

Erin Welsh

Hi, I'm Erin Welsh and this is This Podcast Will Kill You. You're listening to the latest episode in our TPWKY Book Club series where we chat with authors about their popular books in science and medicine. We've gotten to have some fantastic conversations so far and there are so many more to come. If you'd like to see the full list of books we've already covered and those that will be covering later this season as a part of the series, check out our website thispodcastwillkillyou.com where you can find a link to our bookshop.org affiliate account under the EXTRAS tab.

On our bookshop page there are a bunch of TPWKY lists featuring books we've read for our regular episodes, memoirs about health and disease, a list of fiction books about disease. Should we do a book club on disease-themed novels? Is anyone out there a member of a book club on disease-themed novels? Because that sounds like so much fun. And also on our bookshop is of course a Book Club list where you can find all of the books we're featuring in this and last season's TPWKY Book Club series. As always we'd love to hear from you about how you're enjoying these episodes, whether you have any book suggestions for future episodes, favorite episodes so far, whatever your thoughts are, send them to us via the CONTACT US form on our website.

All right, let's get into the book of the week. Dr. Paul Offit joins us to discuss his recent book 'Tell Me When It's Over: An Insider's Guide to Deciphering COVID Myths and Navigating Our Post-Pandemic World'. Frequent listeners of the podcast are no doubt familiar with Dr. Offit's name. We've mentioned a few of his previous books in some of our episodes such as his book 'Vaccinated: One Man's Quest to Defeat the World's Deadliest Diseases' which tells the story of Maurice Hilleman, who developed many of the most common vaccines in use today. Or maybe you've heard us mention 'Deadly Choices: How the Anti-Vaccine Movement Threatens Us All' which takes readers through the history and rise of anti-vaccine sentiment. And Dr. Offit is somewhat of a public health celebrity, appearing on popular news programs championing the life saving power of vaccines.

Offit's titles and credentials are almost too long to list. The Maurice Hilleman Professor of Vaccinology, Professor of Pediatrics at the Perelman School of Medicine at the University of Pennsylvania, Director of the Vaccine Education Center at the Children's Hospital of Philadelphia, member of the FDA Vaccines and Related Biological Products Advisory Committee and so many others. But perhaps one of his biggest accomplishments is as co-inventor of a rotavirus vaccine which has prevented hundreds of thousands of deaths around the world. Offit's passion for communicating about the power and safety of vaccines as well as combating the misinformation and disinformation undermining public health efforts takes shape in his newest book about the COVID pandemic. In the aptly named 'Tell Me When It's Over', Offit takes readers through what we have learned about the COVID pandemic and SARS-CoV-2, the virus at the center of it all.

He breaks down where this virus originated, dismantles the lab leak conspiracy theory, discusses some of the ways that the public lost confidence in US government institutions during the pandemic, explores this new flavor of anti-vaccine sentiment that took hold during COVID and which has really only grown since, and presents ways that we can fight against the rise in anti-science and regain public trust. The COVID pandemic revealed how we can accomplish incredible feats by investing time and resources into public health, giving us a safe and effective vaccine in record speed. But it also showed the gaps in our system, how myths and disinformation can quickly fill a knowledge void and how crucial it is to learn how to communicate our science to the public, including when science doesn't know it all or gets it wrong. COVID is here to stay and unless we do something about it, so is this rise in anti-science and anti-vaccine sentiment. Let's get into this interview right after this break.

TPWKY

(transition theme)

Erin Welsh

Dr. Offit, I really can't express how excited I am to be chatting with you today. You are a huge public health hero of mine and the incredible and impactful science communication work that you do, especially when it comes to vaccines and not to mention your work on developing said life saving vaccines, it is simply amazing. So thank you so much for being here.

Paul Offit

Well thanks for asking me, it's my pleasure.

Erin Welsh

Your latest book 'Tell Me When It's Over' covers the COVID pandemic, getting to the root of some COVID myths, explaining the vaccine, and it essentially acts as a guide for how we're supposed to get used to this post-pandemic world. How did you decide that you wanted to write this book?

Paul Offit

Well it was cathartic. I mean the virus came into the US early 2020. In April, Francis Collins who was then head of the NIH asked me to be part of this public private partnership called ACTIV which stood for Accelerating COVID Technological Innovations and Vaccines. And so we were essentially advising pharmaceutical companies on how best to test vaccines and potential antivirals. And I'm on the FDA's vaccine advisory committee. So I really got to watch this up close. And in many ways the book was cathartic. I don't know if you remember the way it played out in 2020, aside from having nothing, right, we didn't have antivirals til October, we didn't have monoclonals until November, we didn't have vaccines til December. So we had nothing other than avoiding human to human contact.

And then in April the Trump administration was convinced that hydroxychloroquine was our ticket out, right. This was gonna be the magic medicine that was gonna make it all go away. And so the government bought almost 30 million doses of hydroxychloroquine and successfully twisted the arm of the FDA to authorize it without any evidence that it worked, without any evidence that it worked to either treat or prevent the disease. They certainly already knew about the safety issues which were potential heart arrhythmias. And so they approved it and that scared people. It scared me. I wrote an op ed for the New York Times saying fearing an October surprise here, the Trump administration successfully twisted the arm of the FDA to approve a drug that didn't necessarily work to treat and prevent disease. That's their job. I mean the job of the FDA is stand to stand between pharmaceutical companies and the public and protect the public.

So now you're scared about how the vaccine is gonna play out, right. I mean Trump pulled Stephen Hahn into his office and in an invective laden tirade said I want this vaccine out before the election, which was the beginning of November. And were that to be true then you wouldn't have that two month safety follow up that you have for pretty much every vaccine after the last dose which wouldn't be til December. So Hahn stood up, to his credit, stood up to him, put it on their website, this is what we're gonna do. But people still didn't... Now you really had a critical loss of trust in the FDA. Country after country, state after state stood up and said we're gonna have our own vaccine advisory committees. They didn't trust us, they didn't trust the FDA Vaccine Advisory Committee. And so it was a really turbulent time. And between that and a number of what I think were communications errors including not trivial ones that occurred after that, this was a catharsis. I just had to get this book out, I feel much better now, thank you for letting me write it.

Erin Welsh

And as you began putting this book together and deciding what you wanted to include, how was your approach guided by your intended audience? And was that audience, is your audience for this book different than for past books that you've written?

Paul Offit

No, I think it's the same. I think it's the same for my book. I guess the audience will decide that but it's for a general audience, it's kind of a 'what happened?'. Because I think in many ways the book is a story of two remarkable contrasting things. One is that we isolate a virus in January of 2020, we sequence it. So now you can potentially make a vaccine. It's an unusual virus, it had an interesting sort of biological and clinical characteristics. And then 11 months later using a technology, messenger RNA, that we never used before, we had no experience with that technology or with the vector virus approach by Johnson & Johnson, you had two large clinical trials and then in February of 2021 you had a large J&J, Johnson & Johnson trial that showed that the vaccines were effective, remarkably effective.

And then over a period of six or seven months we immunized 70% of the US population, a million people a day, 2 million people a day, 3 million people a day. And I think that was the most significant scientific and medical accomplishment in my lifetime. And I'm old. So my lifetime includes the development of the polio vaccine. I think it was amazing actually. Then we hit a wall and by mid 2021, 30% of this country did not want to get vaccinated. Ultimately 300,000 people lost their lives because they didn't trust us. They didn't trust the FDA, they didn't trust the CDC, they didn't trust other public health agencies. Why? What happened? How did we lose that trust? And I think that's why I wrote the book. What happened? How did we lose it? And how can we get it back?

Erin Welsh

Let's take a quick break here. We'll be back before you know it.

TPWKY

(transition theme)

Erin Welsh

Welcome back, everyone. I'm here chatting with Dr. Paul Offit about his book 'Tell Me When It's Over'. Let's jump back into some questions. Like you said, you've been in the vaccine game for quite some time and you've witnessed firsthand and have written and spoken a lot about this rise in anti-vaccine sentiment over the past few decades. But now post-COVID and during COVID we're seeing a drop in vaccine compliance rates unlike anything previously witnessed. What do you think is unique about this decline? And why was COVID this perfect storm to grow anti-vaccine and anti-science sentiment?

Paul Offit

Well I would have imagined the opposite was true. I mean typically what anti-vaccine activists will say is give me a pandemic, then I get the idea of being vaccinated or even mandating vaccines. Show me a pandemic. Well this was a pandemic. We had more than 1.1 million people die in this country, people were dying right in front of us. I think all of us at least know someone who was at least seriously ill and died. I mean my aunt died of this virus. And so you didn't have to convince people, I would think, that it was real. And the vaccine clearly worked and it was safe. It wasn't absolutely safe but it was pretty darn safe, the mRNA vaccines. It was myocarditis within four days of dose two which was generally self resolving and short lived. But in the scheme of things, considering it was a novel technology for a novel virus, I never really saw the other shoe drop. So you had your ticket out of this pandemic and nonetheless people rejected it.

And I think the reason was because you're right, I think the anti-vaccine movement is stronger, they're better funded and they're stronger. And I think it all has to do with this, which is politics. I think although there's always a political implication for vaccines because they require support, anything I think that requires funding, public funding is going to be political but it doesn't have to be partisan. But this was partisan. On the left anti-vaccine activity was always just don't inject me with anything with a chemical name which is pretty much water, of course, has a chemical name. And on the right, it was this Libertarian 'I don't want the government to tell me to do'. That is the current politics which is federal government off my back. And so that's where all the money came from. Eric Trump, Donald Trump's son, stood up at one of the rallies and said if you don't want to get a vaccine, know that the Republican Party has your back. Which is amazing because it was the Trump administration that created this vaccine with Operation Warp Speed.

And yet, if anything, Donald Trump distanced himself from arguably his greatest accomplishment. So they're very well funded, they're more active than ever. And I think that at the heart of it is mandates. I think when we mandated that vaccine and people lost their jobs and people couldn't go to the bar they wanted to go to, the restaurant they wanted to go to, the sporting events closed down, schools closed, travel was restricted. People felt they they were mandated to wear masks, mandated to get a vaccine. And that leaned into this Libertarian left hook and this is what you have, a well funded sort of Libertarian anti-vaccine campaign that has now been embraced by the right.

Erin Welsh

And I kind of wanted to get into this a little bit more when it comes to like how this misinformation and disinformation spread and the role of social media. What do you think social media is doing to kind of facilitate the spread of this bad scientific information?

Paul Offit

Right. It's just you can very easily find awful information about vaccines that will fit any conspiracy theory. If you're hesitant about getting a vaccine, and it's understandable that you would be hesitant, I mean you're asking people who are otherwise healthy to inject themselves with a biological. In this case the biological is something with which we had no experience and it's a genetic vaccine. And the minute you say that word, genetic, people are thinking it's gonna alter my genes. And that's part of the argument that people have made, right. There's DNA fragments in this vaccine that will alter your genome or that the mRNA can enter your nucleus and get reverse transcribed and then enter your DNA. And that would be the best news for gene therapy ever if that actually was possible with these mRNA vaccines. And so it's very easy to get that notion out there that these vaccines can do harm.

The CDC Director in 2009 was a man named Richard Besser. And that's when we had the swine flu pandemic. And he was great. He was out there every other day, every third day in front of the media answering their questions. This is what the vaccine is, this is how we're gonna distribute it, this is how it's made, this is what the virus is doing, this is where the virus is now, this is where we expect the virus is gonna be. He was the model of how you communicate what we were doing and why we were doing it. So I saw him at a National Foundation of Infectious Disease meeting a couple of months ago and I said that to him. I said you were great, you were a model. He said thank you, I could never do it today. Two reasons, politics and social media.

Erin Welsh

I want to go back to something that you mentioned which is about how this anti-vaccine movement is so much better funded these days. And when it comes to other subjects that are popular with the anti-science crowd, so things like human-induced climate change or historically cigarettes and lung cancer, I feel like it's easier to see, it's easier to make those connections, to see the motivations of the people or the groups that are spreading disinformation. With climate change of course the fossil fuel industry doesn't want to lose profits as a result of changing policies. And that's more or less the same thing with big tobacco. As soon as that link about lung cancer and cigarettes came out, it was like let's quash this. Pretty clear motivation there. But I feel like identifying the drivers of the anti-vaccine disinformation campaigns, it's not as straightforward. So how can we categorize some of those drivers?

Paul Offit

No, that's a really good point. I hadn't thought of it that way. But you're right. I mean what exactly is the financial motivation here? Assuming there's always a financial motivation. And I think it's just an expression of this notion of autonomy, sort of personal freedoms and that über alles. I think that's just sort of become the mantra of the Republican right and I think that's why, or especially the right, I'll just say. And so that's their current mantra. I think it just fits into their zeitgeist. I'm not sure that there is any financial motivation but there's certainly a lot of money to support it, I mean more so than ever.

There was an article for Monograph by a group called the Center for Countering Digital Hate. And they had what they called the disinformation dozen. And so it was 12 people or groups that accounted for about 70% of the misinformation that was out there. Their funding was often the same, they all got pretty much funding from the same source which was the dietary supplement industry. Which in many ways is the same thing because there too is a matter of medical freedoms, we don't want the FDA telling us what we can or can't say because when we say things like this will make your prostate smaller or this will make your immune system better, we want to be able to say that even though we have no evidence that that's true. And so the FDA sort of pushes back and doesn't really let you say that. So you have to be vaguer, right, it supports prostate health, immune health, heart health, whatever. And so they really are in many ways aligned with this group which also likes to make claims that are unsupported.

And I feel like so much of this has to do too with how uncertainty is communicated in popular media. Where scientists and people trained as scientists or as medical practitioners are sort of, it's ingrained in us to be more conservative in saying this causes this or this is the evidence for this or there's a strong relationship. And I kind of wanted, this is like a very roundabout way of getting to my question, which is it's sort of about the way you think that scientists are trained in how to communicate with the public or the popular media and how we can do better with that.

I think our training as scientists is the opposite of the training that we need to educate the public and the media about scientific issues. Because when you write a scientific paper, publish a scientific paper, the biggest sin you can commit is to ever go beyond the data in front of you. So a good scientific paper is one that in theory draws a conclusion. And then the discussion section is full of caveats, right. I really can't say this or this or this because my data limit me in terms of what I can say about that. And so we're always very careful. That's number one. That doesn't come off well at least in the popular press or in the media because it sounds like you're wishy washy. It sounds like you're not sure of what you're saying.

The other thing is it's just the nature of the scientific method which is that you formulate a hypothesis and then you can do two things with that hypothesis. You can reject it or not reject it. But you can never accept it, which is to say you can never prove never. Because the null hypothesis is paramount and you can't ever accept the null hypothesis. So I mean as an example, as a little boy I watched the TV show Superman which was black and white and Christopher Reeve, well it was before Christopher Reeve, it was George Reeves. And he flew. And when you're five years old and you're watching TV, TV does not lie. And so he had his cape and his hair would fly and he would look at the city below and he would fly.

So what I did was I went in the backyard and on a small chair, I stood up and I put a towel around me and put my hands in front of me using the interlocking thumb grip which I thought was critical to the whole experience because that's what he did. And I jumped a few times and didn't fly. Spoiler alert, I didn't fly. Now I could have done it a million times. That wouldn't have proven that I couldn't fly. It would only have made it all the more statistically unlikely. I could have done it a billion times, 10 billion times. Because the scientific method does not allow me to say I can't fly, at least not without a plane. But I can't fly. And so I can say that and I think you have to get used to that. So for example, you can't say the MMR vaccine doesn't cause autism. All you can say is that there are 18 studies that have been done in seven countries on three continents involving hundreds of thousands of people that show that you're no more likely to develop autism if you've gotten the vaccine or if you haven't. That's what you can say.

And so I had to testify once in front of Dan Burton's Committee Office of Government Reform about that issue. Andrew Wakefield had just published his paper, he was on the other side, I was on the side of good, trying to explain what we knew about MMR vaccine or what we knew about autism. And Coleen Boyle who was great from the CDC, she got up and she explained what the early data showed in terms of there was no association, no statistical association with those two things. But Dan Burton heard weakness in that and he said so you can't tell me. You can't tell me it doesn't cause it, do you? Because you have, and I quote, "an out in the back of this thing". And so that, it's hard, you have to get used to that at some level, that you are saying things that at some level scientifically you can't say. And for scientists that's hard.

Erin Welsh

Let's take a quick break. And when we get back there's still so much to discuss.

TPWKY

(transition theme)

Erin Welsh

Welcome back, everyone. I've been chatting with Dr. Paul Offit about his book 'Tell Me When It's Over: An Insider's Guide to Deciphering COVID Myths and Navigating Our Post-Pandemic World'. Let's get back into things. What do you think is the appeal of conspiracy theories like the microchip in a COVID vaccine?

Paul Offit

Well conspiracy theories are easy to understand. They explain something clearly, they give you a handle on it even if it's not true. I mean I think the best example at the beginning of this pandemic was the notion that it was a lab leak. This wasn't a lab leak. I mean I was actually just on Morning Joe this morning at like a quarter to 10 and that was his question. He said to me, and he's a thoughtful, smart man; he said I've had people say to me, people in the medical field or the scientific field say to me sort of on the side, as if this is our secret, that we're trying to hide this, that this may well have leaked from a lab. And first of all it's never happened. Never has a pandemic virus ever been created in a laboratory.

Two is all the evidence is on the other side, right. I mean here you have the western section of the Hunan seafood market where there were dozens of animals that were sold illegally in very close, unsanitary conditions. And the kinds of animals, red foxes, raccoon dogs that can catch and transmit a virus like SARS-CoV-2. I mean SARS-1 was an animal to human spillover event in 2002, MERS was an animal to human spillover event in 2012. I mean it's not like the black plague was created in a medieval biocontainment lab. It's just these things are invariably animal to human spillover events. And you have these sort of pictures that were taken of that western section of the market that were sent to people in the United States, media people in the United States. You see how unsanitary those conditions were. And the Chinese really did look for genetic evidence of this virus, SARS-CoV-2 virus, in things like the machines that kill the animals, the brushes that brush the animals or the tables in which the animals were sacrificed or the cages themselves and found evidence of SARS-CoV-2 virus there.

So if it was created in a lab, then what the laboratory person had to do was then travel 9 miles to where this Wuhan seafood market was, cross the Yangtze river, and then deposit it in a place exactly where you would expect an animal to human spillover event to occur. So this is not a scientific, I mean you don't have the clear smoking gun. I mean you don't have like a raccoon dog standing up like at the end of 'Crime and Punishment' and saying it was me that killed the seafood vendor, right. So you don't have that. But you have a confluence of evidence that tells you it's all on one side. And actually the best comment I've heard is that this is a promiscuous virus. I mean if you were trying to target it to humans, it's targeted to at least three dozen other animal species. And so the line was if this was created in the lab, it was created by an underperforming graduate student. I like that.

Yeah. I mean like you said, we have so many road maps for how this happened and people have been predicting something like this for decades. Ugh. But I think that going back to sort of this cognitive dissonance between people were hoping and hoping for a vaccine and when it finally came out, when it was finally available, there would be someone who as their relative is dying in a hospital, this person would be simultaneously tweeting about microchips or tweeting about fatal side effects from the vaccine. Like where does that cognitive dissonance come from? Maybe that's just like a philosophical question that we can't answer but it's just something that I find really hard to kind of like grapple with.

Well I think part of it is we definitely lost trust. And I think there's a few reasons for that. One is that there's just a general anti-institutional bias. So it's not just the FDA and CDC that's lost trust, the Department of Justice, FBI, etc. Two is there is this flood of disinformation at a level I think we've never seen before. It's never been better funded before. But the third is that I think we did make communications mistakes. And that's one reason why you lost trust and therefore those conspiracy theories become more attractive.

So for example to me the biggest one occurred in July of 2021 when thousands of men go to Provincetown, Massachusetts to celebrate the July 4th holiday. And 79% were already vaccinated. Nonetheless there's a COVID outbreak. So 346 men who were in attendance got COVID, all of whom had been vaccinated, four were hospitalized. So that's a hospitalization rate of 1.2%. That's a vaccine working very, very well. Right? I mean the vaccine is doing what you wanted to do, keeping you out of the hospital. The other 342 had mild or asymptomatic infection. Which when the CDC reported this, the headline in MM, Morbidity and Mortality Weekly Report was 'Breakthrough Infections'. They call these asymptomatic and mildly symptomatic infections breakthrough infections as if this vaccine had failed. The breakthrough was a very negative word. Whereas the goal of this vaccine was to keep you out of the hospital, the goal of this vaccine was to prevent serious infections and the vaccine was doing exactly that.

I mean if you watch Brett Kavanaugh, for example, Supreme Court Justice, he's entering the Supreme Court chamber, he's routinely screened and found to be positive. It was around the same time. And they call that breakthrough infection. If you watch the way that CNN carried that story, you would have thought the man was fighting for his life. I mean Lindsey Graham actually had, again because this is mid 2021, it's two dose vaccine time, he'd gotten two doses of vaccine, he had a three or four day illness that was characterized by sinusitis. And he said, and I quote, "this would have been much worse if I hadn't been vaccinated." Right. Lindsey Graham got it exactly right. And how often do you get to say that?

Erin Welsh

Even a broken clock is right twice a day I guess. Yeah, I think that that sort of messaging has still had lingering effects. I remember seeing a news report maybe a couple weeks back about the latest booster and how it prevented symptoms and X number of people who received it and it's still perpetuating this notion that vaccines are there to entirely prevent any sort of symptomatic disease. And that's not the case.

Paul Offit

This upsets me more than anything else. I mean it's a short incubation period mucosal infection. Mild infection is prevented by high levels of virus-specific circulating neutralizing antibodies at the time of exposure and antibodies don't last that long. They will fade over 4-6 months. I think we were fooled in a sentence in December of 2020 when those two large clinical trials were presented with Pfizer, Moderna. Pfizer, 40,000 person; Moderna, 30,000. Placebo prospective, placebo controlled trials. The efficacy was 95% against severe disease. It was also 95% against mild disease. And the reason is is those were three month studies, those participants had just gotten their second dose. That's why it was so good. So six months later, five studies showed that protection against severe disease was holding up well in the 90% range but protection against mild disease had faded to 50%. That had to happen.

And see that in combination with mandating vaccines, you have to get this vaccine or else you don't get to go to work. And then people would did it, they got the vaccine, then they had a mild illness and said see? The CDC told me that this vaccine was gonna protect me and now it didn't, I'm having this breakthrough illness. I mean it really angered people. Actually if you watch the way, for example, Ron DeSantis doing his stump speeches would often say you all know the CDC told us this vaccine was gonna work and it didn't. Well it did, it worked to prevent severe disease. Actually if you look at the way that they're currently messaging the flu vaccine, the CDC, it's exactly right. Their slogan is 'wild to mild'.

Erin Welsh

I wanted to ask you about something you discussed in your book which is this difference between a deficit of knowledge and a deficit of trust when it comes to the COVID vaccine. And I was wondering whether you could explain a bit more about what you mean by that and also how unequal access to healthcare plays into this.

Paul Offit

Right. I think probably the most telling studies were that those who chose not to get a vaccine often had little contact with the healthcare system which I think is underlining kind of the sorry state of healthcare in this country. I mean we don't have a national healthcare system, so not everybody easily gets healthcare. And so therefore there's that deficit of knowledge because you aren't able to ask your doctor should I get this vaccine? There was a story I tell in this about a nurse or an intensivist named Brittany Kobe in Alabama who would often see people come into the hospital, had unvaccinated, suffering and dying. And she said the question that I always asked was did you talk to somebody about this, somebody in the healthcare profession? And the answer was invariably no. And so I think if you look at for example people over 65, they're certainly more likely, the older you are, the more likely you are to be a Republican. The older you are, like over 65, you're more likely to watch Fox News.

But misinformation isn't destiny. I mean they're also very likely to be vaccinated because 95% of people over 65 are vaccinated because we have Medicare in the United States and so they often can get healthcare. And I think that's key. But I think it is fixable. And the story I tell is one of Ala Stanford who's an African-American surgeon in Temple, the Temple University. And she, with her own money, formed something called the Black Doctors COVID Consortium. So with many of her colleagues, she went into North Philadelphia, a predominantly black and brown community with little in contact with the healthcare system other than an emergency basis. And she just sat in people's living rooms and tried to convince them of why they should get the vaccine.

So they're seeing someone who looks like her, who they therefore trust. And eventually if they said no, she'd come back again or she'd come back again. And she ultimately vaccinated 50,000 people in North Philadelphia. She's a hero, she is an American hero. I just wish that there were a thousand Ala Stanfords who could get out there and do what she did because I think that's the solution. I mean yes, the CDC and the FDA should explain in detail what they're doing and why they're doing it. And yes, I think local and state governments should do that. But I think that Ala Stanford represents a solution to this problem which is we have to find who those people are in those communities that are trustworthy and then get them the resources they need to get into those communities and tell people why vaccination is important.

Erin Welsh

Absolutely. I could not agree more. And I think that part of the challenge with that is kind of something we've already touched on which is the lack of training for researchers or medical professionals in how to communicate information to the public. Where we learn about how vaccines work, we learn about how epidemiological studies work, how clinical trials are carried out. But we don't necessarily learn how to explain that to someone who isn't sitting next to us in the same classroom or even explaining it to them. And so how do you think these sort of opportunities can be improved upon at every level from like training to development of these programs to execution?

Paul Offit

Right. Well I think as always it probably starts at the beginning. I mean my father since passed but he fought in WWII. But he explained to me that as an elementary school and high school student he was actually taught critical thinking, taught the scientific method. We often don't do that anymore. I think that would help. And I do think that... So for example, if you see the CDC recently changed their guidelines in terms of how long one should quarantine associated with being infected. And they said something that made a ton of sense which is one afebrile day. Now see why that makes sense to me is that the virus occurs in two stages, this is true for all viruses. But so the first stage is the virus replication stage, right. Reproduce itself over and over again. Then what happens is the immune response stage which is when you get symptoms, it's when you make antibodies against this virus or you have cytotoxic T cells to kill virus-infected cells. That's when you have symptoms.

So now as the symptoms increase because the symptoms are based on your immune response trying to eliminate the virus, virus replication decreases. So their argument is, and it's a reasonable one, if you have one afebrile day, if you've been febrile and you had a fever, wouldn't it make sense that the immune system is abating? And if the immune system is abating, doesn't that tell you that virus replication is really not a critical part of the disease process anymore? So you're much less likely to be shedding virus. That makes sense rather than saying quarantine for 7 days, 10 days, 14 days. Because first of all viruses don't replicate on the basis of the metric system or the lunar month. So wouldn't it make sense to just peg it to the person rather than to this arbitrary number? So I like that. But explain it. I mean get out there and explain it. Or else what you have then other people trying to explain it for you that may not understand it as well.

Erin Welsh

I want to kind of circle back to this issue of politics and public health. And politics has been involved in public health in the US for hundreds of years, even before the US was the US. Just look back to smallpox inoculations during the American Revolutionary War. And I think that for a lot of us the political discourse during the COVID pandemic revealed just how much public health policies are influenced by the politics of the day. As we head into this election year, what public health discussions do you think that we'll hear more about or will be central to campaign issues?

Paul Offit

Well you're absolutely right. I think politics has always been part of public health because public health requires resources and therefore there will always be a political component but there doesn't have to be a partisan component, which is what I think has happened here. I don't know what's gonna happen. I fear that what's happening is that science is losing its place as a source of truth. I mean Kellyanne Conway said it best, "well we have our alternative facts". The birth of the term 'alternative facts' which somehow is acceptable. And I think with that erosion of trust, the erosion with science is becoming now just sort of another voice in the room. Anything is possible.

And I think we just saw that. We just saw people denying the impact of this virus when 1.1 million people died, when 300,000 people lost their lives because they chose not to get vaccinated, because they chose to lose their lives. I mean that's a frightening time. Worse I think you have hundreds and hundreds of pieces of legislation that have pushed back on vaccine mandates, masking mandates, isolation or quarantine procedures and vaccines. I mean these are the important weapons in public health that are being stripped away at some level. We want freedom but we don't want protection. And I fear that's kind of where we're heading.

So what changes all this? I think again, I'm an optimist. I mean I'm a Philadelphia Eagles season ticket holder so by definition I'm an optimist. But I do think these things have to occur very early on where we educate people about science and educate people about how to think critically. And I think some of that is gone. See I think I became a better critical thinker as a scientist than when I was an MD. When I was just doing clinical work I think I was more of an anecdotal thinker, more of a pattern recognizer. I think once I moved into a base of science, working on rotaviruses, I think I became much better at sort of hierarchically establishing burdens of proof, formulating a hypothesis, subjecting those proofs to analysis. I became a clear thinker somewhere in there. But I'm not sure I learned that in medical school.

Erin Welsh

I really loved what you just said about how science being just another voice in the room. And I feel like this is a future that we have created for the past several decades where in general there's been sort of this demand for and acceptance of debate, where we need an equal sides debate where on one side is the scientific evidence and the other side is whatever agenda somebody is pushing, whether that's big tobacco, whether that's people who don't believe in evolution. There's this like kind of false equal footing debate that doesn't really exist because the science has already been debated over decades of peer review, over decades of conferences and basically what science actually does.

And I think that we have now gotten to the point where it's not even just a two sides debate but it's science vs a thousand different agendas. And I agree that I really worry about what that's going to look like in the future. And I feel like if we say that training students and creating these critical thinking courses in younger students, I mean how many generations then will it take for this to make an impact in policy? That's I think one of my big worries about this.

Paul Offit

You know what? This is sort of a corollary to your worry. I think science, when I would do scientific studies and then go to double stranded RNA meetings to present the science of working on rotavirus. And so you would draw a conclusion and then you would present your data and people would challenge your data. So it's not really debating science maybe in the way you mean it I think. But they would challenge the criteria on which you base your conclusion. Was it internally consistent? Was it robust? Did you do the right controls, etc? And that's what you wanted, you wanted that. You wanted to hear that because that's how your scientific studies got better. That does not work well in a public health arena. It doesn't.

And I think the best example of that for me, well two recent examples but one is the bivalent vaccine. I mean the bivalent vaccine, the thinking was reasonable, right? Omicron BA.1, the original Omicron came into the country in December 2021. It was an immune evasive strain, even if you'd been naturally infected or vaccinated with Alpha or Delta, you weren't particularly protected against mild disease from Omicron. So shouldn't we include Omicron in the vaccine? Perfectly reasonable. So the thinking was all right, let's do a half a dose of the ancestral strain, half a dose of one of the Omicron variants which became BA.4, BA.5. Not a bad idea, didn't work out. I mean if you looked at the data that were presented to our committee in June of 2022, it didn't look like immunologically you were more likely to develop an immune response, a neutralizing antibody response to this Omicron variant if you got the monovalent vaccine, if you got the bivalent vaccine because of imprinting. That's what happened.

So I was a no vote. I voted no for that. Now the next day the government bought 105 million doses of Pfizer's vaccine. But remember I'm in an advisory committee, so we just give advice. So anybody who's in medicine knows people don't have to follow your advice. And then the clinical studies were done. There was one in the US, one in the UK, one in France showing that you were no better off getting the bivalent vaccine or monovalent vaccine. So I said that. I mean I said that nationally, I wrote a perspective piece for the New England Journal of Medicine that said that and it was published at the same time that David Ho in Columbia and Dan Barouch and Harvard published their paper showing there was no difference immunologically in those two vaccines in inducing an immune response, likely neutralizing and protective immune response against the Omicron variant.

Okay. That's okay. It's okay not to get it right the first time, you learn as you go. There's always a learning curve, it's invariably steep with this kind of... It's a novel virus, it's a novel vaccine strategy, it's a novel disease. We're trying to learn as we go. And so explain that. We didn't get this exactly right but we've learned and so you don't see bivalent vaccines anymore. But that's not what we did. What we did was we kept saying it was better because we wanted it to be better. And when I was saying publicly that it's not better, it's not worse, boosters boost, it's a value for people who are in high risk groups, I was hammered by public health officials who were really angry at me because what had I done? I'd gotten off the bus. It's a divisive time, you're on the bus or you're off the bus.

And they felt, I mean because we wanted people to be vaccinated and I get that but don't misrepresent the data because you're only gonna lose trust, not only the public but of scientists who see what the data are. So just be honest and know that you're not gonna get it right. But see that, the fluidity of that, the fluidity of scientific discovery, of learning as you go is disconcerting to the public. I mean I think if you ask people do you think we're gonna know more about science or medicine 50 or 100 years from now than we know now? I think everybody would say yes. But when it comes to your disease or our pandemic, they want to believe everything you need to know right now. And if you don't, then you got it wrong and I don't believe you anymore.

Erin Welsh

I was wondering, do you have like any tips of, you're such a great science communicator, do you have any tips for science communication that you that you have found over the years like work really well? Or even just like general advice.

Paul Offit

Well I think don't be afraid to explain the science. I mean when this whole thing, there's a surgeon general in Florida, Florida actually is one of I think only four states that actually has a Surgeon General whose name is Dr. Joseph Ladapo. So he's become famous for his notion that he put out there and sent something to all these sort of healthcare people in Florida that the mRNA vaccines are contaminated with DNA fragments. Which first of all, it's a manufacturing residual, it's not at all surprising. Anything that's made from cells and it's certainly the plasma DNA that is the beginning of the process of mRNA vaccines, that doesn't just completely disappear as you go through the manufacturing process, there's nanogram levels of fragmented DNA as is true of any vaccine that that is made from cells, measles, mumps, rubella, varicella, rotavirus, all those have small fragments of DNA.

And in fact we eat foreign DNA all the time, assuming you eat anything made from plants or animals on this planet which is pretty much everybody, which ends up in your circulation by the way, and it fragments much larger and in quantities much larger than you're ever getting in a vaccine. But anyways, he put it out there, right? DNA fragments can essentially insert themselves into your DNA and cause cancer. So explain that. Now you can explain that, you can explain how the cytoplasm doesn't like foreign DNA, it's hard to get across the nuclear membrane of a non dividing cell. Then you have to insert yourself into DNA which requires some sort of an enzyme like an integrase. But so you can...

So I was on CNN, right, with Brianna Keilar, and you don't have much time. You got about four minutes to explain why Joseph Ladapo was wrong. But don't be afraid to do that. Try and explain the science simply. Don't just say... So the FDA when they dealt with this, this is fine. I mean they said vaccines are carefully tested for safety, we know that this exists. But so when they do that, when they don't explain the science, they're basically saying trust me. And people don't trust you. So when you give them something to hang onto, even if they don't necessarily understand all those words, like integrase, an enzyme like an integrase, but it is an English sort of sounding thing, right. Integrate into something. So just I'd say don't be afraid of that, don't be afraid to say... People appreciate that. I think they appreciate not being talked down to by making it too simple.

Erin Welsh

In your book you discussed many different important lessons that we learned from the COVID pandemic. And this is a two parter. So the first is what do you think is the most important lesson that we actually did learn? And what do you think was the biggest missed opportunity or the lesson that we didn't learn or unlearned?

Paul Offit

Well I think we learned we can make a vaccine quickly and well and that we can distribute it quickly and well. That was good. I think that the thing that hopefully we've learned is that we need an international surveillance system. You can't depend on a whistleblower in China to tell you that there's a virus that's circulating that's killing people. And China was xenophobic, they didn't let other scientists come in, that gave rise to conspiracy theories. I mean that kind of inability to let foreign or other researchers come in. I think it's in us. I do think, as I sort of talk about the end of the book, I mean when 9/11 happened we all held each other and hugged and cried, we were all in this together. I think that was also true when Pearl Harbor happened. I think we do at some level see ourselves as part of a larger group and we have to if we're going to move forward, we have to see ourselves as part of a larger group.

There's 9 million people in this country who can't be vaccinated, for example, because they're immunocompromised. They depend on those around them to protect them. Do we have any responsibility to them? Of course we do. And I think we have to just kind of do our best to sort of emphasize that we are part of a whole, we benefit from being part of a whole. And just make it clear that that's true. So I don't know. I mean I think we'll see how the next the story of the next pandemic is told but there will be a next pandemic. We've had three pandemic viruses in the last 20 years. We're not that far from the next one.

TPWKY

(transition theme)

Erin Welsh

Dr. Offit, thank you so much for taking the time to chat with me today. I really enjoyed our conversation about this rise in anti-science sentiment and what we can do about it. It's definitely something that is always on my mind. And for those of you who want to know when it's over and how to navigate this post-pandemic world, check out our website thispodcastwillkillyou.com where I'll post a link to where you can find 'Tell Me When It's Over' as well as a link to Dr. Offit's website. And don't forget you can check out our website for all sorts of other cool things including but not limited to transcripts, quarantini and placeborita recipes, show notes and references for all of our episodes, links to merch, our bookshop.org affiliate account, our Goodreads list, a firsthand account form, and music by Bloodmobile.

Speaking of which, thank you to Bloodmobile for providing the music for this episode and all of our episodes. Thank you to Leanna Squillace and Tom Breyfogle for our audio mixing. And thanks to you, listeners, for listening. I hope you liked this bonus episode and are loving being part of the TPWKY Book Club. A special thank you as always to our fantastic patrons, we appreciate your support so very much. We truly do. Well until next time, keep washing those hands.