

5G CRISIS

AWARENESS & ACCOUNTABILITY



Explaining the Mechanism of Wireless Harm, Part 2 Guest: Martin Pall

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Josh: All right, we're back with Martin Pall on part 2 of our conversation on the summit. Dr. Pall, welcome again.

Dr. Pall: Glad to be with you.

Josh: So, we're going to get into the five most critical areas in terms of areas of human health effects that you've identified, that you can kind of sum up for the audience. It's deeply important that we identify and comprehend this information and then help it to proliferate. But before we do, I want to ask you, what is an overview, according to the science, of environmental or ecological impacts from EMF radiation?

Dr. Pall: I want to talk specifically about 5G. Let me just say in the broader sense that you raised it, the EMFs work on the VGCC's on basically any animal cell, even in various invertebrates. They also, interestingly, work in plants in much the same ways. There is a specific kind of channel in plants. It's often called TPC channels. It has a similar voltage sensor to the ones that we talked about in the last section.

And so that voltage sensor can activate that channel. And when it does that, it allows calcium to flow into the plant cells. It's not as specific as the VGCC's for calcium. But that's the main effect, is through calcium. So, the upshot of that is the EMFs work in plants and animals in various sorts in very much the same way.

And with regard to 5G, as we said before, there are gigantic 5G effects near the surface of the body. But there are also effects that go very, very deeply in the body. But nevertheless, the surface effects are important. And so, the consequences of that are that organisms which have much higher surface exposure relative to their volume are going to be much more sensitive to 5G effects. And so, I expect that almost all organisms, plants and animals, are going to be more affected than we will. And we will be highly affected.

So, I expect that the ecological impacts will be absolutely stunning, and of a sort that we can barely imagine at this point. But the reason is I think that plants, even large trees, have their leaves and their reproductive organs highly exposed. So, I think they're going to be highly impacted. And the same thing goes for insects and small birds and mammals, which will be highly impacted.

Interestingly, there was a patent that was taken out to use millimeter waves as an insecticide, because you could kill insects really easily with millimeter waves. So, there is some evidence, in fact, that insects are very, very sensitive to these millimeter waves. And again, 5G, because of the extraordinary level of pulsation, will be vastly more dangerous to the insects and to small birds and animals. So, I'm expecting massive ecological impacts of this.

And one of the things I'm specifically expecting, that has to do with the impact on plants, because EMFs in plants make the plants produce much higher levels of highly volatile and highly flammable terpenes. You can get like hundred-fold increases in these terpenes. And so, they become highly flammable. I mean it's like spraying them with a light spray of gasoline.

And I think a lot of the problems with the California fires, in fact, have been caused by the EMFs. And that takes a longer argument than just mentioning it. But I just wanted to mention it. So, I wouldn't be surprised if we have just gigantic, huge fires all over the place from 5G. And I wouldn't be surprised at all if that's true.

Josh: Can we just take another minute and dive into that? I have heard Jack Crews talk about this as well. How does electromagnetic radiation, wireless, and specifically 5G, how does or would it cause fires, forest fires, or house fires? We know about smart meters causing house fires. Can we dive into that for a brief moment?

Dr. Pall: Yea. Well, the smart meters are a different issue. There you have a technological glitch that caused the fires. But no, this is a different situation.

So, what happens is that the EMFs, also working through excessive intracellular calcium, trigger a regulatory system, which in the normal plants

just helps protect the plants from insect predation. And when you artificially trigger this thing, you can get much, much higher levels of these terpenes and terpenoids. And they have a number of properties.

And I'm only going to talk about one of them, and that is that they are very highly flammable. And that's not the only thing that's important, actually, for fires. There are two other things that happen that are also important with regard to the fires. I don't think we have time to talk about those. So, as I say, it's just like spraying the plants with a light spray of gasoline. They're going to be extraordinarily flammable. And they are.

Josh: I think this is a topic of interest, though. Can you also sum up, what are the two other things?

Dr. Pall: Well, one of the things is that the terpenes actually act to spread this response to other plants. They act as a messenger. The second thing is after that, I think that the terpenes, when you accumulate them, can undergo the chemistry of spontaneous combustion. And in so doing, they can start their own fires. But they start their own fires under specific circumstances.

Josh: Such as having high loads of microwave or millimeter-wave radiation around them.

Dr. Pall: Well, that's an assumption, of course, behind it. But basically what you need is very low wind conditions. You need access to oxygen to have spontaneous combustion. But you also have to accumulate heat from the chemistry of spontaneous combustion. If you have a lot of wind, the wind will both blow away the terpenes and will also blow away the heat. So, you can't have that. I think that if you have low wind conditions, you can generate fires by spontaneous combustion, through the impacts on the plants.

Josh: So, okay, this is some commentary, a bit of speculation in comparison to the other elements of what we're talking about today, which are much more established as fact. But this is your opinion based upon a deep understanding of the existing body of science.

Dr. Pall: Yea. I mean there's other evidence that comes into this. I wasn't planning on talking about this, but yea, there is other evidence that comes into this.

Josh: Thank you for just being willing to go there. So, diving in, your five specific areas that we're going to talk about here in this part two, neuro-psychiatric, reproductive, autism and ADHD, DNA, and early onset Alzheimer's and dementias, not in that order. We'll start with that last one

first. What is very early onset Alzheimer's, and what does the science say about EMFs and its relation to early onset Alzheimer's and other dementias?

Dr. Pall: Okay. So, Alzheimer's historically has been a disease of old people. What we're finding is that over the last fifteen to twenty years or so, there has been a substantial decrease on the average age of onset of Alzheimer's disease, which requires an explanation. And this, of course, roughly corresponds to the time when we've had huge increases in the EMF exposures. That doesn't mean that the EMF exposures are causing it, but it suggests that it may be causing it.

The other thing which is true is that there are some epidemiological studies which suggest that EMFs cause Alzheimer's. Those have been involved mainly with extremely low frequency exposures. And as I mentioned in the last section, the extremely low frequencies work on the same target as the microwave frequencies. So, they are relevant to the issue of what microwave frequencies are, but we're not directly assessing that here. So, there is evidence that electricians and other people who have high exposures to extremely low frequencies have higher incidences of Alzheimer's disease.

Now there is literature showing that not only Alzheimer's disease, but all of the neuro-degenerative diseases, they each have an essential role for excessive intracellular calcium. So, as we mentioned in the last section, the EMFs act by VGCC activation. And the first thing that happens when you do that is you get excessive intracellular calcium. So, the fact that all of the neuro-degenerative diseases have an essential role for excessive intracellular calcium, of course, is consistent with the idea that the EMFs should be able to trigger these.

The other things that have been shown is that you can get increases in neuronal cells and culture of the production of the amyloid beta-protein, which is characteristic of Alzheimer's disease. So, you get this effect from the big increases in the amyloid beta-protein. And there are plausible mechanisms by which this can occur. And in particular, we mentioned in the last section that NF- κ B is activated by the MS. And any increase in NF- κ B will increase the level of crucial protease activity that's involved in producing the beta amyloid protein. So, with all of that said, when you look at mechanisms, what you see is that you see there's a lot of evidence that's consistent, and specifically that this is going on, at least that may be going on. Now, there were two really crucial studies that were published by a research group in China. I think the senior author is Jiang, et. al. And they found that if you gave a whole series of short pulses to rats, to young rats, and then you stopped exposing the rats. So, you just did this for a certain period of time, and then you stopped.

Then you ask, what happens when they're in the equivalent of middle-age rats? And the answer is absolutely stunning. What you see is that all of the rats that were irradiated appeared to have the equivalent of Alzheimer's disease. They have the usual problems with memory and behavior that you see in Alzheimer's in humans. And they also have high levels of the amyloid beta protein and oxidative stress in the brain, which is, again, what we find in Alzheimer's disease. So, this is truly stunning.

Now, we talked before about the fact that 5G is extraordinarily highly pulsed. That's what it's intended to do, is to extraordinarily highly pulse. So, it's reasonable to expect that you're going to get huge responses to these pulsations. We do have experimental evidence, which again, I referred to in the last section, that millimeter waves, which are the frequencies that will probably be used with 5G (there are some people that are backtracking on that), can produce effects on the EEGs in brains of humans. And therefore, it can impact the brains in other ways, because you're seeing impact on those brains, on human brains.

And that doesn't include all the pulsations which 5G will entail. Everything we know about pulsations means that that's going to make things vastly, vastly worse. So, it's reasonable to expect that 5G exposures will produce a similar effect to what you see from the pulsations in the rats. And if it does, then we will produce either universal or near universal early-onset Alzheimer's disease from 5G exposures.

And again, I'm not saying that I have absolute proof of this. What I am saying is that we are taking risks of the sort that no rational society on earth can possibly take. This is not something that any rational society would even think for a microsecond is something that might be an acceptable risk.

Josh: So, Martin, I just want to jump in here. So, there are many studies that indicate this risk, this risk of neuro-degenerative diseases that are all increasing in humanity, relating to EMF and wireless and millimeter-wave radiation. That one study that you mentioned, was it a Chinese study that looked at that?

Dr. Pall: Yea, there were two Chinese studies, the same group.

Josh: Okay, just to confirm, you're saying that those studies were mice or rats.

Dr. Pall: Rats.

Josh: Rats that were exposed with pulses earlier in their life, but then not exposed, and then later on in their lives, they showed Alzheimer's-like conditions. Is that correct?

Dr. Pall: That is correct.

Josh: Okay.

Dr. Pall: Let me just say, Alzheimer's in humans is thought to have a long latency period, from the time you start until the time you start seeing symptoms. And so, this pattern is very, very similar. Except, of course, rats, and generally in rodents, things go about fifteen times faster than they do in humans.

Josh: Yea. Now what do you say in terms of, let's say, some skeptics might have a question about, "Well, if you observe it in mice or rats, it doesn't necessarily translate to an effect on humans, because they're just too, different, apples and oranges." What do you say? Because I've received that kind of comment before over the time of educating people about EMFs. How do you answer that?

Dr. Pall: I think you answer it in two ways. One is that there is a huge literature on animal models of human disease. And so, these are very, very important studies. There are billions of dollars every year that go into these studies, obviously because the NIH and other funding agencies think they are highly relevant to what goes on in humans. So, in fact, here you've got studies and they show this.

And the other thing is that a lot of these animal-model studies, in fact, are stunningly good models of what goes on in humans. And again, people use these models to try to determine mechanisms of what's going on in the human condition. And then, it's more difficult to look at humans. But once you find out how it works in the animals, it's usually a lot easier to look at humans and try to confirm that something similar is going on. And these are things that are very, very important in terms of our understanding of human disease.

Josh: Yea, thank you. So, topic number two is autism and ADHD. What does the science tell us about the link between EMF and autism and ADHD?

Dr. Pall: Okay. So, first of all, I want to say, again, the EMFs act primarily through VGCC activation, and through then excessive intracellular calcium. And so, there is a lot of evidence from genetic studies that mutations in the VGCCs and also in some other genes that influence the activity of the VGCCs, the mutations that produced excessive activity of VGCCs can cause autism. We know that. There is no question about that.

And the other thing which is clear is that there are what are called genetic polymorphism studies. So, here you're looking at relatively common variants in human populations where the form of the gene, again, produces higher activity for the VGCCs. It produces increased susceptibility to autism. So, that says the VGCCs are important, not just in rare mutations, but in the general population that develops autism.

Josh: Is that what polymorphism means? Is that species-wide genetic polymorphism?

Dr. Pall: Yea, genetic polymorphisms are defined as genes in the human genome, where the frequency of that particular form (it's called an allele) is at least one percent of the total. And that then allows you to study those in populations, or they're frequent enough. In other words, you can study them in populations.

So, if I remember correctly, the one that's been studied the most is something like, I don't know, nine or ten percent or something of the forms of this particular gene. And that one, it turns out, is associated with all kinds of biological neuro-psychiatric effects. Autism is only one of them. And so, you get increased susceptibility to a lot of different things.

And then there are also, it turns out, there are polymorphisms in a couple of T-type VGCCs. We haven't talked about what those are, but they're VGCCs that are particularly susceptible to activation. And they also have roles in autism. So, you've got more activity in those and you get more autism, more susceptibility to autism. So, a lot of things of that sort. And so, what I wanted to do . . . And there are a couple of epidemiological studies that also argue for this.

And there's at least one animal study that argues for it, for autism being caused by the EMFs. Interestingly, actually more animal studies have been done with ADHD, which I think, and I think a lot of other people think is, or at least should be considered part of the autism spectrum, just down at a lower level of effects compared with full-fledged autism.

And in animals, this has been shown, I believe, in mice. If you do prenatal exposures to EMFs and then you stop exposing them, the mice develop ADHD-like effects that go all the way through adulthood. So, these are very long-lasting effects, where there are changes in the brain caused by the radiation in utero that produce long-term changes in behavior very similar to what we see in ADHD. There are also, by the way, some epidemiological evidence that argues that EMFs are involved with causing ADHD as well.

So, there are a lot of different kinds of evidence pointing in this direction. I think what we should talk about is a figure that discusses how this whole thing works. And I'm going to put on something on my screen. So, you're going to be looking at a figure here. If you look at the center top part of it, you've got low-intensity microwaves and various other frequency EMFs, which activate the VGCCs and produce increased intracellular calcium. That's what Ca^{2+} is, the increased intracellular calcium.

So, you're following down there towards the lower left. And the increased intracellular calcium then impacts five different mechanisms that are involved in the formation of the synapses in the developing brain. And so, during the perinatal period, the period just before birth and just after birth, there is a huge amount of synapse formation.

So, the synapses are the ways in which different neurons in the brain communicate with each other. And in order for the brain to work right, it has to have the right kinds of synapses, or at least largely the right kinds of synapses. And so, the synaptic formation is very important.

And it turns out that there are five mechanisms there you can see that control dendritic outgrowths, synapse formations, synapse maturations, synapse elimination, and also something else called MECP2 function. All of those have critical roles in regulating the formation of the synapses. All five of those things are regulated by intracellular calcium. So, this is really stunning that you can get these effects through the VGCC activation.

Now I also think the chemicals have roles in this process. And we talked about this before in the earlier section, I guess. You can get chemicals acting on the NMDA receptors. We see that on the upper right side; again, producing increases in intracellular calcium, making that impact on synapse formation as well.

There are reasons why I think that the primary driver of the autism epidemic is probably the EMFs, rather than the chemicals. The main reason why I think that is that a lot of the chemicals that act to activate the NMDA receptors, the increases in the amounts of those chemicals skyrocketed in the thirty years following World War 2. That was really before the autism epidemic started. So, my feeling is that those chemicals are not the primary driver. They may act synergistically with the EMFs, however. And so, I'm not saying they don't have any important roles. I think they probably do.

Josh: What about metals such as mercury in terms of driving autism, according to your research, and also metals combining with EMFs to act as antenna, if you will?

Dr. Pall: Well, the metals, mercury acts also to give you increases in NMDA receptor activity. And some other toxic metals can also do that. So, they can have roles through these pathways. Let me just say that the action of these different chemicals, they act along different pathways in order to impact the NMDA receptors. So, unlike the EMFs, which are directly acting on the VGCCs through the voltage sensor, here you have various kinds of pathways by which different kinds of chemicals can act. But they act along different pathways to give you impacts of this sort, where you get excessive intracellular calcium. And they also can impact the synapse formation.

So, that's the basic pattern. And let me just say, there is a huge amount of evidence that the synapse formation is absolutely key in autism of various sorts, including the fact that autism patients, and autism animal models have changes in the conductivity of the brain. And it's the synapse formation that determines the conductivity of the brain. So, these are all things that are, I think, quite important.

Josh: What can you say about, you mentioned in your work the role of de novo mutations that have been observed? What are de novo mutations, and how do they relate to autism, just in brief before we move on to the third category?

Dr. Pall: Yea, that's a very important point, and it allows us to move on to the third. So, what happens is that, we talked about the DNA effects in the last section. You get cellular DNA damage produced. And the way it is produced is from the free radicals derived from peroxynitrite. They attack the DNA, and you get single-stranded breaks, you get double-stranded breaks, and you get oxidized bases in the cellular DNA.

Those things, then, can produce de novo mutations when they occur in germline cells, that is cells that end up producing sperm or eggs. And then you can pass those mutations on to the next generation. So, something like twelve to fifteen percent of the autism patients have de novo mutations of a sort that influences the occurrence of autism and that impacts either directly or indirectly the synaptic formation in the developing brain.

So, we think that these de novo mutations . . . So, a de novo mutation is something that did not occur in either parent. Neither the male parent or the female parent had a mutation. So, that means that the mutation occurred in a

specific germ cell, or at least in a precursor of a specific germ cell. And that then caused it to be passed on to the fetus. And that then greatly increases the occurrence of autism in those people that carry those mutations.

And what's important here is the following. When you look at mutations, you can look at them in different ways. So, one way of looking at them is in terms of what kind of changes are occurring in the DNA at the DNA level, and how can those kinds of changes be produced.

Josh: Okay. So, just to wrap up this second section, autism and ADHD, if the viewer wants to go deeper, I can suggest Dr. Martha Herbert's research with Harvard. She has done some research in this area. Are there any other points or any other recommendations that you would have in going deeper on autism and EMF?

Dr. Pall: Well, the thing that I wanted to mention to you . . . There are studies on the role of synapses and synaptic formation in autism. There are studies on the role of intracellular calcium in autism. Those are things that are very important here. But the other thing that I want to say here is the following. Three kinds of mutations that we talked about, there are three kinds of DNA changes that are produced through VGCC activation. Those three can produce the major types of mutations at the DNA level that, in fact, are involved in causing autism. Those are chromosomal rearrangements, copying over mutations, and point mutations. And all three of those turn out to be very important sources of the de novo mutations that occur in autism.

Josh: Okay. And this is our third area, DNA effects.

Dr. Pall: Right.

Josh: What else do we need to know about how EMF affects DNA?

Dr. Pall: Well, the main thing you need to know is that there is a large amount of evidence that human sperm can have these DNA changes, DNA attacks on human sperm. And those are the same changes that we know produce mutations. So, the linkage between the DNA changes and the mutation is very well documented.

And one would expect then when you have exposures of the sort that we are exposed to often every day, Wi-Fi, cell phone radiation, cell phone tower radiation, etc., when you have those things every day we are exposed to, you have to be very, very concerned about what's happening to the human gene pool, to what's the sum total of all the genes that we have in humanity. And

how much contamination is going on of that gene pool because of high levels of mutation?

And I have to say the most convincing evidence that we have, that we are seeing a big increase in mutation, I think comes from the autism studies that we talked about earlier. There's something going on there to produce these mutations in the autism individuals. And they are becoming much more common than they used to be. So, we have reason to be deeply concerned about that. And that's the third issue. Are we in the process of destroying our gene pool? And if so, then we're extinct for that reason as well.

Josh: Okay, so, about the DNA effects, Martin, how far along are we in that potentially irreversible change, genetic change in humanity? And what do you feel, according to the science, how much worse are we going to find 5G to be, just in terms of DNA mutations?

Dr. Pall: Yea, okay. Well, look, first of all, this is not a potentially irreversible. Mutations are irreversible, and they are cumulative. You just accumulate more and more. You almost never have a reversal of a mutation. It's extraordinarily rare to have reversal of a mutation. So, what we have here is a situation that things are inherently cumulative and irreversible.

Now, as I alluded to before, in some ways I think the autism genetics data is the best data we have that argues that we're already far along in terms of mutations. The autism incidence has gone up something like two-hundred-fold over the last fifty years or so. And when you've got twelve to fifteen percent of those carrying these de novo mutations, you're talking about a lot of events. So, it's still a minority, but it's still a lot of events. And these are the mutations that are occurring in genes that influence the synaptic connections. But there are, of course, lots and lots of other genes that don't.

So, I think that argues that we are already pretty far along in terms of the mutations, based on the exposures we've already had. And, of course, again, the reason that I'm so concerned about 5G is that both the frequency and the incredible stunning amount of pulsation it will involve means that the effects on the VGCCs will be vastly greater. And, therefore, everything will be hugely increased.

And let me just say something more about that, because when you look at double-strand breaks in the cellular DNA, they have certain special properties. And that is that when you have two double-strand breaks in different locations, you end up getting various kinds of chromosomal rearrangements. They're going to go up more or less as at least the square of the dose, maybe even higher.

So, that means when you see a much bigger effect from a huge amount of VGCC activation, you could see gigantic increases. And I expect to see gigantic increases from 5G. So, what the industry is doing with 5G is making it impossible, impossible, for people to avoid this stuff. It's just horrible. It's just outrageous what's going on.

And one of the things that we haven't talked about, which I think is terribly important, Dr. Boyd Haley proposed that the level of male dysfunction that we're seeing is caused by essentially the same mechanism that is involved in causing autism and ADHD. And if that's true, and both autism and ADHD are much more common in males than in females. And we know, for instance, from genetic studies, that the same gene found in a male produces more severe effects than that gene found in the female.

So, for whatever reason, males are more sensitive to that issue of the disruption of the synaptic formation and in the developing fetus. I think that may be due to the unique hormonal situation of male fetuses, where you've got testosterone produced from the fetus, but you also have a lot of estrogen and progesterone from the mother. There may be things of that sort going on. But for whatever reason, males are more sensitive.

So, if this is what's causing male dysfunction, and the process goes on during the perinatal period, then dysfunctional males that we're looking at are mostly age twenty or greater, or maybe eighteen or greater. So, they were in utero at least eighteen to twenty years ago and also much more than that when the exposures were vastly lower than they are. So, with that said, if Haley's view is right, and we've have had huge, huge increases in exposures, what it means is that we will have a gigantic epidemic of male dysfunction coming down the way from the exposures we've already had.

Josh: How do you define male dysfunction?

Dr. Pall: There are a lot of things in males. Males don't do nearly as well in school as they used to. Males have difficulty now in taking responsibility for things. And I think, in fact, many young males feel that they're not functioning in the way that either the society or they expect. And so, they are frustrated as hell about it, and for good reason. I think that a lot of the political changes that we've seen are probably caused by that. And so those are things that are important.

There are all kinds of things that we haven't talked about that are really major, major issues, one of them being the fact that the electromagnetic fields are actually physiologically addictive. I think that we talked about that on the

phone. And that's a huge, huge issue. So, as I say, every time I look at something new, it makes things vastly worse. You know, in 5G, the more you think about it, the more of an absolute total nightmare it is. It's just incredible. Again, no rational society on Earth can possibly take these risks.

Josh: Yea, what a wakeup call. Okay, going on to the fourth area, what reproductive effects? You mentioned that you touched on this previously. But what reproductive effects have you observed in humans and animals from following EMF exposure?

Dr. Pall: Okay, so again, you get changes in the structure of the testis, the structure of the ovaries. And those have been studied in animals. You get increases in sperm counts, increases in sperm motility, and lowered sperm quality based on other kinds of measures. You get lower levels of oocytes of eggs. That's been shown in animals. You get increases in spontaneous abortion. There's a lot of evidence in humans of that. And you get decreases in each of the three types of sex hormones and decreases in libido. So, all those things are going on.

Now, how far along are these in human populations? And here we get to really crucial stuff. So, there was a big meta-analysis that was published by Levine et. al. in 2018, if I remember correctly, which showed that sperm counts have dropped below 50 percent of normal in every single technologically advanced country on Earth. And reproductive rates in all of those countries, with a single exception, have dropped well below replacement levels.

So, they were running in 2016 about seventy-three percent of replacement levels. That means you're going to have a big drop in, and you already have a big drop in births. And you're going to have a big drop in children going through school and then workers and so forth within one generation. Now, maybe you can say we've got too many people. Maybe that's good. Maybe that's alright. And that might be true.

But what happened, there was an animal study that was published by Margaret [inaudible] twenty-one years ago, where they showed that young pairs of mice put in little cages on the ground in an antenna park where the levels—they actually studied two levels. But both of those levels were well within our safety guidelines, so nothing should have happened. But what happened was there was an immediate drop within the first liter.

So, a liter of mice takes thirty days. They're really quick. So, you get a first liter in roughly thirty days and your second liter in sixty days and so forth. What happened at the higher level of exposure is there was a drop in the first liter, a drop in the second liter, no third liter. No third liter.

Josh: Ninety days later.

Dr. Pall: Yea, yea. And that apparently was irreversible or almost completely irreversible. Essentially you take them out of EMFs and you see almost no recovery at all in the reproductive rate. The same thing happened at the lower level exposure, except it took to the fifth liter to crash to zero. You get irreversible or almost irreversible. So, within a very short time period in mice, you can get a complete crash in reproduction.

Now those mice were exposed under uniform conditions. That is each location, you had uniform. So, you expect them to behave more uniformly than they will in human populations. We have more variation. And in addition to that, things as I said before go roughly fifteen times faster in rodents than in humans. So, you wouldn't expect us to crash that quickly.

So, then the question is are we seeing any evidence for crashes in human populations? And I think now we are starting to see evidence of that. And those occurred between 2016 and 2017 in three small, densely populated, high-technology East Asian countries. And those are Singapore, which had a thirty-one percent drop in reproduction in one year, absolutely stunning. Macao, which really isn't a separate country, but has separate statistics, had a twenty-six percent drop. And South Korea had an eleven percent drop in reproduction within one year.

The South Korean government has been trying to stimulate reproduction, because they knew it was way too low. And it has totally failed, as you can see. The first six months of 2018 for South Korea are out, and they had another roughly nine percent drop in reproduction. So, I think those countries are going over the cliff. And they're now down well into the forties range based on 2017.

Josh: Forties range of what?

Dr. Pall: In the forty-percent range of replacement levels. So, within a couple of years, if this continues, they will be looking at extinction. I think the rest of the technologically advanced countries will follow along within another couple of years. The U. S., interestingly, in 2018 had a two percent drop in reproduction. That's not enough really to say, "Okay, we're crashing." But it may be the first part of it.

And so, I think that, again, we're looking at risks of the sort that no rational society on Earth can possibly take. We may well, and again, if we have, and these are based on the exposures we already have, obviously. If you put in 5G,

it will probably have a gigantic effect. Further expansion of 4G is probably going to have a gigantic effect. And putting a radar in cars so they can drive themselves, that gives a lot of extra exposures.

I mean we're running as fast as we can in exactly the wrong direction. And so, here again, we have every reason to think that we will probably have population crashes within a few years. I mean I estimate something like four years at this point.

Josh: That's amazing. I mean it's really hard-hitting. That reminds me of that movie from maybe fifteen years ago called "Children of Men," in which nobody knew why people couldn't have babies anymore.

And nobody knew maybe if we apply it to this real-life scenario is because of the incredible super-prevalent incidents of propaganda and industry spin and preventing this information and fake studies by the industry. And all of this is really positioning our scenario so that humanity is being threatened from being able to continue.

So, by people sharing this information and bringing awareness to it and having solutions like Timothy Schoechle talks about in the summit, like others talk about in the summit, that we can go to wired. It's simple. There are examples of cities that are doing it and reducing our wireless exposures. We're seeing now the critical need of getting this information out. So, let us avoid that scenario like in that movie, "Children of Men," by getting this information out.

So, just wrapping up here, a few minutes, if we could. Running out of time, but the fifth area is neuro-psychiatric effects. Dr. Pall, what does the science tell us about EMF exposures and neuro-psychiatric effects?

Dr. Pall: Okay. Well, so, I published a paper on this in 2016. And what's interesting is that I keep discovering other people who have found similar patterns. At the time that I wrote that paper, there were two or three earlier studies that showed similar patterns, and now I know of a total of ten. That's interesting.

So, what I found was that you get effects. People argue and they find, "I can't sleep. I'm tired all the time. I'm depressed. I'm anxious. My memory doesn't work." There are also sensory problems that develop in the eyes and in the ears and so forth. And so, anxiety and depression have become incredibly common all over the place. Lack of sleep, lack of concentration, all of these things are epidemic in our societies.

And almost everybody knows that. You can't miss it. And we know they are all caused by EMF exposures and various types of EMF exposures, not just one type or two types or something. And yet, we're ignoring this stuff.

The underlying mechanism is primarily a mechanism which has been studied in animals, and that is the brain function. The brain structure, rather, is impacted by these low intensity EMFs. And those things develop slowly over time, as do the neurological neuro-psychiatric effects. What you see is that the brains in these animals, these were studies done, a lot of them in the 1960s and even 1950s, where you could take animals and expose them for different periods of time and then look at the structure of the brain.

And what you find is that initially the structure changes slowly over time. If you then take the animals out of those exposures, they will recover spontaneously. You put them in a low EMF environment, they will recover. It will take a couple of months or something, but they will recover. If you keep exposing them, the effects get more and more severe with time. And then they become irreversible, at least apparently irreversible. You take them out of the field and they still have these.

You get absolutely bad effects on the structure of these brains. And one of the things I remember reading about was the average neuron in the brain has about a thousand synapses. And they were doing these studies, and what do they find? They find a neuron that has zero synapses; zero synapses! Imagine you go from something like a thousand to zero. How massive the effects have to be to produce that!

And so, you see these things. They become extraordinarily powerful. And there were also occupational exposure studies which were done on humans, which showed that these effects are cumulative. So, you look after, let's say a year-and-a-half to two years of exposure. You have modest effects. You look after six years and they become really vastly more serious. So, they become much more severe with time.

So, when you have these things that are already widely occurring in our populations, and where you have things like, for instance, people live near cell phone towers, people living within three-hundred meters of a cell phone tower, which is probably forty percent of the population, having substantial impacts on these neurological and neuro-psychiatric effects. We have major, major impacts from many of these exposures that we have. And all of this is covered up by the industry propaganda. It's really extraordinarily disturbing what is going on here.

And so, my guess, my projection, and this is based on what we know from the occupational exposure studies and what we know from the animal studies. And as I say, things typically go about fifteen times faster in the animals. That's a rough estimate.

You can make some . . . and my guess that I made about a year ago was that we probably had something like five to seven years until our brain function would absolutely crash. In that case we would go into utter chaos. And I have to say, given what's happened over the last year, I think that's probably a reasonable estimate. I mean I think we're going down that route. That's based on the exposures we already have.

I'm not talking about 5G. I'm not talking about further expansion of 4G. I'm not talking about putting radar in cars. We have every expectation that our collective brain function will crash. I'd guess now that it's something like four to six years from now. And again, that's completely apart from 5G. 5G might make it four to six months.

Josh: So, you're talking about . . . Okay, just to sum this up. I mean this is obviously heavy for us all. But it's a science-based realization of what could very well be happening to the human species. This isn't fear-mongering. It's not projecting based upon lack of facts. You are a scientist, and you're a professor emeritus. And you're telling us that by pushing this wireless and micromillimeter wave radiation agenda forward, we could have only a handful of years left for civilization as we know it.

Dr. Pall: No, I'm saying that given the exposures we already have. If we put out 5G, we could crash within months. And if your collective brain function crashes, we would just go into utter chaos.

Josh: Okay, so, do you have with this knowledge and perspective that you have, do you have any hope for the future? Are there any silver linings? And if so, what would we need to do in order to preserve life, in order to have a safe and healthy future?

Dr. Pall: There are lots of things we could do. But the first thing we have to stop doing is running as fast as we can the wrong direction. And that's putting out more and more of these exposures. So, we really have to block 5G. We have to block 5G. We can't have that. We have to really block further expansion of 4G. And the answer is trying to basically do both of them together. And we have to stop putting radar in cars to drive themselves. We have to look very skeptically at any further exposure. And we have to start reducing exposures. A lot of these exposures are not that hard to reduce. We

have countries where cell phone towers can only put out 1 percent of the radiation that ours do.

Josh: Like India, for example, cut theirs tenfold. They reduced their emission standards by a factor of ten a number of years ago, based upon largely the sterility and reproductive studies, I believe.

Dr. Pall: Yea.

Josh: Okay, now you talked about what we as a society need to do. What about at the individual level? What's a good strategy from your perspective? And others are speaking about this in the summit. But is it getting together, sharing the information, and is educating our local governments and teaming up with them to make a stand against industry's push?

Dr. Pall: Well, I mean ideally that would be true. I have to say I'm living in Portland, Oregon, which thinks of itself as a right-thinking sort of place. And the city council and mayor just caved on all of this stuff. So, it's a real challenge. And it's not like nobody told them what was going on. I have to say we probably need a few hundred-thousand lawsuits. That's probably what we need.

Josh: Like with Monsanto and that two-billion dollars now in May 2019. The lawsuits there, we need the same thing to happen and swiftly in this wireless situation.

Dr. Pall: We need something that's the rough equivalent of what we did in World War 2. This needs a major, major effort. It needs something where we have the sense of that if we don't do this, we will be doomed. And I don't think that is an overstatement at all.

And let me just say, the five scenarios that I just outlined, you can argue against them. There are arguments against them. I don't think they are very good arguments, but there are arguments against them. And let's say maybe one or two of them are wrong. You still can become extinct from the others. I mean the point is we're doing . . .

And there are lots of things. For instance, we don't need Wi-Fi for anything. We can do everything wired. And I was amazed when I went back to Washington State University after I gave the talk on this stuff. When was it? About four or five years ago, shortly after I published that. I guess it was about five years ago now. And I was shocked since I left there, they've taken out all the wired connections. We had wired connections in every single office on the campus. They put in Wi-Fi. I mean how stupid can you get?

And now we have college students who are exposed to Wi-Fi all the time. And what do we find? We find the suicide rate skyrocketed. The level of depression has skyrocketed. That's not surprising. There are just all kinds of stuff that is just simply stupid. I don't know.

What's interesting about this when I talk about these things, and I say these things. These things you need to think about. These are outrageous things to say. There are a few people who actually call me on it. They say, "This is outrageous. It can't possibly be true." Because I think so many of us have the feeling that all kinds of things are really going wrong, and we know they are going wrong. And therefore, when you hear something that makes sense out of how they are going wrong, why they're going wrong, it resonates with people's personal experience.

So, I think there are lots of ways we can make these improvements. The hardest thing has to do with cell phones. But I'm sure cell phones could be designed to be much safer than they are. There are patents that companies have taken out on how one can do that. But they're not doing it. And so, even the most difficult thing, which is cell phones, and everything else can be wired.

Josh: Yea. Wow! I'm just feeling the gravity of this. And I'm feeling the responsibility to just really help this get out in as big of a way possible, so that we can start making the changes at home and within community, the online community, with getting with others, with other groups, and educating our elected officials, and really mitigating the harm.

And at the same time, we need to stop these agendas. We need massive lawsuits. We need empowered movements, notice of liability process. I've entrusted that to Cal and the board. And we need them to come out and to release that in a big way. We need in-the-box lawsuits, legal action, like we're seeing with Monsanto. This is really like I'm just feeling the emotion of this. And I'm just appealing if you're watching this, please help this get out. And please get involved in this conversation.

We're doing this from a place of love and from preserving life. And Martin is presenting the facts in a very powerful way that's challenging you right now, as much as it's challenging me. I know that. But I just encourage you to be part of the solution. And just trust in the essence of life that is bringing us together at this time.

There are amazing things happening and transformations happening in the world. We know that there is an awakening happening. And we feel on the

other end the compression, the tension, the death-wish almost that the shadow-side of humanity has.

And so, I just invite and encourage you to be part of this. If you're watching this, thank you. And I encourage you to go deeper and share this information and decide that we are going to save our species. We are going to take a stand for life, for our kids, and for everything that we value.

So, with that being said, Martin, I'm just so grateful for your information, for presenting this in a way that is so . . . Obviously it's challenging. It's heavy. But it's a wakeup call. It's a reality check. And it's science-based. So, thank you so much. Do you have any closing thoughts for the viewers on this talk?

Dr. Pall: Well, I just wanted to add something. And that is there are approaches to shielding that can be useful. We haven't talked about those.

Josh: Yea. We have other experts on the summit talk about those. But absolutely, shielding fabrics, paints, wiring your mice or keyboards, wired internet and so forth, absolutely.

Dr. Pall: I mean the only other thing I would say is that everything you care about, that I care about, anybody cares about, is being severely attacked by this. Everything is being severely attacked. And I have to say my worst nightmare is that perhaps our collective brain function has already deteriorated to the point where we can't deal with this; in which case we're doomed. I certainly hope that that's not true. But when you look around the world and you see what's happening, I think you have to ask the question. It's really incredible what's happening.

Josh: It's real. It's getting real on the planet, planet Earth.

Dr. Pall: Yea.

Josh: Martin, thank you so much again for your time today and for helping wake us up to the reality of the situation.

Dr. Pall: Thanks for doing this.