

**NH COMMISSION TO STUDY THE ENVIRONMENTAL AND HEALTH EFFECTS
OF EVOLVING 5G TECHNOLOGY**

Meeting held:

1/10/2020

8:30-11:00am:

LOB 308

Meeting called to order by Rep Abrami at 8:30 am.

In attendance: (12)

Rep. Patrick Abrami-speaker of the house appointee

Rep. Ken Wells- speaker of the house appointee

Kent Chamberlin-UNH-appointed by the chancellor

Denise Ricciardi-public-appointed by the governor

Michele Roberge-DHHS- Commissioner of DHHS appointee

Dr. Paul Heroux- Professor of Toxicology, McGill University- speaker of the house appointee

Rep. Gary Woods-speaker of the house appointee

Senator Jim Gray-president of the senate appointee

Carol Miller-NH Business & Economic Affairs Dept.

Senator Tom Sherman-president of the senate appointee

Bethanne Cooley-CTIA , trade association for wireless industry and manufacturers

Brandon Garod-AG designee, Asst. AG Consumer Protection

Not present: (2)

Frank MacMillan, Jr. MD-NH Medical Society Environmental Medicine

David Juvet-Business and Industry Association

Agenda:

I. Approval of minutes from 12-13-19:

Minutes were approved. Unfortunately, the minutes were posted on our website prior to approval. We will make sure that does not happen again.

Abrami: Discussion about subcommittees and members meeting outside of the regular meetings. Small groups are allowed under the rule is 50%+1. If groups are larger, we will have to develop subcommittees.

II: Theodora Scarato, Executive Director Environmental Health Trust:

Environmental Health Trust is a scientific think tank. We coordinate with scientists all over the world on issues such as wireless, climate change and environmental health issues. Dr. Davis has long worked on climate change, toxic chemicals, environmental possible causes of breast cancer and toxins in the environment. I have a lot in a power point. I hope it will be useful for you. I will not get to everything in here as my focus will be on policy.

At EHT, we publish research and brief policy makers as well as develop educational campaigns for people and for parents on how do you reduce exposure. I have a lot of materials. The most recent paper I published was with Frank Clegg, former Microsoft Canada President. There are links to all of this and more in the power point and it's all hyperlinked.

The Babysafe Project: There is a campaign that we have co developed with Grassroots Environmental Education is called the Baby Safe Project. This campaign has been signed on to by over 240 doctors and scientists and educators, to reduce exposure to pregnant women and developing babies because of research showing brain impacts. Dr. Hugh Taylor, who presented at the press conference for this campaign talked about his research showing damaged memory and increased hyperactivity after cellphone radiation exposure to pregnant mice. There is other research that Dr. Davis will go into as well showing impact on brain cells to what would be legal exposure limits of radiation.

Many pregnant women take the phone and rest it on the abdomen because they don't know. People don't know to keep the device away from the abdomen or use safer technology and you won't get that exposure. I have a quote from Dr. Taylor, chief of Obstetrics at Yale. That might be someone that you would be interested in having to talk about his research. He has a quote: "I am deeply concerned about growing exposure to cellphones." There is a video online at the BabySafe Project where you can watch him talking about this with recommendations on how to reduce exposure.

Wireless and energy consumption: Health and environmental effects of 5G are not just about the radiation, it's also the energy consumption from all of these devices and all of the additional small cells. There is a French climate think tank report (The Shift Project) which talks about the explosion of energy use. Even though there are energy efficiency gains, they are not keeping up with the amount of devices and these new installations, which create an increase in energy use. They document that as well as the environmental effects and every part of the life cycle of devices. For example: You have conflict minerals, e-waste from disposing devices and energy use of the manufacturers. All of these are polluting our environment. This report has a short two pager which is useful for the highlights.

Insurance coverage: I know that one of the questions of the commission is: why don't insurance companies cover damages from electro- magnetic field exposure? As you probably know, in the annual reports of almost all of telecom companies are statements to the shareholders such as "If radio frequency emissions from wireless handsets or equipment on our communications infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues". "We currently do not maintain any significant insurance with respect to these matters."

We have a page on our website linking to all the annual reports with these statements. Why are shareholders being warned of potential risks in the future and not people? I got involved almost a decade ago because I am a parent. I did not believe this at all. I knew enough that I had to take some time to dig in and here I am.

We have list on our website that we try to have a repository with compendiums of information that has all the white papers of industry where the insurance companies rate EMF as a high emerging risk. The SwissRE report just came out rated 5G mobile networks: the impact is high. The quote in this report with regard to health effects is: "As the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency." I think that's most people's concerns here.

The Harvard Center for Ethics Report: What's going on here? If there are all these studies showing adverse effects, why isn't there the follow up that we would all expect from an exposure this great? In this report, the investigative journalist talks about money that has gone to Congress and the way that the FCC has former telecom executives as commissioners and also when you retire from the FCC, many commissioners end up working for the industry. This is all documented and he also talks about the correlation to Big Tobacco. "It is these hardball tactics that recall 20th century Big Tobacco tactics." This report is from 2015 and I really want them to update it because so much has happened since in terms of this issue with the revolving door. The title of the report is: How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates by Norm Alster. There is also published research that has found industry involvement affecting the quality of the results, the design of the studies, sponsorship and publication bias just like there would be in most industries. The consulting firms of Big Tobacco are now working with Big Tech. There is a report out that we are looking at a 12.3 trillion dollar market.

Revolving Door: This is a slide that I made showing the Former FCC Chair, Tom Wheeler was the former head of CTIA, Ajit Pai, the current FCC Chair was formerly a Verizon counsel, Brendan Carr, FCC Commissioner who was a former lawyer for Wiley Rein LLP who represented the Wireless Industry in suing San Francisco for their Cell Phone Right to Know Ordinance. Bruce Romano, Asst. Legal Chief in the FCC's Office of Engineering and Tech went to the law firm of Wiley Rein representing the CTIA.

Short Timeline of US Regulatory Action on RF and Human Health: This is probably one of the most important slides that I have. You don't have it in your packet.

Abrami: please give us your non PDF versions of your files that we can click hyperlinks.

Scarato: I will do that. This is just a short timeline. It does not have everything in it.

In the 1970s-1990s, the EPA had a robust research program tasked with developing RF safety limits.

1996: the EPA was defunded and told that they could not work on EMF as they were set to release their phase one of safety limits which was on heating effects. The second phase was supposed to be on non-thermal.

1996 FCC adopted RFR exposure limits based largely on limits developed by industry and military connected groups (ANSI/IEEE C95.1-1992 and NCRP's 1986 Report).

We adopted those limits without our experts setting what is a safe limit? What is a safe limit for long term? What is a safe limit for children and pregnant women? Later in 2008, the National Academy of Sciences did a report documenting gaps in our understanding of the issue. What is going to be the impact of children exposed for a lifetime? That is my number one question. My background is as a social worker and I directed programs in schools. I worked with a lot of kids who were born of crack addicted parents. I know the differences between the kids. You have trauma, brain impacts from prenatal exposure. Kids who have been adopted and we know their history. That's what really brought me into this too. Knowing the challenges of my clients and knowing the impact that brain damage can have.

2001: GAO report and letters from experts in government saying there were problems with these limits. Those were not responded to. In 2008/2009, there were Congressional hearings on cell phone radiation.

2012: GAO Report: "FCC cannot ensure it is using a limit that reflects the latest research on RF energy exposure." Reassess RF limits and update phone compliance testing requirements.

2012: H.R. 6358 The Cell Phone Right to Know Act was proposed at the federal level and not passed. When I found out cell phones emitted non ionizing radiation, I thought what?? Why didn't I know that? My kids spent time on the phone because long distance was free and I spent hours on the phone talking to my girlfriends. I just wish I had known and I could have made that decision.

2013: FCC open inquiry proceedings (in response to GAO 2012 report) We have links to the docket and the submissions, doctors, scientists, industry, cities, lawyers.

2018: GAO listed status of the 2012 report as "closed/not implemented". But just recently, the FCC issued an item closing the inquiry, saying there is not science that says we need to update our limits. They based that on the FDA's opinion. There is a three page letter in the docket. You can see all of these.

Abrami: Just so you know Theodora, one of our goals is to try to get someone from the FCC to actually talk to us. We are a state. We are not the federal government. But I am not going to give up trying to get someone from FCC to answer our questions.

Scarato: I would hope the FCC as well as the FDA would answer your questions. We have questions. Scientists have been writing letters. I have a slide on letters that have not been responded to. I believe the American people need to have answers to these questions. What the FCC did on Dec 4, 2019 was to say there is no need to update the limits, "that we decline to revisit our RF exposure policy as it pertains to children". "Similarly, the FDA maintains that the scientific evidence does not show a danger to any users of cell phones from RF exposure, including children and teenagers" even though there was a submission in the docket on damaged brain cells.

There were submissions that said the testing of the phones should require zero spacing. They don't think that they need to. They think the information in devices is adequate to inform people of these issues. I think I am pretty smart and I did not know that information was there. I have a Samsung Android and I cannot find my SAR testing easily at all. It is not in my phone. It is not listed online. The only way is to go to the FCC and type in your model and make to figure it out. That is not adequate. I would expect more of our government.

Gray: Mr. Chairman. I do object to some of this testimony. Let me explain why. A lot of the testimony that we are getting right now is: somebody wrote a letter and we didn't get an answer. Somebody else wrote a letter and we didn't get an answer. I have sat through many hearings on vaccines and listened to this electromagnetic radiation all the way from when I was a teenager and we were worried about the power lines. I would love to hear the data that you have got. The experts from the FCC have said there is no scientific data out there. That's what I am interested in, the scientific data that deals with 5G, because that is the crux of this committee. If there is data about the scientific problems with 5g then I want to hear that but I don't want to hear that I wrote a letter and I didn't get an answer.

Abrami: Well, I don't disagree with you. We are trying to get at the essence of this. I want to talk to the FCC directly and the IEEE. We are still trying to get at the facts. We have talked a lot about the science on the commission probably more than any other state legislature. I am hearing conflicting things about the FCC. Did they look at biological effects or not? I want to know. It would help us as a commission to understand. As the Chair, I am not releasing a report if the FCC says X and we say Y without data to base that on. People will ask, just like you did. What did you base that on? The FCC says its fine. That's why we have to keep digging.

Sherman: I want to remind the commission that this is our guest. We don't usually shut down a guest because we don't like what they are saying. I would ask that we let her speak as invited and you can be your own filter for what she has to say rather than objecting to her testimony.

Woods: I understand the Senator's concern. But by the same token, even if we have scientific data, we need to know what context or social context this has been interpreted and conveyed. That is just as important to me. If we find that the FCC got a letter and didn't respond and we know there is a study about that, then that non response is important. I understand that data is important but the context and how it is conveyed is also important.

Abrami: The other thing Theodora, you are doing a great job laying this out. This commission is deep into the weeds on this. We don't know all of what you are saying here. We are filling in gaps so continue along your presentation. The other thing we will be talking about with Devra is we need to see that some of these studies are replicated. We can't look at a study and say that's bad if it's not replicated. For me to feel more comfortable, science has to be replicated.

Scarato: She is going to be talking about that. I had read the questions that your commission is tasked with. I was basing my presentation from the policy side based on those questions. I am trying to explain why and give you links to it. For example, the American Academy of Pediatrics sent a letter with concerns to the FCC. I felt it was important to talk about this.

Abrami: I agree. Public policy wise, like you said earlier, most people don't know you shouldn't keep it on your body. I did not know that myself until about a year ago. As a commission, we would really like to see what other states and municipalities are doing if you have that.

Scarato: I can fast forward to that.

Abrami: You may want to do that because we may run out of time.

Scarato: The Systematic Review: This is important. It is a gold standard and I want to point out that is hasn't been done. When scientists are writing letters, one of the questions asked is where is the systematic review? Where is the full report on all the studies and what they found and how to weigh them by independent experts? What does the science say as to what is a safe level? I know that is a question that you are looking at.

What do US Health Agencies say about NTP study? I am pointing this out because I think it's important for the commission to see what different federal agencies are saying on their websites about this issue. For example, on the National Cancer Institute, unless you know what you are doing, you would be hard pressed to even know what this study found. All they say is, "primary outcomes observed...". This is not what most of the American public would even know what that means. The FDA disagrees with findings of NTP yet no systematic review, no report, no citations, no FDA peer review. The CDC says nothing about NTP. EPA says nothing on NTP and sends you to the FCC. The EPA used to actually have statements on their site. We watch all the sites and you can see what they previously said. They had a statement about an open question of safety, but that's been changed.

2014 The Department of Interior letter states "however, the electromagnetic radiation standards used by the FCC continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable to today".

2002 EPA letter to the EMR network of VT: "federal health and safety agencies have not yet developed policies concerning possible risk from long-term, non-thermal exposures"- Robert Hankin, EPA,2002.

FDA: Scientists 2019 letters to the FDA that have not been answered.

NTP: Ron Melnick is a 28 year NIH senior scientist, who lead the design of the NTP study. He has published how there are unfounded criticisms of the NTP and addresses that.

The FCC said testing phones are zero mm is unnecessary. Women put their cellphones in their bra. I can probably find three or four women on the street in DC who carry their phones in their bra because they don't know. Phones are always radiating even when you are not on them. They say that operating instructions are adequate. Kids don't know.

Abrami: Theodora, please for the sake of time, it would be great if you get to what states or municipalities are doing.

Scarato: Montgomery County, MD has a federal court challenge to the FCC. This was filed before the FCC did its filing stating they don't need to update the limits. This case is still proceeding. How can the FCC be streamlining 5G when they haven't completed their inquiry? The FCC should complete the 2013 review before issuing 5G streamlining order. See the links to Putting the cart before the horse-“FCC's 5G first, safety second” policy by Albert Catalan, Eric Gotting and Timothy Doughty, the Journal of Local Government Law. That's one of the lawsuits to know about. I have a link to the filing.

Cooley: Mr. Chairman and Ms. Scarato, I don't mean to interrupt but I think there needs to be some clarification to that slide. The way that you characterize it is that Montgomery County is suing on RF grounds. Montgomery County raised the RF issue in light of the FCC's state and local item with respect to streamlining 5G facilities. I think that's an important clarification for the minutes. I hope I wasn't disrespectful by interrupting you but I wanted to make that point.

Scarato: I hope I was clear on that. What they are saying is, how can you streamline 5G without having finalized the inquiry preceding it or pushing something forward without having done the review?... not that there is a health problem. That is what I meant if I wasn't clear on that.

Cooley: I believe that Montgomery filed again though after the FCC item on Dec 4th. I would like that to be clarified.

Scarato: Oh. I know they are continuing their case.

Cooley: They are continuing their case. I am not disputing that.

Abrami: Theodora, you may want to check that out and get back to us.

Scarato: Yes. I will

Letters from Senators: We have links on our site of senators who have written letters to FCC and FDA, asking for their review on 5G and their letters.

Lawsuits: I wanted to point out two lawsuits: 1/ Irregulators vs FCC and the Fegan Scott lawsuit. Irregulators lawsuit alleges that there was money for maintenance of wired lines that was switched to wireless. I am summarizing. The Fegan Scott lawsuit is about separation distance in phones.

NEPA decision: The FCC's action to streamline 5G, has stripped local authority with regard to infrastructure. There was an appeal by the National Resources Defense Council and Native American Tribes that was won. There needs to be compliance with NEPA (National Environmental Policy Act) for small cell and wireless facilities. Cities and states have argued about amount of caps and leasing spots. There are two separate cases. The FCC has vacated a part of their order saying they do not have to be in compliance with NEPA. So now, small cells need to be certified it meets NEPA requirements. The NRDC did a Q&A about what this means in terms of municipalities. I will provide a link to that.

Federal level: Three Bi Partisan bills on 5G passed the House at the federal level. (H. Res. 575, H.R. 2881, H.R 4500)

Local ordinances: Cities and towns have been coming up with in order to address this because many people say ,I don't want these in my front yard and what do we do? Then they realize they don't have an ordinance in place to handle it. They don't have a permitting process. They don't have any kind of authority. Cities and towns are trying to find out what authority they have and make the most of it. Examples: (City of Los Altos: installation of small cells on public utility easements in residential neighborhoods is prohibited; 500 ft. set back from schools; 500 ft setback for multi-family residences in commercial districts; 1500 ft separation between installations)(Petaluma: 1500 foot minimum separation; No small cell shall be within 250 ft of any residence)(Bedford, NH: 750 foot setback in residential) (Burlington, MA: annual recertification fees; applicant must pay for legal notices of public hearing) (Fairfax, CA: small cells prohibited in residential zones; 1500 ft separation; city to study citywide fiber optic cable network)

Example of issues that come up from lack of infrastructure and permitting/compliance: I will tell you what happened in our town. On this slide, that small cell on private property is illegal even when it was placed on private property six years ago. It was placed there even though the permit was for down the road. The owner repeatedly testifies asking, can you please remove this from my property? Everyone says they can't because no one has authority. It is still there. What is happening is that there isn't the infrastructure that there needs to be to oversee the permitting process that needs to be done. Community members started looking in to this and found several permits that were incomplete and over a dozen that were placed where they shouldn't be placed. Then there is the whole issue on, why can't this woman get that removed from her home? You could have a whole meeting on permitting, review and compliance.

Sherman: I don't understand. We already have utility poles and rights of ways. If this is in violation, why doesn't it fall into the utility right our way or violation thereof and why can't it be removed on existing statute? For example, in Rye there are double telephone poles going in and they are failing to remove the old poles. That's a violation of the right of way and now will be removed. I don't understand why this would take five years if they are in violation of the right of way.

Scarato: I am not going to profess to know all of the details of it. You can watch her present just a few months ago. Every jurisdiction has different policies.

Abrami: I know this isn't the science part of our discussion. 5G means something different to everyone. Different companies are rolling out differently. We are concerned what's in those antennas, how much power is coming from them, how far away should they be from each other, a home or business. Eventually, we will get to that. From a policy stand point, we have to understand the science to be able to make intelligent recommendations Just from an aesthetic standpoint, as a homeowner, I would be upset too. We need to separate the aesthetics from a science too. Some people just don't want it for aesthetic reasons. We are concerned about both because there will be push back. We are trying to get ahead of the curve and understand the science.

Scarato: We all had that question but it's quite complex because every antenna or small cell facility will have different antenna depending on the network using a variety of frequencies. 4G is a backbone of 5G, as I understand it. There is a study that came out that I don't know if Dr. Davis will talk about. There is a study that looked at small cells in communities and communities without them and found there will be an overall increase in environmental level. Industry will say it's negligible. Scientists looking at biological effects will say it's important to consider, I believe. I don't want to speak for anyone but I know that is what is being put forward. That's a good question. We aren't getting 5G but are getting 4G and they put cells 2-10 homes.

Abrami: Usually, we hear of 5G in mm waves, further up the spectrum.

Scarato: But they aren't going to be using only mm waves. They are also using low, mid and high band frequencies, at least from the CTIA report. All of those frequencies will be utilized in 5G depending on the carrier and location. So, to say it's only mm waves is...

Abrami: Every company is different is my guess.

Scarato: What can cities do to retain their authority? Many cities want to retain as much authority as possible related to 5G. There are now 120 cities in Italy passing resolutions on 5G. In Cyprus, they removed wireless from pediatric units and provide safety information for parents. Internationally, is all online on our website EHTrust.org.

Cooley: Thank you for your presentation. We can talk about what is happening internationally but the US has a unique set of laws. In terms of what cities can do, we have to remember the FCC state and local order is the law of the land. It went into effect in January 2019. Yes, it is being litigated. Oral arguments are February 10th in the Ninth Circuit in Pasadena, CA. As we are looking at policy recommendations, we have to remember there is federal law. There is also the Communications Act section 332, specifically which we should delve into because other states are looking at what they can and cannot do in this space. I want to frame that properly. Yes, there are ordinances around historic preservation, aesthetics that cities can look at. But in terms of legal framework, I don't think New Hampshire would want to be inviting litigation by recommending something that would perhaps run afoul of federal law. On that slide, I wanted to make that point.

Scarato: I would expect that lawyers would assure that local, state and federal law was being evaluated depending upon where you are. There is a lot that you can do and a lot that you can't do. There is a lot that cities can do actually.

Cooley: Yes. Absolutely, I am not disagreeing with that. The only other point I wanted to make. You mentioned a Federal Right to Know law that was introduced in Congress in the early 2000s and you mentioned the San Francisco Right to Know Ordinance which you seem to allude could be something the commission could look at.

Scarato: As I understand, San Francisco continued their arguments and decided to pull out because whoever won would have to pay the court fees and it was not implemented.

Cooley: That's correct. It was never implemented.

Scarato: Also, the Berkley cell phone law did pass which I did not talk about. It basically says that people have the right to know when they buy a phone from a retailer that if it touches the body, it could exceed FCC limits. The Supreme Court let it stand.

Cooley: It was not implemented.

Scarato: Right.

Roberge: On your slide that had cities with protective ordinances, you use the term facilities in terms of setbacks for facilities. Are you referring to antennas?

Scarato: When I said facilities it refers to the installation of equipment and antenna.

Roberge: I just wanted to make sure we were talking about antenna and equipment not a facility as in a building.

Sherman: I have a quick question. With multiple different networks and multiple different carriers in any one municipality are there multiple different 5G networks being proposed? Does each one emit a certain amount of radiation? If for example, you have T-Mobile and Verizon in same setting, what does that mean for total exposure for the public? Is it double? How does that work?

Abrami: To add to that question. Currently, there are towers with multiple antenna, will there be sharing?

Cooley: Yes, there will be sharing and Theodora made a great point. Carriers will be using different frequencies. T-Mobile for example, their 5G will mostly be on their existing macro towers. So they are going to be 200 feet in the air vs Verizon or AT&T who might be using the millimeter wave on that light pole. It's not kind of a yes or no answer.

Sherman: If we are in Concord and we have T-Mobile, Verizon, AT&T all providing service, are we going to have three different networks to which we are exposed all at the same time? Or is it one shared network? The ultimate question is does it mean are we going to have 3X the 5G exposure? And what does that mean?

Cooley: I am not an engineer but the answer is no. Depending on the facility being used, they are going to have different power levels which will change the amount of non-ionizing being emitted. So, it's not really apples to apples to say.... you've got one Verizon, one AT&T, one Sprint and one T-Mobile because they are probably not all going to be on the same facility because they are using different spectrum frequencies. So, it's not just to say, Yes.... You will increase by four. This is really an engineering question.

Scarato: While that's true, it's also true they don't want to share installations. It came up in Washington, DC. They don't want to share a hotel but that means that different carriers don't want to share an installation. Each will have its network rolled out. You will get the increases.

Cooley: But that's specific to DC. There are locations where hoteling does occur and carriers share one pole. It's completely specific on the network needs and the spectrum being used.

Abrami: We have an engineer right here with a question.

Gray: I wanted to go back and defend my comments in the middle of the presentation. When a guest is asked to come given the criteria, I expect certain things from that guest. I don't expect to get bombarded with health things that are trying to tug on my heart strings, other information that doesn't go back and say yes. We have this but here is the data that I can look at that says this is happening. I've got a lot of people from Health and Human Services coming to talk to me about vaccines that say here is anecdotal information that this person ended up with because of that vaccine. We go through this whole presentation and we say, so what real data did they present at all that says here is this radiation, this frequency of radiation, this level of radiation that caused these things and that is why we are protecting you. So, when we go further than that and you say there are a bunch of cities out there who have regulated placement of antennas. What information did they use to regulate that? If it's clearly identified information then everybody across the country would have done it. Or is it because they were scared? I am on the planning board and City Council in Rochester. There are people there who would like to regulate all kinds of things. It's just like the environmental thing, global warming. Give me data. Don't give me, I asked a question and I didn't get an answer.

Scarato: Dr. Davis will be talking about that data and all that data is on our website. Dr. Davis is presenting the science. I am presenting the policy.

Abrami: Yes, Theodora. You did exactly what I asked you to do. I was trying to get a sense what's going on around the country related to this in terms of ordinances and states taking action and all of that. We, as a commission are doing a pretty good job of not taking things on face value. We are trying to understand the science. This may have not met your needs today on this but we are trying to get as much information on this as we can. I understand your position, Senator Gray. When I talked to Devra the other day, I told her what I want to know is what studies have been replicated multiple times.

We will be meeting through October on this and we will continue to try to bring in the right people. We have the outlines and the picture and we have a lot of filling in to do as a commission. Thank you for your comments but our guests are our guests. As a commission, we do appreciate you coming here.

Wells: I just want to make a quick point from a moment ago, just to clarify the science of electric fields and magnetic fields. When we talk about electromagnetic radiation, they are additive. It does not depend on the frequency you are talking about. It does not depend upon what brand name it is or the locality. It's called the superposition principle. If you have multiple carriers in an area, they will overlap and add.

Sherman: I think that answered my question.

Chamberlin: The 1996 Telecommunications Act says that health effects from exposure to radiation cannot be used for objecting siting. How does that come into play or does it come into play in the legislation you are familiar with?

Scarato: Well, it says that concerns about environmental effects cannot be used in the siting of facilities. This was then interpreted by case law and lawsuits to be health concerns. If there is a community and people only talk about health concerns and the city says because of these health concerns our citizens have, we are not going to site the tower, then they can be sued. People say don't we have a right? How can this be? (Section 704 of the 1996 Telecom Act) I didn't mention this, but at that time, this was the most heavily lobbied bill in the United States. The lobbying only increased after. The amount of money that went into that bill was pretty impressive. I would say that everyone should be able to have their time in court to argue if they have been harmed.

Cooley: I would add that there is litigation just filed yesterday actually in Camden County, Georgia with Verizon. They are suing on the merits of that very issue. The FCC has exclusive jurisdiction over regulating anything that emits RF. So, if a locality does violate that, they may see litigation as we saw yesterday.

Scarato: Several times companies or CTIA have sued and they haven't always won. They haven't always talked about health issues but aesthetics and other things.

Sherman: For my part, I found this very helpful. So, thank you for coming. We are trying to make our decisions on whether or not to move forward or how to move forward based on as much science as we can. You have given us a nice framework on what others are doing in terms of implementing policy. With your help, there has been for me a nice framework on what are the limits of our capacity to do so.

One of the most troubling parts to all of this and you are not the only one who has shared this with us, so you are not alone is that it sounds like the FCC has sole jurisdiction over what happens with the rollout of these networks, yet they are completely in bed with industry.

In the medical world, which I represent, we have a similar problem with pharma and their regulation and the FDA. This is not something this commission can take on but you provided a framework in a nice way to help us understand what are the limits of policy that we could actually consider and roll out if we wanted to provide regulation. Thank you for coming and providing some of that perspective. I think we need both policy and science. So this has been helpful.

Heroux: I would like to address you as representative of CTIA. I just want to drag you out of your comfort zone. As a specialist, I have heard hundreds of reports of deleterious effects of electromagnetic radiation, and you have sat very patiently as we outlined these things in sessions.

What about the positive effects of cellphone use? What I mean by that is, if because of wireless and a cellphone, I can avoid a car trip and then perhaps a car accident. Then surely there are benefits to this,

right? There are benefits to the use of wireless. Has the CTIA supported and documented the benefits to using wireless? After all, we have to balance the negative with the positive.

Cooley: Thank you so much for that question. This is a policy question, right in my wheelhouse. Absolutely, I will do a plug for CTIA.org. Accenture and Deloitte have done host of studies on the benefits of what 5G will bring to this country. Nationally, 3 million new jobs, 500 billion contributed to the US GDP.

Heroux: I am sorry. I don't mean about economic activity because that is dollars that can go one place or another. I am talking about avoiding deaths and diseases. Surely, wireless has substantial capability. I perceive that your industry has not documented these things in great detail but have been driven by an alternative variable, which is commercial success. In other words, if things are bought, people want them. So this is an index on how useful they are. My point is...we love potato chips but we can have trans-fat potato chips. You see where I am going?

Cooley: Yes. The benefits of 5G for remote health care. If you live in a rural area and you don't want to have to drive into the city or remote surgery. AT&T is doing some really exciting stuff. There is the first 5G hospital at Rush hospital in Chicago. There are absolutely benefits to consumers and society and agriculture. Drones survey networks so we can see where people are without service. We need to save them if their houses are on fire so we can communicate with first responders, so yes. There is a ton of research on that and independent agencies as well. I would be happy to provide this commission with those studies.

Heroux: Most of those things like remote surgery doesn't need 5G. It can use fiber optics. What I am talking about is specifics. So you could come up with a report that would document the advantages of wireless specifically independent of data transmission. We have not seen that much documentation on this aspect of it. Ultimately, we will have to balance these things right?

Cooley: I am happy to share those use cases with the commission because I disagree.

Abrami: yes. I would agree.

Cooley: I am happy to share those reports we have right now and there are a host of reports coming out, I think second quarter of this year that are not CTIA. We don't do the research. Other entities do the research. I am happy to share those.

III.Devra Davis PhD, MPH, President, Environmental Health Trust (via speakerphone):

I have been working in science at some of the highest levels for many years. We started Environmental Health Trust when I was at the University of Pittsburgh Cancer Institute, where I had set up the Center for Environmental Pharmacology. I worked as a member of the President's Cancer Panel. I was

confirmed by the Senate. So, I have been around for a while. I have written two books. The most relevant and recent book is "Disconnect: The Truth About Cell Phone Radiation".

I am going to first explain that when it comes to getting information about any toxic agent whether it is chemical or in this case, RF, we look at experimental studies including *modeling* of exposure. Please understand that that is all we have for exposure. We can't go inside the brain and actually pick up exposure when it comes to humans. What we can do is use computer simulations that are anatomically based on models of the human brain including specific parts of it that are relevant. I will talk about today, particularly the hippocampus. We can fairly accurately model those. Those models have been validated and are used right now. Some of the models I am going to show you are used to set the standards for surgery or approval of equipment by the FDA.

Then there is *in vivo* testing which means whole animals. We take animals and expose them usually over a period of several weeks or some time for two years. Rarely, are animals exposed from before birth to their death.

Next we have *in vitro* studies which look at cell cultures either animal or human cells to measure DNA damage or other things that happen in cells. Those studies, I want to stress are done in order to predict human effects and prevent them. That is why every drug that you take is subject to animal testing. The same standards being applied to testing drugs have been applied to testing RF. Please keep in mind that everything we know for certain causes cancer in people because we have data for example from asbestos or arsenic will produce it in animals.

In terms of *ecological* studies, we can look at trees and grasses. There are experimental studies as well on bees and other smaller animals.

Finally, we have *epidemiology*, the study of people and I am a fellow at the American College of Epidemiology. I was also a member of the American College of Toxicology. So, I am familiar with both of these overall approaches both, toxicology and epidemiology.

For epidemiology, *cohort* studies are the weakest form of analysis that we have. In the case of what we are looking at for brain cancer, we cannot follow people through their entire lifetime with detailed information. We therefore rely on case control studies of those with the disease and compare those to others who do not have this disease but are otherwise similar.

The next slide shows you a child. It explains that because of the modelling studies that have been done, we can conclude without question, that children will absorb more RF into the brain soft tissue inside the skull and 10x more into the bone marrow of the skull, compared to adults.

Virtual reality simulations: I just showed that to you because virtual reality is a very cool and exciting thing but the way it is often used is with wireless transmissions and when you have a microwave radio right in front of the eyes and frontal lobe, you are getting greater exposure if you look carefully through the top of the skull of the six year old on the right side. You can see much greater penetration into both eyes and we are very concerned about the eyes of children right now from a number of exposures.

Summary of the EU REFLEX Project: The European Union in about 2000, funded about ten million dollars for twelve different research labs in seven countries. They were asked to look at the question of whether or not the same radiation that would be received from cell phones could break DNA in a variety of human cells and by the way including brain cells and human lymphocytes and fibroblasts. The conclusion of that study, much to the surprise of the people doing it, was that they found clear evidence of DNA damage. At the beginning, when they first found positive results, they assumed they had faulty equipment. They had so much money that they went out and bought new equipment to test things. Those of you with a medical backgrounds, which I am pleased to know are on your commission and also part of your legal body there, understand that being able to buy new equipment means you have a lot of money. The results shocked the researchers. They clearly showed changes in gene and protein expression in several different cell lines. Interestingly, they did not show damage in the mature human cell line. Damage was much greater in human fibroblasts and human cell lines that are less mature, stem cells.

Abrami: Can you go back to that slide please? So, they replicated a study that was done in 1994 but it was a 2004 study they replicated again?

Davis: Yes. In 1994, Lai and Singh produced a study showing damage to the brain of the rat from cell phone radiation, DNA damage. They were shocked by the results. They did the study all over again. When they were about to publish the results, the industry engaged in what was called "War Games". That was the strategy and what it was called in 1994. Remember, in 1994, very few people used cell phones (about 10%). People in industry understood the importance of this, went to the journal that accepted the article for publication and tried to get it unaccepted. They went to the NIH and accused the researchers of fraud and went to great lengths to conduct what they called War Games. That was 1994. In 2004, when another group was asked to see if there was anything to this, they were confident they would find nothing. In 2004, they replicated it.

Abrami: This is the EU REFLEX group.

Davis: The Comet Assay: Right but there's more. I'd like to show you more about the replication of the DNA on deregulation of cell proliferation and exaggerated programmed cell death otherwise called apoptosis and genotoxic effects all show from very little exposure. The next slide is a summary from there (The Comet Assay). You can see the sham or the perfect cell on the left is a cell with no DNA damage. When you have damage, you get a common tail. See the tail on the top right and the bottom. In 1994, those tails were only measured by somebody looking at them and giving you an estimate of what percent tail there was. Now we have much more sophisticated ways of automating the measure and extent of that tail. The top right is damage from gamma radiation like you would get from massive exposure from a CT scan which could happen in a pediatric CT scan where the scanner is not properly set. The top left slide is your control. The far right on the top is the impact of gamma radiation from xray like pediatric CT scan gives you that much exposure. The bottom right was what they achieved after 24 hours of exposure to mobile phone like radiation at 1.3 watts/kg.

Abrami: Is that continuous exposure for 24 hours?

Davis: Yes. It was exposure like a cellphone. A cellphone is not continuous. Within four seconds, you get huge changes in power density over time.

Abrami: I am trying to understand how far away that cellphone was from the eyes. This is eyes right?

Davis: No. These are not eyes. These are cells taken from the brain.

Heroux: It is slightly lower than the FCC SAR limit.

Davis: It was below the US current standard of 1.6 watts/kg.

Subsequent work confirms the REFLEX project. They showed clear evidence non- thermal microwaves from mobile phones affected repair of DNA in human cells. They showed the same effects at the GSM frequency of 915Mhz. These studies referenced at the bottom of the slide, were all produced subsequent to the REFLEX Project from 2004, 2005 and 2009.

Abrami: so there are four other studies listed there?

Davis: That's correct.

Sherman: All of those corroborate the findings of DNA damage?

Davis: That is correct. Further, the next slide is from Lerchl.

Lerchl: Lerchl was widely known as a skeptic of any of this. In 2015, Lerchl started with exposure at conception. The rodent reproduces in three weeks. In a very short time, you can follow these animals through their lifetime. Then the equivalent of early childhood, the animal was injected with a known carcinogen, something that we know causes cancer (ENU). Then, those animals were subsequently exposed to RF exposure. The levels of exposure were .04 watt/kg, .4 watts/kg and 2 watts/kg. What you can see is that the control animal developed very few liver cancers. The ones exposed to the carcinogens developed more. But the ones exposed to cellphone radiation developed far more. Much to the surprise of the investigator, they were able to show that the mice exposed in the womb to a known cancer agent, then exposed to cellphone, had significantly higher rates of cancer, tumors to the lung and liver. The study was designed to replicate an earlier study by Tillman, also of Germany. When he first presented his results, said they were remarkable. His study was ignored. Lerchl found higher rates of cancer in all of these mice. Also survival times of the animals were much lower of those who were exposed. This was a very powerful replication as well and further replication because you had asked me, Mr. Abrami about focusing on replications.

The NTP study: You already heard about this so I won't go into that. But, I want to remind you that what is on the website of the National Toxicology Program right now summarizes this information. It states clear evidence of tumors in the *heart* of male rats. I want to stress these are very rare cancers. I suppose in a way, that's the good news. There was also some evidence of tumors in the brain of male rats, again rare. There were multiple cancers in other organs, some of which did not achieve statistical significance

but were still elevated. In the NTP study, they said, not only do we have evidence of cancer but precancerous conditions of the heart, meaning damage to the heart. This is quite worrisome.

The publication that came out from NTP shows DNA damage to the *frontal cortex* of both rats and mice. I want to stress that although the cancer showed up only in the rats, the DNA damage showed up in both the rats and mice. There is clear evidence of replication of results of DNA damage. The cancer results are also replications. This is not a one off study.

I want to stress something about the frontal cortex. It's really hard to get mice to make phone calls. That is why the exposure has been carefully calculated not to increase the temperature of the animal but to allow whole body exposure that simulates the kinds of exposures that can occur today.

Slide 14 and 15 give you a much more detailed analysis of NTP. Slide 14 looks at the tail of DNA using computers now. In 1994, they had people who could just look at the tail. Now we have computers to do it. They can score the number of cells in terms of the evidence of fragmentation of the DNA. Zero is your control. You will have some fragmentation of DNA just because that's life. We are breathing. We have sunlight. We get DNA damage all the time. If we are healthy, we eat our broccoli and sleep in the dark, we will have repair of our DNA. This is showing that exposure to CDMA which is a type of cellphone radiation. You get statistically significant damage indicated in the male rat *hippocampus*. The hippocampus is what allows us balance, memory and impulse control. It has been well studied in many different systems and shown to be damaged by exposure to cell phone radiation. Slide 14 is showing you the rat and slide 15 is showing you the mice.

Slide 15 shows the effects to mice are in the *frontal cortex*. In the rat, it was the *hippocampus*. Slide 16 discusses the implication of the NTP result. Dr. Melnick was involved in setting up the study originally in 2008. The study was designed to test whether or not heat was the only effect. They set up a study that did not heat up the animals. That design was carefully calculated by Swiss engineers using methods that are validated, they were able to show results that I just showed you, increases in brain tumors, increases in heart as well as DNA damage in multiple organs in both rats and mice.

Abrami: Is that the replicated study that was done?

Davis: Yes. Smith-Roe is the first author of that study that was just finally published in 2019. Dr. Melnick and I and many others believe that the FCC by issuing its latest order saying we are going to be keeping our 23 year old standard for RF is ignoring this body of evidence I just showed you and more. I would like to show you a little bit more.

Gray: Before you leave that. The radiation that you applied is less than what it would take to heat. What is that in relationship to normal radiation from a cellphone an inch away from the head?

Davis: Thank you for that question. It is the same radiation you would get from a phone and they did it with ten minutes off and ten minutes on simulating the way we are exposed. As you may be aware, even when a phone is in your pocket as long as it's turned on, it's constantly checking for signals from a tower.

Gray: I understood that it was the same radiation. What is the level of radiation? I want to know if the radiation that I would get from a cellphone an inch away from head is a higher level than what these rats and mice would have experienced just below the level that would cause heating.

Davis: Well as a matter of fact. I am really glad you asked that because the answer is we get more exposure from our phones than these rats got. The reason we know that is because I assume you have seen the results of the Chicago Tribune test. Have you?

Abrami: No.

Davis: Theodora, I think you should show them the 60 second video of the test from Chicago. Do you have that? The Canadian Broadcasting Corporation, the French government and most recently the Chicago Tribune have actually taken real phones and tested them. They have found that the phones when in your pocket emit actually more radiation than the NTP study. The NTP test, tested the amount that they are supposed to emit. The Chicago Tribune paid for independent testing at an FCC approved lab. They took phones off the shelf and what you may not be aware of is that the way phones are tested today. They are provided by the manufacturer to a test facility and they select the phone to be tested. There is a whole scandal about that because as it turns out when you do that, of course the phones pass the test. When you take phones that you can buy and test them next to the body, they all fail the current test. (Nine out of ten of them to be precise) They fail it by as much as five fold in the United States.

Sherman: That is significant, what she just said.

Scarato: I wanted to say that when you put a phone near your body, you are getting an intense localized exposure near where the phone is. NTP did that at localized exposure, not the full body number. They wanted to see what the intensity would do to the tissues. This is not a whole body number but a localized number that we are talking about when we are comparing. The FCC occupational limit is 8.

Abrami: So, when they did the test and took the phones off the shelf what did they do?

Scarato: They measured the SAR levels at body contact and at 2mm and the French government measured hundreds of phones and body contact and found excesses of the limit.

Abrami: Most of the public is putting it next to the body because they don't read the fine print.

Sherman: I am trying to get at what is the significance of exceeding by five fold in the Tribune test? What does that mean to us?

Davis: The significance of the Chicago Tribune test should be that it would call for re-examining the whole test approach.

Sherman: So we are basing the emissions coming from phones based upon the tests done by the manufacturers under FCC guidelines but these independent tests in Europe and by the Chicago Tribune

and Canada are showing no, that's not necessarily the case. We may be getting five times that exposure of RF. Is that correct?

Davis: That is perfectly said. Thank you.

Scarato: in high exposure conditions.

Cooley: I just want to add to the record from that Chicago Tribune story which came out in August. The FCC immediately opened an investigation to look into that. On December 19th, after doing their own independent investigation, the FCC published a report saying they tested the same models and found all of them compliant with the FCC exposure limits.

Sherman: This is the FCC that currently has every member as a member of industry, former, future or current. Is that correct?

Cooley: The commissioners. If we are talking about the "Captured Agency" slide that Theodora had. The commissioners don't do the testing.

Sherman: No. But they are the ones who approve what comes out. It's like an Editorial Board. Is that correct?

Cooley: I don't know how or if they approve of a report. I don't know that process.

Davis: The protocol for the FCC was developed based on the assumptions that the only effects that needed to be avoided were heating. The tests were developed 23 years ago when phones were solely used by medical and business people. How many of you used a phone 23 years ago?

Sherman: I did.

Davis: Well, you are probably the physician in the room.

Sherman: yes.

Davis: My dad was a brigadier general and he also had one but very few people with normal jobs had phones. It was only about 10%. That's when phone protocols were set up and they were set up to be tested up to an inch away from the body because they would be in a holster which is the way people had pagers and phones in those days. They didn't carry them. They had them in a holster.

Scarato: Can I clarify what Beth is saying here? When the FCC did their test after Chicago Tribune, they tested at 5mm from the body. They didn't test at zero mm which was the whole point. They said they are compliant but if you look at the test report, it says 5mm. Then the news headlines read, "they are compliant". But it says right on the report... 5mm. The issue is people have close contact.

Gray: The 5mm problem bothers me alright? The reason it bothers me is there are 2.54 mm per inch so if I take 5mm, I am at a quarter of an inch or so and when I look at where the antenna is in the phone because there is a spacing there, I would think that 5mm is probably a pretty good distance when I have the phone right up to my ear.

Davis: It turns out that the antenna in the old days were towards the head. The newer antennae are toward the thyroid and lower. Your smart phone can have four or five antenna: One for data, one for video, one for voice, one for satellite GPS which is not RF. You have multiple antennae now that are located lower in the phone. We are now concerned that one of the explanations, not the only one but one of the explanations for the increase in thyroid cancer could be cellphone radiation.

Ramazzini: (slide 18) I do very much appreciate the opportunity to speak to all of you. I am delighted and honored to be able to speak to you and the fact that you exist really means a lot to all of us that have been working on this issue for quite a while. I never imagined I would be spending a decade or more of my life on this. I previously worked on lead and asbestos and I thought this would be a pretty simple issue but it's not simple. Ramazzini did a study like Lehercl but they took thousands of animals and exposed them at different levels before and at conception and followed them until they died.

Their results on slide 19 was to show damage, the same type of damage that the NTP found at levels of exposure to their animals that were far less than NTP. In particular, they showed a *synergy* between RF and xrays (gamma radiation). *This is really important because it shows there is an additive effect between RF and gamma radiation (xrays).*

Abrami: the Ramazzini study was an independent study basically in parallel?

Davis: yes. It is the equivalent of the NTP for Italy.

Uptake of glucose in the brain: Slide 20 is a summary of a paper that was published in JAMA by some of the top researchers of the US government, the Director of the National Institute of Drug Abuse on the effects of cellphone exposure to the uptake of glucose in the brain.

Slide 21 shows the study design. A person with two cellphones strapped to their head. The study was done more than a decade ago. They had a PET scan which can measure the uptake of glucose in the brain. The person with a phone strapped to their head did not know whether the phone had been turned on or not.

Slide 22 is the results. If you look at the slide to the right, it shows the increase in glucose in the parts the brain that got the most exposure. Look at the slides comparing glucose uptake when the phones were turned off compared to the slide with the phones on. Look at the increased amount of glucose in the exact part of the brain there was the exposure. Why is that important? *Alzheimers* has been called *diabetes of the brain* because people with Alzheimers have too much glucose in the brain. Nobody knows the consequence of having too much glucose in the brain from holding a phone next to your head. It remains unknown. This study was subject to "War Games" as well.

Slide 23 explains part of what might be going on. You will see the control on the left without exposure. The slide on the right shows little tiny dark spots of damage, *indicating that the blood brain barrier has been breached*. At the bottom of the slide you will see references.

Abrami: is this a human brain? Or no?

Davis: oh no. We can't do that. These are Sprague Dawley rats.

Davis: at the bottom of the slide you will see references to subsequent studies. The first study showing this was in 1975. Alan Frey did that work. Cold War was still on and radar is a vital part of it and he was basically told to stop doing research. All of that is documented in my book.

What happens when you have a cellphone in your pocket: I have done a Ted X talk that I think you will find interesting. I make the point that sperm have to swim the equivalent of the distance from Los Angeles to Hawaii in order to succeed in fertilizing an egg. Do you know why it takes at least a quarter of a million sperm to make a healthy baby?

Abrami: why?

Davis: It's because they don't know how to ask for directions.

Abrami: I fell for that one.

Davis: When you get these slides on your own computers, you can simulate the exposure. Look at the white in the control slide. That indicates either the nucleus or the border. On the exposed slide, you can see that on some of the cells, the nucleus has been degraded and in many cases, the border is gone. Again, indicating damage to the membrane. So, cellphone radiation damages the membrane of the *brain* as well as the *testes*. I believe the *eye*, as well.

Abrami: I see the Cleveland Clinic quote there. Was this research done there?

Davis: Yes. Some of this research has been done there. Some of it has been done in Australia at their equivalent of the Cleveland Clinic and other work has been done at other clinics. What's interesting is that people doing this research started to do it two decades ago because they were concerned with the number of doctors showing up having fertility problems. What they concluded in a cross sectional analysis was that those who had the most beepers and things on their pelvis had the lowest sperm count.

Recent study glioma on Slide 28: Summary of the most recent work I have done with Prof. Anthony Miller who has himself authored more than 600 publications. It basically shows every study that has looked at people who have regularly used phones for ten years or more, for an hour a day or more we found an increase in *glioma*. More studies have been done now. The most recent study was released this week.

Thyroid Cancer: The American Cancer Society supported a study of thyroid cancer. It was done at Yale University that shows a double risk of thyroid cancer from those using phones that had specific SNPs which are quite common. These SNPs have to do with repair like p53 and other things that have been identified. The newer phones have antenna located closer to the thyroid. The study concludes that they have found a link to an increase in cancer from regular cell phone use. *It was just published this week.*

Effects on children's brains: Slide 31 tells you of the effects on the brains of children are substantial. Here is a study that looked at the brain matter of preschool aged children, using MRI. I don't know how they got approval for this study but they did. They concluded that there was degradation in the brain white matter looking at microstructures with heavier regular screen use, which is further reason why the American Academy of Pediatrics has said we must reduce exposure in young children.

Abrami: They based it on one study or the preponderance of evidence thus far?

Davis: Well, this is one study but it's a replication of many other findings on effects of attention, behavior and learning in children.

Effects on memory in teenagers: Slide 32 looks at teenagers and again they find a deficit in memory of kids. I will let Theodora talk to you about synergies on slide 33 they found in Korea. Mr. Abrami, you had stressed you wanted replication. I am showing you these are all replications of results on adverse effects on learning, behavior and attention from cell phone use in children.

Why so many conflicting studies? Slide 37: The answer is, follow the money. The majority of the studies in this field have been funded by industry or the military. That's just a fact. Analyses of the studies show that 75% of all the negative studies have been funded by industry or the military. Microwave News 2006 assessed *funding bias*. You don't need to be a statistician to know which way the wind blows.

Insurance Industry Slide 39 shows secondary insurance Swiss Re and Lloyds of London and others will not cover damages from wireless devices or EMFs. They rank it in the same category they once ranked asbestos.

Abrami: We were well aware of this fact. Have you spoken to anyone from the insurance industry about this? Why don't they insure?

Davis: Several years ago I did. They run the numbers. They think there is sufficient scientific concern and the 10K reports of wireless industry say they may face liabilities from lawsuits. There are lawsuits right now on behalf of people with brain cancer that are still going through the courts. They have not been thrown out and frankly I think they are going to win.

The last slide is the one of the cartoon. I just want to remind you. It had been very difficult to get people to stop smoking in the environment of children because the science had been deliberately manipulated. Unfortunately, that is what we are dealing with here as well. Why did the FDA reject the NTP? They have not even given a reason.

Sherman: We kept hearing about the need expressed by federal agencies for a comprehensive review of all the studies that have been done and yet that hasn't been done is my understanding. Is there any plan for comprehensive review? If there is, would that review take into account funding sources? We know from several other medical studies that the impact of funding is huge on conclusions and editorial control of final conclusions on the studies.

Davis: Environmental Health Trust, I can say is that we are the mouse that roared. We have managed in the paper that I shared with you, Miller et al. That is the closest thing to a comprehensive analysis. That was done in 2018 two years ago.

Abrami: We have to pause. Beth has to leave. I am thinking about the 14th of Feb for our next meeting.

Cooley: I am not available but I can see if someone internally is.

Davis: What is your schedule for completing your work?

Abrami: We have until October to have our report finalized.

Davis: Your work will be vitally important because there is a huge gap. The federal government has abdicated it's authority for years. We have been really shocked at the appalling situation with the FDA. It just flies in the face of science I have shown you just briefly here. I could have shown you even more on male and female reproduction in animals. I could have shown you more effects on humans. This simply indicates that there is a robust body of scientific evidence, including the study I just showed you that just came out on the thyroid (Luo 2020). That study is putting another nail in this coffin. We know industry knows how to make safer phones. The real question is for 5G, what does all this mean?

Sherman: Can we get a link to that?

Scarato: Yes, and also the bees because they look at MM waves specifically.

Abrami: Yes. We are interested in bees. That is an area we want to pursue.

Davis: I have a video in my slides of the bees. This study was done by bee experts with three hives. What it showed was the hive with phone off and the control hive had no effect. The hive with the phone turned on, those worker bees did not return and they stopped producing honey. Obviously, you are not going to have a phone in a bee hive. But it's clearly indicating a susceptibility to this exposure.

Abrami: This has been very helpful. We are trying to get the facts and understand. Unfortunately, as a commission, we don't have the resources of the federal government here in New Hampshire. We don't get any funding to do anything other than us being here as volunteers. We are going to work as hard as we can to get at the facts. We would like to hear from the FCC somehow or at least a member that was in the room. You suggested that there may be someone that may be willing to chat with us.

Davis: I think he may be willing to do it without being identified by name. It is a tough business.

Abrami: Well, we will take him anonymous.

Davis: I will ask.

Sherman: I can talk to our federal delegation and see if they can twist some arms to get somebody here. This is something Jeanne Shaheen should be able to compel.

Davis: I fully agree by the way .The appalling thing is there isn't any staff member at the FCC now with any training in this field of bio-electromagnetics.

Abrami: I would like to know in their last ruling, what they based their decision on?

Davis: Montgomery County if preparing to file suit against the FCC because in their statement, they confirm the 23 year old standard. They do not show any recognition of the 1900 pages of scientific evidence they received in response to their proposed rules. They asked the question: in advanced notice of proposed rule-making, should we change our standards? They received hundreds of scientific statements including from us stating that they should. In failing to review the 1900 pages, they are violating the Administrative Procedure Act. I don't know if any members of your commission are a lawyer.

Abrami: We have someone from the AG's office on our commission.

Davis: That's wonderful! I would like to talk to the AG and see if the state wants to join this lawsuit as an Amicus. It doesn't cost any money. Montgomery County probably has a budget equal to your state.

Garod: have any other states joined?

Davis: We think California is going to. What I have been told by a reliable source who was at the meeting, was that Ajit Pai said, I don't care about science. This is what we are doing. That is so arrogant.

Sherman: Are the FCC meetings public?

Davis: This one was certainly not.

Abrami: Devra, I will connect you two by email and you guys can have a chat.

Davis: and I will connect the AG person with the AG person in California.

Abrami: well, we will start with you talking to him. We are out of time now. We would appreciate maybe down the road having another conversation with you.

Davis: I am happy to do that. The fact is that the federal government is failing in its duty to protect public health. That's very unfortunate and therefore you guys are in a very important role. You really are. I have been accused of being a closet Republican. The fact is it may take Republicans to do this because the Democrats have been in bed with these guys for a long time. I hope I don't offend anybody.

Abrami: Let me see, about half anyway.

Davis: The fact is both Republicans and Democrats are both well supported by this industry.

Abrami: At the state level we do this on the cheap. We don't get any money.

Davis: I know you are a citizen legislature with real lives and real jobs and you are doing this as well and I am truly grateful to each of you.

Abrami: We are trying to do what we can do and to get the facts. We appreciate your time and Theodora as well. I will connect you with Brandon our Asst. AG. Another other questions:

Woods: how do you know the level of scrutiny the FCC gave to the scientific information provided? You say they didn't look at it. How do you know that and what level of scrutiny did they give it?

Davis: I know that because of a person who was at the table when this happened.

Woods: Ok

Sherman: Is there any reference to the science?

Davis: No. it's as if all of it doesn't exist. Let me be clear, five years ago I brought a number of different scientists who had done this research from Turkey and England to the FCC and met their so called interagency group on RF radiation and briefed them. There is such a group. They have no power. They have no authority. They have no statutory standing to do anything at all except to advise. I don't go into the FCC to brief anyone any more. There is no one to brief. In fairness to the agency, they have huge responsibilities to a lot of different things. This issue is one where yes, you want faster connections to your services. You don't want you fire and police to rely on wireless. It's not reliable. Snow and rain can interfere with it. When you have too many people trying to call, its slow. We cannot afford to have emergency services, public health and the hospitals relying on wireless. It's not safe. We need wired connections and we need to have a major push for fiber optic cable and broadband access to and through the premises.

Abrami: We saw that on 911 in NYC.

Davis: From the point of view of the Dept of Defense, they have issued a report on this warning about the vulnerabilities we face. Demanding wired connections for those that need them is the way to go. I think those in public safety have to reset the conversation. If you are really going to protect public health and safety, you've got to have it wired. It's the only secure connection you can have.

Scarato: I want to add to what Devra was saying about to the two questions about the FCC. How do we know what the FCC did or did not review? There is actually an item the FCC released where they talk about the decisions they made and based on what. As an example, Environmental Health Trust put in countless submissions. We were one of the high submission groups and they didn't address our submissions at all. They addressed some but the large majority of research on biological effects was not addressed in any deep way that one would expect. On the NTP, they just said we are going with what the FDA said. There is a three page paper on what the FDA says and there is only one paragraph on the biological effects. Scientists would expect a more robust document that goes over you gave this study but this scientist thinks this. That wasn't there.

My second question of who is doing a systematic review? The WHO EMF Project which is different than the WHO International Agency for Research on Cancer, there have been a lot of criticisms of transparency on the WHO EMF Project for many reasons of which I have a link to. They have been trying to do a review and it's been mired in questions of transparency. Who are the experts? Who is picking

the experts? Whereas, the International Agency for Research on Cancer, when they did their 211 determination that you are familiar with Class 2B possible, they vet the researchers for ties with industry and I should add that they are now calling for a reevaluation for the carcinogenicity of RF and that should be completed before 2024. That is model systematic review on everything.

Miller: I would argue that the solution that Devra is proposing does not solve the problem at all. Our public safety entities all have fiber to the premises. They don't have access to fiber when they are on the road. So mobility and interoperability are key.

Davis: Let me be clear. There is no 5G for voice. There is probably not going to be 5G for voice for perhaps a decade or more because 5G as you all know is fast and short. It doesn't go very far. In order for you to have 5g on the road, you need to bury it in the highway and people are proposing that by the way. The 3G and 4G that you use now travel miles.

Miller: Are you saying that 5G is the only product or technology that causes radiation?

Davis: No.no.no.

Miller: So, it doesn't matter which generation, 3, 4 or 5. They all cause radiation. I think the mobility factor is very important. So the solution needs to come elsewhere within the design of the devices and not to be taken lightly.

Davis: I completely agree. That's why California issued safety advice about how to use cellphones more safely which your commission should consider. The French government issued a guidance that will take effect in July that said, the abdomen of teenagers and pregnant women should not be exposed to cell phone radiation. That's the French government conclusion. We need to educate the public about how to use cellphones more safely and we need to encourage cellphone designers to do frankly what many of them are already doing to redo the software and the hardware so exposures are much less. There are things that they are doing to do that. Within the industry, there are people I have talked to who say the only problem is the lawyers, no offense again.

If they come out and say now we have got a safer phone and people will say, why didn't you make one before? What about all these people who have tumors in their ears and tumors in their brain and other problems that came from their phone? It's a huge liability problem for them. You are absolutely right. We need safer phones. By the way, our twitter handle is @saferphones.

Abrami: We have had conversations about that in this commission recently as well. This shouldn't be adversarial with industry. We should be shooting for the same goal. Let's make it safer.

Sherman: Devra, two of my close friends were Marianne Donovan and Ron Herberman.

Davis: oh my goodness. Two of my dearest friends.

Sherman: I served on a board with them. But back when Ron was testifying and taking an awful lot of heat for that in Congress, one technology that was available was a very lightweight shielding along the skin side of cellphones to shield from RF from the antennas. Do you know what happened to that? It was low cost and light weight and could have been incorporated into the phone without much difficulty.

Davis: That was a company called Pong but has been renamed. There are cases that have been devised that do reduce the radiation somewhat.

Gee, then you know then what Ron went through. You know what happened to Ron who was such a distinguished scientist. He told me had never experienced anything like that in his professional life.

Sherman: yes, I was there when that happened.

Abrami: Out of respect for everyone's time, we need to go.

IV. Next meeting: February 14th. 8:30-10:30 Agenda to be determined.

V. Meeting Adjourned at 11:00am.