

Techtopia with Chitra Ragavan

Episode 6: Dr. Robert Pearl

Chitra Ragavan:

The extraordinary scientific and technological innovations around the COVID-19 vaccines, have enabled the U.S. Government and governments around the world to deploy multiple vaccines against the lethal virus, allowing a gradual reopening of society and return to a new normal. Hello, everyone I'm Chitra Ragavan and this is Techtopia. What do we need to do to defeat COVID-19 once and for all? And how can technology be used to prevent such devastating pandemics in the future? Here to answer those questions and more is Dr. Robert Pearl. He's the author of a new book out this Spring called *Uncaring: How the Culture of Medicine Kills Doctors and Patients*. Dr. Pearl hosts, the popular podcasts, *Fixing Healthcare* and *Coronavirus, The Truth*. Dr. Pearl, welcome to Techtopia.

Robert Pearl:

Thank you so much. It's a pleasure to be here.

Chitra Ragavan:

It seems as if we're finally seeing the light at the end of a very dark tunnel with these multiple vaccines being given emergency authorization, more and more shots given in arms, schools starting to reopen, businesses reopening. What's your assessment of where we are today compared to even a month ago, here in the U.S. and what are we likely to see in coming days, weeks, and months?

Robert Pearl:

Great question. Let me go back to one thing that you said earlier. I want listeners to know that all the profits from the book *Uncaring: How the Culture of Medicine Kills Doctors and Patients*, goes to a charity, *Doctors without Borders*, so if they purchase the book, they actually are going to be contributing to some global healthcare delivery. Thank you. In terms of the vaccine, this is a massive breakthrough. In "The Coronavirus: The Truth" podcast that Jeremy Corr and I do, I talk about chess games, an opening set of moves that the United States totally failed at. We did insufficient amount to limit the spread, to provide education, to have a national strategy, we could spend hours talking about the failures. But the middle game that we're in right now, is one of the vaccine and it's absolutely brilliant, particularly the messenger RNA vaccines.

Robert Pearl:

I know that a lot of your listeners are in the tech world, CEOs of companies, so to help to provide context, the human body or the viral organism has genetic material, and that

material directs the body to create proteins. And between the genetic material in humans inside the nucleus and the actual proteins that are created, there is a code sent out. It's called messenger. Think about that, the message is trotting out there with the code and RNA for the ribonucleic acid. And although it's been thought of for a long time, that we could take this RNA, this messenger RNA, and inject it into people, get their bodies to produce the proteins that are responsible for the infection, the proteins that are specific to the virus or the bacteria for that matter, and then get our bodies to create an immune response, it had never been done. Despite two decades of trying to make it work.

Robert Pearl:

It's why it was a long shot. And I wrote a piece in August questioning whether we'd be successful. And that was only seven months ago, and today 95% efficacy, tremendous safety, that's what the vaccines currently are able to do. And the beauty of it is how fast, I knew vaccine can be produced. In the past, it took a minimum of five years, and that was fast for a lot of vaccines. Now we can do it in a matter of about six weeks. And we'll probably talk a little bit about some of the new mutant strains, which is a great threat to us. We can actually modify the vaccine as needed to be able to respond to the mutants. Because we understand the single change protein in these new viruses and we can design new messenger RNA to create that exact protein going forward.

Chitra Ragavan:

Yeah. And in fact, Moderna is trying out, it's doing a trial, looking at some of these variants and Johnson & Johnson, I think has been found to be very effective against some of the variants, so already you're kind of seeing that the existing vaccines may offer some, if not a lot of protection plus any new vaccines that may come out to deal with the variance, right?

Robert Pearl:

Absolutely. The current vaccines, there's three main variances, there's one in the United Kingdom, one in South Africa and one in Brazil. The one from United Kingdom is the one that right now represents as much as 30% of the disease in the United States, and the vaccines are still effective, although probably slightly less. It's less clear what's going to happen with the other two variants, although there should be at least some degree of protection and the opportunity to be able to change the vaccine and as you say, people are looking at that. They're also looking at giving a third dose to boost the antibody levels that are produced even higher as a possible alternative solution. Again, for listeners, what then happens technologically is that this messenger RNA has to be put into the human body, and it can be done that in one of two ways, the Pfizer and the Moderna vaccines injected directly into the muscle, the messenger RNA is surrounded by a lipid, a fatty capsule that keeps it from being broken down, it gets inside the muscle and it stimulates the response.

Robert Pearl:

The Johnson & Johnson, which is a single dose vaccine, takes that same messenger RNA and puts it inside of actually a chimpanzee adenovirus from which humans don't become sick, and that accomplishes the same goal and outcome. So I'm very optimistic that we have the tool to succeed. I am concerned because we've done such a poor job overall that... In this, I'll call it the end game, that we're not going to be able to checkmate this virus. And I say that not because of the technology, the technology should be able to accomplish it, but it's going to require that enough people have the vaccine to reach what's called herd immunity. So if you think about a virus that has, what's an R naught, it has the ability to go from one person to three, which is what the original Coronavirus could do, and you're able to immunize two out of those three people, then what's going to happen is the virus can't propagate and slowly it will disappear.

Robert Pearl:

The challenge of these new mutant variants is that they have an "R naught" (R_0) closer to five. They're about 60, 70% more transmissible, and therefore more people are going to have to be vaccinated. And my big concern is that sometime in May, maybe June, but probably in May, we're going to get to the point where the supply and demand for this vaccine is going to start flipping around, and where fewer people are going to want it than we have vaccines, and we're not going to be able to reach the point that we can actually eliminate this virus. And if that happens and the mutant forms, even let's say, continue with one more change to make it even more transmissible, we could find ourselves way back where we started rather than being at the end of the tunnel.

Chitra Ragavan:

Wow. A lot to think about. And obviously we've had, like you mentioned, so many hurdles, the politics, the testing, manufacturing, deploying, supply chain, and all of those are still sort of ongoing to various degrees, and there's going to be a ton of second guessing and soul searching going on for years, as you said, about what could have been done differently, but looking forward a bit, what are some of the biggest shifts both from this technological perspective of this vaccines, plus COVID testing,, quarantining, that would change the way we will deal with future outbreaks of this or other diseases?

Robert Pearl:

One thing that's very positive about the mRNA type vaccine, is that every living structure has genetic material. So the opportunity exists that we could develop successful vaccines against diseases, malaria being a great example, that has frustrated us and actually kills millions of people every year, not in the United States, but in other countries, and we could come up with a vaccine. One of the issues, as you know we've dealt, with is that particularly for some diseases that are predominant in poor countries, the economics have not led vaccine manufacturers to create vaccines although they could have, all that potentially could be changed as a result of this new vaccine technology. In terms of future pandemics, hopefully we'll have in place better opportunity to identify it. We were probably two months late globally, and being able to understand what was going on inside China, I'm hoping that would not be the case.

Robert Pearl:

The technology that is out there in a variety of ways, both directly being able to see the scientific findings, being able to see the healthcare changes, and be able to see the kinds of questions through artificial intelligence, that people are asking. When everyone starts asking about some disease we haven't heard of, we can have a pretty good guess that this could be the start of some kind of pandemic and we'll have a better technological tools to be able to understand the landscape, and then to be able to find the offending organism, be able to do its genetic sequencing and come up with a vaccine. So that opportunity sits in place. Having said that, I think we have to understand a variety of challenges that this Coronavirus has created. One example is, we think about the national borders, the virus doesn't care about borders. There are 7 billion people in the world, and it can mutate in almost any place around the globe and pose danger to those nations that are seemingly protected.

Robert Pearl:

The second one is going to be the economics. We're seeing that right now with the Coronavirus vaccines, countries like the United States are holding on to more doses than the citizens could even take, no less that they might be willing to take. We're seeing some of the same, called hoarding, in Europe and there're nations that are going to be looking at two years from now. We're seeing the economic challenges created even by a relatively inexpensive vaccine in a country that is so poor that it can't afford to purchase it, and we're seeing issues, very strong issues about race. This is the theme of one of the chapters of the book *Uncaring: How the Culture of Medicine Kills Doctors and Patients*. Why would black individuals have three times higher rates of death percentage-wise to population from Coronavirus.

Robert Pearl:

Pose that question to a group of physicians and what are they going to point to? They'll point to the social determinants of health, the social economic factors around them, they'll point out the fact that African-American workers tend to be in jobs that can't be done virtually and therefore they have to go into work often taking buses and subways, areas of ease of transmission. Maybe they live in homes with multi-generations, and it can be brought into the home by others, and then they become sick, and if they become sick, they have the possibility of critical disease and death. And then you look at some of the statistics. You have to ask yourself why early in the pandemic, when there were not enough testing kits, and two people came to the emergency department, one a white patient one a black patient with exactly the same symptoms, the doctors test the white patient twice as often.

Robert Pearl:

Why when the black patient had a procedure performed, did he or she receive 40% less pain medication than the white patient? We can look at the fact that the mortality of black patients delivering a baby is three times higher than white patients. Except when the attending physician is a black physician. There's all these issues sitting there in a culture of medicine, beyond the systemic ones. One of the things I believe that we have

to do going forward, if we want to protect the people, both in the United States and around the globe, is to address both these systemic and these cultural ones, and the place that comes together is going to be technology.

Chitra Ragavan:

And on a related note, you're seeing the emergence of biosurveillance technologies like vaccine passports, suggestions for electronic bracelets that can monitor quarantining, and of course, wearable devices, even like the Fitbit are able to detect changes, right? In respiratory rate or other potential indicators of COVID-19. And on the one hand, these can be powerful tools to be able to prevent pandemics, but on the other hand, going back to your comment about the racial inequities in society, there are a lot of potential downsides to creating the haves and have nots in society. Where do you think biosurveillance technologies will head in the future given COVID-19 and the issues they're going to raise.

Robert Pearl:

There are so many areas of technology in healthcare that are massive, that are going to explode in the future or I should say, should explode in the future. What's going to inhibit them? The culture of medicine. The fact that physicians are not as interested in some of these areas as they need to be, instead, they're very attracted to certain technology like robots, that sound very cool and things that they can build for, but don't have the same impact. What you're describing is tremendously relevant. If I had to break it down into a few pieces, what you're describing is, how do we understand what's going on sooner in the world around us? And they're using these monitoring devices, whether you're going to do it through some input on your smartphone, through a Fitbit, whether you're going to do it by looking at social media and seeing what people are commenting upon, the opportunity to use artificial intelligence, to me is a remarkable tool that's there assuming that we take action as soon as we identify a problem that is not yet great enough.

Robert Pearl:

One of the problems. And you listeners are, many of them are engineers and have mathematical backgrounds. It's the difference between arithmetic numbers and exponential numbers. When a virus expands from one to three, what you see is that it's very small, incidents early, mask the fact of how it's going to explode. And early on, we talked about the lily pond that doubles each day in size. And it takes, let's say 60 days to become fully covered. At day 59, it's only half covered. At day 58, it's only a quarter covered. In day one and two, three, four, five, you can't even tell that anything's going on. That's what happens in those areas because the human mind can't calculate exponential change, machines have no problem doing it.

Robert Pearl:

AI has no problem figuring this out and coming up with a longer term view. So that opportunity is sitting there. The ways that we can use monitors to be able to evaluate blood pressure, pulse, oxygenation is very advanced right now and becoming more advanced. The problem that exists right now, this gets back again into this culture of

medicine, and it also gets into the legal and the companies with this technology, is that we are not applying the most advanced technological mindsets to their use. Now, what do I mean by that? Well, let's assume that we can do continuous blood sugar monitoring for a patient with diabetes, right? If in doing that, what do we want to be able to do? We want the machine or the AI loaded into a machine to be able to tell the patient how they're doing. We might even want that machine to make treatment suggestions, but more significantly what we want it to be able to tell the individual each day is that they're okay.

Robert Pearl:

Now, what do I mean by that? Well, think about how we deliver healthcare in the United States today. I see you with a chronic disease, let's say it's diabetes, and I tell you something about changes you should make. And then I say, I'll see you again in three months. Well, tomorrow you may be in trouble or you might not be in trouble for a year, and yet we treat every patient the same. The technology has that ability to be able to look at the changes, given the inputs and the minimum maximum levels that I set as a clinician and be able to inform you each day, and so now I say to you, "I'll see you whenever you need me to see you." I don't need to see you in three months, I may need to see you in three days or might not just see you for a full year, I should see you once a year just to make sure everything's okay, but the technology will help monitor you with that.

Robert Pearl:

There's a device right now that does that. It's the artificial defibrillator, the implantable defibrillator. And the way the implantable defibrillator works by law, is that when it fires, which means that you had a heart problem, for which you'd have to restart your heart, there's a national collecting place to which that information gets sent, and then the clinician gets immediately notified. That's the only example of where the machine is basically saying, the doctor doesn't need to see you because it hasn't fired or the doctor needs to see you because it did fire, and then he or she needs to see you today. That's what I believe we need. Now, why isn't Apple or Google developing it today? Because of the legal risks.

Robert Pearl:

If something goes wrong, they're going to have to defend why a patient had a problem that theoretically, a doctor might've been able to prevent. The reality is that problems happen all the time, because that's the nature of medicine. You make your guesses based upon 95%, 98%, 99%, 99% still means 1% of people will have an untoward effect. It's just that 99% will be better. That's a risk right now, a legal risk that no company has been willing to undertake. I hope that some of your listeners will move forward and make it happen. It would transform the way that healthcare is provided in the United States.

Chitra Ragavan:

You are the former CEO of the Permanente Medical Group, which is the nation's largest medical group. You're former president of the Mid-Atlantic Permanente Medical Group. And in these roles, you've led 10,000 physicians, 38,000 staff responsible for treatment of five million Kaiser Permanente Members, and you've been named one of Modern Healthcare's 50 most influential physician leaders. But you have been unafraid to really turn the lens on your profession and ask some really hard questions based on your experience. Your first book was called *Mistreated: Why We Think We're Getting Good Healthcare. And Why We're Usually Wrong*. And your upcoming book, this Spring is called *Uncaring: How the Culture of Medicine Kills Doctors and Patients*. What's it been like to sort of turn the lens on yourself and your fellow colleagues and what is the premise of your new book and how did COVID-19 inform your thinking?

Robert Pearl:

When I wrote *Mistreated* at the time, pre-COVID, the way you promoted a book was to go around to a variety of conferences and give talks, to go to a variety of communities and give presentations, and I worried. Going on radio shows, TV shows, I was worried how doctors are going to respond. I didn't write the book in any way to castigate the physicians providing the care, I wrote it to castigate the healthcare system. One that fails to encourage prevention, one that undervalues primary care, one that is overly expensive, not the people but the system. But I worried about the people and what was interesting to me, I didn't hear a single physician who complained about the book. In fact, most of them came up to me and thanked me and they thank me for two reasons. First of all, a lot of them had their own family stories. And I begin the book with the story of my dad and how he died of a preventable medical error. And they said to me, "If it can happen to you and me and we're both doctors, imagine what happens to everyone else."

Robert Pearl:

And the second thing they talked a lot about was burnout, and 400 physician suicides a day. And that's what led me to writing this second book, *Uncaring: How the Culture of Medicine Kills Doctors And Patients*. And it's similarly is not a castigation anyway, for the people providing the care, they work incredibly hard. You do remarkable work. It's the culture of medicines not the system, it's the culture of medicine. Now what do I mean by culture? Culture is the combination of beliefs and values, norms, they're not taught in any classroom, you can't find them in any textbook, you learn them by observing those more senior to you, you'll hear the stories that are told, you are able to watch the actions of people, the language they use. And so that's the question that I looked at.

Robert Pearl:

And the culture of medicine, the physician culture, has a beautiful side to it. It came out during COVID. You had physicians going to the hospital, working 12 to 24 hour shifts, facing great personal danger. When there weren't enough gowns, they put on garbage bags, and when there were not enough N95 masks, they put on . . . they knew that as they passed the tube through the mouth, towards the lung, through the vocal chords, the minute it hit the vocal chords, the patient would always cough and spew virus into

their face. When there weren't enough breathing machines for the patients who needed them, they figured out ways to put two patients on the same machine. Something we had not, not only not been done it'd never even been thought of in the past.

Robert Pearl:

Yeah. The culture of medicine is... The physician culture, is capable of helping physicians to do remarkable, remarkable things. But what's not seen? Is that as in all cultures, it has a negative side. One of the things we saw during this pandemic is that 88% of people who died had two or more chronic diseases, these could be diabetes, hypertension, obesity, chronic lung or heart disease, and many of these problems are either preventable or easily controlled. And it's not that we couldn't do it, hypertension is a great example, it's the most common chronic disease that patients who went on to be hospitalized and died had. Across the nation today, we control it 55% of the time. In Kaiser Permanente, when I was the CEO, we controlled it over 90%. Now, why, how did that happen? We had the same doctors, the same medication, the same, or we had different technology, we had a different culture, a culture that valued prevention, a culture that valued avoidance of complications, patients' safety, a culture that had a common electronic health record so that every clinician is sharing the same information and can act upon it.

Robert Pearl:

But in the culture of medicine, the physician culture, in most communities, those things are just not valued, we elevate the cardiologist who unblocks the coronary arteries, we don't elevate the physician capable of preventing them in the first place, for being there. We saw during COVID-19 that African-American patients, black patients had three times the mortality of white patients. If you think it, about how did this happen? Doctors would quickly point out all of the, it's called social determinants of health, all the societal and economic issues that are out there and pour to the fact that black workers often are in jobs that didn't allow them to stay home working virtually, they had to go in to do a lot of the maintenance work, let's say at a particular organization. Had to take buses and subways to get there. They were exposed. Maybe they lived in households with lots of people. But then they skip over the other issues, they skip over the fact that when the black patient or the white patient came to the ER, with the same symptoms that the white patient got treated twice as often, that the white patient got the 40% more pain medication after a procedure. All the things that exist in the culture, the culture allows us not to see the racism that is institutional and provided and the culture maintains values from the last century. That will be interesting for the technological leaders listening in to fully understand.

Robert Pearl:

You see, in the past, in the 20th century, we didn't have enough medical knowledge. What did we elevate and value? The intuition of the doctor, the anecdotal experience of the individual physician. We saw variation as a way of finding out answers. 21st century. We know most of those answers. What's the most valued now? Using technology to provide consistent care to patients. And this is part of the problem because physicians clinging to the culture of the past, don't see this as being as valuable. They see it as

demeaning, the physician, rather than elevating the individual and the book, looks both at the problems that exist and what the solutions are going to look like in the post-Coronavirus era.

Chitra Ragavan:

And is that what you mean when you say that today's physicians have... In your book, have a surprising disdain for technology?

Robert Pearl:

Technology that undermines the values of the culture is technology that is seen to threaten them. I talk about Ignaz Semmelweis. Ignaz Semmelweis was a physician in 1850s, in Austria, and he got appointed the head of the maternity unit. And at the time, people thought that the cause of death following delivery, well, they knew the cause. 18% of people in his particular hospital were dying from what's called Puerperal fever. And they thought the cause were miasmas, this little smelly particles wafting up from the streets. Semmelweis when he takes the job though, notices that the adjacent facility, one run by midwives, not by skilled physicians, has a mortality of two thirds lower, he's embarrassed. Often in medicine it's serendipity that helps us understand what's going on, a colleague of his nicks a finger while doing an autopsy on a woman who's just died from Puerperal fever, and he goes on to develop a clinical course and to die with seemingly the same symptoms and findings as this particular woman.

Robert Pearl:

And he comes up to the idea that somehow it's physicians who are carrying something, either on their hands or the leather aprons they wore over the three-piece suits from the autopsy room to the delivery room. And he makes people change their leather aprons before they go in to do a delivery and dip their hands in chlorinated water and lo and behold, mortality drops from 18% to 2%. what do you think happened? Do you think the rest of the world followed the lead, did every hospital started putting these mechanisms in place? No. He publishes the paper, no one pays any attention, he ultimately is hospitalized in a psychiatric facility and dies alone four years later. I mean, think about it all the systemic reasons that we would be thinking about for this tremendous advance in science are overwhelmed by this culture.

Robert Pearl:

Why? Because the idea that physicians could carry an infection from one room to the next room means that then it lowers their esteem, their position in the societal hierarchy because now they're not just healers, they're actually causers of disease. And those leather aprons, they were signs of respect in the culture. The more pus, the more blood, the more experience you had, the idea that they could be causing the problem was simply not one that Semmelweis' colleagues could entertain. Now, why do I think the story is so powerful? It hasn't related today. Well, today hospital acquired infection is still a major problem. It's the third leading cause of death in the United States. 1.5 million people get infected and over a hundred thousand go on to die. The most common bacterium is C. Diff, Clostridium Difficile. And unlike the Coronavirus, it's carried on

people's hands not transmitted through the air and you can solve it through hand-washing.

Robert Pearl:

But what our studies show doctors today fail to wash their hands one in three times, when they go from one hospital room to the next hospital room, it's no different than in Semmelweis' time. Technology that is going to make the practice of medicine seem routine, that's going to make the value or the doctor seem less important. It's going to be at a flattening in the hierarchy in medicine. These will be resisted by physicians, not because they don't save lives, but because they reduce status. That is how culture works. And yes, the problem is going to be that the best solutions, whether they're algorithmic solutions around evidence-based medicine, AI derived approaches that we already know are going to be as good or better than physicians can do in many areas, those will be rejected if, as a consequence of that physician esteem, physician position on the hierarchy drops, that is how every culture works, including the physician culture.

Chitra Ragavan:

Dr. Pearl, thank you for that great story and sobering anecdote, and for joining me on Techtopia, it's always so good to talk to you. Dr. Pearl, where can people learn more about your book and about your body of work?

Robert Pearl:

For listeners who would like more information, they can go to the website, robertpearlmd.com. There they can sign up for the monthly musings at no cost and with no advertising, on the monthly musings, themselves. They can access if they pre-order the book *Uncaring: How the Culture of Medicine Kills Doctors and Patients*, with all profits going to Doctors Without Borders. They can get four freebies, a signed bookplate, your reading guide, a reference guide of all the books that can be learned from on this particular area, and a preview of the introductory chapter. That's robertpearlmd.com, and I look forward to getting any feedback that listeners have about these ideas or what they find on the website. Thank you so much. I hope the listeners will now use this as the opportunity to create the technology that patients deserve and physicians need to use, that's going to make American medicine once again, the best in the world.

Chitra Ragavan:

Dr. Robert Pearl is a clinical professor of plastic surgery at Stanford University School of Medicine, and is on the faculty of the Stanford Graduate School of Business. Named one of Modern Healthcare's 50 most influential physician leaders, Pearl publishes a newsletter with more than 12,000 subscribers called *Monthly Musings On American Healthcare*. And he's a regular contributor to *Forbes*, he's been featured on *CBS This Morning*, *CNBC*, *NPR*, and in *Time*, *USA Today* and *Bloomberg News*. This is Techtopia, I'm Chitra Ragavan.