300 MHz à 3 GHz 3 GHz à 30 GHz 30 GHz à 300 GHz

The 5G frequencies that are being introduced at this stage of development are centimetre waves and cannot be confused with millimetre waves.

[1] INRS, in the document entitled "Champ électrique Champ magnétique, onde électromagnétique à l'usage du médecin du travail et du préventeur", Ed 785, p.70 .

4. 5G exposure data

4.1. ICNIRP and its guidelines

There is considerable controversy surrounding the International Commission on Non-Ionising Radiation Protection (ICNIRP) [1]and its role in setting recommendations to protect the health of mobile phone users. This is supported by numerous international publications showing a range of reasons why states and health agencies should step back from this organisation and its 'experts'.

We would therefore like this controversy to be explicitly included in the final report.

We provide you with several elements justifying this position:

- The report on the conflicts of interest of ICNIRP experts by MEPs Michèle Rivasi and Klaus Buchner[2]**, which concludes with a reminder:**

  "In addition to the fact that some ICNIRP members are simultaneously members of the International Committee on Electromagnetic Safety (ICES) of the Institute of Electrical and Electronics Engineers (IEEE), registered in the United States, we have seen the close cooperation of ICNIRP members with ICES, the International Committee on Electromagnetic Safety of the Institute of Electrical and Electronics Engineers (IEEE). The IEE brings together many actively and structurally involved professionals from the media, telecommunications and military industries.
- *Under the current leadership of the ICNIRP, these links have been further strengthened "with the aim of setting internationally harmonised safety limits for exposure to electromagnetic fields". This can be seen as a potential real conflict of interest.*
- ***It is clear from the ICES minutes[3] that ICNIRP worked very closely with IEEE/ICES on the creation of the new RF safety guidelines that were published in March 2020. This means that major telecoms companies such as Motorola and others, as well as the US military, had a direct influence on the ICNIRP guidelines, which still form the basis of EU policies in this area***."

- Many French and international investigative media[4] have highlighted the existence of proven conflicts of interest. For example, a team of journalists from Investigate Europe devoted no less than 22 articles to this subject in 2019.

[1] The International Commission on Non-Ionizing Radiation Protection
[2] https://www.michele-rivasi.eu/wp-content/uploads/2020/06/ICNIRP-rapport-FR-FINAL-JUIN-2020.pdf
[3] https://www.ices-emfsafety.org/wp-content/uploads/2017/08/TC95-Minutes-SC3-SC4-January-2017.pdf
[4] https://www.investigate-europe.eu/en/2019/how-much-is-safe/

- Many independent scientists denounce the unscientific nature of the ICNIRP's work, such as Finnish Professor Dariusz Leszczynski[1] and Swedish Professor Lennart Hardell[2] who, in an article published in 2020, said of their work on 5G:
  "*Conflicts of interest and industry links appear to have contributed to biased reporting. The lack of a proper and unbiased risk assessment of 5G technology puts people at risk. In addition, it appears that a cartel of individuals is monopolising the assessment committees, reinforcing the risk-free paradigm. We believe that this activity should be labelled as scientific misconduct.*"
  This is also what Dr Joel Moskowitz, one of the authors of the study (Choi et al, 2020)[3], based on a meta-analysis showing that exposure to one's mobile phone for 1000 hours or more or for 17 minutes a day for 10 years is associated with a 60% statistical increase in the risk of brain tumour. Thus, following its publication in the International Journal of Environmental Research and Public Health (IJERPH), two members of the ICNIRP commission (Röösli, Karapidis) engaged in a full-scale critique of this work. This practice of scientific harassment is characteristic of ICNIRP and is detailed in this article[4]!

- The decision of the Court of Appeal of Turin[5] in a landmark ruling in January 2020. In effect the Court recognises that scientists funded by the telephone industry, or members of the ICNIRP, are less reliable than independent scientists:

"Much of the scientific literature that rules out the carcinogenicity of RF exposure, or at least maintains that research to the contrary cannot be considered conclusive... is in a position of conflict of interest, which is not always asserted: see in particular on page 94 of the report, the applicant's defence (not challenged by the other party) that the authors of the studies indicated by INAIL, named by name, are members of ICNIRP and/or SCENIHR, which have received, directly or indirectly, funds from industry. P. 33. »

CTU Turin states:

"It is considered that less weight should be given to studies published by authors who have not declared conflicts of interest. In this case, conflict of interest situations may arise in relation to the assessment of the health effect of radio frequencies, for example:
1. cases where the author of the study has advised the telephone industry or received funding for studies from the telephone industry
2. if the author himself is a member of the ICNIRP. »

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[1] https://betweenrockandhardplace.wordpress.com/2021/03/22/overwhelming-power-of-icnirp-opinions-through-backing-from-gsma-mwf-telecoms-who-and-governmental-agencies-like-arpansa-bfs-tno-stuk-et-al-meekly-follow-and-disseminate-misinformation-on/
[2] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7405337/
[3] https://www.mdpi.com/1660-4601/18/3/1073
[4] https://www.saferemr.com/2020/11/new-review-study-tumor-risk.html
[5] https://www.phonegatealert.org/wp-content/uploads/2020/01/Décision-cour-dAppel-de-Turin-janv-2019.pdf

4.1.2 Guidelines published in 1998

We would like the report to state explicitly that these recommendations, which have been incorporated into European legislation, are at the root of the so-called "Phonegate" scandal, which has highlighted the overexposure of all mobile phone users for the past 30 years, well above the regulatory limits established for the thermal effects of waves and measured by the Specific Absorption Rate (SAR).

In this regard, we are more than surprised that the conclusions of ANSES, in its 2016 report[1] on SARs, are not even mentioned in this 2021 report. Even more worrying is the total absence of any reference to the ANSES report of October 2019 on the health risks of mobile phones worn close to the body.

So here is a quick extract from the ANSES opinion in its 2016 report p 6/17 :

"*Local SAR measurements of mobile phones in contact with the body carried out in 2015 by ANFR showed, based on a sample of mobile phones, that the resulting exposure can sometimes be high: **of the 95 mobile phones sampled by ANFR, 89% of them measured in contact with the body had a SAR greater than 2 W/kg and 25% a SAR greater than 4 W/kg**. In addition, the instructions for use of 25% of the phones tested with a body contact SAR greater than 2 W/kg did not indicate a minimum distance for use.*

Numerical modelling of head exposure shows that, for anatomical reasons (size, weight) or due to the dielectric properties of young or immature tissues, children may be more exposed than adults, particularly in the brain areas closest to the skull.

*In addition, studies that have assessed whole-body SAR report higher exposure levels for children than for adults, particularly in two frequency ranges: around 100 MHz and around 1 to 4 GHz. The SAR can then exceed the basic restrictions by 40% when exposure is equal to the maximum permitted level for adults (reference levels). **This means that for anyone shorter than 1.30 m, the regulatory exposure limits are less appropriate**.* »

The choice of inappropriate distances for testing mobile phones (between 15 and 25 mm from the skin) until June 2017, the choice of testing values on 10 g of tissue instead of 1 g (FCC), the duration of exposure, the size of the dummy, etc., have resulted in hundreds of millions of users being exposed to actual SAR levels far in excess of the levels that should not be exceeded.

Indeed, new evidence in our possession shows that since 2016 our fears concerning overexposure linked to the choice of a 10 g or 1 g SAR measurement are perfectly justified.

The journalists of France Télévision had SAR tests carried out for 1g and 10g for the

[1] ANSES report 2016 Radio frequency exposure and children's health

"Complément d'enquête" programme broadcast on 12 November 2020[1]. They entrusted the ART-FI company[2], which specialises in SAR measurements, with 11 different mobile phones, both new and second-hand, from HUAWEI, APPLE, SAMSUNG, XIAOMI and NOKIA. They then sent us these measurements for analysis.

For example, a new iPhone 8 tested on the rear panel at 2535 MHz:
- at 5 mm for 10 g (1.251 W/kg) and for 1 g (3.226 W/kg)
- at 0 mm for 10 g (3.298 W/kg) and for 1 g (10.168 W/kg)

All the measurements carried out show an increase in SAR when tested on 1 g of tissue according to the American standard of the Federal Communication Commission (FCC). Thus the second-hand iPhone 5 tested at 0 mm reached a SAR of over 12 W/kg (i.e. more than 3 times the authorised limit in Europe and the United States of 4 W/kg).

This is also confirmed by Professor Om Ghandi's[3]article based on the test reports published by the ANFR, which states

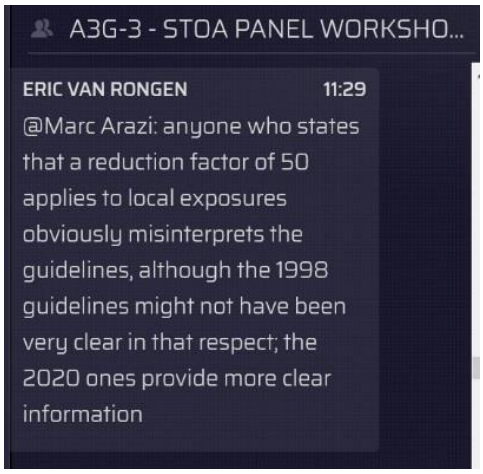
"The ICNIRP guidelines state that the SAR at 10 g, under actual use conditions, should not exceed 2 W/kg and the FCC requires compliance with IEEE C95.1-1991 [1] which is set in terms of a SAR at 1 g of 1.6 W/kg. It has been shown in peer-reviewed publications [4], [6] that due to the relatively shallow penetration of RF energy coupled to tissues, the SAR at 1 g is generally 2.5 to 3 times higher than the SAR at 10 g.

For mobile phones held against the pinna, the measured SAR at 1 or 10 g will also be much higher if SAM had not used the lossless artificial plastic spacer instead of the human pinna simulating the tissue. As shown in [5] and [6], the plastic cone spacer artificially separates the radiating mobile phone antenna by up to 10 mm of additional spacing for RF-coupled regions of the head, resulting in an underestimation of the SAR at 1 g and 10 g by a factor of 2 to 4. This factor of 2 to 4 for the higher SAR is also confirmed by the results measured by ANFR in Table 1 where higher SAR values are reported in columns 3 and 4 which are for separation distances of 15 and 5 mm respectively. »

Furthermore, why did ICNIRP Vice President Eric Van Rongen wait more than 20 years to point out that the safety factor of 50 around SAR, which is supposed to protect the health of users and which is included in the 1999 European Directive, did not concern local SARs, even though this information has been included on all official government sites since then?

[1] https://www.francetvinfo.fr/replay-magazine/france-2/complement-d-enquete/complement-d-enquete-5g-londe-dun-doute_4152949.html
[2] https://www.art-fi.eu/
[3] Microwave Emissions From Cell Phones Exceed Safety Limitd in Europe and the US When Touching the Body, IEEE, 2019

Confirmation during a working meeting at the European Parliament via an exchange between Marc Arazi and Eric Van Rongen via this screen shot :



www.radiofrequences.gouv.fr/exposition-du-public-a70.html

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FAQ

Exposition du public

publié le 7 août 2017 (modifié le 13 mars 2018)

+ PARTAGER

A quelles sources de champs électromagnétiques sommes-nous exposés dans la vie quotidienne ?

Les individus évoluent dans un environnement baigné en permanence par des ondes électromagnétiques et en particulier par des radiofréquences. Les applications émettant ces radiofréquences sont multiples : radio, télévision, téléphonie mobile, Wi-Fi… et les technologies évoluent très rapidement. Les situations d'exposition se sont également diversifiées : elles ont lieu au domicile, sur le lieu de travail, mais aussi lors des déplacements…

Pour savoir plus, consultez la rubrique "sources d'exposition"

Les valeurs limites d'exposition garantissent-elles la sécurité sanitaire du public ?

Les valeurs limites d'exposition actuellement en vigueur garantissent la sécurité sanitaire du public par rapport aux effets avérés des ondes radiofréquences, c'est à dire les effets thermiques à court terme (échauffement des tissus).

Pour garantir la sécurité sanitaire du public, les scientifiques définissent un seuil critique comme étant le niveau d'exposition à partir duquel il est possible d'observer le premier effet thermique ayant des conséquences sanitaires chez l'animal. Un facteur de sécurité de 50 est alors appliqué à partir de ce niveau afin d'obtenir une valeur limite d'exposition cinquante fois inférieure pour la population générale. Appliquer un facteur de sécurité permet de prendre en compte les incertitudes scientifiques pouvant exister (liées par exemple à la méthode d'extrapolation des résultats des études de l'animal à l'Homme).

Pour en savoir plus, consultez la sous-rubrique"Elaboration de valeurs limites d'exposition"

Quelles sont les valeurs limites pour le DAS ?

Les terminaux radioélectriques, notamment les téléphones portables, ne doivent pas dépasser des valeurs limites de DAS. Ces niveaux sont définis par la recommandation européenne 1999/519/CE. Ils sont repris dans la réglementation française par l'arrêté du 8 octobre 2003 fixant les spécifications techniques applicables aux équipements terminaux radioélectriques.

Ces valeurs limites découlent des travaux de la Commission internationale de protection contre les rayonnements non ionisants, l'ICNIRP . En 1998, l'ICNIRP s'est prononcée au vu de l'état des connaissances scientifiques disponibles et n'a retenu que les effets avérés de l'exposition aux ondes, notamment l'échauffement des tissus. Sur ce point, un coefficient de sécurité de 50 a été retenu pour fixer les limites de DAS. L'ICNIRP assure une veille continue des avancées scientifiques dans le domaine et n'a pas, jusqu'à présent, révisé ces valeurs limites.

We therefore ask for a complete reworking of this part, integrating all the elements, including the main elements of the ANSES reports of 2016 and 2019.

As a reminder, mobile phones are the primary source of human exposure. And this point will be even more important regarding the exposure of millions of users to 5G phones. We will come back to this, knowing that this point is almost absent from this report. Only a few lines mention the potential risks.

This is also the case for exposure to connected objects, which is not included in the elements of this report, contrary to the request of the public authorities. It therefore seems to us legitimate and necessary for ANSES to respond.

4.1.3 ICNIRP Guidelines issued in 2020

These guidelines, still based solely on the thermal effects of waves, are just as controversial as the previous ones. The refusal to take into account non-thermal effects still shows how this organisation is only there to spread language.

It is worth noting that in April 2020, four years after the Phonegate alert, the ICNIRP introduced the safety factor of 10 for local SARs for the general public. We see this as a timely attempt to avoid legal risk for mobile phone manufacturers. This is the hallmark of the ICNIRP.

However, public authorities and ICNIRP continue to ignore the recommendations of the ANSES report of July 2016 (page 15/17), namely concerning both distant (antennas) and nearby sources of exposure, and the specific case of children:

"The Agency recommends, in this context, that the reference levels for limiting environmental exposure to radio frequency electromagnetic fields (related to distant sources) be reconsidered, in order to ensure sufficiently large safety margins to protect the health and safety of the general population, and especially of children...
With regard to near-field exposures induced by the use of mobile communication devices, the Agency considers that it is necessary to: reassess the relevance of the specific absorption rate (SAR) used for the establishment of limit values for personal exposure, for the purposes of protection against the known and proven health effects (thermal effects) of radiofrequencies; and develop an indicator representative of the actual exposure of mobile phone users, regardless of the conditions of use: signal used, good or poor reception, mode of use (call, data loading, etc.). »

4.2 Near field exposure

As the report rightly points out: "*Exposure of the head or any other part of the body to a source placed in this area below $\lambda/(2\pi)$ is difficult to determine, due to the particularly complex coupling in this area.*"

But this is not the only point that makes the measurement complex. Indeed, the presence of several antennas in the phone (3G, 4G, wifi, etc.), the "all connected" and the emission of several simultaneous frequencies will make it almost impossible, at this stage of knowledge, to make a reliable and realistic measurement of the exposure of the head or the body. Moreover, this is a point that is hardly detailed by the ANFR, which is supposed to ensure exposure levels. So what about the desire to develop a technology for 5 billion users without knowing the consequences in terms of exposure ("*exposure levels <u>should</u> be low*")?
It is also noteworthy that it is the GPP grouping that is cited as a reference here. As a reminder, this group is once again a direct emanation of the mobile phone industry.

4.2.1. International comparisons

We propose that, in order to obtain a satisfactory overall view, a summary table be drawn up incorporating the DAS levels for the countries concerned.

United States (p78)

The presentation, especially concerning devices close to the body, is too simplistic and does not correspond to reality. In fact, as early as 1996, the FCC[1] introduced standards that are more protective than those of the ICNIRP. Thus, the exposure level on 1 g of tissue is completely disregarded instead of 10 g for the ICNIRP. This results in a threefold reduction of the SAR level.

See the elements presented here p 8 and 9 with the article by Pr Om Ghandi in the IEEE magazine and the measurements made by the Art Fi laboratory for Complément d'enquête.

It is therefore completely inaccurate to talk about 80% of the basic restrictions...an American being at least three times less exposed than a European simply because of the measurement on 1 g of tissue instead of 10 g.

Concerning Russia, it is worth noting that SAR is not used as a unit of measurement and that the exposure level is four times lower!

For Switzerland, we would like it to be clarified that, according to Berenis' letter of July 2020 concerning the new ICNIRP standards: "*Radiation from mobile terminal devices (e.g. mobile phones) is not subject to the precautionary principle contained in the Environmental Protection Act*"

It is therefore absolutely essential to allow a comparison of exposure limit values, and to do so without taking into account the misleading information on safety factors (see above).

4.2.2. Evolution of limit values in the context of 5G deployment

Mobile phones :

It should be noted that, once again, there is no mention of exposure to mobile phones!

Technological developments leading to 5G in the sub-6 GHz frequency band (p81-108)

Only a few lines are devoted to nearby sources, p 90 and 105, which are blatantly inaccurate.

We ask that the teams and work mentioned on page 90 be specified.

[1] **Federal Communication Commission**

As a reminder, there is also a DATA base[1] of SAR monitoring measurements published as a result of the legal actions of Dr Arazi and Alerte Phonegate against the ANFR.

4.3 Far field exposure

Measurements on 5G sites not yet fully operational in France

The report states:

"Taking into account the above-mentioned reduction factor of 13.5 dB and an antenna gain of 24 dBi, the exposure indicator for this 5G link would be 1.1 V/m and 1.8 V/m, respectively for a transmission power of 80 W and 200 W.
This method of calculating an exposure indicator has been integrated into the "National guidelines on the presentation of simulation results of exposure to waves emitted by radio installations" published by the ANFR (ANFR 2019c). "

The estimated values in the various scenarios are therefore in the order of 1 to 2 V/m, which is already two to ten times the 2011 recommendations of the Council of Europe, whose figures are not quoted (o.6 V/m while waiting to reach o.2 V/m).

But what will really happen?
The ANFR itself gives much higher values in urban areas in certain cities (up to 4 V/m)[2].

As a counterpoint, a concrete example of an antenna project on a building in the 15th arrondissement of Paris, which already has a radio station, and on which the operators Bouygues and Free want to add real 5G at 3500 MHz.

We find (extract from the tables of technical characteristics given by each operator on their information file at the town hall[3]):

For Free,
3G antennas with a maximum power of 30 DBW or 1000 Watts
4G antennas 33 DBW or 2000 Watts, double that of 3G,
5G antennas 47.6 DBW or 57,000 Watts or 20 times the power of 4G !!!!

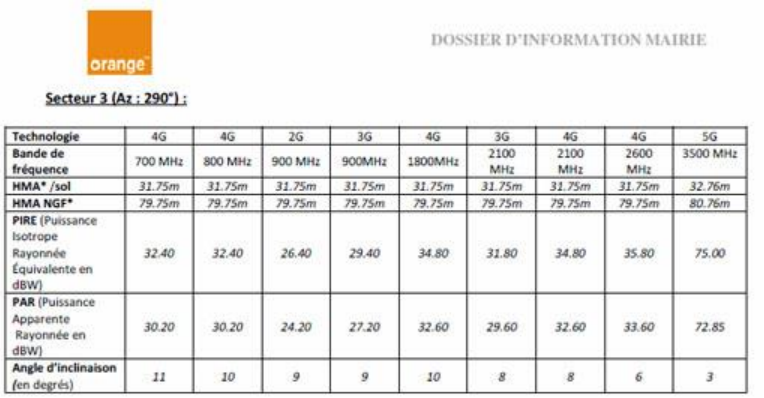
For Bouygues,
3G antennas 28 DBW or 630W
4G antennas 35 DBW or 3200 Watts
5G antennas 46.7 DBW or 46700 Watts.

[1] https://data.anfr.fr/explore/dataset/das-telephonie-mobile/
[2] https://www.anfr.fr/controle-des-frequences/exposition-du-public-aux-ondes/la-mesure-de-champ/observatoire-des-ondes/
[3] IMG files submitted to the town hall of the 15th district of Paris

A quick calculation**, considering only one 5G antenna,** gives an electromagnetic field of **12 V/m at 100m. The ratio is therefore a factor of 10!**

To this should be added algebraically all the power values of the other antennas!

Worse: in an IMD file submitted by the operator Orange to the town hall of the 18th arrondissement, for a building also located in Paris, an EIRP of 75 dBw for a single 5G antenna, which corresponds to a power of 31622000 Watts, giving a theoretical exposure of 300 V/m at 100m!



orange

DOSSIER D'INFORMATION MAIRIE

Secteur 3 (Az : 290°) :

Technologie	4G	4G	2G	3G	4G	3G	4G	4G	5G
Bande de fréquence	700 MHz	800 MHz	900 MHz	900MHz	1800MHz	2100 MHz	2100 MHz	2600 MHz	3500 MHz
HMA* /sol	*31.75m*	*31.75m*	*31.75m*	*31.75m*	*31.75m*	*31.75m*	*31.75m*	*31.75m*	*32.76m*
HMA NGF*	*79.75m*	*79.75m*	*79.75m*	*79.75m*	*79.75m*	*79.75m*	*79.75m*	*79.75m*	*80.76m*
PIRE (Puissance Isotrope Rayonnée Équivalente en dBW)	*32.40*	*32.40*	*26.40*	*29.40*	*34.80*	*31.80*	*34.80*	*35.80*	*75.00*
PAR (Puissance Apparente Rayonnée en dBW)	*30.20*	*30.20*	*24.20*	*27.20*	*32.60*	*29.60*	*32.60*	*33.60*	*72.85*
Angle d'inclinaison (en degrés)	*11*	*10*	*9*	*9*	*10*	*8*	*8*	*6*	*3*

Question about the attenuation factor proposed by ANFR (*Lignes directrices nationales sur la présentation des résultats de simulation de l'exposition aux ondes émises par les installations radioélectriques*[1]*):***

The text says:

"For mobile phone service using steerable beam antennas, the higher variability of exposure requires a new 6-minute reduction factor corresponding to scanning the beam for 4.4% of the time in a given direction, or 13.5 dB. This factor corresponds to a 1 GB download in a given direction with an average data rate of 500 Mbps. This factor may be reviewed as usage changes."

In this case, the application to a radiation giving an electromagnetic field of 12V/m at 100m (by the classical formula) would then be only 12/22.4=0.53V/m. (22.4 corresponding to 13.5 dB)

[1] https://www.anfr.fr/fileadmin/mediatheque/documents/5G/consultation/consultation-5G-Lignes-directrices-nationales.pdf

This "attenuation", which has no real scientific basis, is used by operators for exposure simulations. It thus makes it possible to give low and reassuring values which in no way correspond to the health risks incurred.

We therefore believe that the data provided in the report is far from reality and does not reflect the observations on the ground.

Concerning the assessment of the level of exposure in the frequency bands below 6 GHz.

The Council of Europe Recommendation of 12 July 1999 (1999/519/EEC) [1]and the French Decree No. 2002-775[2] indicate values between 27 and 87 volts/meter as limit values for public exposure, depending on the frequency. Moreover, the ANFR protocol insists on averaging over 6 minutes. This does not correspond to the regulatory requirements. The limit value is a maximum value that should not be exceeded, compared with another maximum value.

The 5G measurements presented by the ANFR, which are included in the ANSES report, do not correspond to ARCEP's data on the power of 5G antennas tested in 2020 in various French cities. The forecasts made are based on average traffic projections, over 6 minutes, which are completely random. All the more so as 5G aims to develop connected objects in the 26GHz band. No indication is given on the measurement method.

***However, in the ANFR document of April 2020: Assessment of public exposure to 5G electromagnetic waves*:** the following can be found [Component 2] results of measurements in the 3400-3800 MHz band):

Chapter 5.1 Exposure indicator
"The interest of this indicator is that it allows a calculation of exposure in real conditions by applying a reduction factor in relation to the theoretical maximum power" ANFR

Tables page 32

4G	Actuelle	Future
Puissance maximale	60 W	160 W
Gain maximal de l'antenne	18 dBi	18 dBi
Atténuation sur 6 minutes	- 4 dB	- 4 dB
Vitrage	- 2 dB	- 2 dB
Champ E estimé à 100 m	**1,7 V/m**	**2,8 V/m**

Tableau 9 : estimation du niveau de champ électrique à 100 mètres d'une antenne 4G à l'intérieur d'un bâtiment avec une hypothèse de puissance typique actuelle et une hypothèse de puissance future.

[1] https://op.europa.eu/fr/publication-detail/-/publication/9509b04f-1df0-4221-bfa2-c7af77975556
[2] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000226401/

5G	Hypothèse basse	Hypothèse haute
Puissance	80 W	200 W
Gain	24 dBi	24 dBi
Atténuation sur 6 minutes	- 13,5 dB	- 13,5 dB
Vitrage	- 2 dB	- 2 dB
TDD	- 1,25 dB	- 1,25 dB
Champ E estimé à 100 m	**1,1 V/m**	**1,8 V/m**

Tableau 10 : estimation du niveau de champ électrique à 100 mètres d'une antenne 5G à l'intérieur d'un bâtiment avec une hypothèse de puissance basse et une hypothèse de puissance haute.

Summary results of the simulations (5G report page 100/241) :

Le Tableau 15 permet de comparer le champ dû à la 5G seule à celui de l'état initial ou de la 4G optimisée. Il précise le niveau moyen mesuré mais également le pourcentage de points dits « atypiques » pour lesquels le niveau d'exposition dépasse 6 V/m.

Tableau 15 : Comparaison des valeurs de champ, calculées au niveau de façades pour divers scénarios.

	Niveau moyen (V/m)	Pourcentage des points supérieurs à 6 V/m
État initial	1,1	0,6 %
4G optimisée	1,8	3,2 %
5G seule	1,4	1,1 %

À la différence du Tableau 15, le Tableau 16 envisage le cas du majorant 5G pour lequel la 5G cohabite avec la 4G optimisée. La colonne de droite du tableau donne la valeur du champ qui pourrait être égale ou dépassée sur 1 % des points de mesure.

Tableau 16 : Niveaux des champs calculés pour divers scénarios. Les 2 valeurs successives indiquées dans le Tableau correspondent à des points situés respectivement à une hauteur de 1,5 m au-dessus du sol et sur le devant des façades.

	Niveau médian (V/m)	Niveau moyen (V/m)	Niveau pour le 99e percentile (V/m)
État initial	0,6 – 0,8	0,8 – 1,1	2,9 – 4,8
4G optimisée	1 – 1,3	1,3 -1,8	4,8 – 8,6
Majorant 5G	1,5 – 1,8	1,7 – 2,3	5,6 – 10,4

Dans le Tableau 16, la valeur médiane prévisible en « état initial » de 0,6 V/m est comparable à la valeur de 0,52 V/m qui a été mesurée en milieu urbain sur différentes zones du territoire (ANFR 2018). On remarque de plus que les calculs effectués pour des points de réception situés sur l'ensemble des façades mènent à des valeurs supérieures de 20 à 30 % à celles calculées au voisinage du sol. Cela s'explique par la présence d'un espace plus dégagé quand on s'élève au-dessus du sol, les émetteurs étant généralement situés sur des points hauts.

"Assuming the addition of 5G transmitters to the optimised 4G deployment (5G Majorant), the average exposure level in the whole mobile phone band would increase by about 30% and would become, at ground level, equal to 2.9 V/m in the initial state and 5.6 V/m for the 5G Majorant..."

"Statistical variations in field strengths were calculated by introducing ***a stochastic model*** of the cities, and the results were then fed into a simplified 4G network simulator...". [1]

These tables are based on average values to which reduction factors have been applied.

[1] ANFR (5G report page 101/241)

First of all, in the principle for calculating the indicator proposed by the ANFR, it is proposed to reduce the level of exposure by a factor of 13.5 dB compared to a permanent transmission for 6 minutes (4G). This simulation seems completely random. The rest of the paragraph confirms this randomness.

Furthermore, a comparison of a reduced average value with a limit value, i.e. a maximum, is inconsistent.

The ANFR's reflections on the measurement method are presented, but absolutely not a completed measurement method, as one might have expected from a scientific report.

It goes without saying that this report only and without scientific or metrological basis goes in the direction desired by the government of expressing a health-protecting level of exposure, displaying both low levels of exposure and hiding behind thermal effects alone, contrary to the reality.

5. Health effects

5.1. International institutional positions on the health effects of 5G (p61-68)

Presentation of WHO positions

The presentation of the WHO's positions is questionable. A simple FAQ is mentioned, omitting to say that a report is being prepared for 2022.

In addition and on the legitimate issue of the classification of mobile phone waves, an article in The Lancet Oncology[1] , dated 17 April 2019, has made public the list of agents proposed to be evaluated or re-evaluated for carcinogenicity during the period 2020-2024 by the International Agency for Research on Cancer (IARC), which is part of the World Health Organization (WHO).

A panel of 29 experts from 18 countries, meeting in March 2019, after studying and analysing the latest scientific data and studies, established a ranking of agents in two tables: Table 1 for high priorities, Table 2 for medium and low priorities.

As such, radio frequencies have been classified in Table 1 as a high priority.

[1] https://www.thelancet.com/action/showPdf?pii=S1470-2045%2819%29302463&fbclid=IwAR3PsrT0L6HWNG8kZzpgDMyc5bwIkyVXUQTF_9YJyDtV_3QcTM5jBC9VzVk

We would therefore like to see the addition of these references and an adapted rewriting of this passage.

European Commission

We propose that it should be added that while the European Commission has indeed "not carried out any studies on the potential health risks of 5G technologies", it has at the same time funded hundreds of millions of dollars for the development of 5G by industry since 2013 (as the report points out on p.20 and p.115). This shows its lack of political will to fund public research on this subject over the last 10 years.

Furthermore, we do not share the opinion of the expert committee on the document "the effects of 5G wireless communication on human health"[1] to minimise its scope.

It states: *"The European Environment Agency (EEA) has long advocated the precautionary principle in relation to EMF exposure, pointing to past failures in its use that have resulted in often irreversible damage to human health and the environment. Taking* ***appropriate, preventive and proportionate action now to avoid plausible and potentially serious health threats from EMFs should be considered wise and sensible in order to safeguard the future****. The EEA calls on EU Member States to work towards better informing citizens about the risks of EMF exposure, especially for children.* ».

And a little further on: "Therefore, the Scientific Committee on Emerging Health and Environmental Risks (SCHER)[2], which replaces the former Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), stated in a statement[3] in December 2018 that the assessment of the significance of 5G is considered high. **Furthermore, the potential hazards are considered high in terms of magnitude, urgency and interactions (with ecosystems and species)**. This statement suggests that a 5G environment could have biological consequences, due to the lack of "**evidence to support the development of exposure guidelines for 5G technology**".

United States

We would like to see mention of the debate and controversy over US standards and regulations and their 'scientific basis'.

Indeed, a legal action underway by several American organisations against the FEDERAL COMMUNICATIONS COMMISSION (FCC) aims to challenge the entirety of American standards governing the protection of the health of mobile phone users.

[1] https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646172/EPRS_BRI(2020)646172_EN.pdf
[2] https://ec.europa.eu/health/ph_risk/committees/04_scenihr/04_scenihr_fr.htm
[3] https://ec.europa.eu/newsroom/sante/newsletter-archives/12735

See the detailed account of ongoing actions on the Environmental Health Trust (EHT) website [1]-

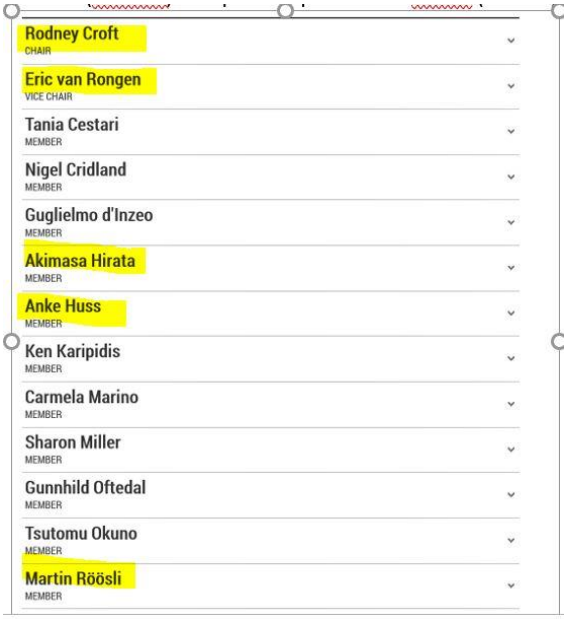
Europe

We would like to see the direct or indirect presence of ICNIRP experts in many European countries and in the work carried out by their agencies **highlighted. It** therefore seems essential to us that this point be systematically mentioned in the associated comments, especially as we consider this organisation and its work to be highly questionable. We will return to this point at length later in the chapter on its recommendations.

This includes, among others, the following countries

- Germany (for the record, the ICNIRP is based at the Bundesant für Strhlenschutz, Bfs[2]);
- Sweden, where 4 of the members of the Scientific Committee on Electromagnetic Fields are members of the ICNIRP, namely Van Rongen, Röösli, Huss, Houbo;
- In Switzerland, the advisory group of experts on non-ionising radiation (Berenis) [3]is chaired by Martin Röösli (ICNIRP);

Current list of ICNIRP Commission members [4]



[1] https://ehtrust.org/eht-takes-the-fcc-to-court/
[2] https://www.bfs.de/DE/themen/ion/strahlenschutz/strahlenschutz_node.html
[3] https://www.bafu.admin.ch/bafu/fr/home/themes/electrosmog/newsletter-du-groupe-consultatif-dexperts-en-matiere-de-rni--ber/le-groupe-consultatif-dexperts-en-matiere-de-rni--berenis-.html
[4] https://www.icnirp.org/en/about-icnirp/commission/index.html

5.2 Reflections on the interactions of electromagnetic waves with living organisms in the new frequency bands of 5G technologies (p109-127)

Absorption of electromagnetic energy in the frequency band around 3.5 GHz

It should be noted that the only reference in this short chapter is to the RF Dosimetry Handbook, 5th edition, 2009[1]. However, we would like to make it clear that this report was produced by the US Air Force research laboratory and signed by a single person, William P. Roach. We believe it is necessary to present other research results from civilian laboratories.

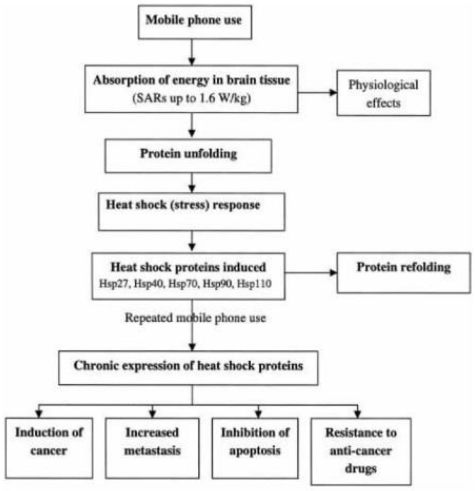


Fig. 2.7: Mécanisme potentiel d'induction du cancer suite à une exposition chronique aux micro-ondes [90].

Furthermore, for a better understanding, we would like the level of absorption to be directly correlated to the uses of the mobile phone, i.e. in the hand (skin, muscle), in the ear (skin, bone, brain), in a front or back trouser pocket (skin, fat, muscle), in a bra (skin, fat), in a pocket near the heart (skin, bone, muscle), etc.

Penetration depth and reflection coefficient of electromagnetic waves

As for the abstract of the article by Wu, 2015, referenced in the report, it "*gives examples of current regulatory requirements, and provides an example for a **60 GHz** transceiver. In addition, the propagation characteristics of millimetre waves in the presence of the human body are studied, and four models representing different parts of the body are considered to evaluate the thermal effects of millimetre wave radiation on the body. Simulation results show that about 34% to 42% of the incident power is reflected at the skin surface at 60 GHz. This paper **shows that power density is not suitable for determining exposure compliance when millimetre wave devices are used very close to the body.** A temperature-based technique for safety compliance assessment is proposed in this paper.* "

As for the article by Hirata, 2018, "*it reviews dosimetric/analytical studies on human exposure to radio frequencies above 6 GHz where new wireless communication systems have been deployed. A systematic review was conducted for steady-state temperature studies for sine wave exposures*

[1] https://www.rfcafe.com/references/articles/radiofrequency-radiation-dosimetry-handbook.pdf

and transient temperature elevation studies for short pulse or pulse-train exposures. Although a limited number of studies were reported on experimental studies, fair agreement between analytical, computational and experimental temperatures was observed. ***The need for research, especially for experimental studies, was emphasised to quantify the uncertainty of computational results as well as to improve the justification of limits in international guidelines/standards****.* "

The following table is included:

Table 1. Power transmission coefficient and energy penetration depth into tissue

Frequency, GHz	Power transmission coefficient into skin (Trans)	Energy penetration depth *L* (mm)
6	0.47	3.7
10	0.49	1.9
30	0.54	0.43
100	0.70	0.18
300	0.84	0.14

* Adapted from Foster *et al.* (2018b), based on a uniform half plane of tissue with dielectric properties of dry skin.

This suggests that the penetration of about 1.1 to 0.4 cm into muscle or skin tissue corresponds to the frequency bands between 0.9 to 6 GHz and not 3.5 GHz as indicated. At this frequency the estimated penetration would be 0.7 to 0.8 cm.

5.3. Health effects of exposure to electromagnetic fields from 5G technology (p129-194)

In fact, it is only these 65 pages that are really devoted to the potential health effects of waves.

We associate our remarks with those of the ECERI research group and the joint working report produced to which we are signatories. We therefore attach the link to this document as an integral part of our response.

Analysis of the NTP results

We would like to add that the analysis made of the National Toxicology Program (NTP) study[1], a

[1] https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones/index.html

study costing more than 25 million dollars, does not correspond to its results nor to the opinion of the independent experts who reviewed the conclusions during a Peer Review meeting in 2018.

We therefore request at least a reiteration of the conclusions as they appear in the NTP report and then, possibly, an analysis to assess their limitations**. The summary statement that "These studies do not clearly indicate a potential carcinogenic effect of radio frequencies in humans" is false (see screenshot) and again appears to us to be an opinion rather than a scientific demonstration.**

The NTP studies found that high exposure to RFR (900 MHz) used by cell phones was associated with:

- **Clear evidence of an association with tumors in the hearts of male rats.** The tumors were malignant schwannomas.
- **Some evidence of an association with tumors in the brains of male rats.** The tumors were malignant gliomas.
- **Some evidence of an association with tumors in the adrenal glands of male rats.** The tumors were benign, malignant, or complex combined pheochromocytoma.

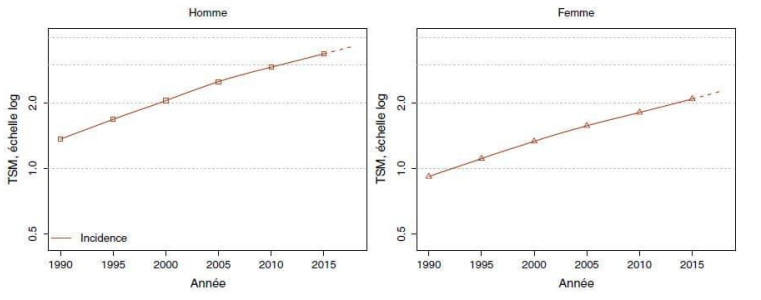
Glioblastoma and epidemiological data from Santé Publique France

As regards the possible health consequences for humans, the ANSES 5G report makes no mention of the epidemiological results of Santé Publique France.

More disconcertingly, the analysis made by the committee of experts runs counter to the results and conclusions of Santé Publique France. Namely:... "*an absence of associations between radiofrequencies and cancer (adult, child), particularly with regard to brain tumours*".

However, the Santé Publique France agency[1], with the Francim, Hospices Civils de Lyon and Institut National du Cancer cancer registries, published in July 2019 (updated in September 2019) national estimates of cancer incidence and mortality in metropolitan France between 1990 and 2018. These are based on modelling of observed incidence data (new cases) up to 2015 by cancer registries, supplemented by projections up to 2018.

FIGURE 2 | Taux d'incidence en France selon l'année (taux standardisés monde) - Échelle logarithmique - Système nerveux central - Glioblastomes avec confirmation histologique



[1] https://www.santepubliquefrance.fr/maladies-et-traumatismes/cancers/cancer-du-sein/documents/rapport-synthese/estimations-nationales-de-l-incidence-et-de-la-mortalite-par-cancer-en-france-metropolitaine-entre-1990-et-2018-volume-1-tumeurs-solides-etud

Volume 1 of the report focuses on solid tumours (27 tumours and 22 subtypes). Between 1990 and 2018, the overall incidence rate of solid tumours remains relatively stable in men and continues to increase in women. At the same time, **the annual number of new cases of histologically confirmed glioblastoma (one of the most aggressive types of brain cancer) has increased fourfold or more for both sexes.**

Santé publique France estimates that there were 3,481 new cases of glioblastoma in metropolitan France in 2018, 58% of which were in men. This compares with 823 in 1990.

TABLEAU 4 | Nombre de cas en France selon l'année - Système nerveux central - Glioblastomes avec confirmation histologique

		Année						
		1990	1995	2000	2005	2010	2015	2018
INCIDENCE								
	Homme	471	626	818	1 094	1 393	1 756	2 003
	Femme	352	465	604	780	987	1 270	1 478

Age-specific trends show an increase in incidence for all ages and sexes between 1990 and 2018.

Tendances par âge

TABLEAU 6 | Taux d'incidence en France selon l'année et par âge - Système nerveux central - Glioblastomes avec confirmation histologique

	Âge (années)	Homme			Femme		
		1990	2018	VAM* (%)	1990	2018	VAM* (%)
INCIDENCE							
	40	1,0	2,5	3,3 [1,8 ; 4,8]	0,6	1,3	3,1 [1,1 ; 5,1]
	50	2,9	6,3	2,8 [1,8 ; 3,9]	2,1	3,3	1,7 [0,4 ; 3,0]
	60	6,2	14,8	3,1 [2,3 ; 4,0]	4,0	9,5	3,1 [2,2 ; 4,1]
	70	5,9	21,3	4,7 [3,8 ; 5,6]	4,8	12,8	3,6 [2,6 ; 4,6]
	80	2,9	20,4	7,2 [5,7 ; 8,7]	0,8	17,0	11,7 [9,8 ; 13,6]

* : Variation Annuelle Moyenne

According to Santé Publique France, similar observations have been made in the United States where an increase in the incidence of glioblastoma was also observed in the 1980s-1990s -in connection with diagnostic advances. In addition, an Australian study reports an increasing incidence of histologically confirmed glioblastomas over the period 2000-2008-.

In conclusion of its analysis, Santé Publique France considers that extrinsic factors that may play a role in the increase of glioblastoma incidence could be
"*The most recent* epidemiological studies and animal experiments would favour a carcinogenic role for electromagnetic fields [15]-*. **The latest epidemiological studies and animal experiments***

would support a carcinogenic role for electromagnetic field exposures *[15].* [1]

For Dr Annie Sasco, cancer epidemiologist, former Director of the Research Unit at IARC-WHO:

"The evolution of the incidence and mortality rates of central nervous system tumours as a whole and especially of glioblastomas over the last thirty years is particularly worrying. Of course, diagnostic procedures have evolved and play a role, especially for older people. Nevertheless, there has been a real increase, including in younger people, for whom it is likely that diagnostic methods have changed less than in older people, and which may therefore be linked to environmental factors, primarily the use of mobile or wireless phones. "

Over the last two decades, nearly 50,000 people in France have been affected by this extremely aggressive brain tumour, which has a very high mortality rate. It was also during this period that mobile telephony exploded and that manufacturers overexposed us to the waves of our mobile phones.

All the elements are available from page 316 to 322 of the Santé Publique France report

All this confirms, once again, the more political than scientific direction of this report, which even goes so far as to ignore the results of another health agency.

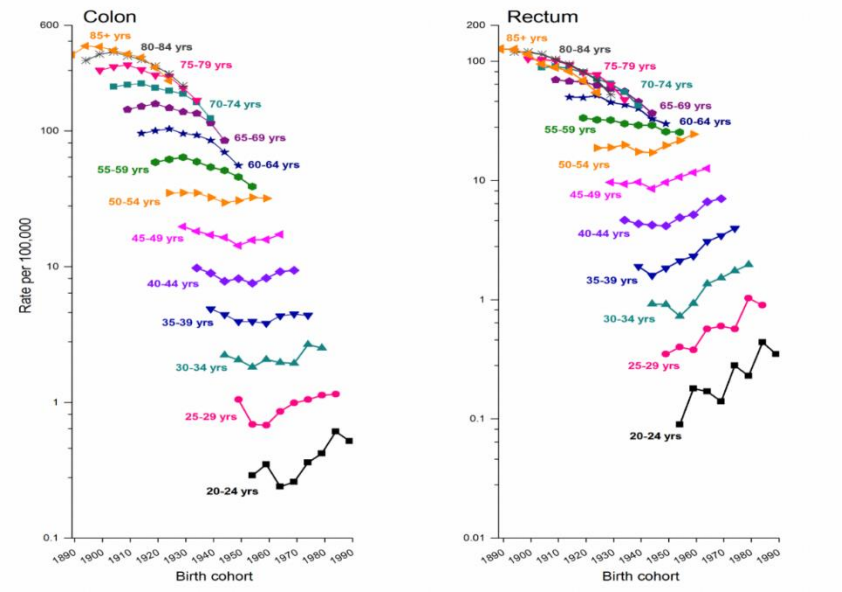
We would therefore like the elements of this Santé Publique France report to be included in the references of the 5G report.

Other types of cancer

Similarly, the risks could extend to other organs. De-Kun Li [2], senior epidemiologist and EMF researcher, believes that brain tumours have received too much attention at the expense of other types of cancer, including colorectal cancer.

Efforts to reduce colon and rectal cancer have been successful for people over 50. Incidence in older Americans fell by 32% between 2000 and 2013, largely due to better screening. But the picture is very different for young adults. According to the American Cancer Society, people born around 1990 are four times more likely to develop rectal cancer and twice as likely to develop colon cancer in their 20s than people born around 1950. (Rates among young adults are still relatively low; see charts below.)

[1] 15] Anthony B. Miller, L. Lloyd Morgan, Iris Udasin, Devra Lee Davis. Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102) Environmental Research. 2018. 167:673-683.
[2] https://microwavenews.com/news-center/de-kun-li-crc



U.S. Trends in Age-Specific Colon and Rectal Cancer Incidence Rates *Source:* R.L. Siegel, et al,*JNCI, Vol.109,*2017 - Supplementary Figure 4

Trends in colon and rectal cancer incidence rates by age and year of birth, United States, 1974-2013-Trends in colon and rectal cancer incidence rates by age in the United States Source: R.L. Siegel, et al, JNCI, Vol.109, 2017 - Supplementary Figure 4

According to the latest annual report from the National Cancer Institute[1], colorectal cancer is the most common cancer in men aged 20-49.

"Nobody can explain this apparent contradiction," Li told Microwave News. Known risk factors for colorectal cancer include obesity, unhealthy diet and lack of physical activity, but Li doesn't think they can solve the paradox. "If anything," he says, "it's that younger generations are more health-conscious and have better diets."

Another hypothesis proposed by Li is the habit of young people to carry their mobile phones in the front or back pocket of their jeans. "When placed in trouser pockets, phones are in close proximity to the rectum and distal colon and these are the sites where the greatest increases in cancer are observed," he explains.

Li's hypothesis assumes that phones continue to emit RF radiation when placed in a pocket. This is the case, especially for smartphones, but exposures are difficult to estimate.

Increases in colorectal cancer in young people are being reported around the world, not just in the US - including in many European countries, as well as Australia and New Zealand. A few weeks ago, IARC reported that between 2008 and 2015, the incidence of colon cancer in 20-29

[1] https://www.cancer.gov/news-events/press-releases/2019/annual-report-nation-2019?cid=eb_govdel_en_pressrelease_arn

year olds increased by about 18% per year in Denmark, 8% in Australia and 4% in Ireland. While the risk decreased in Canada and Norway, rectal cancer rates in these countries increased by 3.5% and 10.6% per year, respectively.

In their article in The Lancet - Gastroenterology & Hepatology - the[1]IARC team gives an opinion:

"Although the incidence of colorectal cancer in adults under 50 years of age remains low compared to older age groups, our results are concerning and highlight the need for action to address the increasing burden of the disease in younger cohorts."

Also in May, a second research group reported similar trends in 20 European countries in Gut [2], a BMJ journal. On average, colorectal cancer increased by 7.9% per year in 20-29 year olds between 2004 and 2016. The effect reduces with age: the increase in 30-39 year olds was 4.9%, and 1.6% in 40-49 year olds.

In 1990, the rate was 0.8 cases per 100,000 Europeans aged 20. In 2016, it was 2.3/100,000. The big jump has come recently: for the period 1990-2004, the incidence increased by 1.7% per year, but it rose to 7.9% per year from 2004 to 2016.

"My hypothesis could turn out to be wrong," Li concedes, "but this potential explanation is more plausible than any of the other current hypotheses." People should be informed of the possible risks, he says, so that young adults can decide to take precautions and colorectal cancer researchers can weigh up the pros and cons.

Over the past 20 years, Li, who works for Kaiser Permanente in Oakland, California, has conducted a number of groundbreaking studies on the effects of high-frequency EMF. In 2001, he reported that women were up to six times more likely to miscarry when exposed to magnetic fields above 16 mG (see MWN, M/J01[3] and J/F02)[4]. This early work has been supported by others and there are now at least seven studies that show an EMF-related risk of miscarriage. **None of these studies were included in this report!**

In other projects, Li has shown that magnetic fields can affect the quality of human sperm and that prenatal exposure to EMFs can cause asthma and obesity in children.

Newly published data show the same trend in Canadian men and women[5]. These findings are published in JAMA Open Network. The article is open access.

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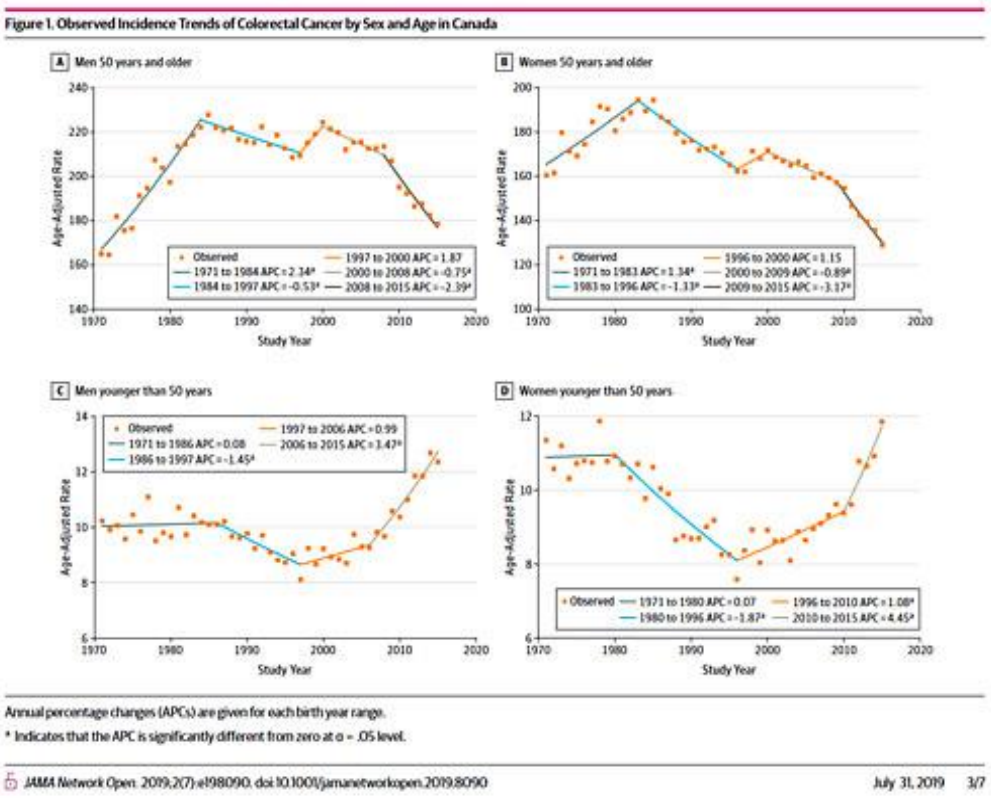
[1] https://www.sciencedirect.com/science/article/abs/pii/S2468125319301475
[2] https://gut.bmj.com/content/68/10/1820.abstract
[3] https://microwavenews.com/sites/default/files/sites/default/files/backissues/m-j01issue.pdf
[4] https://microwavenews.com/news/backissues/j-f02issue.pdf
[5] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2740066

Colorectal cancer rates are decreasing in the over 50s and increasing in the under 50s.



Concerning the report of the Health Council of the Netherlands 2020 "5G and Health", we would like to highlight the presence of ICNIRP experts (2), including the Vice President, Eric Van Rongen, in the secretariat of the said report. This, in our opinion, greatly limits the analyses.

As for the CCARS Spanish report, which is limited to about 15 pages, it provides no guarantee of the seriousness of the scientific work.

5.4. Possible effects of exposure to radio frequency fields in the (24-60) GHz band

The conclusions (point 6.4.3.3) of this chapter leave us perplexed, to say the least, as they contradict the reality of the research and, already, of usage.

5.4.1. Effects on the skin

Dr **Hugo Schooneveld is a** biologist, neurobiologist and endocrinologist from the Netherlands and is an advisor to the Dutch Electrohypersensitivity Foundation. He has conducted numerous surveys to assess the health problems caused by electromagnetic fields.

Its latest study is entitled: ***"The 5G communication system - Expect skin and general health problems".*** [1]

Summary :

"In the Netherlands, the first transmitters for 5th generation mobile telephony have been put into operation by three telecommunications companies. The transmitters in the Netherlands are mainly operating on 700 MHz. This is a kind of "entry-level 5G" transmitter, without the characteristics of the later 3.5 GHz transmitters in 2022 and the 26 GHz transmitters in 2027 or later. Some people may experience additional complaints of electrical stress (EHS). Not only for the chronic 50 Hz timing pulses in the signal, but also because of the many 3.5 GHz "small cells" that have to be installed and increase exposure. The proposed 26 GHz transmitters increase the risk of skin damage and disruption of physiological functions due to non-thermal effects. The skin is a large, delicate, thin and fragile organ. The recently updated ICNIRP exposure limits do not take into account the special position and functions of the skin. There are effects of 5G radiation on biological matter, but the link between physiological effects and health problems is not being researched. It is time to set up a "working group" to specifically elucidate the effects of 5G radiation on the skin and on well-being and adjust exposure limits accordingly."

We ask that this study be included in the report.

There is also a need to review the scientific findings both in the context of medical treatment and military use.

5.4.2. Genotoxic effects

We do not agree with the introductory position aiming to conclude that: "These studies did not detect any genotoxic effect as such".

Once again, some studies or works were ignored by the members of the expert committee.

Thus, the "Study of the modification of gene expression after exposure to millimeter waves at 60 GHz" (Habauzit et al, 2015)[2] shows that at 20 mW/cm2, millimeter waves modify gene expression, mainly due to the thermal effect. See the tables of conclusions presented at the congress of the Institute for Research in Health, Environment and Work (IRSET)

[1] To read the report: https://www.hugoschooneveld.nl/bestanden/Extern/The%205G%20communication%20system%20-%20Expect%20skin%20and%20general%20health%20problems.pdf

[2] https://sfrp.asso.fr/medias/sfrp/documents/Bordeaux-S9a.pdf

Conclusions (1/2)

A 20 mW/cm², les OMM modifient l'expression Génique

- **Principalement dû à l'effet thermique**

- **Norme d'exposition grand publique à rediscuter**

Pour une exposition aigue en condition athermique

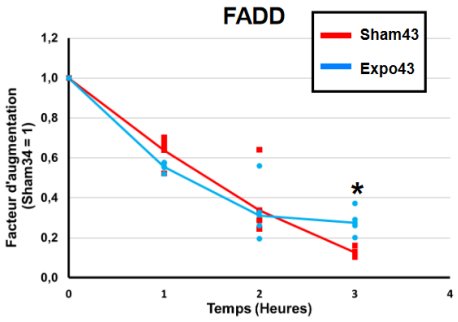
- **OMM ne modifient pas l'expression génique des Kératinocytes**

Si Exposition associée à un effet thermique

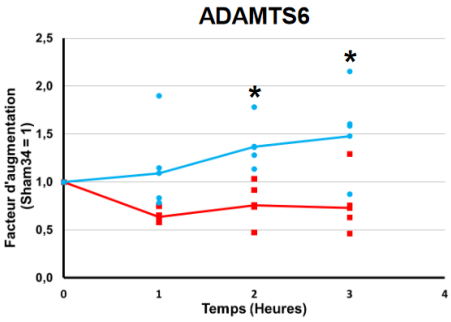
- **Modification de l'expression génique des kératinocytes**
- **Les OMM modifient l'expression de certains gènes**

2 Types d'effets observables

- Différence de façon de chauffer



- Effet propre des ondes



Quid des traitements chroniques?

14/15

This had in fact been raised during the ANSES pre-report, which had added to the bibliography another study by this team:

Habauzit, D., C. Le Quement, M. Zhadobov, C. Martin, M. Aubry, R. Sauleau, and Y. Le Drean. 2014. "Transcriptome analysis reveals the contributionof thermal and the specific effects in cellular response to millimeter wave exposure." PLoS ONE9 (10):e109435. doi: 10.1371/journal.pone.01094351[1]

And their findings are consistent with the risks of gene damage. Indeed:

[1] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0109435

"*Radiofrequency radiation is a new form of environmental pollution. Among them, millimeter waves (MMW) will be widely used in the near future for high-speed communication systems. This study aimed at evaluating the biocompatibility of MMW at 60 GHz. To this end, we used a global gene expression approach to evaluate the effect of acute exposure to 60 GHz on primary cultures of human keratinocytes. Controls were performed to dissociate the electromagnetic effect from the thermal effect of MMW. Microarray data were validated by RT-PCR to ensure reproducibility of results.* ***Exposure to MMW at 20 mW/cm2, corresponding to the maximum incident power density allowed for public use (local exposure averaged over 1 cm2), led to an increase in temperature and a strong modification of keratinocyte gene expression (665 genes differentially expressed)***. *Nevertheless, when the temperature was kept artificially constant, no change in gene expression was observed after MMW exposure. However, a heat shock control did not exactly mimic the effect of MMW, suggesting a mild but specific electromagnetic effect under hyperthermia conditions (34 differentially expressed genes). By RT-PCR, we analyzed the time course of the transcriptomic response and 7 genes were validated as differentially expressed: ADAMTS6, NOG, IL7R, FADD, JUNB, SNAI2 and HIST1H1A.* ***Our data revealed a specific electromagnetic effect of MMW, which is associated with the cellular response to hyperthermia. This study raises the question of co-exposures combining RF and other environmental sources of cellular stress.***"

5.4.3. Medical uses

The expert committee writes: "On *the basis of the studies mainly focused on the potential pain-relieving effects of radio frequencies in the "millimetre" range and their mechanisms, the available data, i.e. a study on humans, do not allow to conclude whether or not there is an effect on noniception or analgesia*"

However, it seems to ignore a large body of scientific literature and the latest research in this area.

In 2016, Remedee Labs[1] designed the first endorphin stimulator for individual use to manage pain using **millimetre waves**. The solution is based on the patented MEET (Microelectronic Endorphin Trigger) module, the first miniaturised millimetre wave emission module for medical application. The MEET module can be integrated into very small devices, allowing individuals to manage their own pain management. The first device with the MEET module is undergoing several clinical trials in European hospitals.

This bracelet uses millimetre waves to stimulate nerve endings in the wrist. The pain centre of the Grenoble Alpes University Hospital will start a multi-centre clinical research to study the Remedee Solution on the improvement of the quality of life of fibromyalgia sufferers. Currently the research will include teams from Paris, Valenciennes, Rouen and Grenoble. Source Ouest France [2].

The Scientific Council of Remedee Labs includes Dr Yves Le Dréan, a scientist who is regularly

[1] https://remedeelabs.com/fr/
[2] https://www.ouest-france.fr/sante/prise-en-charge-traitements-diagnostic-vos-questions-sur-la-fibromyalgie-ebd39356-b324-11eb-936a-8b56d4eb2d1d

involved in the work of ANSES on radiofrequencies. He is one of the authors of no less than 15 articles referenced in this report.

However, there is no information on these recent medical and industrial developments in this report.

However, the latter writes in an article (Le Dréan, 2012) on these subjects: "*Three frequencies are commonly used in therapy: 42.2, 53.6 and 61.2 GHz, at surface power densities ranging from 5 to 15 mW/cm2 . At these powers, a slight increase in temperature is recorded at the skin surface. Therefore, the biological effects described cannot be considered as purely non-thermal. For this therapeutic use, WMOs are used alone or in combination with another treatment.* ***In Eastern European countries, exposure of patients to these waves has shown positive clinical results in the treatment of various diseases, such as ulcers, cardiovascular diseases, wound healing, bronchial asthma, skin disorders, cancers, and pain relief [3]****. The scientific literature on this subject is very varied, but two main effects of WMO on the body can be highlighted: 1) an analgesic effect, and 2) an effect on the inflammatory response and the immune system. How these radiations (known to penetrate very little into biological tissues) can act on such diverse pathologies remains a mystery. More than 95% of the energy is absorbed by the skin [4], making this organ the main target of WMOs and surely the starting point for potential biological effects. The skin is not a barrier isolated from the rest of the body and signal transmissions are possible via the bloodstream or the nervous system. For example, it has been proposed that MMOs may activate the peripheral nervous system [5, 6]. It is also possible that exposure induces the secretion by skin cells of molecules that can act as chemical mediators in the bloodstream*.

As Maxim Zhadobov (Senior Researcher in Biomedical Electromagnetics (BEM) at the IETR / CNRS) wrote in his 2006 PhD thesis[1]:

"Low-power millimetre radiation (1-10 mW/cm2) is used for therapeutic applications [123, 124]. This method is recognised in some countries (Russia, Ukraine and other Eastern European countries) as a successful means of treatment and has applications in clinical medicine [125-127]."

Thus he recalls:

"The first devices were developed and marketed in the 1980s. The three most frequently used frequencies are 42.2 GHz (λ0=7.1 mm), 53.6 GHz (λ0=5.6 mm) and 61.2 GHz (λ0=4.9 mm). Clinical results have been obtained for the treatment of different diseases: ([128]. OMs are used as monotherapy or in combination with other treatment methods. As adjuvant therapy, they are used to decrease the toxic effect of chemo- and radiotherapy in cancer treatment [129]. The OMs therapy method (OMT) consists of local exposure of the skin to OMs. The duration of exposure is 30 - 40 min per day for 7 - 15 days [130]. [2]

Since then, the uses of millimetre waves have been developing rapidly, as can be seen in the

[1] https://tel.archives-ouvertes.fr/tel-00121677/document
[2] https://tel.archives-ouvertes.fr/tel-00121677/document

report "ENJEUX DES USAGES INDUSTRIELS ET COMMERCIAUX DES ONDES NON IONISANTES ELECTROMAGNÉTIQUES ET ACOUSTIQUES" published at the end of 2019 by the Conseil général de l'économie[1].

Thus the rapporteurs write, page 66/95:

"Electromagnetic fields and microcurrents are officially used in several countries to diagnose and treat a wide variety of neurological (pain), allergic and musculoskeletal dysfunctions (Germany, Switzerland, China, Russia...), notably as an extension of acupuncture techniques (China). Under different conditions, various uses as treatment aids179 (or even treatments) for certain tumours are practised or studied. They are likely to replace chemical medications with equivalent or even superior efficacy180 , fewer side effects, lower costs, less energy consumption and greater ease of production (less cumbersome marketing authorisation, no chemical industrial sites, etc.), and are therefore accessible to small and medium-sized enterprises, particularly for relieving or treating chronic pathologies. "

"They are the subject of major investments by digital majors such as Alphabet, which is becoming a global player in health (subsidiary Galvanibioelectronics with GlaxoSmithKline), but also Apple and Microsoft,.... Some of these alternative or complementary techniques to chemical pharmaceuticals are announced as likely to arrive on the market as early as 2026. In view of the fundamentals mentioned above and the acceleration of publications and the resources deployed in Germany, but above all in China, the United States and India, it is likely that research in this field will lead fairly quickly (already today for some subjects, announced for 2026 for others) to targeted applications, as a complement to or replacement for conventional chemical and pharmaceutical methods... "

And, of course, these are just a few examples highlighting the health effects of waves and, in particular, millimetre waves on humans. So much evidence from both science and medical knowledge that contradicts the report's conclusions on this subject.

5.4.3. Military uses

It is regrettable that studies carried out in France in the 1980s at the request of the army on the effect of 3.5 GHz frequencies on the health of laboratory rats, at the University of Rennes in the 1980s, were not included in the list of documents examined. CRIIREM has made all the studies in its possession available to ANSES.

We ask that they be included in the report.

Concerning civil and military radars, in the context of studies on the health effects of

[1] https://www.economie.gouv.fr/files/files/directions_services/cge/ondes.pdf

electromagnetic radiation emitted by radars developed by the DGRST and the DRET? military research bodies of the Ministry of the Armed Forces, the following points should be highlighted:

1°) Radars are classified as detection and tracking devices for civil and military purposes used in aeronautics, aerospace, maritime navigation and in connection with satellites. They operate with pulsed frequencies ranging from 3 to 9 Gigahertz. There are also Weather Radars on board aircraft, but also in weather stations and in airport control towers, they operate with frequencies ranging from 4.5 to 9.4 Gigahertz.

These various radar frequencies are therefore listed as belonging to the future 5G.

2°) As early as 1980, the international symposium "Electromagnetic Waves and Biology" in Jouy-en-Josas? organised by the Union Radio Scientifique Internationale (URSI), the Centre National de Recherche Scientifique (CNRS), the International Radiation Protection Association (IRPA), the Bioelectromagnetics Society (BEMS-USA) and the World Health Organisation, reported alarming results concerning the athermal effects of radiation emitted by radars.

Studies concluded that neonatal exposure to microwave radiation permanently disrupted the reproductive physiology and stress adaptation physiology of adult animals and also affected the hypothalamic neurovegetative system.

In addition, the International Labour Office (ILO) in Geneva in its booklet 57 on the protection of workers against microwave radiation from radar indicated that the probable athermal effects in humans correspond to those proven by animal experiments, in particular with regard to impacts on the eye (cataract and retinal lesions), on hearing (Frey effect), on reproduction and genetic effects. **Finally, the ILO concluded that the observed effects and probable effects should be considered dangerous and that health safety should therefore be reinforced by an additional factor.**

Today, the Report on the microwave attack on the US Embassy in Moscow is declassified. It reveals that employees were chronically exposed for 9 hours a day to weak radar signals ranging from 9 to 19 V/m. Chromosomal aberrations and high rates of leukaemia were detected in the exposed children and adults in the American Embassy. In addition, this Report puts to rest the controversy about microwave syndrome or microwave disease affecting some workers and the military. It also corroborates the fact that **the WHO classifies microwaves as a Group 2B carcinogen and that their effects are listed in the International Classification of Diseases in Chapter XII under index L57-8 and L58-9.**

Moreover, the report of the Conseil général de l'économie [1]on page 56/95 tells us on this subject: "...millimetre wave radar (30-300GHz) seems to be used as a weapon to disperse demonstrations in the United States 129 (Source: IMS laboratory, Bordeaux University)

[1] https://www.economie.gouv.fr/files/files/directions_services/cge/ondes.pdf

As Georges-Henri Bricet des Vallons points out in his 2007 article, 'The Non-Lethal Weapon in US Military Strategy: Strategic Imagination and the Genesis of Armaments'[1]:

"In April 2005, Raytheon was awarded $7.5 million by the Pentagon to complete the experimental fielding of a prototype anti-personnel wave gun. This decision definitively formalised the research conducted since the early 1990s on an anti-personnel weapon capable of actively protecting access to sensitive areas and breaking up riotous mobs. The declassification in 2001 of the Los Alamos laboratory's research on electromagnetic waves made it possible to learn about the progress of exploratory work on these new-generation weapon systems.

These directed energy weapons (DEW) currently represent one of the most promising areas of high-tech weapons foresight and reflect the Pentagon's desire to maximise the potential of directed energy to reverse traditional patterns of asymmetry. Since 1995, more than $51 million has been allocated to, among other things, microwave studies at the Air Force laboratory in Kirtland. These programmes culminated in the fielding of two major anti-personnel directed energy devices in 2006, one microwave - the ***Active Denial System (ADS)*** *- and the other acoustic - the Long Range Acoustic Device (LRAD).47 These systems are currently deployed in Iraq and the United States. These systems are currently deployed in Iraq and are being actively tested on the civilian population*.

Regarding the ADS, Wikipedia[2] describes it as follows:

"The ADS emits a beam of electromagnetic waves with a frequency of 95 GHz towards a subject. When the waves hit the skin, the energy of the waves turns into heat upon contact with the water molecules in the skin. A 2-second pulse would raise the skin to a temperature of about 55°C, causing an intense, painful burning sensation[3]. "

"*These thermal effects appear for exposures to high power densities (at 10 mW/cm2, the¨T is about 1°C at the level of the skin in humans). Thus, in the event of exposure to very high powers, local temperature rises can lead to sensations of pain, or even to burns in the worst cases. This principle has been used by the American army to develop a new type of non-lethal weapon (known as the Active Denial System), allowing crowd dispersal. Mounted on a military vehicle, these devices emit very high-powered WMOs at a frequency of 94 GHz [1]. The result is a sudden increase in skin surface temperature and a flight reflex.*

Because of these well-established thermal effects, there is no longer any doubt that WMOs can, under extreme conditions, affect biological functions.

[1] https://www.jstor.org/stable/23703475?seq=1
[2] https://fr.wikipedia.org/wiki/Active_Denial_System
[3] https://fr.wikipedia.org/wiki/Active_Denial_System"

According to the article, "Biological effects of millimetre wave radiation (94 GHz). What are the long-term consequences?" [1]

"Long-term deleterious consequences are not considered from an operational point of view; they cannot be dismissed out of hand because on the one hand, positive results obtained from Russian studies are often scientifically suspect, and on the other hand, some of these results are contradictory, ***although those concerning athermal effects cannot be refuted****. Conversely, the results published in other countries (in practice in the United States) are rare in civilian - university laboratory circles, and partial or classified in military circles.* ***A definitive conclusion, particularly on the risks of cancer or immunological disturbances, is not currently possible. In the current state of knowledge, these long-term effects cannot be taken into account to determine protection (or safety) limits which are established on the basis of practical thresholds corresponding to proven effects (perception, pain)****".*

6. Electromagnetic Compatibility

In no part of the document is the issue of electromagnetic compatibility addressed, although several warnings have been issued.

What is the situation today with this guard band between 24 and 25 GHz?

The Délégation Générale pour l'Armement has developed the use of electromagnetic weapons (guns, cannons, drones, missiles and bombs) with the aim of damaging or even destroying the electrical, electronic, bionic, satellite and aeronautical installations of potential enemies.

These disruptive and damaging effects fall under the heading of what physicists call electromagnetic compatibility or EMC.

With regard to 5G for civil purposes, the French Post and Electronic Communications Code imposes essential requirements guaranteeing electromagnetic compatibility (EMC) between electronic communications equipment and installations with proper use of the radio frequency spectrum while avoiding harmful interference to third parties. The frequencies emitted by 5G are very close to the frequencies used by aeronautics, aerospace, maritime navigation, satellites and weather radar.

The possibility of EMC malfunctions involving resonance phenomena is foreseeable and must be taken into account. In addition, **electrical and electronic devices operating in the immediate environment may also be affected, such as medical aids like pacemakers, drug pumps,**

[1] J-C Debouzy, 2006 - https://www.academia.edu/33230609/Effets_biologiques_des_rayonnements_millim%C3%A9triques_94_GHz_Quelles_cons%C3%A9quences_%C3%A0_long_terme_

intracranial and auditory devices...

We ask that these effects be taken into account in the report.

7. Bibliography

In a "Studies not selected" section, we ask that the studies proposed by the members of the dialogue committee be indicated

In addition, for the studies selected, we believe it is important to specify the method of financing (private, public) and the presence of ICNIRP experts (current or past).

Indeed, some research, where available, has shown that studies have been funded by industry and/or conducted by ICNIRP experts.

Thus Foster, whose biography includes no less than five studies, at least two of which were funded by the Mobile World Forum lobby. As for Hirata[1], who co-authored some of the articles, he presents himself as being affiliated with the ICNIRP from 2005 to the present.

As some of the articles referenced are directly written by the industry, or financed by their lobby (GSM, Mobile World Forum) examples :

Haneda, K. 2016. "Indoor 5G 3GPP-like Channel Models for Office and Shopping Mall Environments". In 2016 IEEE International Conference on Communications Workshops (ICC, 694-699,. Kuala Lumpur. [2]

3GPP. 2016. "TR 38.900 V14.1.0 "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Study on Channel Model for Frequency Spectrum above 6 GHz (Release 14". Tech. Rep

Aerts, S., L. Verloock, M.Van Den Bossche, D. Colombi, L. Martens, C. Törnevik, and W. Joseph. 2019. "In-Situ Measurement Methodology for the Assessment of 5G NR Massive MIMO Base Station Exposure at Sub-6 GHz Frequencies". IEEE Access7: 184658-184667. [3]

Croft, R. J., S. Leung, R. J. McKenzie, S. P. Loughran, S. Iskra, D. L. Hamblin, and N. R. Cooper. 2010. "Effects of 2G and 3G Mobile Phones on Human Alpha Rhythms: Resting EEG in Adolescents, Young Adults, and the Elderly." Bioelectromagnetics31 (6): 434-44.[4] .

[1] http://researcher.nitech.ac.jp/html/176_en.html
[2] https://doi.org/10.1109/ICCW.2016.7503868
[3] https://doi.org/10.1109/ACCESS.2019.2961225
[4] https://doi.org/10.1002/bem.20583

Neufeld, Esra, Eduardo Carrasco, Manuel Murbach, Quirino Balzano, Andreas Christ, and Niels Kuster. 2018. "Theoretical and Numerical Assessment of Maximally Allowable Power-Density Averaging Area for Conservative Electromagnetic Exposure Assessment above 6 GHz." Bioelectromagnetics 39 (8): 617-30. (Mobile wolrd forum) [1]

This is the conclusion of the article by A.Huss et al, (2007)[2], which recommends:

"The interpretation of the results of studies on the health effects of radio frequency radiation should take sponsorship into account. »

The study also shows the impact of the funding method on the results. For example, studies funded by public or mixed funds show more results on the effects of mobile phone use on our bodies compared to those funded by industry.
Document 17

Conclusion

Our work of analysis, bibliographic research and putting into perspective the various elements of the ANSES report has led us to take a detailed critical look at this new ANSES report on 5G.

In the short time of six weeks available to us to submit our comments, it was not possible for us to be as exhaustive as we would have liked in order to respond to the many points of scientific, methodological or metrological criticism that merited it.

Moreover, we have rapidly made available to the international scientific community, by our own means, an English version of the ANSES report. This will allow us to continue this work of understanding the health risks related to 5G waves, both in close sources (cell phones,

connected objects) and in distant sources (relay antennas, micro-antennas, etc...). In view of the final report, we ask ANSES to submit the final work, during a public debate, to a group of international experts independent of any conflict of interest and recognized for their competence in the field of radio frequency waves. This is the only way to rebuild trust between all parties and, most importantly, with the general public.

[1] https://doi.org/10.1002/bem.22147
[2] https://pubmed.ncbi.nlm.nih.gov/17366811/

Annexes

1.Studies on 5G which we ask to be taken into account in the report

5G studies

Author	Year	Title
Bandara, Priyanka	2020	5G Wireless Deployment and Health Risks: Time for a Medical Discussion in Australia and New Zealand
Lin, J.C.	2020	5G Communication Technology and Coronavirus Disease [Health Matters]
Barnes F.	2020	Setting Guidelines for Electromagnetic Exposures and Research Needs
Karaboytcheva M.	2020	Effects of 5G wireless communication on human health. European Parliamentary Research Service (EPRS). Briefing document: PE 646.172. March 2020.
Neufeld E.	2019	Discussion on Spatial and Time Averaging Restrictions Within the Electromagnetic Exposure Safety Framework in the Frequency Range Above 6 GHz for Pulsed and Localized Exposures
Blackman C.	2019	*5G Deployment*: State of Play in Europe, USA, and Asia. Study for the Committee on Industry, Research and Energy, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2019.
El-Hajj AM	2020	Radiation Analysis in a Gradual 5G Network Deployment Strategy. 2020 IEEE 3rd 5G World Forum (5GWF), Bangalore, India
David H. Gultekin	2020	Absorption of 5G radiation in brain tissue as a function of frequency, power and time. IEEE Access. Published online June 12,

		2020. DOI: 10.1109/ACCESS.2020.3002183.
Adda S et al	2020	Theoretical and Experimental Investigation on the Measurement of the Electromagnetic Field Level Radiated by 5G Base Stations
Nasim I.	2019	Adverse Impacts of 5G Downlinks on Human Body. 2019 SoutheastCon. Huntsville, AL. 11-14 April 2019
Jamshed MA	2019	A Survey on Electromagnetic Risk Assessment and Evaluation Mechanism for Future Wireless Communication Systems
Pawlak R	2019	On measuring electromagnetic fields in 5G technology
Persia S	2018	Radio frequency electromagnetic field exposure assessment for future 5G networks. IEEE 29th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 2018. IEEE
Nasim I	2017	Human Exposure to RF Fields in 5G Downlink. Submitted on 10 Nov 2017 to IEEE International Communications Conference
Colombi D	2015	Implications of EMF exposure limits on output power levels for 5G devices above 6 GHz. IEEE Antennas and Wireless Propagation Letters. 14:1247-1249. 04 February 2015
Koh TH	2020	Factors affecting risk perception of electromagnetic waves from 5G network base stations
Lin JC	2019	Telecommunications health and safety: US FCC affirms its current safety limits for RF radiation and 5G wireless
Pujol F et al	2019	Study on using millimetre waves bands for the deployment of the 5G ecosystem in the Union: Final Report. A study prepared for the European Commission
Mehdizadeh AR	2019	Editorial. 5G technology: Why should we expect a shift from RF-induced brain cancers to skin cancers? J Biomed Phys Eng. 2019
N.P. Zalyubovskaya	1977	"Biological effects of millimeter waves," in a Russian-language journal, "Vracheboyne Delo."
Leszczynski, D.	2020	Physiological effects of millimeter-waves on skin and skin cells: an overview of the to-date published studies. Reviews on Environmental Health
Alekseev SI	2019	Biological effects of millimeter and submillimeter waves. Handbook of Biological Effects of Electromagnetic Fields (B. Greenebaum and F. Barnes, editors), 4th ed, Chapter 6, pp. 179-242, 2019
Belyaev IY	2000	Nonthermal effects of extremely high-frequency microwaves on chromatin conformation in cells in vitro-Dependence on physical, physiological, and genetic factors. IEEE Transactions on Microwave Theory and Techniques. 2000
Ryan KL	2000	Radio frequency radiation of millimeter wave length: potential occupational safety issues relating to surface heating. Health Phys. 2000
Christ A	2020	RF-induced temperature increase in a stratified model of the skin for plane-wave exposure at 6-100 GHz. Radiat Prot Dosimetry. 2020
He W	2020	Implications of incident power density limits on power and EIRP

		Levels of 5G millimeter-wave user equipment. IEEE Access. 10 Aug 2020
Kojima M	2019	Ocular response to millimeter wave exposure under different humidity levels. J Infrared Millimeter Terahertz Waves. 40(5):474-484. 2019
Parker JE	2020	Revisiting 35 and 94 GHZ Millimeter Wave Exposure to the Non-human Primate Eye. Health Phys. 2020
Wang Q	2017	Attenuation by a human body and trees as well as material penetration loss in 26 and 39 GHz millimeter wave bands. International Journal of Antennas and Propagation. 2017
Wu T	2015	The human body and millimeter-wave wireless communication systems: Interactions and implications. IEEE International Conference on Communications (ICC), Jun 2015

2. **Discussion with David Demortain on the report on the public controversy on 5G**

From: Marc ARAZI

Good morning Mr Demortain,

Thank you for your reply.

Concerning the first point, you mention it explicitly on page 25. Here is the passage: "If new associations have appeared in the field of the controversy (PhoneGate Alert for example), they are the result of splits with older ones". We would therefore like this factually incorrect point to be reviewed in your report and that of ANSES. Furthermore, it does not seem useful to me to repeat my time with Priartem, which I left in 2014... The creation of Phonegate Alert dates from 2018. And as our statutes show, our association has an international vocation and not a Franco-French one, as our board and our international scientific council demonstrate. And this should be made clear!

As our interview was in 2019 and we did not record it because we trusted you, it is difficult for me to prove that this point was indeed more than extensively developed by me during our long exchange. But I am sure that I particularly insisted on the continuity of the deception of the industry concerning the health risks of future mobile phones. This is what we have been working on for almost 5 years. Moreover, to quote your e-mail of 6 September 2019, you assured us that: "Yes, if you wish, we will send you the parts of our report that concern your association before delivering it to ANSES so that you can ensure that our report is in line with your comments". You have not kept your commitments. We would therefore appreciate it if you would send us the recording of this interview, given our disagreement with the content of the interview.

Thank you for recognising that the issue of media capitalism is one that should be worked on in the future, but by leaving it out of your initial analysis, in our opinion, you have treated the media coverage of this issue in a superficial and totally biased way. The consequence is to distort any relevant and reliable analysis. This point deserves at least to be included in the preliminaries of your work. We therefore count on you to point it out.

Finally, as far as the articles in The Conversation are concerned, it is indeed ANSES, on its own initiative, that added them. The way in which your work is included in the ANSES report facilitates this confusion, and perhaps it is deliberate? Indeed, it does not seem appropriate for the health agency to quote this media in a scientific report, especially as it is contested for its controversial "pro-industry" theses. We note with interest that you also consider that it would be "a mistake to do so".

For your full information and transparency, we will publish in our response to the public consultation all our exchanges.

Yours sincerely

MA

From: David Demortain

Hello Mr Arazi,

Thank you for this feedback, it is the interest of proofreading to clarify this type of points, I try to answer you below. My apologies for the delay in replying, it took me time to resume communication between myself and Aurélien, who is now working in another laboratory.

On your first point: I can't find a passage where we write that PhoneGate is the result of a split from Priartem. We mention splits between associations more generally, and also point out that you are a former member of Priartem - perhaps more times than it is relevant to do so: I can delete a number of these mentions if you wish).

The issue of risks related to exposure to 5G smartphones was hardly mentioned in the interviews we conducted. There was little or no mention of this issue in the press or on social networks either. During our interview, you briefly mentioned the fact that the phones would incorporate a 3G/4G antenna and a 5G antenna, with a new power density indicator. But you didn't elaborate on this too much.

We have not worked on the issue of industrial influence on the media for this report. We have not collected any information on this issue or conducted any specific research that would allow us to address and objectify it. Your comments raise the question of how the capital ownership

structures of the media, and their own digitisation, impact on journalistic work, or the lack of journalistic work on the implications of the expansion of digital and telephony infrastructures. This would be well worth working on in social science research (but it is not currently on the agenda of my lab).

Regarding The Conversation, I don't think we highlight this source. I can't even find any mention of the site in our reports - but it would be a mistake to do so. If you have the time to point out the particular passage or passages where we give this impression, it would be useful for us to correct it.

Yours sincerely

David Demortain

From: Marc ARAZI

Good morning Mr Demortain,

I have done a first quick reading of your reports, including the elements integrated in the report published for consultation last Tuesday. In this regard, I have three questions I would like to ask you:

On what factual basis did you consider that Phonegate Alert was the result of a split with Priartem?

Why did you ignore our discussion about the consequences of overexposure to waves from our mobile phones (Phonegate), especially in the context of the new 5G smartphones (if I remember correctly this was one of the main points about the deception of the industry in our exchange)

How do you justify highlighting the site "The conversation" known for its pro-industry theses? And why didn't you mention the problems linked to the shareholdings of the main French media and the weight of advertising?

We will certainly raise other points after a thorough reading. And finally, we deeply regret that you did not keep your word about proofreading the passages concerning us (even if these are almost non-existent).

Sincerely,

MA