

# Fighting the Rise of Anti-Science

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## SUMMARY KEYWORDS

Anti-science, vaccine hesitency, public health, infectious diseases.

## SPEAKERS

Maggie Fox, Peter Hotez

### **Maggie Fox** 00:00

Hello and welcome to One World, One Health where we chat with people working to solve the biggest problems facing our world. I am Maggie Fox. This podcast is brought to you by the One Health Trust with bite-sized insights into ways to help address challenges, such as infectious diseases, climate change, and pollution. We take a One Health approach that recognizes that we are all in this together and everything on this planet — the animals, plants, and people, and the climate and environment — are all linked.

One Health also usually involves science. Science means asking questions and systematically answering them using proven methods. Scientists share information and build on what they've learned, and they agree they must prove their assertions. They can't just make stuff up.

The scientific community can and does call out mistakes and fabrications, and yet we're living through an extraordinary time when people are doing just that. In the face of facts, scientists are under attack, especially in the United States, and now, this attack is coming from the very top —from the White House. A vaccine denier, Robert F. Kennedy Jr., has been given the job of running the United States Health and Human Services (HHS) Department, which oversees the single largest funder of biomedical research in the world, the National Institutes of Health (NIH). HHS oversees the Centers for Disease Control and Prevention, a world leader in public health. It oversees the Food and Drug Administration, which regulates drugs, vaccines, food safety, and medical devices.

One person who's been fighting to prevent the kind of anti-science that is on the rise is Dr. Peter Hotez, Dean for the National School of Tropical Medicine at Baylor College of Medicine in Houston, Texas. He's invented vaccines, advocated for better treatments for neglected tropical diseases, and worked to control the spread of viruses, and he's written a new book called “The Deadly Rise of Anti-science: A Scientist's Warning.” He's joining us on One World, One Health to talk about his book and how to counter this recent rise in hostility to science and public health.

Peter, thank you so much for joining us.

**Peter Hotez** 02:20

Thanks. It's great to see you again, Maggie. We have a lot of history of 20 years of talking to each other about various pandemics and infectious disease outbreaks. It's always good to catch up with you.

**Maggie Fox** 02:32

We go way back, and you have always helped journalists, and the public understand science. I can't tell you how grateful I am, and I know many people are as well.

**Peter Hotez** 02:43

Well, you're also one of those individuals who work hard to get it right, and not everyone does that. So, it's especially rewarding for me to work with you.

**Maggie Fox** 02:51

Well, it's all a team effort, right? Science is a team effort, and I think that's one of the things we're going to talk about. It's one of the reasons that you can trust it.

Gosh! You and I have been through a lot! We've been through anthrax, Ebola, Zika, various flu outbreaks, bird flu coming and going, and there's a measles outbreak going on in Texas right now. Nonetheless, these are tough times to be a scientist, and you have spent a huge amount of time fighting misinformation and disinformation. Aren't you getting tired of it?

**Peter Hotez** 03:25

You know, at times, I do! I often say during the day and when I'm in the mix and, you know, in lab meetings or writing papers and articles and even books and talking to people like you on podcasts like this, I'm all ruffed up, and it's great, and I love it, but the frequency and the tone of the politically motivated attacks against me and colleagues is getting much worse. Now, in the United States, there is this politically driven movement to portray scientists as cartoon villains or public enemies, and I'm front and center of that, and it's tough and a scary place. It's a bit demoralizing because, you know, we've always talked about them. I always say the United States is a nation built on the strength of our research universities and institutions, right? That gave us a Manhattan Project and victory in the Cold War, and winning on human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), and cancer, and having it all flipped on its side for somebody's political or financial gain is discouraging.

**Maggie Fox** 04:28

There's probably no good reason to speculate about why people are doing it. But do you have some ideas about what people get out of attacking science?

**Peter Hotez 04:38**

I can at least begin by talking about the vaccine and virology space. It came from two convergent paths. The way I got involved in this is that some of the vaccine scientists made a low-cost COVID-19 vaccine, reaching 100 million people in India and Indonesia, proving we can bypass the big pharma companies and make vaccines for parasitic diseases, the ones the big pharma companies are not interested in. That's what I always wanted to do. I did my MD and PhD in New York City in the 1980s at Cornell University and Rockefeller University.

The unplanned part was having four adult kids, including Rachel, who has autism and intellectual disabilities. If you remember the original assertion against vaccines from Robert F. Kennedy Jr. and others, it was that vaccines cause autism, and I had written a book — “Vaccine did not cause Rachel's autism.” That wound up making me public enemy number one or two.

Then about 10 years ago, the stuff about autism stayed, but it also piled on another aspect that was more around, you know, the health and nutrition industry. So, the phony supplements and nutritional supplements, spectacular cures including ivermectin (an antiparasitic drug) and hydroxychloroquine (antimalarial and is also an antirheumatic drug), and the level of the attacks against me went up again because I was bad for business. You know? I was telling them, “No! You don't need these nutritional supplements. You don't need ivermectin or hydroxychloroquine. What you need to do is get vaccinated, whether it's against COVID-19 or childhood immunizations.”

And then it took a third quantum leap higher when that got adopted by the far right of the Republican Party. That began with this health freedom, medical freedom movement about 10 years ago, especially where I am, in Texas, and anti-vaccine groups started getting Political Action Committee (PAC) money. It was so frustrating because I'd say, “Look, I don't care about your politics, that you're right as an American citizen, but don't adopt this stuff, because it'll be dangerous for your family, for your kids,” and that's what accelerated during COVID-19 and it started at the Conservative Political Action Conference (CPAC) in 2021 where the rhetoric was first, they'll vaccinate you, then they'll take away your guns and your Bibles, and they basically called vaccinations “instruments of political control”.

But it got even worse than that because then they falsely discredited the effectiveness and safety of vaccines. They brought on all these anti-vaccine activists, and then the pile on came from members of the House, Freedom Caucus, Fox News, and the Joe Rogan podcasts. And you know, saying, “You don't need to get vaccinated, just take your ivermectin,” and this kind of nonsense. And the consequence was, in my State of Texas, of the 100,000 deaths we had in the state of Texas, almost half were after vaccines became widely available in 2021 because so many Texans refused to take a COVID-19 vaccine. So, they were victims of a disinformation campaign.

So, 40 to 50 thousand deaths, Maggie, you know, unnecessary. Unfortunately, now that is not stopping. There's no auto correction after people, but even after the revelation of all the deaths, it's spilling over into childhood immunizations along the same partisan divide.

The Gallup World Poll just did a survey at the end of last year asking the straightforward question to parents: which is more dangerous, vaccines or the disease they're designed to prevent? And a significant number, very much along the same partisan divide, said the vaccines were more dangerous, which is ridiculous.

So, it's spilling over to childhood immunizations, and this is why we're in this situation now where we have huge numbers of kids now in my State of Texas, in adjoining states not getting their childhood immunizations, and then you start to see breakthrough infections. That's why, right now, as we're speaking, Texas is going through a horrific measles epidemic. So, the official numbers are over 1,20,425, and we just had our first measles death from an unvaccinated school-aged kid, which is so tragic, but we're still in the early phases of this. I think this is going to continue to accelerate. It, just like the unnecessary 40 to 50 thousand COVID deaths; we're going to see unnecessary hospitalizations and deaths from measles. So, it's so tragic to watch this unfolding.

**Maggie Fox** 08:38

As you mentioned, people don't always act in their own best interest. With COVID-19, people failed to get vaccinated, and they paid for it with their lives. But when people do actively turn away from good information, whether it is provoked by social media, politicians or troublemakers of other sources, how do you get them to listen?

**Peter Hotez** 09:00

Well, part of the problem is access, you know, because they're all watching the same Fox News channels. And it's not that I have anything against Fox News. I was going on Fox News till they stopped inviting me because I wouldn't go along with the hydroxychloroquine nonsense. Then the invitation stopped. They're unfortunately embedded in this bubble. They're on the same social media sites. I am always happy to go on Cable News Network (CNN) and MSNBC and or all the local news shows. And, you know, write for whatever newspapers interested in having me write. I do that, but I sometimes have this sense of frustration that it's walled off from the people who really need to hear it the most.

**Maggie Fox** 09:40

And, of course, it's also people who aren't even consuming mainstream media that you mentioned, like "Fox News". And, of course, this is a growing global problem. There's a young person in my family who is interested in science and facts but also complains that the media doesn't cover X, Y, and Z, you know, complaining that there was no media coverage of bird flu. And when I said, "I believe you might be mistaken," There's been a fair amount of coverage. What he meant was that he does not see it in his own social media feed.

**Peter Hotez 10:08**

I mean, I'm old enough to remember, 6:30 every evening you watched either Walter Cronkite or the Huntley and Brinkley Report, the National Broadcasting Company (NBC), and it almost didn't matter, because you were getting a sort of a unified American version of the news. But it wasn't only that, Maggie.

It's once you shut off the evening news and have supper or dinner, depending on what you call it. You know, you hung out with your friends, and if you started espousing some conspiratorial nonsense, your buddies would look at you and say, "What the heck are you talking about? Go have another beer," and it would modulate you, right? But you don't have that anymore. Instead, you start going online, and you just start getting access linked to the crazy stuff without any filter. So that's a part of it, is the fragmentation of society.

But the fact that really does trouble me is that scientists are portrayed in this light as doing something nefarious. I do also say it's partly our fault too, Maggie. That you know, especially in the research universities and the academic health centers, we tend not to do a lot of public outreach, or don't encourage it, and so that creates this vacuum that allows the bad actors to come in and weaponize, you know, what we do and portray us is these kind of shadowy figures and white coats plotting all sorts of nefarious things.

That's one of the things that I tell the leaderships of when I give lectures, whether it's medical grand rounds or pediatric grand rounds at academic health centers, I say, "Academic health centers are too involved in protecting their brand and in not letting the scientists out there to speak, and not everyone wants to do it, but there's a group who does and by making ourselves invisible, you have added to the problem." And we need to turn that around and offer our PhD students, our MD PhD students, our residents, our fellows, our trainees, our assistant professors how to do public engagement and communication.

**Maggie Fox 12:04**

And a lot of scientists, you know, you're one of the best examples, but a lot of people do take the time to explain science to the media. A lot of this isn't one person's fault. The world is changing. People consume information in different ways. But on top of all that, an unprecedented thing is going on. The current US administration is tearing apart biomedical research and science in a way that has never been seen before.

Even if you talk about training new scientists to talk to the public, they're not going to get a chance because they've all been fired right into their probationary periods. And funding for academic research is cut off. This is going to affect the whole world, too, right? Because the US is the single largest funder of this kind of work around the world. Is there going to be a way to fix it?

**Peter Hotez** 12:54

Yeah, and what I say is, this is not the extraordinary event this is being portrayed. This is the capstone of a process that's been evolving.

I mean, we should never have gotten to the point where the dodge would be just to slash NIH or National Science Foundation (NSF) budgets. There should have been enough ardent support from Congress to stand up for it, and hopefully, we'll get it corrected.

But one of the things that I'm saying, and I just gave a talk last week at Baylor College of Medicine to the PhD students and MD PhD students, is, even if we can fix the indirect cost issue to institutions, there will be significant cuts to government funding for science, especially biomedical science. And don't take the attitude that this is short term, you know, because one of the things I'm hearing from some academic health center leaders is, "Hey, don't worry, the House and Senate is going to flip in a couple of years, and this will all go away." As for me, I don't think so! I think this is more enduring. I think we are a different country from the one I grew up in.

You know, think about how you're going to reinvent American science positively, and I think we're going to have to rely a lot more on the private sector, a lot more collaborations with industry, a lot more collaborations with biotech. I think we're going to have to allow both senior scientists and young science scientists fluidity to go back and forth between the biotech industry and academia. We've got to loosen up some of the constraints that don't make that possible right now and maybe change PhD education to make it more biotech focused and less on the traditional model of spending five to seven years in a laboratory with one principal investigator and writing a couple of papers that we need to change as well.

**Maggie Fox** 14:38

That raises the other question, though, if you know, one of the things you get accused of all the time is, "You made all this money off your vaccines." As you know, the accusation against scientists is that they're getting rich off this stuff. You and I know that is absolutely 100 percent not true. But if people move back and forth between industry and academic or government, medicine, isn't that going to worsen the perception that it's all too tangled up?

**Peter Hotez** 15:02

Yeah, it might, and the anti-science people will continue to weaponize whatever they can. So, it's not perfect, it's not saying it's a perfect answer, but it may be one opportunity. You know, it's interesting. I mean, daily on Twitter (X), I get an accusation that I'm a shul for pharma and secretly making millions. And my wife Ann says, if only, right, what did I do? I made a low-cost COVID-19 vaccine with no patent that reached 100 million people. I think, you know, in my and our other vaccines for parasitic diseases, I once tallied it up. I think in my 40 years of developing new vaccines, I've made less than \$5,000 you know, from all my vaccines, so I'm not complaining, just that I didn't plan on getting rich, and I haven't gotten rich, but I have a wonderful life being a professor, and I've been able to support four kids and my

family, and it's been an incredibly meaningful ride, but I didn't get rich, and we've got to tell that story too.

**Maggie Fox** 15:58

Can we talk about the measles outbreak in Texas as we're recording this podcast, and it is a pre-recorded podcast. The first death was reported in that outbreak. What's going on? Is this an isolated community that's affected?

**Peter Hotez** 16:10

Well, it started in a Mennonite community, and there's nothing anti-vaccine about the Mennonite community. It's just that it's an insular group, and all it took was a couple of anti-vaccine activists to swoop in and gain access and take advantage of the fact that they did not have access to a lot of real information, which was weaponized and convinced them not to get vaccinated.

But the problem is, it's not just the Mennonite community that the whole area of West Texas has some of the lowest vaccination rates in Texas and the country. So, a low vaccination rate is like the warm waters of the Caribbean when a hurricane hits in the summer, and as long as there's enough warm water around, the hurricane will continue to accelerate, and that's what the unvaccinated kids are. So, this thing is just ripping through. And so many hospitalizations with measles occur in an epidemic form; around 20 percent of the kids get hospitalized.

That's about the numbers we're at right now. A certain percentage will get measles pneumonia, requiring more intensive care, and measles encephalitis, or measles otitis, leading to deafness, or measles diarrhea. Eventually, we'll start seeing deaths because Measles is a killer disease.

Throughout the 20th century, measles was the single leading killer of children. Two to 3 million kids died, and now we've brought it down through global vaccinations to around 100,000 still a lot of kids, but it's a fragile ecosystem, and once you stop vaccinating, and once community level coverage goes down below 90 percent Measles can rip through it, just like a hurricane in the Caribbean in the summer, and that's what's happened.

**Maggie Fox** 17:43

A part of that's caused by the measles virus itself. It's extremely infectious.

**Peter Hotez** 17:49

Yeah! I mean, especially among unvaccinated kids. So, if you line up 10 unvaccinated kids and expose the measles virus, nine of them become infected. One of the reasons is that it takes a very low dose of the virus to set up the infection, so you don't need a big inoculum of virus. Also, this virus can linger in the atmosphere. So, if someone has measles, and especially before they get the virus and stop feeling very sick, they're releasing the virus into the atmosphere. Even if they leave the room, that virus will

linger in the atmosphere for a couple of hours. So, you can walk into an empty room that has the measles virus from someone who was there a couple of hours before and become infected. So, between that and the low dose, that's why measles has one of the highest reproductive numbers of any virus between 12 and 18. That means a single individual, on average, will infect 12 to 18 unvaccinated individuals. And that's what we're seeing, and that's why this is going to continue to accelerate. The other thing about measles is that they have a very long incubation period. So, what we're talking about now is that a bunch of other kids are being infected that we won't realize have measles for almost another two weeks. So, I think this will be a long-lasting epidemic.

**Maggie Fox** 19:03

What other research are you working on? You've always got your fingers in lots of different pies.

**Peter Hotez** 19:07

I've got some new vaccines that we're developing, and I'm very excited about that. I'm also doing some things around climate health. With the rise of all of these infectious diseases, because of climate change and urbanization, we're starting to see a lot of illnesses where I'm in Texas and the Gulf Coast, such as dengue and chikungunya and zika and maybe yellow fever could return. And writing my books and trying to convince myself I'm not too old to learn new things. I'll be 67 this year, and I'm still in the mix, and we'll see how long it can go.

**Maggie Fox** 19:41

Peter, thank you so much for taking the time.

**Peter Hotez** 19:44

Maggie. You're as great as always, and thanks for doing what you're doing. I look forward to speaking with you again.

**Maggie Fox** 19:50

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