[00:00:00.910] - Joe
Oh, hello, friends. Welcome to the show. This episode of the podcast is brought to you by Tushy. Tushy actually came up during this podcast organically.

[00:00:10.690]
What Tushy is, is it's a bidet attachment that you put on a regular toilet. It starts at only seventy nine bucks. It's a fantastic deal. And it sprays clean water right on your dirty parts. Now, if you've never used a bidet, you just been wiping your butt with toilet paper.

[00:00:30.100]
Listen to me.

[00:00:30.940]
If you got shit on any other part of your body, would you use a dry piece of paper to wipe it off and be satisfied? Of course you wouldn't.

[00:00:38.170]
So why are you satisfied with your butthole being barely clean, not even clean?

[00:00:45.160]
You're just smearing it. Listen to me. Tushy is the way to go. It sprays water directly to your ass. It removes the poop completely. So you're not sitting on bacteria that leads to nasty things like hemorrhoids and yeast infections and UTIs and itchy buttholes and skidmarks. I use one. It's awesome. It's so much better than just toilet paper and it saves you a lot of money on toilet paper. This is what came up during the podcast.

[00:01:11.620]
You just need a tiny little bit to pat your butt dry. You could use a towel if you want to and eliminate all your toilet paper. It cleans your butt and it's better than wet wipes. Wet wipes are fucking terrible for you. They're terrible for the environment and they cause anal fissures.

[00:01:27.130]
You don't want anal fissuring, right? Tushy starts just 79 bucks. Go to hello Tushy dotcom slash Rogan and get ten percent off your order. And free shipping. It's fuckin' awesome. Trust me. Way better.

[00:01:40.480]
You know what else is awesome? The motherfuckin' cash app. That's right.

[00:01:44.350]
The motherfuckin' cash app. The cash app. The number one app in finance in all of the land. You probably already know the cash app is the easiest way to send money between your friends and family. Without having to hold onto that dirty paper. Well, the cash app is also the very best way for you to buy Bitcoin. With the cash app, you can automatically purchase Bitcoin daily, weekly or even biweekly, known in the industry as stacking Sats.

[00:02:10.870]
Sats is short for Satoshi, who's this legendary person who created Bitcoin.

[00:02:15.580]
Nobody even knows who it is. Crazy. It's a mystery. Bitcoin is not a mystery. Bitcoin is a transformational digital currency that acts as a decentralized peer to peer payment network powered by its users with no central authority. A lot of people think it's the ideal way to use currency.

[00:02:35.730]
And you can start doing that right now, today, it's a real thing, and a lot of people are very high on Bitcoin. And of course, when you download the cash app and enter the referral code, Joe Rogan, all

one word, you will receive ten dollars. And the cash app will also send ten dollars to our good friend Justin Ren's fight for the forgotten charity, building wells for the Pigmies in the Congo. And through this program, we have raised a shitload of money and built several wells and are in the process of building many more.

[00:03:05.280]
So it's very exciting and we're very proud to be a part of this. And Justin Ren's probably the greatest human being that's ever lived. So don't forget, use the promo code. Joe Rogan, all one word when you download the cash app from the App Store or the Google Play store to day.

[00:03:20.220]
We're also brought to you by movement. Movement is a company that makes cool watches, they make great blue light glasses, eyewear and jewelry. Gwate ...great quality and style, but it doesn't break the bank. And they're starting their online Black Friday sale early so you can get ahead of the holiday shopping with the biggest sale from them of all time.

[00:03:49.270]
Movement builds quality watches, their watches feel like a 500 dollar watch, but for a fraction of the price. They're durable, really nice looking, and they're designed in-house out of their Los Angeles headquarters.

[00:04:03.010]
They have dope blue light glasses. Their movements ever scroll blue light filtering glasses or one of my personal favorites I love... Look, it protects your eyes from long hours in front of screens and they come in cool styles. They have dope sunglasses, they're sweet. They have nice packaging. So it's a good thing to gift. Their products are one size fits all in their gift. Guides help you find the gift that fits someone's personality. They're shipping as fast.

[00:04:30.790]
They offer free returns all the way into next year. Not that you'll need it. Check out movement's biggest sale of the year with fast shipping and free returns by going to m the m t dot com slash Rogan and we're brought to you by Express VPN. Express VPN will hide what you're doing online from sneaky peering eyes.

[00:04:59.150]
Do you know incognito mode doesn't really work in clearing your history doesn't really work. They're not private. Your Internet provider can still see all the sites you visit and they're legally allowed to sell data to ad companies with Express VPN.

[00:05:15.740]
Your Internet connection gets rerouted through secure servers so that your Internet providers, whether it's Comcast or Verizon or whoever it is, they can't see your site history. So if you're out there looking at all the websites that Jamie goes to, no one will know.

[00:05:32.140]
It's available on all devices, computers, tablets or smartphones, tap one button to connect, super simple, it's the fastest excuse me, the fastest, not the fastest. It's the fastest, most trusted VPN on the market. I use it. It's awesome. I love it. Easy to use. It's rated number one by CNET, Wired, The Verge and countless more. And you can go to express VPN Dotcom Rogan and you get extra three months for free on a one year package.

[00:06:01.750]
That's x p r e s s vpn dotcom Rogan Express VPN Dotcom Rogan. Go there to learn more tarar.

[00:06:14.350]
My guest today is returning to the podcast, Nicholas Christakis from Yale.

[00:06:21.100]
He is a brilliant man and he has written a book on covid, a book on all the various problems that we're encountering, the vaccines and all the different things. And he gave a very enlightened depiction of what's going on and description of what's happening and what we are I want to say, look forward to.

[00:06:43.900]
But what we're going to encounter and and what can be done to really to to mitigate all these issues. I really enjoyed talking to him and I hope you enjoyed as well.

[00:06:54.130]
Please welcome Nicholas Christakis government podcast, The Joe Rogan Experience Train, My Day Job podcast, my life all day.

[00:07:05.860]
Yeah, I got into cigars lately, I did so October and during the month of October, no drinking at all, and I started smoking cigars. Kind of the sober October work for you is great, but do it every year. It's a nice little reset. It's interesting, you know, I mean, I have another friend of mine who stopped drinking altogether and he said that it was making him cranky when he was drinking and of course, there were extra calories.

[00:07:32.480]
And I listened patiently to him and thought I would love to do that. But at the same time, it's hard to give up completely.

[00:07:38.600]
So I enjoy a glass of wine with a meal that that I miss the most. That was the worst when I was, you know, having a steak. And I just kind of like a nice glass of red wine right now. Yeah, but other than that, I don't drink much. I'm not much, much of a boozer. Although when November kicks in, I know I can drink again.

[00:07:57.810]
There's usually a few days of excess which is speaking of the subject of covid-19 the current pandemic we're into. That's not a good thing. There's a lot of people out there destroying their immune systems. Drinking is a very funny video that I found online of this gentleman who runs around his neighborhood. And he noticed that during the lockdown he would run around his neighborhood and he would see the recyclable bins and they were just filled with empty alcohol containers.

[00:08:26.480]
He's like, this is crazy.

[00:08:27.620]
This this is for the week. Like, how much of these people drinking just vodka and wine? And there's a lot of that going on.

[00:08:35.510]
Yeah, people have actually looked a little bit at that at alcohol consumption. And it's a little bit like the toilet paper shortage. I don't know if you followed the whole toilet paper shortage thing. Well, what's happening is there's a shift in consumption. You know, a lot of the drinking that was taking place in restaurants and, you know, at at bars is now taking place at home. So I think it's like half and half like half the consumption in the past was at home and half was out of the home.

[00:09:01.700]
And now it's almost all at home, which is part of it. But I also think, as you're suggesting, the actual amount is going up, too. So so, yes, it's you know, it's contributing to weight gain and other problems in our society.

[00:09:14.360]

The toilet paper thing. There's an easy fix for this, folks. That's way better. And I hate to do this to plug a sponsor, but it's a good sponsor and sponsor called Toshie. And Toshie makes a bidet attachment that just fits onto a regular toilet and it cleans your butt. There are only seventy nine bucks and it's fantastic. It cleans your butt so much better than just toilet paper and it cuts your toilet paper consumption down by like eighty five, 90 percent because you just need a little bit of toilet paper to pat your butt dry at the end.

[00:09:45.290]
Do you ever use one of those bidet attachments.

[00:09:47.370]
Well, by Greece they're not uncommon everyday. So I of course am familiar with them. But we don't have one here but me.

[00:09:56.690]
You should get it again. You should get one. I'm telling you so much better.

[00:10:00.950]
We may. We may.

[00:10:02.540]
In fact, you know, I can't believe we've covered alcohol in bidets.

[00:10:07.670]
Yeah. So let's talk about this. How did you what made you decide to write a book on the current pandemic and the disease? Well, I mean, for me, it started I was reading news reports in January about what was happening in China, but I wasn't paying a ton of attention. And then I have these Chinese colleagues with whom I've been doing research for a long time, and they contacted me in the middle of January. We had been using phone data in China to study how earthquakes, for example, change human social interaction.

[00:10:40.910]
So after an earthquake, Putu, people call and we could imagine that the first person you call is very important to you, for instance. And so we could use the phone data to study social interactions. And so we decided to use the phone data to study the pandemic and and to study the movement of people through China and how they might carry the virus with them, which started in Wuhan in November some time. And and and then we noticed or I saw in the data that on January twenty fourth, the Chinese were so concerned with a virus that they basically detonated a social nuclear weapon and they put nine hundred and thirty million people, almost a billion people under home confinement starting January twenty fourth.

[00:11:28.090]
And I could see that in the data. And that really got my because your emotions ceased, people stopped moving in the whole country. And that that really got my attention. And as I got worried and it was clear to me that this was going to be a serious global pandemic. And so I began to redirect the activities of my laboratory at Yale to study more and more about about what was happening with this virus. And we did a whole bunch of projects, some of which, if you're interested, we can talk about.

[00:11:58.330]
We released this app called Hu Nahlah HQ and a L-A who Nahlah, which you can get thousands of people use it now. It's like it's like ways for coronavirus. It's it's not a contact tracing app that looks backwards. It crowdsource is information about who you're connected to. One of the things I study is networks and where you live and forecast your risk. So people down the road from you are reporting a traffic jam or a cop and you can exit the highway and avoid that.

[00:12:27.910]
And people, your friends, friends, friends are reporting a fever. It can ripple back through the network

and feed this information to all anonymous. It's it's anonymized. It doesn't, you know, doesn't report who is having what anyway. And the app, incidentally, temporarily.

[00:12:45.570]
Accesses your contacts, we don't copy the contacts, it doesn't copy that, but it makes it easier for you to identify who your social connections are anyway. So we did that. We did a whole bunch of other stuff, which maybe we'll talk about. And so in the month of February, as we were doing all this work, I was getting more and more worried. And and that our nation wasn't preparing. And so in March, I started sending out some Twitter threads like Epidemiology 101, like basic stuff, and a lot of those started to go viral and people were so hungry for information about it, it became clear to me, you know, factual information about what was happening.

[00:13:23.530]
And then in the middle of March, my editor, my long term editor at Little Brown, a woman by the name of Tracy Beha, contacted me and said, Would you like to write a book? And I thought, yes. And my motivation was that I wanted to help the American public understand what we were facing. And I was very worried that people weren't taking this seriously enough. And so so that's why I wrote the book. I wrote the book because I thought this is something I know about.

[00:13:52.930]
This is something I care about. I care about our country. I didn't see our leaders as doing the things they needed to do. And I just wanted to help people understand what was happening and and what was likely to happen.

[00:14:05.630]
What do you think should have been done that wasn't initially like in the January, the month of January. It's when everyone was alerted to the fact this was going on in China. The White House knew, everyone knew, but we didn't really lock anything down to March. What do you think should have been done?

[00:14:21.700]
Well, first of all, the I people like me knew this was going to be a serious global pandemic for sure, by the end of January. And the president, we now know, unsurprisingly, was briefed even earlier.

[00:14:34.360]
Right.

[00:14:34.540]
I mean, if the president, you know, was it didn't have more information than me, then there's something wrong, something wrong in our country. And but certainly by the end of January, when China locked down, as we discussed, we should have begun immediately preparing our testing capacity, manufacturing PPE. We should have, I think, begun the incredibly important challenge of preparing the nation for the challenge we would face, like gearing up for a kind of war.

[00:15:03.610]
You know, we were about to be invaded by the virus. So public messaging would have been really important to tell people, you know, we're we're facing a common threat. We're going to have to endure some sacrifice. We're going to have to work together to repel this threat. Here's some basic information about the nature of the threat. So all of these things are ventilator's. For example, also another sort of material that we needed preparing our hospital systems.

[00:15:29.170]
For example, we lost several months in which we didn't we didn't really prepare. And I honestly, I don't understand why our leadership failed us in this way.

[00:15:39.050]
He's responsible for them. There was a there's an also an issue where the pandemic response team

that was in place for the previous administration was disbanded and sort of reassigned. Correct. So I don't know.

[00:15:52.930]
Yes. I don't know all the details about that. I know it wasn't just the Obama administration. They inherited the pandemic response from the Bush administration. And the CIA has been identifying emergent pandemics as a serious national security threat for a number of decades now, as I actually discuss in the book. And of course, people like Bill Gates have been warning about this. Tony Fauci was writing about this stuff when you and I were in elementary school. So so there's there's a lot of institutional knowledge about the existence and nature of these threats.

[00:16:24.340]
And and so I don't I don't know why they weren't we weren't better prepared when we saw what was happening in China. What could have been done differently? I mean, obviously, manufacturing of PPE and all those things. That that absolutely should have happened and that would have actually avoided a very unfortunate thing that happened where Foushee actually was telling people they don't have to wear masks and later admitted the reason why he did that is because he didn't want people rushing to get masks and that would take masks away from the first responders.

[00:16:57.480]
That's a very, very unfortunate thing that he did because that eroded people's confidence in in what he's saying.

[00:17:04.980]
It it lets you know that there are people that are in positions of power like himself or positions of influence that will lie for the better. Good, but still lie. Yeah, so let's not so the details of the Foushee statement, I honestly don't know, I haven't dug deeply to know exactly what he said. And when I can retrace for you some basics. However, about mask wearing early on, I actually put it on my Instagram because it was so crazy when he was saying it.

[00:17:32.860]
It was an interview that he did on television and he was saying for the general public, you know, you don't have to wear masks. He's not helping you. And he was actually saying it might be bad because you'd be messing around with it and touch your face. Yeah, you could.

[00:17:45.500]
So so initially it was a little bit initially there was ostensibly some confusion about whether it was advantageous to wear masks or not. It's clearly advantageous. It's advantageous to the wear and it's advantageous to others. It reduces the stress on the system. But if everyone were to wear masks and just to be very, very clear, it's neighborly.

[00:18:06.310]
Wearing mask is like driving the speed limit or not driving on the opposite side of the road. And there's now abundant evidence on the benefits of mass wearing. And furthermore, and then I'll come back to your Falchi issue.

[00:18:17.710]
The the if we were to all as a nation wear masks and adopt some other basic things, it would allow us to keep our economy running better in our schools open. In other words, we can't have everything. There's a there's a deadly virus that's afoot. And so we're going to have to grow up and be mature, do some things that are uncomfortable and unpleasant and may even seem silly. But if we do those things, we can we can avoid doing other worse things like shutting down our economy.

[00:18:46.270]
But anyway, can I can I stop you for a second? Because this is something that's actually kind of important when people are wearing masks like this is the common argument against it is that the virus particles are so small. If you're breathing in air and it's getting through gaps in your mask, the

virus is going to get through. But the the impact of having a mask, the positive impact is that you're if there is some virus in the air or virus coming from you, it's going to be greatly reduced.

[00:19:14.020]
Correct. Like especially in N-95 mask. You know, there are two parts to what you're saying. First of all, water molecules are infinitesimally small and they're much smaller than the pores on the fabric of your umbrella, but your umbrella stops the rain. Why is that? Well, it's that the water molecules aren't coming down as molecules are coming down in droplets. So even though the virus is very small, much bigger than a water molecule, but still very small, and you're right that the virus itself could go through the fabric of a mask.

[00:19:46.330]
That's not what's happening. Droplets are coming out of your mouth or are coming from someone else towards you.

[00:19:52.570]
And the mask is extremely effective at stopping droplets.

[00:19:55.810]
But isn't hasn't it been shown that the virus is also aerosol now? Yes.

[00:20:01.480]
So there's also aerosol transmission. And we can talk about the two of you, obviously. Yes. Let's talk about that. But before we move to that, let's just say one more on the droplets, which is that when you exhale, think about how if if you wanted to if you had a fire hose at your house and the water was spraying out of the fire hose and you had two different strategies for stopping the water from landing on the floor of your house, one strategy would be to run around with buckets and try to catch the water as it was landing from this arc of the fire hose.

[00:20:33.700]
And another would be to like put a kink at the end of the fire hose and stop the water from coming out in the first place. One of the reasons that masks are so effective, even homemade handmade masks.

[00:20:44.080]
Forget the N-95, which is what I wanted to come back to, is that they are like plugging a fire hose or a garden hose at the opening.

[00:20:51.280]
It's much more effective than trying to have someone else wear a mask, for example. So you're wearing the masks. And furthermore, in the case of coronavirus, one of the big problems is people don't know if they're sick. This particular germ is very nasty. You can transmit it before you have symptoms. So one of the reasons for people to wear masks is they don't know they're transmitting the disease. It's very efficient to stop the viral, drop the droplets before they leave their mouth and from spreading to others.

[00:21:18.250]
And when you wear a mask, you also protect yourself from inhaling droplets of other people. The ninety fives are more medical grade mass. They're even better than the cloth masks that you can buy on the Internet. But those if you're going to use those effectively, you have to seal them around your face and use them and you don't really need to use them. Those I mean, you can if you have them, there's nothing wrong with it. But you also don't want the ones with valves.

[00:21:41.530]
Those don't really help.

[00:21:42.670]
You know, the valve ones are kind of silly, aren't they? Yes, it doesn't. That defeats the whole purpose.

It can do it.

[00:21:48.400]
It still helps. But yes, these are all relative things on the aerosol thing. What you're talking about is some of the things that you exhale from your body. Our little dried particles of viruses that are suspended in the air and these can go a further distance and there is, in fact evidence of aerosol transmission, which is different than droplets, both go through the air, but droplets are big and fall to the ground, whereas it's like it's like raindrops versus little particles of dust that can float in the air, for instance.

[00:22:20.480]
And so there is aerosol transmission and the and the mass that we use don't necessarily stop that. You'd need like an end. N-95 mask well fitted to stop that. But the masks still help. So I don't think there is a really good argument. I mean, I wish we didn't have to wear masks. I mean, I, I, you know, it's unpleasant, but of all the unpleasant things, you know, we could choose from doing, you know, if the choice is do I close the schools in my local community or do I have everyone wear masks to me that's you know, yes.

[00:22:53.700]
Wear that. It's pretty straightforward and simple. There's a great video online that I saw this morning of a guy who held up a lighter and he used a bandana first and he blew through the bandana and put out the the the lighter. And then he put on a cloth mask and it was hard to blow through, but he did it and put out the light.

[00:23:16.450]
Then he put on N-95 and it didn't do a damn thing, put on a surgical mask. It just wiggled the flame a little bit, couldn't put it out. So it just shows you the difference in the quality of the mask. Yes, my doctor does not recommend bandannas. He was saying don't wear that. He's like, please, it barely stops anything. And if you want if you want to wear something, please wear a mask. An actual mask.

[00:23:36.690]
Yes.

[00:23:37.080]
Although, again, I would say that something is better than nothing. And one of the things that one of the things I think is going to come up in our conversation and we might as well tackle it now, I was trying to think of like. Well, I was trying to think of sort of general principles that are relevant here is there's no in a time of a deadly contagion, Joe, there's no life without risk. And many people are used to this, used to thinking about risk in their lives, but many are not.

[00:24:02.180]
And I think what I would like people to understand is, is that there's the world has changed. There's a new virus that's entered our species. It's not going to go away. It's going to be with us forever. And we have to, first of all, accept that second, take steps to address it. And third, recognize that no single step is perfect. Even a vaccine is not perfect. So everything is shades of gray and degrees of risk.

[00:24:25.910]
So, for example, even the 14 day quarantine rule, that's just a statistical distribution. Two point five percent of people are still infectious after 14 days. We just cut it off at 14 days. We say, well, almost everyone can't spread the virus anymore after 40 days. But but not it's not true that no one can spread the virus. So there's still some risk or you can wear a mask and it reduces your risk, but it doesn't eliminate your risk.

[00:24:52.130]
And so so pretty much everything we do is not perfect. And there's and so we have to begin as a society and as households or as individuals make decisions about what risks we're willing to tolerate.

[00:25:07.240]
And yeah, Jamie was brought something up this morning that people that had SARS, it showed that they had immunity to covid-19. Jamie, what were you talking about earlier?

[00:25:21.740]
It was saying that I might have misunderstood or said that to you, but they are comparing immunity to SARS. They said that they are still carrying important immune cells 17 years after recovery. And they're saying that might be the same sort of thing with coronavirus, that you might have immunity for a long time.

[00:25:38.030]
But there have been people that have been reinfected in as early as three months, and that's correct. Yeah.

[00:25:43.730]
So this is, again, another complicated topic. So, yes, we now have some evidence that some people can be reinfected, but it's probably extremely rare. We don't know one hundred percent, but it is probably extremely rare. And part of the reason is that if you get covid and they test you and then three months later you get over it again and they test you again, they found you and they say, aha, this person had it before and isn't immune.

[00:26:10.340]
But there could be hundreds of thousands of people who also had covid who were exposed and didn't get infected, didn't get symptoms the second time, and so nobody tested them. So you see, we we only ascertain we only see the ones that, in fact do get reinfected. So you are right, there are have been now some cases proven with genetic testing that have been infected more than once. But we still think it's rare. The thing that Jamie was alluding to is there are two parts to it.

[00:26:35.720]
One is how long does the immunity last? And honestly, we won't know the answer for sure until time passes. There's no way to be certain.

[00:26:45.500]
But but we do believe that immunity will be sustained, will be reasonably sustained. And furthermore, I don't want listeners to confuse the difference between antibody levels declining and your being immune. So when your body is infected, you mount a defense, a response, and you produce you produce antibodies.

[00:27:03.530]
And for almost all infections, those just decline over time.

[00:27:07.010]
And in fact, with coronavirus those those and circulating antibodies, those proteins that attack the virus go down to, you know, very close to zero by about a year, let's say.

[00:27:17.300]
And this was completely expected. There's nothing surprising about this.

[00:27:21.410]
But your body has in the interim also begun to develop something called memory immunity or t cell immunity. And that's what protects you from reinfection. And we believe we have evidence for that. People have sustained such t cell memory immunity, how long that lasts. So Jamie was saying with SARS, one which struck us in two thousand, three people can find evidence that even 17 years later you can mount an immune response because your body remembers that it fought off this thing 17 years ago.

[00:27:51.080]

And one more thing, and that is all different than the question of cross immunity, which is also becoming now people are the whole country is getting, you know, allergy lesson. Yeah, which is that?

[00:28:03.500]
Which is it? But you say I said, which is probably good. I mean, it's about time that people recognize that in terms of pandemics. This is I don't want to diminish the death or the suffering or anything, but it could have been far worse.

[00:28:22.460]
I'm so glad you said that because. Because we're on the one hand, it's this is a bad germ, so roughly speaking, it'll kill about one percent of the people that get get it symptomatically. You get this disease, you have symptoms, you've got a one percent chance of death. It varies by age. And we can come back to that, too, if you're interested.

[00:28:46.720]
But as you're saying, it could have been so much worse. I mean, there's no God given reason this virus isn't killing 10 percent of us or 50 percent like the bubonic plague. And if you remember the movie Contagion, I think in the movie Contagion, it killed about a third of the people that got it. And there's honestly no reason that this I mean, we could have been facing that situation. You know, there's no necessary reason we're not facing that situation.

[00:29:11.470]
So you're right, it could have been much worse.

[00:29:13.210]
And in fact, the 2003 coronavirus killed about 10 percent of the people that got symptoms from it. So it was about 10 times as deadly as the one we're facing now.

[00:29:22.750]
Why has there been so little discussion, especially from our governments, our leaders, about methods to strengthen your immune system? That has been particularly frustrating to me. There's been so little discussion about vitamin supplementation, about changing your diet, about exercise, keeping yourself healthy, making sure you get enough sleep, lowering alcohol consumption, all these things that have been absolutely proven to boost your immune system. Why has there been not negating the use of masks or social distancing or all the other things that we know are effective?

[00:30:00.610]
But why has there been no discussion about boosting your immune system? I don't know, but it's a really good question you just asked, so you're right, there are all these sort of healthy living things you can do from exercising, getting better sleep, reducing stress, stress, losing weight, reducing alcohol and tobacco consumption, all of these things that enhance the ability of your immune system to fight off infection. And that has not been part of the public health messaging campaign.

[00:30:33.290]
I don't know the reason for that, it should be actually, now that you mention it, we should be encouraging people to do that. I have to say, however, that I don't want us to get into a situation in which as many very fit people can get this German die. Yes, and I don't. And also people can be behaving well or poorly and get this germ and die. And as a doctor, you know, I'm very understanding of human beings frailties.

[00:31:00.620]
You know, we all are human. We were soft on the outside and we don't deserve to die of a germ or anything else as far as I'm concerned. And so I don't want us to say, oh, well, so-and-so was obese or so. And so, you know, I was a smoker.

[00:31:16.580]
And so, you know, they deserve their fate.

[00:31:18.240]
No, no, no, we're not saying that. But I know, but I know you're not. But I'm saying on the one hand, I want to encourage good behavior. On the other hand, I want us to be careful not to suggest that that you weren't doing.

[00:31:28.670]
But I'm just sort of clarifying the point that it's your fault if you catch it and die. Yes, right. Of course. Of course.

[00:31:34.270]
Yeah. Yeah. And people and you know, and I think. I think people should be should prepare their bodies for the possibility of being infected, but realize that there's no guarantee, you know, it's like those poor marathon runners that drop dead, you know, having run marathons their whole lives. You know, it's Jimmy. Yeah, that was Jim.

[00:31:54.680]
Fix is a famous guy who wrote books on running. And Bill Hicks had a hilarious joke about him running and dying. Yeah, it's that's unfortunate. But that's probably some sort of cardio disease that he had. Yeah. There's there's ways that the government could have done it without shaming people that did get sick. There's there's I mean, it wouldn't have taken much time to tell people. I mean, I've had multiple health experts on this podcast that talk about different methods to strengthen the immune system, particularly supplementation with vitamin D.

[00:32:29.330]
It seems to be in fact, she's talked about this as well, seems to be particularly effective with boosting your immune system. And also it's a giant problem with people who are who wind up in the ICU.

[00:32:42.860]
There's a recent study that showed that 84 percent of the people in the ICU with covid were deficient in vitamin C and only four percent had sufficient levels and I'm sure.

[00:32:55.710]
So, no, I haven't followed that particular literature.

[00:32:58.220]
But, you know, as someone who loves the sun and, you know, I strongly endorse, you know, getting adequate sun exposure for vitamin D alone.

[00:33:08.580]
Yeah, but, you know, the sun is the best way to get vitamin D for sure. But the way to get it, if through the sun requires you to be in shorts and nothing else, like a like a Neanderthal running around all day, that's how we're designed. I mean, that's like that's really what we're supposed to be doing. That's it's very unfortunate that we figured out houses. I mean, it's kept us alive and kept us protected from predators in the elements and all sorts of other things that would have killed us.

[00:33:36.740]
But it's severely diminished our ability to absorb vitamin D from the sun and vitamin D being not just a vitamin, but also maybe even possibly mislabeled as a vitamin. It's really a hormone, right?

[00:33:48.470]
Well, it can be a precursor to hormones. Yes. But I think that, boy, you've wandered into an area that's sort of I'm trying to remember my medical school the last time I thought about vitamin D synthesis.

[00:34:00.740]
And but my memory is it doesn't take much sun exposure per day for your body to produce adequate levels of vitamin D, I think an hour, a day or something like that. But yes, in general, you're right. That is

to say that, you know, a lot of the ways we live in the modern world compromised our immune systems and their functioning.

[00:34:19.370]
I think there's very few people that are actually getting their blood work done. So even when you say an hour a day, give you sufficient levels, how many of these people are actually going an hour a day and then getting bloodwork done and finding out what the actual vitamin D levels in their blood are?

[00:34:34.730]
Very few that it's it's highlighting a weakness in our understanding of our own bodies.

[00:34:42.410]
See, this I mean, this part I would certainly agree with Joe in the sense that as a nation, in a way, we've. Now, to put this exactly, I don't say we become soft, because that's not exactly what I want to say.

[00:34:55.190]
It's sort of like I'll say in a week what you'll say we're not you know, we we want our cake and eat it, too.

[00:35:04.440]
In a way, that's sort of what I'm trying to talk up a little bit about with respect to the pandemic as well, which is that we all wish that we didn't have to endure this unpleasant reality, that this virus is now afflicting us. It's a little bit and we're all tired. You know, we all have covered fatigue, but it's a little bit like being in the dentist chair and he's done two root canals and you don't want him to do anymore, but you're not wanting any more.

[00:35:28.250]
Root canals has nothing to do with whether you need them. Right. You know, unfortunately, this is the reality that we're facing. And so what I really want and what I wanted to do in the book in Apollos era was to sort of help people to see the world for how it really is now, which is that something big has happened, something that doesn't happen. But every 50 or 100 years or so, it's it's and this and more importantly, this, this way we've been the virus has forced us to live, which feels so alien and unnatural to us.

[00:36:00.830]
In fact, this way, it's not new to our species. It's just new to us. You and I think this is outrageous. How how can we have to do all of this stuff? But, you know, our ancestors have been dealing with this for thousands of years. Yes. We're the first generation to have to do this. This is our time in The Crucible. And I would I would hope for better for us.

[00:36:21.560]
And in terms of crucibles, it's so small. I mean, again, not to minimize the death and the suffering, but I'm in the middle of reading Harare's book Homo Deice. Yeah. And, you know, in it the beginning of it, he talks about famine and plague for most of the first chapter and the just the sheer numbers of people that have died in past plagues throughout human history, but before antibiotics and before we even understood what what viruses were.

[00:36:49.560]
I mean, it's horrific, but we're anything we're I mean, the bubonic plague would sweep through cities in Italy and kill half the people like within a month. Half are dead or smallpox.

[00:37:00.950]
When when when the Europeans landed in in this in our continent and they brought with them old world diseases to the new world, the smallpox would wipe out Native American populations. Ninety five percent of the people would die.

[00:37:14.840]
Yeah. Yeah. Insane. Yeah. Yeah. So, yeah. So we're very fortunate in term, as we said before, that this is the disease we're dealing with, I think in many ways this is going to give us a much better understanding of what could happen and give us a better, better understanding of what we need to do if something new comes along. Yes, I mean, I think that's right.

[00:37:43.610]
I mean, I think I mean, you're kind of I'm actually glad that you're going there because one of the things I don't want I don't want to be seen as this like nihilistic doom saying, you know, pessimistic a guy too late and too late. Yes.

[00:37:59.120]
I'm glad you are bringing up the fact that actually there could be another pandemic.

[00:38:04.670]
Yes.

[00:38:05.210]
And usually usually if you look at the respiratory pandemics for the last three hundred years, the pandemic interval is about 10 to 20 years.

[00:38:14.030]
That means we have a pandemic every 10 or 20 years, but they're not deadly usually. So, for example, we had one in 2009, the H1N1 pandemic. Most listeners might have a vague memory of hearing about it, but people didn't really pay much attention because it didn't kill many people. It was like a common cold. So we had a pandemic, but it wasn't very deadly. Then we had the two thousand and three previous coronavirus of SARS.

[00:38:37.760]
One pandemic could spread to about 30 countries, but for various reasons, that pandemic extinguished. And we only had about eight thousand people worldwide who died of that. So we'd also sort of forgotten that the last serious pandemic we had of influenza A virus, it's a different virus and the coronavirus was in nineteen fifty seven.

[00:38:56.990]
That was the second worst pandemic we've had in 100 years. And the previous leading killer was, of course, the 1918, the so-called Spanish flu pandemic.

[00:39:06.500]
And the current pandemic we're having will be almost as bad as that in the sense that just to be clear to listeners, it's not going to kill tens of millions like that pandemic killed. We don't think. But the point is the current pandemic we have is the second worst that we have had in one hundred years, worse than the fifty seven, which was the previous second worst. So so it you know, so so pandemics come every 10 or 20 years.

[00:39:30.290]
They're only really bad, let's say, every 50 or 100 years. But there's no reason that we couldn't have another one soon, you know.

[00:39:38.810]
And in fact, right now there's surveillance systems in place in China which monitor the emergence of new influenza strains. And there was just a paper published a couple of months ago suggesting there's a serious strain of influenza blooming, blooming brewing. I'm sorry. So, you know, we'll see. This one is a weird one, right?

[00:40:00.650]
Whereas a lot of people get it in there, asymptomatic. I've had several friends that got it and literally

experience no no symptoms there around people that had it. They got it. They tested positive and got as little as a mild headache or a slight cough or a day. Jamie had it and he thought he had a sinus infection. He thought he has allergies and he thought it was just his allergies kicking in. Turns out he was positive, but he was very fortunate.

[00:40:33.650]
It was a very mild case. Do we know why with some people get it when some people get it? It's devastating, including young people. I have a young friend. He's twenty eight. He got it.

[00:40:43.820]
And he was really ill for two weeks, whereas some people get it and it's nothing. Yes.

[00:40:51.140]
So we we have some sense of some of the reasons it varies, but not a huge understanding yet of the intrapersonal variation. But I would like to go on a tangent based on that, that highlights the ways in which these kind of protean manifestations of this disease, the fact that with this condition, you can go from everything from having no symptoms to mild symptoms like Jamy to more serious symptoms like your 28 year old friend, to really severe symptoms, to being hospitalized, to dying.

[00:41:26.060]
Right. There is this incredible range of diseases that this particular virus can cause.

[00:41:31.880]
And in a way, this is very unfortunate for us because it makes it so much harder as a society to take the virus seriously and to combat it. Let me let me give you an analogy. So I want listeners to imagine that there are two worlds I'm about to describe, two different worlds in world A, there are a thousand people and a virus infects 10 people in this world, makes them seriously ill and one person dies. So we would say that in this world, 10 percent of the people that got sick died of the virus.

[00:42:06.040]
That's World A in World B. There are a thousand people. The virus infects 100 people, 90 of them get mild illness, 10 of them once again get serious illness like in World Day. And one of them dies again, like in World Day. So in this world, in World B, one hundred people got sick and one died. So we might say one percent of them died in World Day, 10 percent of the people that got sick died in World B, one percent of the people that got sick died.

[00:42:36.730]
Now, many people hearing about this might might think that it's better to be in World B because, you know, it seems like the virus is less deadly. But that's a delusion, because if you stop and you think about it a little bit more clearly, World B is the same as World A plus an extra 90 people got mild illness. In other words, nobody. Right, no right. Thinking person should prefer to be in World B than to be in world A inWorld.

[00:43:06.010]
A ten out of a thousand people got seriously ill and one died and in World B, that happened. Plus another 90 people got mildly sick. So it's clearly worse. The overall situation is worse than World B, and that is, in fact the situation that we are facing. We are in a like a world B situation with this virus. And the reason it's hard is that it all these extra people, those 90 people who got mild illness make people take the disease more casually.

[00:43:35.830]
Whereas in world, A, people might say, well, not many people are getting sick, but when they get sick, 10 percent of them die. Wow. We should take this disease seriously. Do you see what I'm saying?

[00:43:44.680]
Yeah, I do see what you're saying. So this virus is very sneaky in that way. Yes.

[00:43:48.640]
It's really like if you wanted to engineer a virus that's going to spread the most, that's kind of how you would do it, have it affect so many people, whether like it was nothing and then some people where, you know, they're dead within a few days.

[00:44:01.970]
Yes. And also, as you pointed out earlier, it also has this property of being transmitted, transmissible when it's asymptomatic. So just to just to remind people HIV is like that, you can have HIV for years and not know it. You're spreading it to your sexual partners and then it kills you much later versus smallpox, which you can't really spread smallpox before you have symptoms. You the pustules erupt on your body and that's when you become infectious. So there's a there's a there's a there's no asymptomatic transmission in smallpox and there is an HIV and SARS.

[00:44:38.350]
One from two thousand three was more like smallpox. In other words, people didn't begin to transmit the virus until they actually had symptoms from it, which is one of the reasons it was easier to control, because when people got symptoms, we could isolate them. Whereas with the SARS that we're facing now, the sars-cov-2 covid-19 people can transmit it when they're when they're not symptomatic. And in fact, there's a lot of analyses that have been done that show.

[00:45:01.360]
About seventy five percent of the infections have been acquired from people who are asymptomatic.

[00:45:07.360]
So there's another issue as well that we can compare to smallpox in that you can develop a vaccine for smallpox that actually works for your whole life. You can't really do that with covid, correct? We don't know for sure. We don't know that for sure. We I don't know that for sure. I'm hopeful that we'll be able to have a vaccine that has long term confers long term immunity. But I don't think we know that either way for sure.

[00:45:33.820]
Can you describe what's going on with these MRSA viruses and how they differ excuse me, MRSA vaccines and how they differ from a regular vaccine? And what what's coming down the pipe from Pfizer? These are MRSA vaccines. It's different in that it doesn't actually contain the virus, but it boosts your body's ability to fight off the virus.

[00:45:56.740]
Yeah, so so there are many different ways of developing vaccines. And the idea the general idea behind a vaccine is, is that we want to give you a kind of an ersatz infection. We want to expose you, make it as if you had been infected, but without the risk of getting the disease to trick your immune system into mounting an immune response so that your body's then prepared if it gets the real infection to fight it off. And one of the simplest ways you can think about it is so-called live attenuated virus.

[00:46:31.060]
This is an old technology where you you take the virus to the laboratory, you culture it hundreds of times and hope for mutations that weaken the virus's ability to make you sick, but nevertheless keep. The virus able to elicit an immune response and then we give you that strain as a shot and you have, let's say, a mild illness, you've you develop antibodies and immunity and it's sustained. Or you can have inactivated virus like one of the Chinese.

[00:46:59.410]
The so-called the Sinovel vaccine, that's fact was one of the first to start, which was out of China, is is a live attenuated virus. So that is. Oh, I'm sorry. I say live attenuated already. I can't remember. But anyway, the sign of that vaccine is a virus in which they they take the virus. I'm sorry. I know it's not like the previous example. In this case, we take the virus and we treat it, let's say, with heat or with chemicals to kill the virus, but still have it be immunogenic.

[00:47:27.930]
And that's another approach. And there are many other approaches, a dozen or so or nine or 10 different approaches, one of which is this Marnay idea. And here what is done is so. So I'm sorry.

[00:47:40.920]
Before I tell you about that, another approach might be to take take the RNA from the coronavirus that codes for a very important protein, the spike protein on the surface of the coronavirus, and insert that into a a really benign virus, let's say, like a cold virus, for example.

[00:47:58.590]
So we take this other species of virus. We genetically engineer it so that we insert some material, some RNA into it.

[00:48:06.630]
Let's say that forces that virus when it infects your cells to give you a common cold, but also to express this protein as if you had been infected with covid or coronavirus, and then you mount an immune system to that immune response to that protein and now you're immune. So we gave you like a mild illness and we protected you from a more serious one. The RNA viruses are vaccines are sort of like that. We inject you literally with with with RNA.

[00:48:36.150]
And the idea is, is that your cells take up the RNA and start making the protein, the alien protein that your body would have made, like if we had infected you with a real coronavirus.

[00:48:48.210]
The real coronavirus, as many people remember from high school biology, the virus can't reproduce on its own. It inserts its genetic material into our cells, which then start producing the viral the virus itself. But now, in a sense, instead of giving you the whole virus, we give you a little part of it, just some part of its genetic material. The RNA, which in an ideal world does the same thing, gets inserted into your cells.

[00:49:13.710]
You start expressing this protein, which then your body attacks and you develop an immune response to it. And we are amazingly lucky that that our scientists have been able to develop not one, but two different vaccines. And we'll have many other vaccines using different modalities. I have no doubt that come out in the next year or two. But The Moderne on the Fizer vaccines, we're very lucky that they exist and that they are apparently quite effective. But but the story is not over on those.

[00:49:43.740]
I don't know if you want to talk about that, but but it's good news. But I don't want people to get overoptimistic either, because, you know, it's my job to be a bit of a downer.

[00:49:53.400]
Well, this is the this is the unfortunate narrative that people keep saying the virus is killing.

[00:50:03.120]
It's like the average immune system is ninety nine point whatever percent effective in protecting you from the virus, meaning ninety nine point whatever percent of the people who get the virus survive, whereas no ninety nine percent of people overall survive, one percent will die of all people who are infected, approximately.

[00:50:23.580]
And if you're older than 70 or 80, 20 percent will die.

[00:50:27.510]
So why why is the number that people keep talking about far less than that? Why is the reported

number of people that get the virus who actually wind up dying? It's not one percent. We're not we're not seeing one percent nationwide in terms of people getting the virus and dying.

[00:50:44.700]
No, we know the answer to that question. No, I don't think there's any ambiguity scientifically. So so so in order to in order to really compute these numbers, it's not easy.

[00:50:53.940]
You're right. We have to look at how many people have to have a way of ascertaining who's infected. And then we have to have a way of ascertaining of those how many died. And and and that's called the infection fatality rate. And there was just a recent meta analysis looking at very good data from around the world, multiple studies using different approaches that estimated that the infection fatality rate is between point five and point eight percent. And there's something called the case fatality rate is the fraction of people who have symptoms who go when infected, who die.

[00:51:28.500]
And that number is about twice that. So about half the people get the virus and have no symptoms at all. So if you get symptoms, you have a higher risk of death. And so you can double point five, two point eight becomes one to one point six percent of people who who develop symptoms from the disease die. And there was another very good study that was just released a couple of weeks ago that estimated the infection, fatality rate to be about one percent.

[00:51:55.290]
So there's a lot of the numbers. I'm sorry, but this is but the. Symptoms, yeah, but even without symptoms, the infection fatality rate is certainly not less than half a percent and could be as high as one percent, I would say it's going to be in that range, the IFR, the infection fatality rate. Isn't there a large percentage of people that get it that don't have symptoms?

[00:52:15.820]
Half. About half. We think that's right. OK. Of the people who get it don't have symptoms. But you said ninety nine point something. Percent of people who get it survive. And that point something is important. So I would say that if you said ninety nine point five percent of the people who get infected survive, I would say it could be. But it's somewhere in there.

[00:52:35.730]
I don't think I gave a number. I think I said ninety nine point something. But the point being that unfortunately, a lot of people saying this vaccine is 94 percent effective or 90 percent effective. Yeah, but that we ask. Yeah, yeah. But that what that means is, is that if you're if it reduces your risk of death by that fraction. So for example, in the vaccine trial, in the Pfizer trial, these numbers are approximate in they had about forty three thousand people in the trial.

[00:53:09.700]
Half of them got the vaccine, half of them did not. And in the people who got the vaccine, nine people up to nine, let's say nine or 10 got even though they were vaccinated, still got coronavirus, still had the disease. The vaccine was not perfect. And in the in the arm that did not get the vaccine. The other 20 thousand people, let's say 90 people approximately got coronavirus.

[00:53:35.830]
So what the vaccine did is, is it reduced your probability of getting the disease from 90 out of 20 thousand people over the time window of the study to 10 out of twenty thousand people? So the point here is, is that the vaccine is reducing your risk of getting seriously ill if you're infected. And and and and it's not and you're certainly better off. In other words, you would have had, let's say, a one percent chance of dying before.

[00:54:04.690]
And now you have a point, one percent chance of dying, 90 percent lower than that, because we you know, we've given you the vaccine.

[00:54:11.110]
Does that make sense?

[00:54:11.830]
Completely. I understand exactly what you're saying. What I'm trying to say is there's an unfortunate narrative where people are saying, I'm not going to take a vaccine because the human immune system is more effective than the vaccine. That's not true. That's what I wanted to get out of. You people are saying, yeah, go ahead. Well, no, I'm saying the vaccine the whole way vaccines, vaccines work is it enhances your your performance. You know, it's like it stimulates your immune system to make it even better at fighting the the virus.

[00:54:44.500]
There's there's no sense in which you could argue that an unchallenged immune system is superior to a challenged immune system, a system that has been, you know, been given a vaccine.

[00:54:54.250]
So this is what's important to tell people. Right, because this narrative of 99 percent of the people who get it, ninety nine point whatever, your immune system is effective in fighting off this disease, whereas with the virus, it's only 90 plus whatever percent effective in preventing the virus. So this is not a that's not a good narrative, correct?

[00:55:18.580]
That's right. And the way to think about it is just to pick some round numbers, as you were saying, and like and like like me, you sometimes use the word virus when you mean vaccine and you use the word vaccine, which means that all the time.

[00:55:31.570]
Yeah, I do it all time. It's so annoying. Yeah. But anyway, let's say for the sake of argument, you have an unvaccinated you have a ninety nine percent chance of surviving if you get infected.

[00:55:41.530]
Right. You have to add to that the benefit of the vaccine, which is 90 percent, let's say, effectiveness. So it'll reduce your probability from ninety nine percent chance of surviving to ninety nine point nine percent chance to survive.

[00:55:55.960]
Thank you. That's exactly what I wanted to get out of you. Yes.

[00:55:59.900]
There that when when you talk about the people that took the vaccine and we know you have the data between the difference of the vaccine, the people that got the placebo, the people that got the vaccine that still wound up getting covid, did they do health screenings on these people and find out what comorbidity factors they may have had and see if there's anything that would indicate that there's particular risks?

[00:56:25.900]
We don't know that yet. Those results haven't been released and also what we don't know. So we don't know the answer to that. But we will know. And also what we don't know yet, as we we don't know how safe the vaccine is. So first of all, just to be very clear, both Pfizer and Moderna have released interim results. And we have every reason to believe that the final efficacy results will be about the same. So as they complete the trial in the coming month or two and more people get sick in both arms, we don't expect suddenly the vaccine not to work.

[00:56:53.230]
I mean, we've gotten to a point where we're pretty sure that the vaccine will be effective at. But we don't yet know the safety of the vaccine is one thing. Another thing we don't know and we also don't

know something else is very important for people to understand again. And since everyone needs to be an immunologist now. Imagine that you're doing a trial and you're trying to see whether a vaccine works or not. You have to define what counts as works, what counts as an end point.

[00:57:20.730]
So let me give you three possibilities. One possibility is we're going to measure, does the vaccine prevent you from even getting infected? Or does the vaccine say you are not or do we say the vaccine is not going be able to stop you from getting infected? The virus is going to take root in your body, but the vaccine is going to prevent the virus from making you seriously ill.

[00:57:40.110]
Or do we say actually the outcome we really care about is death, does the virus reduce your probability of death? So it's possible that the vaccine, for example, might just to illustrate this point, prevent you from getting seriously ill, but not reduce the probability of death. In other words, in the butt in the Pfizer trial that I just described you with a not in the in the vaccine arm, 10 people got sick. And in the not in the placebo arm, 90 people got sick.

[00:58:09.570]
What if in both arms one person died, one out of the 10 in the vaccine arm died and one out of the 90 in the in the other arm died? We would say that the vaccine was effective at lowering your probability of getting ill, which is great, but it had no effect on dying. That's possible. It's possible that the vaccine will work at different phases of the illness process. And so the Pfizer trial revealed that there was a greatly reduced probability of people getting infected.

[00:58:44.100]
The Moderna trial actually showed that its vaccine reduced the probability of people getting seriously ill, which is great, but it might, in fact, have no effect on mortality. Still, we don't know. Furthermore, we also don't know whether this vaccine, even if it works. Reduces reduce, even if it works, to reduce your probability of getting sick or dying, whether it works to reduce your ability to infect other people. So so maybe we start vaccinating the population.

[00:59:15.460]
We're reducing the individual recipient's probability of getting sick, but they still can spread the disease. So so this is something else that's not known. So we don't know the safety. We don't know which outcomes are really being affected and we don't know if it affects infectiousness. And all of these things are things we will soon learn in the coming year, but we don't yet know them. So I just it's fantastic news that we have a vaccine, but I just don't want people to get think it's a panacea is good.

[00:59:42.700]
Please go continue. No, no. I'm just going to say one more thing, which is that. Which is that is that. Hold on, let me just remember what I was about to say about the vaccine and. I forgot what I was going to say, but go on, you were going to say something. Sorry. No, no, it's my fault. This is the problem with Skype calls.

[01:00:05.690]
Well, no, it's not just that. It's just it's a complicated topic. And there's you know, all I've been thinking about is coronavirus for the last 10 months. I mean, there's just so much stuff in my mind about this thing that, oh, I remember because I thought I was wanted to talk to you about this. So I want people to also begin to think about who should we give the vaccine to, like what are the ethical and public health issues associated with as we start producing the vaccine?

[01:00:32.380]
You know, first we'll have a million doses. Well, who should get the first million doses? It's pretty ethically uncontroversial that the very first doses should go to the people in the placebo arm of the trial because those people took the risk of being experimental subjects. They were randomly assigned to the placebo arm. They clearly should get first dibs on the actual effective drug that's now been shown to be effective because of their contributions. OK, great then. Pretty uncontroversial.

[01:01:02.140]
Is that the next group of people to get it should be doctors, nurses, firemen, policemen, first responders, ambulance drivers, all of those people, health care workers, those people, because they're putting themselves in harm's way during a contagious disease to protect the rest of us. They should be next. OK, fine. But then who who's next after that? And here it gets very tricky, both ethically and from a public health point of view.

[01:01:28.150]
And let me give you one an example of this. So on the one hand, you might say we should vaccinate, let's say, vulnerable elderly people or people with chronic illnesses, they have the greatest chance of dying. If they get infected, we should give the first 10 or 20 million doses, should go to elderly people in nursing homes. And there's a lot of compelling reason to do that. But it turns out that such individuals from a network science perspective are at what's called the end of the transmission chain.

[01:02:00.530]
It actually might make more sense and we might save more lives from a public health point of view if we vaccinated working age people, people who are out and about. Because if I vaccinate you and I, by virtue of making you immune, stop you from transmitting the disease to other people. Since you're out and about and seeing lots of other people, I might actually wind up saving more lives, paradoxically, by vaccinating the people at lowest risk.

[01:02:25.850]
How do you educate people on that? That seems like a complicated one to explain. Yes.

[01:02:31.850]
So that's and our nation is going to face this dilemma very soon, in fact, because when the initial of course, if we had three hundred million doses, we wouldn't have to make these choices. We just give everyone the shots who wanted it. And incidentally, the cold chain requirements for this, this is another topic now tangent on a tangent.

[01:02:48.080]
But, you know, many rural parts of our country simply don't have the kind of refrigerators that are needed to stockpile and administer these vaccines.

[01:02:59.300]
What kind of scriptwriter's are needed for these vaccines?

[01:03:02.420]
Well, the Pfizer one needs a minus 80 refrigerator. These aren't common like below the low, dry, ice cold.

[01:03:10.760]
And so and so not every pharmacy, your local CVS or Walgreens doesn't have usually this type of refrigeration. And so you so you and plus all the trucks transporting it, like from the moment that the vaccine is manufactured until the moment it's injected, it has to be most many vaccines on all vaccines have to be in what is known as the cold chain. They can never be defrosted. And building the logistics to distribute the vaccine is a big, big challenge.

[01:03:40.220]
So not only do we have to invent a vaccine like we are, which is magnificent, that our nation is able to do that, but we have to manufacture it, which is not easy. You know, we need little glass vials, we need millions of them, and we need factories that can produce this particular kind of vaccine, et cetera. We need to distribute it like the cold chain, the refrigeration I mentioned. And most important, we need to persuade people to accept the vaccine.

[01:04:06.920]

And this touches on what we were discussing earlier, whether people will believe that the vaccine is useful. And, of course, we have an anti vaccine population in our country and so on. So all of these challenges have to be overcome. So if we had three hundred million doses of the vaccine, this would be less of a dilemma. But initially, we're not going to have that. We're going to have some lower number of doses and those doses will be more easily administered in metropolitan areas that have the right refrigerators.

[01:04:32.210]
So we as a nation are going to need to begin to think about this, about how to, you know, choose or distribute the vaccine.

[01:04:40.910]
That's very complicated. Now, the difference between the Pfizer and the Moderna vaccine is what? Well, as I'm told, and I'm no expert on this narrow topic, that the Moderna vaccine actually doesn't require as cold refrigeration for reasons that I don't understand, since they're both RNA vaccines, they both are encased in lipids. One of them requires a much colder temperature for distribution than the other. So the Maidana one, I'm pretty sure is the one that is is can can it doesn't require quite as cold a refrigeration, which makes the logistics of distribution much easier.

[01:05:19.930]
Do we know? We don't have any idea why. I'm sure experts know that I don't know the answer to that. Why why does is there anyone who's tried both? Is there any benefit in getting vaccinated with both vaccines?

[01:05:34.830]
I doubt that because they're very similar in approach.

[01:05:37.410]
But I can imagine that the time will come when there might be some benefit in getting two complementary vaccines when we have developed still more approaches, as we were talking about earlier, when you can get this and also that. Now it's also possible. I mean, we just don't know the answers to all these questions. It's also possible. So some significant fraction of people who die of coronavirus died because of their own body overresponse to it. Their immune system is too, too dramatic to dramatically responds.

[01:06:09.150]
And it's possible that that we may not want to give people multiple versions, different kinds of vaccines, because we might overexcite their immune system in a way that actually harms them in some way. So these things are all going to be are all going to be sorted out, you know, in the coming year. We just I just don't want people to think it's all simple because it's it's not.

[01:06:32.970]
Now, Donald Trump is 74. He's overweight, needs cheeseburgers every day. When a guy like that catches covid and is fine in four days, people get very dismissive of it, unfortunately. Right. What did he receive? What kind of treatment did he receive and how different is it than what the average person would receive if they got sick?

[01:06:56.280]
So he he faced a very significant risk of death, and I think he got lucky. So remember, his doctors put him on dexamethasone.

[01:07:05.370]
So so far, we only have one proven drug that lowers your risk of death if you're seriously ill from covid. And that's a very simple steroid called dexamethasone and. Remedy Severe has not been shown to lower mortality. It has been shown to lower your length of hospital stay. So there's some benefit to it, but it doesn't appear to lower your risk of death.

[01:07:27.840]
What would be the difference between lowering your risk of hospital stay and lowering your risk of death?

[01:07:33.150]
Why would they let you out of the hospital if you hadn't shown significant health improvements and wouldn't live in health improvements when significant health improvements signify that your body's recovering better?

[01:07:46.140]
Yeah, it's a mystery and it's confusing. And when the first Ramdas of your trial was published a few months ago, it didn't show a benefit for mortality. But it showed. But it showed a trend. It looked like it would help and it made sense. Like if it's lowering your hospital duration, probably it's good for you and it will also lower your risk of death. But then another trial came out, much bigger trial as part of the I think it was called the Solidarity Consortium, either solidarity or the recovery.

[01:08:11.160]
I can't remember right now consortium out of England, which showed that actually Ramdas of your had no benefit for mortality. Now, how can that be? Imagine that. Imagine that you have one hundred people who are sick and in the group that gets from this severe, they only wind up spending an average of 10 days in the hospital. But 10 of the people die. And in the other study, the people that did not get REM severe. One hundred people get sick and they spend an average of 12 days in the hospital.

[01:08:41.820]
But again, 10 of them die. So the SVR has lowered the hospital duration from 12 to 10 days, but it hasn't affected the probability of people dying. That's entirely possible. So there is, in fact, what appears to have happened and this was a study you said that was in England.

[01:08:57.770]
Yes, it was a large study that was I think I think the subjects were not just in England, it was organized by a group of English scientists, either the Solidarity or the recovery consortium.

[01:09:07.790]
And I just don't remember right now the the name of it. But but I want to go back to your question about the president. So the president was given dexamethasone. And when that happened, I stated publicly that either the president was sicker than they were telling us. So he was sufficiently sick that they wanted to give him dexamethasone because giving dexamethasone early in the course of the disease before your very sick actually can harm you. So you don't want to give it to someone at the beginning of their disease.

[01:09:38.440]
You need to wait until they're sufficiently sick and then it helps you. So either he was sicker than they told us and so they were lying to us or he was really needed, the dexamethasone, in which case he faced a significant risk of death.

[01:09:53.500]
So people in the trials that show that the dexamethasone worked. Seventy four year old overweight people, men and men, are much greater risk of dying than women of this condition. Who got the dexamethasone? They had about a 20 percent chance of death. So I think the president actually faced a 20 percent chance of death when he was at the hospital, which is a big risk of death. And I think he got lucky, know he survived. He was also given the cocktail of artificial antibodies to the disease, which I think is another promising approach to treating this condition.

[01:10:27.310]
We don't yet have the results of those randomized controlled trials, but we'll also know soon if those drugs help. So this was an experimental treatment that they gave him? Yes, they gave him, not the

dexamethasone.

[01:10:39.370]
That was a well documented treatment. Right. But the antibody antibody cocktail was apparently the CEO of the company of Regeneron was his golfing buddy or something. I'm not exactly sure. So whatever it was, it seemed to be very effective. And and no, I would think that he went on a wild tweet storm. It seemed like he had a lot of energy.

[01:11:01.150]
Well, the dexamethasone may have given him a steroid high. I wouldn't conclude that the antibody cocktail was necessarily effective. We don't know. No, I didn't.

[01:11:09.670]
I didn't mean that. I meant the treatment, the overall treat, whatever they gave him when he was in the hospital. The response was for a 74 year old guy to be back on the campaign trail with this rigorous campaign that he was doing four or five days later. Pretty impressive.

[01:11:26.200]
Yes. I did not expect that at all. And and as I said, I think he got lucky. And I do think, you know, steroids can give you can make you a little psychotic and a little manic, actually. And and I think I mean, you can't really know from a distance.

[01:11:41.620]
But to me, he had a as a doctor looking at him, I thought this man has a little bit of a manic feel to him. But then they your and even that went away just from the Twitter feed. Yeah, I mean, isn't that how he always is? Well, I'm not an expert on Donald Trump's tweets, but if you just looked at some of the things, you're right, maybe he was always that way. But if you look at if you look at some of the things he did, like I think the little having the Secret Service drive him around the hospital was a bit, you know, was a bit manic.

[01:12:15.710]
You know, that was like a very irresponsible thing to do, would expose people to risk it, put his own health at risk. I mean, you and I, if you and I were in the hospital with covid and we told our our doctors, you know, I just want to go for a drive around the block right now.

[01:12:28.850]
Let me go. I mean, they would they would say no, you know, that would not be an OK thing to do. They wanted to wave to people, right?

[01:12:36.710]
Yes. Yeah. Hilarious. Yes. I mean, I think I think one of the things. And I make this argument in Apollos Arrow. One of the things that's very interesting to me about about plague's earlier you talked about how plague's were one of the four horsemen of the apocalypse, is that that the that that lies and denial are like the squire of the horsemen.

[01:13:03.350]
They, like, follow right behind. And in a way, you would even say that lies and denial, since they've occurred for thousands of years, whenever there's an outbreak, people have always developed superstitions. They've wanted to deny what's happening. There's been a lot of lying. There's been a lot of snake oil salesmen. You know, there's just a lot of mendacity that that follows the germ.

[01:13:26.690]
So the germ is spreading through social connections and bullshit is spreading through social connections. And I think that we saw this even in the president where he was, you know, frankly misrepresenting what was happening. We now know that he was told that it was going to be a pandemic in December, but was saying, oh, it's just a flu, nothing's going to happen. Nothing's gonna happen.

[01:13:44.930]
He was lying. And and his whole hydroxy a chloroquine story, there was no evidence that this drug would work. But, you know, he was like a snake oil salesman selling it. And you could even make the argument that. That it is the perfection of our democracy, it's the fact that we have a democratic system that allows us the popular will to be reflected in the leaders that we elect so that if the people wish to be lied to, they will elect a liar.

[01:14:13.600]
Can I can I pause you for a second? There is a lot of people that did believe that Hydroxycut, when at the time had some positive benefits, including my doctor, who is not a Donald Trump supporter. This is no no evidence at all. There was some suggestion that based on in vitro studies that the drug might work, it wasn't crazy to consider that it would work. I mean, it wasn't a crazy idea to say maybe this drug works, but there was no clinical evidence that it worked.

[01:14:41.640]
There was no randomized controlled trials that showed.

[01:14:44.040]
But isn't that also because there was no time for any randomized controlled trials? Because this was the initial stages of the pandemic?

[01:14:51.510]
Yeah, so so I'm not saying that it wasn't crazy to think that it might work, but to say that it does work is a different statement.

[01:14:58.020]
I agree with you wholeheartedly that his endorsing of it as being some sort of a miracle cure was irresponsible. Yes. And but that's also kind of what he does, right? Like when he was sitting next to I'm sorry, what is her name? Berk's. What was her name? Yes, yes. Yes. And he was saying maybe we can yeah. Maybe we can use some sort of internal disinfectant on people and all that. He's he's riffing.

[01:15:27.600]
He likes to have you know, he's the guy that likes to have the answers when he's giving these speeches and he likes people to pay attention. And I think the response he's it's that's that's how he usually is as a human being. He gets to be 70 years old. Now, all a sudden, he's the president of United States and he's doing this now becomes a problem.

[01:15:48.480]
Yeah. So this is what I would like to say. So I and I set it up by saying, you know, it's a it's a reflection of the perfection of our democracy that we are able to get the public will. And it's reflected in our leaders. And if the public will, as to, as I said, to have someone who tells you only good news and doesn't tell you bad news, we're going to get that. But I don't think that unless the leaders off the hook.

[01:16:10.500]
And actually, before I explain that, let me just go back and say it's also true that many other leaders in other European nations, like in Italy or in England, also flubbed this.

[01:16:20.050]
So it's not the case that only Trump singularly botched the response. Now, there were leaders in South Korea, in New Zealand, even in Greece, you know, who had a successful response. But my point is where the United States of America, I expect more of us. We have the CDC. We're the richest nation on earth. We you know, we we we have our scientists and doctors. We have this we spend seventeen point seven percent of our GDP on health care, that we have the National Security Agency.

[01:16:51.510]

We have everything you would need to do better.

[01:16:55.890]
And I expect more from us. So I, I absolutely do fault him for for flubbing this. But I also think the American people need to take some responsibility and need to sort of man up, you know, and recognize that the world has changed. There's some serious stuff that's going on and we have to do better in how we confront this threat. We can't be like children pretending that it's not there or or fantasizing that it'll just miraculously go away.

[01:17:28.080]
That's not a mature response. And we have, unfortunately, a long road ahead. And, you know, we are not at the beginning of the end of this pandemic. We are just at the end of the beginning. And just to set the stage a little bit, here's what I think is going to happen. So it's great that the vaccine has been invented and we'll have several of them, but as we've discussed, they're going to be some problems and challenges in in manufacturing it and distributing it and persuading large numbers of people to get it and so on.

[01:17:59.580]
And that's going to take time, let's say, a year. So let's say the vaccine is approved in a couple of months, the beginning of twenty, twenty one.

[01:18:06.690]
I think we're going to spend all of twenty, twenty one doing all that other stuff, distributing the vaccine and so on. Meanwhile, the virus is still spreading and right now probably about 12 percent of Americans have been infected with the virus in the end. For various calculations and reasons, probably about 50 percent need to be infected, the final attack rate probably needs to be about 50 percent before we reach this threshold known as herd immunity. So we're about a quarter of the way there, let's say.

[01:18:35.710]
So the virus is going to keep spreading and while we're doing all that other stuff.

[01:18:41.750]
So either way, I think we get to twenty, twenty two before we've reached herd immunity either naturally because the virus has finally attacked that many people or artificially because we immunize that many people. So at that point, just to be clear, the virus isn't gone. It's still in our world and still circulating, but it's epidemic thrust.

[01:19:01.720]
It's epidemic capacity now has been neutered. And we have the virus will be so-called endemic when we reach the herd immunity threshold, either by vaccines or naturally, that's 20, 20 to let's say. But that's just then we've overcome the biological and epidemiological impact of the virus, and until that time we're going to be wearing masks are going to be intermittent school closures, we're going to have to have physical distancing. There's going to be gathering bands. You know, hospitals will be full periodically.

[01:19:30.830]
This is going to be the world we're in for the next year or so. And then we'll get to the point where we have the herd immunity one way or the other. But then you see, we have to recover from the psychological, social and economic shock. You know, let's not forget, tens of millions of Americans are out of work. Many small businesses have gone out of business. We have sort of a reshaping of our economy and all kinds of radical ways.

[01:19:59.060]
And it's going to take a while for that to unwind. Also, a lot of people are going to be disabled by this condition. So far, we've been talking about death probably five times as many people will be disabled, will have some form of long term disability, renal, cardiac, neurological or pulmonary.

[01:20:15.200]
So if we have a, let's say, half a million Americans for sure, half a million Americans will die of this condition, maybe as many as a million. It's going to in the end, by the time the pandemic is over, it's going to be a number in that range, whatever that number is, about five times as many will be disabled. So let's say half a million Americans die. We're going to have two and a half million Americans with some form of disability.

[01:20:33.740]
We're going to have to cope with that as well. So if you look at the history of epidemic disease, it's going to take a year or two to recover from that. So I think it's twenty, twenty four before we really begin to enter the post pandemic period, when life will return to, you know, proximity to normal with with some persistent changes in in our society. And I'll say one more thing and then I'll shut up. If you look at the history of previous pandemics, what typically happens is, is during the time of the germ hitting the society, people get more religious, they become more abstemious, they save money, they withdraw from other from social contact, and they avoid risks.

[01:21:20.600]
Risk aversion increases, risk taking declines. All of these things happen. And then when that when finally the epidemic is over, all of those things reverse. People relentlessly seek out social interactions, you know, sporting events and nightclubs and restaurants and political rallies, people, sexual licentiousness goes up a spending. People start spending money. Risk taking comes back. When one person, Niall Ferguson, actually, who kindly reviewed the book in the Times Literary Supplement, when he read this description, he goes, you know, here's hoping that this is what it'll be like.

[01:21:55.970]
So I think come twenty, twenty four, twenty to twenty, twenty three that period, we're going to have like the roaring 20s again when our society is going to really be unleashed from from the shock that we we are experiencing.

[01:22:11.540]
I'm looking forward to that. One thing I got an urge you please your every time you get excited and slap your table, we get a loud bang out of your microphone.

[01:22:20.510]
OK, sorry. We talked about the economic issue. You briefly just touched on it.

[01:22:28.040]
What do you think can be done to mitigate the economic impact and what what states do you think are doing it right versus what states you think are doing it wrong? It seems to me that one of the big problems that people are having with this pandemic is all of a sudden governors and mayors have these powers that they never had before. And they don't seem to totally make sense, like they're allowing people to have mass protests and they're actually encourage them, encouraging them, but they're not allowing people to go to the gym.

[01:22:59.780]
They're allowing people to do things like go to Wal-Mart or go to Target, but they don't want them going to restaurants. California is particularly restrictive and just today entered into a they went back to phase purple, whatever the fuck that means, whether they're shutting everything down. And this is right after the governor got caught going to a restaurant with a bunch of other people doing things that he specifically told people not to do. This is a problem that people have with the power that government has now assumed.

[01:23:32.420]
And the real concern that many people have, myself included, is that we're never going to see them give that up. Is that the power that they have now to tell people to stay home, don't work, shut down

schools, shut down Jim, shut down restaurants that they're not going to let that go? People enjoy using power and especially if they have a legitimate. Legitimate good cause war like we do here in the pandemic.

[01:24:00.510]
So I share your concerns and I understand what you're saying, and there are many components to what you just said, first of all, I want people to understand that even during the bubonic plague in England, when the government wasn't ordering restaurants to close, the economy still collapsed.

[01:24:19.560]
So we have to draw a distinction between what the germ is doing to us and our economy and what it would have done regardless of what government did versus what we are doing to ourselves in order to fight the virus. So I don't want people to think that, oh, if the government was doing nothing, our economy would be going great.

[01:24:37.980]
No, I don't I don't agree with that either. I think the economy would still be fucked, but it would be less fucked. California is more fucked than Austin, Texas is. That's a fact. All right. Well, I believe you on that. I don't know the precise I mean, what's happening in Austin, but I don't think that the economy would necessarily be less fucked if you if it if if the government took no action. In fact, the the the principle the ideal principle, at least, is that by the government acting, we can protect the economy.

[01:25:06.600]
So, for example, if the government were able to effectively force people to wear masks and if everyone wore masks, we actually could maybe have a functioning economy.

[01:25:16.620]
That seems to be the message that we should get out.

[01:25:19.680]
Yeah, so so just to be clear, the ideal world, I'm not saying that's how government is working, but I'm just saying in an ideal world, we as a people band together and say we're facing a common threat. Look, if if if we had an enemy on our on our borders, you know, if we were being invaded by an army, you grabbing your gun and going to the frontier, it's useless, right? You can't stop the army by yourself is solitary.

[01:25:41.820]
Action is not adequate in this situation.

[01:25:43.980]
Furthermore, everyone else on their own, running to the frontier in a disorganized way also is not effective. You need leaders. You need structure. You need platoons. You need weapons. You need strategy. You need all that other stuff, that coordination to repel the invader. And it's the same with this. We save our skins by working together to repulse the invader. And in an ideal world, that's what government would do for us. It is an expression of the collective will for collective self-preservation.

[01:26:13.350]
So so I just wanted, first of all, to draw the distinction between what the virus did to us versus what we're doing to ourselves, which we seem to agree on now, the hypocrisy of our leaders. And then I'll come to the power issue. The hypocrisy is really worrisome to me. And we talked about this earlier. I think public messaging is a crucial part of the battle we had to get had ahead of us. So we have to have people be honest with us and we have to have them be consistent.

[01:26:37.740]
We can't say, oh, this is what you need to do, but I'm going to the French Laundry for. Yes, you know, that's not OK. Exactly. So I totally agree with that. And that's why I want our leaders, for example, when they appear in public to wear masks. I don't think that, you know, a lot of the political politicians

who are going to public events, not wearing masks, you know, Vice President Pence, for example, went to the same event at the Mayo Clinic.

[01:27:04.530]
Everyone else was Masti wasn't mass. That's not the right message, in fact. Right. And here's the other thing. Just to just to be clear, I know what's happening in North and South Dakota right now. I've been following it a little bit and also in in in Idaho and other parts of the northern part of our country right now.

[01:27:21.840]
It's in the nature of exponential growth to be deceived. Exponential growth is not an intuitive concept. So when experts say the shit is going to hit the fan in a few weeks or it's really bad right now. The man on the street goes out or the woman on the street goes out and looks around and says nothing is happening, it's not so bad right now. What are you talking about? And it seems like the expert is lying.

[01:27:45.170]
But what happens with exponential growth is, you know, one becomes two, becomes four, becomes eight, becomes 16. It looks like nothing has happened, becomes thirty two, becomes sixty four cases or death. There's not so many deaths. It doesn't look so bad.

[01:27:57.800]
But then it explodes.

[01:27:59.900]
Right. Exponential growth, as we all learned in high school algebra. And and that's the problem. And by that time, by the time that explosion takes place, it's too late. And this is why leadership is so important and why we as a people need to try to elect or empower individuals or honest with us or not hypocrites who act according to their prescriptions and who tell us the plain truth of what it is that we're facing because we are going to have to work together to get the best of this virus.

[01:28:27.830]
What is happening in South Dakota? North Dakota, I'm not aware. Their hospitals are at capacity and and the per capita, I think North Dakota has the highest per capita death rate of any place in the world right now, but it's a rural and not a very populous state.

[01:28:44.290]
They're also pretty wide open. Right. They really didn't enforce any restrictions at all. Correct.

[01:28:50.560]
And on the one hand, I am not saying and this is important. I'm not saying that every every place. Well, there are some things that I think we need a national strategy for. So, for example, inconsistent rules from place to place can harm us. It's like designating one part of the swimming pool for pissing and just hoping for the best.

[01:29:09.240]
I mean, that doesn't it doesn't work when there's a contagious disease.

[01:29:13.120]
That's a great example. I wish it were. Mind if someone else came up with this? But anyway. But so that's not you know, we need to have some kind of national strategy. We need some consistency. We can have every little town having this town is mass. The next door town is not mass. This town closes its schools. The other town doesn't close its schools. You know, this state bans gatherings, but the adjoining state does not ban gatherings.

[01:29:35.920]
We need some consistency. Having said that, however, it is also the case that different states are different. Know the population density. New York City is completely different than the population

density in Vermont or in North Dakota.

[01:29:48.400]
And I can understand why people that live in rural states might say, well, we have one advantage, which they do have, you know, being less dense, the population density being lower. But that doesn't mean you can just count on that advantage and do nothing else. And this is this is something I wrote about. It's called the Swiss cheese model of pandemic control. So imagine that every layer of defense is a piece of Swiss cheese, for example, school closures or physical distancing or wearing masks or banning gatherings or or testing, for example.

[01:30:20.640]
So each one of those is a layer of defense, but each of them is not perfect. They have little holes in them.

[01:30:26.490]
You should have the intuition that if you have just one layer of defense, it's imperfect. They're holes the virus can get through. But if you add another piece of Swiss cheese with a holes are randomly positioned, maybe there's only a couple of gaps left after that second piece of Swiss cheese where a couple of holes happened to line up and then you add a third or fourth slice.

[01:30:43.530]
And by the fourth line of defense, there are no holes left to penetrate all four layers of Swiss cheese. This is what we need to do as a nation. Any one layer of defense is not enough. We need multiple layers.

[01:30:56.910]
But the good news is, first, if we have enough layers, we don't necessarily need any more after that. So, for example, let's say we you know, we wear masks, we physical distance, we have we ban gatherings and we and we have testing. Maybe that means we don't have to close schools because they don't add anything else. Adding another piece of cheese to the as the fifth layer is not necessary. And furthermore, this is what happened at the White House.

[01:31:22.410]
They relied on one layer which was testing. They didn't have macing, they didn't have physical distancing. They thought, oh, was just going to do testing. It's not enough.

[01:31:30.120]
And in this day, though, because I don't think they did, I don't think he was getting tested. I don't think he was either, honestly. But I have no inside knowledge.

[01:31:40.780]
I need to hear is when they asked him when was the last time you had a negative test, you asked me was the last time you had a negative test yesterday? I get tested every day. So if they're not asking him if he's not answering that question, there's only one reason because he doesn't want to lie, because he knows, other people know. So he knows he's got an inner circle that is a little a little Chatty Cathy talk a little bit and they're going to they're going to rat them out, especially if he doesn't win the election, right?

[01:32:08.940]
Yes. I think he wasn't getting tested. I think that's right.

[01:32:12.390]
I think they probably had the idea that will test everyone else that comes in contact with the president. Yes. And they also, by the way, tests are also not perfect. Remember, we said there's no life without risk. These are all probability distribution. So the tests are some tests are exceptionally good, but they're not perfect. You get a false negative.

[01:32:28.440]
Well, he's always using a rapid antigen test. Correct. He's using the the the the test where they're doing the nasal swab or the the the saliva test.

[01:32:39.840]
I don't know exactly what testing methodology was in use at the White House, but what I suspect happened is he got infected from someone else.

[01:32:47.760]
And then I think and this is just rank speculation. I think he was the point source after that, because if you look at the network pattern of of who got the disease, including the person, the Coast Guard officer that was carrying the nuclear football who got infected, by the way, this is just to be clear, in my view, the height of irresponsibility to be so lax, the fact that our leadership was infected, including even the person holding the nuclear football, this is irresponsible, right?

[01:33:12.060]
I mean, we should expect more from the White House. But anyway, the. If you look at the pattern of people, if you map out the network of who got infected, I think he was the common denominator for a lot of the infections. And so I think he got it somehow. He wasn't being tested. I speculate this is speculation and then he spread it to lots of other groups. So basically, the president is a super spreader.

[01:33:36.180]
Say it. Yes, I think there's the data fit with the claim that the president was a super spreader. Yes.

[01:33:45.540]
Yeah. So clearly that's a gigantic problem.

[01:33:51.990]
Elon Musk apparently now has covid. And one of the things that he was talking about is how to test came back positive and two tests came back negative. And a lot of people are criticizing him about this on Twitter, complaining about it without researching the nature of these tests themselves, and that the issue being that these tests are not that effective. If you have a very mild case of the virus or if you barely have any in your system, and that they might show positive and negative in the same day.

[01:34:27.100]
I don't know the details of Elon Musk's testing. I have to imagine that Elon Musk has good testing. So I was surprised by his description and I don't believe he released information on whether he was having PCR tests for the virus or antibody test for identity.

[01:34:42.100]
He did. He released it that its rapid antigen test.

[01:34:46.840]
So he wasn't getting PCR test for the virus.

[01:34:49.240]
He didn't this particular time when he tested four times too negative and too positive. He's pretty specific about it on Twitter. And that's when people were criticized.

[01:34:58.310]
And those were all antics. Those were all antibody tests.

[01:35:00.970]
So, yes, I believe I'm 99 percent sure because he was actually then questioning the the effectiveness of PCR. Now, there's something I wanted to discuss with you because I got confused about it.

Someone was saying that with PCR tests, when you get to a certain number of tests, then it becomes problematic. Correct, like an individual, an individual having a certain number of PCR tests. There's no way I can think of that would be the case, I mean, what the difference is mean, the PCR test, the PCR test is a test of of saliva or or or nasal secretions for the virus.

[01:35:44.320]
And typically, after you recover, you you don't shed the virus any more. Now, you can test positive for a while afterwards because you might still have some RNA from the virus in your system, but you're not infectious. So you can test positive, but you can't infect anyone else. But usually after a number of weeks, you no longer test positive. And that's done with the antibody test is a test of your body's response to the virus, the proteins that you produce to fight the virus.

[01:36:11.050]
Usually usually you take that from blood. But people have now developed saliva antibody test, which is much more convenient. And and those will be positive for a number of weeks or months, as we were discussing earlier. And there are two different kinds of antibodies are actually there, more than two. But there's a so-called IGM and IGG, the IGM spikes within two or three days and some tests can detect that very sensitive and the ECG almost immediately afterwards.

[01:36:35.860]
And you can use antibody tests to detect as your body fighting off the virus.

[01:36:42.130]
These are two different kinds of tests, the saliva test. This is something that I've heard of, but I've never seen implemented. What what is is there a more effective version? Is saliva more effective than the nasal swab?

[01:36:59.010]
Well. Just to be clear, the saliva test could be the saliva test for the virus or saliva test for the antibodies. It's it's much different once there's two different ones. Yeah, they're different. They're different things and they're different tests. And the saliva is, of course, much easier for all of us that having blood drawn or having someone put a Euterpe in our nose. So people are scrambling and have developed saliva tests both for the virus and for the antibodies to the virus.

[01:37:26.780]
Now, which is, again, great news, incidentally, just to be clear to people, why did the nation make a sacrifice of flattening the curve? Like why did we have the school closures and the lockdowns and all of that stuff back in the spring? The reason we did it was to stop the percussive force of the virus. Like it's like a tidal wave was going to come ashore and we built breakers offshore so that the amplitude of the wave would be reduced.

[01:37:52.160]
Still, the water would come ashore, but it would come ashore more slowly than this huge wave hitting us. And the reason we did that was so that we could have our health care system begin to function, develop, discovered that dexamethasone works, invent vaccines, invent tests, improve the tests, make the test easier for us to take. So all of these things have happened in the last nine months. This is why we did the sacrifices we did last spring.

[01:38:20.960]
And incidentally, this is why further sacrifices might be might be called from us. If we continue to behave well, we might be able to spare a lot of deaths because then we'll have really good vaccines that have been shown to work. We'll have more medicines to treat the sick people. Our hospitals won't be inundated. Doctors can take care of you better when the hospital is 60 percent full. Then when the hospital is one hundred and twenty percent full, they're not as exhausted.

[01:38:49.280]
The doctors. Do you want an exhausted doctor or with lack of supplies that's worried that he or she is

going to get sick? Or do you want a well rested doctor with adequate supplies that is mentally fit and ready to care for you? So all of these are reasons we're flattening the curve back then and now. And so so these tests, these miraculous tests that we have for saliva now have all been invented in the last couple of months. Jamie, did you find anything on the PCR?

[01:39:16.610]
Nothing. OK, I know, I know, I know, I know, I can't imagine a way, Joe, I can't imagine a way that the testing itself. Could be worse for you. No, no, no, no, no, no one's saying that. No, it was something saying that it becomes ineffective after a certain number of cycles here. Here's another question.

[01:39:41.330]
Why do we have these upswings and why do we have waves? Like what is the cause of waves? Is it people relaxing? Is it people gathering? Going to bars seems to be particularly problematic, right? Like, what is causing these waves? Is it that people get relaxed?

[01:40:00.950]
So it's a lot of different things are doing it so that the existence of a of a second wave right now was completely unsurprising to anyone that studies respiratory pandemics. I'm unfamiliar with the respiratory pandemic in the last hundred years that hasn't had multiple waves. Incidentally, I'm telling you now, maybe we'll have you back on the show in a year. There'll be a third wave. A year from now, there'll be a third wave and actually probably a fourth wave to the amplitude of that wave.

[01:40:28.610]
If we have a vaccine will be lower, but we'll still have a blip up in cases a year from now, winter compared to eight months from now, summer. So restaurant pandemics come in waves and they do that for a number of reasons. One has to do with social interactions, the pattern of how people interact.

[01:40:47.120]
Schools are open. You know, in the summertime, schools are closed and in the fall the schools open. And schools are a place where lots of human beings mix are 50 million children in schools and three or four million adults that teachers and janitors and others and cafeteria workers that work in schools and and parents drop off their kids and pick them up and chat at the school. So there's just a lot of social mixing that takes place in schools in the wintertime.

[01:41:12.830]
People live differently. They move indoors. They have more close contact with each other. It's easier for restaurant pandemics, pathogens to spread indoors than outdoors, as everyone knows by now. So human behavior changes in the winter.

[01:41:25.640]
And this is why, incidentally, the germ typically goes to the southern hemisphere for its winter while we're having summer and then comes back north with our winter comes furthermore.

[01:41:37.130]
There's there's physical and physiologic reasons, so the dryness of the air and the coldness of the air may facilitate the dispersion of the virus and our bodies, may our immune systems, as you were discussing earlier, may function differently in the summer and in the winter. So for a host of many reasons, it is very standard that respiratory diseases have this scalloping sinusoidal pattern up higher in the winter and then lower in the summer. So there's nothing surprising about what's happening right now.

[01:42:11.570]
The one big unknown is how bad will the pandemic be now? Will it be in the 1918 pandemic? There were the second wave was four times as deadly as the first wave.

[01:42:26.420]

And the question in many experts minds right now is, is this called the 19 pandemic, this second wave that America is beginning to experience now? Will it be as deadly as the first wave or more deadly?

[01:42:38.600]
And and I fear that it will be more deadly and, you know, over a Americans are dying every day of this condition, every single day, day after day.

[01:42:48.530]
And that number is likely to go up unless we really get our act together. And even when we do get our act together, that it'll take about three weeks before we see that the deaths plateauing and then beginning to decline. So so we're going to have thousands and thousands of deaths, like a battleship turning like even if we start to make the turn, it's going to take many miles before the battleship turns. Same is going to happen here. And so I think, you know, we're going to have it's going to be bad.

[01:43:14.750]
Unfortunately, I think many, many Americans are going to die.

[01:43:19.610]
And again, this is not diminishing the impact of the disease or the fact that it's a dangerous disease. But one of the things that the CDC had said was that only six percent of the people who died from covid-19 had only covid-19 and that the rest had an average of two point six comorbidity factors.

[01:43:41.390]
Yeah, but a little bit. Let me ask you a question. If you have diabetes and you're driving down the highway and you're in a car accident, what do we say killed you? Car accident, yeah, we say the car accident killed, we don't say, well, you had diabetes, so, you know, we're not going to say the car killed you. So the fact that people and in fact, we all ultimately are going to die.

[01:44:04.180]
Right. But you know what?

[01:44:04.960]
People will reverse that. Right? Like people will say that people with leukemia who also had covid, they're listening that as a covid death when they really had leukemia anyway, and they were probably likely going to die.

[01:44:16.630]
Yeah, but the person with diabetes was probably going to die of their diabetes, but they got into a car accident. So my answer is, is that I can answer this question. So my answer is that the usual way we think of things that kill people, we think of the proximate cause. You know, let's say let's say I had chronic obstructive pulmonary disease or I had end stage renal disease and someone shot me. You know, just because I was getting dialysis and someone shot me doesn't mean that I was going to die anyway of my renal disease.

[01:44:42.850]
Therefore, I wasn't murdered. I was murdered. That's what killed me. Right.

[01:44:45.880]
But you're talking about violent actions versus diseases and comorbidity factors. It's I don't think that's a fair comparison when you tried.

[01:44:53.260]
I think it is fair because let's say you have the same exact situation. Let's say you have cancer and you're getting chemotherapy and you're being treated for the cancer and then you get infected with a with the pneumonia and you die of the pneumonia. You wouldn't have died. But for the pneumonia in this case, the scenario I'm putting to you is now, if you're going to make the argument you're making and I understand where it's coming from, I don't mean to dismiss it completely.

[01:45:19.120]
You would also then have to apportion all deaths to have a fraction due to different causes. So you would say this person had had had diabetes and they also got coronavirus. So we're going to say it's 50 percent of the death is due to diabetes and 50 percent is due to to the coronavirus. And you could go then if you wanted to do that, you could like for all causes of death, you could apportion them and that would result in, you know, rejiggering multiple things.

[01:45:49.000]
But it's not fair to just pick on coronavirus and say, well, actually, people would have died of something else. So we're not going to count those deaths.

[01:45:54.850]
But that's not that's not what we're saying.

[01:45:56.500]
What people are saying is that the actual danger of the disease is is greatly exacerbated by the poor health of America.

[01:46:06.280]
That's true. This is what I'm getting at, is that. Yeah, yeah, that is true. That is one hundred percent true. And and the comorbidities greatly increase your risk of death.

[01:46:14.920]
So that is true. And this is, incidentally, one of the reasons why I mean, Sweden is having its own problems right now.

[01:46:20.890]
But one of the reasons it wasn't really fair to hold up Sweden as a comparison for our strategies, that the Swedes are much healthier than we are. And they have a you know, there's a completely different society. Yeah. You know, we're not, unfortunately, as healthy as the Swedes. Yeah.

[01:46:37.000]
That is something that I feel like we could have gotten into people's heads eight months ago and perhaps made a dent in the the impact of the virus. It's hard to tell people you have to be healthier. They don't want to listen. People have their habits and they have their vices and they have their behavior patterns that they're just accustomed to. And it's very difficult to break people out of them. But some people would have listened, some people especially terrified, faced with the possibility of either surviving a pandemic or not, may have done something differently.

[01:47:13.120]
And it's one of the things that frustrates me so much about not just the government response, but the media's response to this is that I don't see anybody out there saying you got to get healthier and it's the one thing that might save you.

[01:47:26.770]
Yes, I mean, I agree completely with that and there are anecdotal stories, I have some of them in the book of elderly people who are who fear getting this and who are not only, let's say, withdrawing socially and limiting their contacts, but they are trying to get fitter. You know, they're exercising more and trying to prepare their bodies for the possibility that they might get an infection and try to optimize their chances. So I totally agree with that.

[01:47:55.720]
You know, but it's hard it's hard to persuade people to to behave in a healthy way. It's always hard, let alone. But you're saying I think correctly, you're saying, look, it should be easier to motivate them to do it now.

[01:48:07.960]
Well, it might be hard, but it's not impossible. And there's been zero effort. Zero. Yes. It's almost like the like it's not going to work. Let's let's just not try that and let's just shut down all the businesses. That seems to me to be asinine. Yes.

[01:48:23.710]
So I think that's right. So this is where we're getting back to the sacrifices expected of us. Like if you want, you know, if Americans were willing to work together to like, let's say I'm going to make this up, but let's say for the sake of argument, we were given a choice. Either every American can lose 10 pounds or every American is overweight, which is like sixty six percent of Americans are overweight, two thirds of them or more are overweight.

[01:48:46.060]
Every overweight American can lose 10 pounds or we're going to close the businesses in their community. Actually, you know, I mean, I haven't done the calculation. We'd have to do it. But you can imagine doing such a calculation and concluding that, you know, actually that would be equivalent. And so we should tell people, you know, this is your dilemma. You're being called to action.

[01:49:05.170]
You're not you're not being drafted into a war. But you need to sacrifice. You need to do your part. And your part is, you know, this. So I agree with you, Joe.

[01:49:14.140]
I mean, I think I think you're going to get them to be motivated that way, telling people they have to sacrifice and do your part. People are fucking selfish. Tell them, listen, this is going to save you. This is the thing that's going to make you healthier. This is the thing that's going to give you a better chance at surviving if you get infected. But what frustrates the shit out of me? A person who's spent most of my life thinking about health and fitness and wellness is that there's been zero impact.

[01:49:41.350]
There's been zero by the government, zero impact on people's health in that regard, zero discussion of strengthening your immune system and strategies and having health experts talk about proven strategies for boosting your immune system. There's been none of that.

[01:49:58.930]
Yes, I think that should be part of the messaging. And I, I actually know some people that I can relate to that may help the may influence the national messaging on this topic, actually. So I'm going to I made a note of this point and I know someone I can communicate this to.

[01:50:17.680]
Well, there's plenty of peer reviewed studies, national policy.

[01:50:21.430]
Well, that would be wonderful because there's plenty of peer reviewed studies on the impact of specific vitamins and nutrients on your immune system.

[01:50:28.990]
Yeah. What else do you think we need to do that we're not doing? I think we we talked about some of that already. I mean, you know, I think we we need to get much better with testing. We need to get better with masking. We need to, unfortunately, avoid gatherings. We need to be better with public messaging. We need to prepare the nation a bit more to understand what we're facing. I, I think we do need more coordination.

[01:51:01.930]
I don't think this kind of patchwork approach will work. So these are all the things I think we we should be doing. And and in that messaging, incidentally, I would second what you said, which is encouraging people to take better care of themselves, which is a good thing to do anyway. So I think that that's

already a pretty tall order, Joe. I mean, I don't know what more we can do. We are making heavy investments in.

[01:51:24.240]
In vaccine technology and in science, which I think we need to do, I think we we do need to take our public health infrastructure a bit more seriously. It's sort of a very unsexy thing to spend money on, on public health departments. But we need them. You know, when this when this pandemic struck, we didn't even have contact tracing capabilities at the level we needed. It's it's very sort of bread and butter kind of public health capabilities.

[01:51:47.700]
But we compare it to Asian countries. We didn't have that. So so there are a number of strategic investments. As a nation we need to make, all of which, incidentally, are peanuts compared to what's happening to us. I mean, Larry Summers, a former Treasury secretary, a former colleague of mine from when I was at Harvard, now I'm at Yale and a colleague of his, David Cutler, who's a health economist at Harvard. They published a paper about a month or two ago which called the the coronavirus, the the 16 trillion dollar virus, 16 trillion dollars.

[01:52:18.720]
These are vast sums of money. And they estimated that the hit to our economy. By the virus was eight trillion dollars and that there was a further eight trillion dollar loss because of the deaths, illnesses and disability from the virus, so our nation has suffered from the moment this virus took root in our society. It has suffered a 16 trillion dollar loss. It's like it's like having a big house that just is burned to the ground. It's gone. You know, it's just a big loss.

[01:52:54.290]
And and and that's that's what we're facing as a country, actually. And I just think we I mean, I'm repeating myself. I think we just need to confront that and deal with that as sensibly as we can.

[01:53:07.400]
I think one of the more unique things about America is that we have all these different states and we get to see all the different responses that different states have. And that's one of the more confounding things about California's draconian methods, because it hasn't really been effective. There's still massive infections and deaths and it doesn't seem to have done that much, particularly right now with the giant wave that they're experiencing. Florida is weird, right? Because Florida is essentially said, fuck it, you could do whatever you want, haven't they?

[01:53:40.310]
They've basically opened up everything live, sporting events, concerts, restaurant.

[01:53:44.930]
I don't I haven't I haven't track it at this level of detail. But I do want to emphasize that even if the government says you can have live sporting events, only certain, many people still won't go. So there is still.

[01:53:55.730]
Yeah, but you're talking about Florida, I bet. So I said you're talking about Florida. I bet they'll go there.

[01:54:03.560]
The test monkeys there, the test monkeys for America.

[01:54:07.910]
I mean, people in Florida while folk, they'll do some wild stuff.

[01:54:12.890]
Yeah, I, I think wrestling alligators. Yeah, I haven't I haven't tracked, you know, every state and what every state is doing. I don't track it at that level. I definitely have. And also, incidentally, I also don't

look at cases by testing. I look at deaths. Right. Because deaths are much less ambiguous, like testing numbers can go up and down because we test more. Yeah, we test more or less.

[01:54:38.580]
This is, you know, so the deaths are much harder to fudge.

[01:54:41.310]
So I monitor deaths.

[01:54:42.510]
I have a sense of how many Americans have died on any given day and the cumulative toll of death. But I don't. And I occasionally I'm paying attention to different states like earlier. We're talking about the Dakotas. So I haven't paid close attention to Florida and California like Florida.

[01:54:55.890]
The governor had a press conference is why I'm bringing this up, where he was bringing up where, you know, you had different age groups. He had a chart and he was showing that we have to protect the most vulnerable, which is people, particularly older folks and obese folks. But he was basically saying for everyone else, this is not nearly as dangerous. Now, a lot of people got angry at him for this and they said it was irresponsible the way he was describing it.

[01:55:20.940]
But I'm pretty sure they're basically opening up most things.

[01:55:26.340]
I mean, they have Disney World is open in a limited capacity there, whereas Disneyland in California is completely shut down and has been since March.

[01:55:35.160]
Yeah, but I have to I have to make a point here about this. And this goes back to our issue of our conversation about risk. So it is the case that most young people, if infected with this disease, face a very small risk of death. You know, let's say if you're in your 20s, you have like one in three thousand chance of dying if you get infected. On average, if you're sick or you have some other condition or whatever, OK, your ire, but the truth of the matter is that young people face a low risk of death of all causes, like I have kids in their 20s.

[01:56:05.680]
I wouldn't want my kids to get sick. If they did get sick, I would I would take some solace in the fact that this particular pathogen seems to spare the young. It needn't have been this way. Other pathogens kill the young and spare the old like Spanish flu.

[01:56:19.690]
Yeah, like that's not the case here.

[01:56:21.640]
So I am I do take as a parent some solace in the fact that, you know, my kids, if sick, would be very likely to survive. But I would not say, oh, never mind if you get sick. That's not true. Their risk of death is very low from all causes. So why you would willingly accept an extra cause of death, especially one that doesn't offer any benefits. It's not like you're driving a race car and risking death, but you're having fun, you know, driving the race car.

[01:56:47.860]
This is like you just think Florida's explanation for that would be that they want to open up their economy because they think there's a danger in closing the economy that is not discussed as often as the danger, like in terms of the risk to human life, suicide, drug addiction. There's a lot of factors in a depressed economy.

[01:57:09.520]
Yeah, and poverty is deadly. I mean, people losing their job. One hundred percent. I totally agree. And this is why going back, I think first thing we have to do is we have to tell the difference between what part of the economic damage is just due to the virus and what part is something we can do, you know, like we're doing to ourselves so we can effect it. Because remember, people are going to stop going out and shop shopping just because they know there's a deadly virus out.

[01:57:34.900]
So let's say for the sake of argument, fifty percent of the circulation of human beings that is reduced, that is lost is because people themselves are making these decisions. So the economy is going to tank just because people don't want to shop anymore. And that's been happening for hundreds of years with far with epidemics. So there's that part. Then there's the next part, which is things that we're doing by banning gatherings or closing restaurants or whatever.

[01:57:58.300]
And then now if we're going to decide whether to do that or not, your argument begins to have traction because you can say, look at when we closed down that part of the economy, we're contributing to poverty and suicide and drug use and depression and all these other adverse effects. And then we have to engage in the very difficult and transparent as a society utilitarian calculus of saying, are the lives we lose because of that more or less than the lives we save here?

[01:58:29.650]
I agree that I think that we do need to be very cold hearted about it and do these calculations and publicize them. So if the governor of Florida said, I have thought deeply about this and I've consulted experts and we've done the calculations and we've concluded that we're going to have an extra hundred thousand deaths or thirty thousand deaths in Florida. Because we are not closing the economy due to covid. Whereas if we had closed the economy, we would have saved those lives, but we would have lost some other number of lives and here is what I'm doing.

[01:59:01.420]
Furthermore, dear Floridians, because we're not slowing the spread of the virus. Some of you will get sick. You go to your local hospitals and will be turned away to die. Because our beds are full capacity and I am making that decision that we're going to take those deaths and we're going to take that awful outcome of people being turned away at the hospital door, and we're doing that because we don't want it. We want to avoid these other deaths that would at least be honest.

[01:59:28.320]
And, you know, I would respect that, but I don't see that that's what's happening.

[01:59:32.100]
I don't think that deep thought is going into it. I don't think serious calculation is going into it. And I certainly don't see governors saying we're going to keep our economy open. But the price of that will be these deaths. And when X, Y, Z happens in a week or in a month. I told you so that I don't see happening. Well, that's that I that politically we can have our cake and eat it, too. That is kind of political suicide.

[01:59:56.030]
Right? To say that to say we're calculating that a lot of you are going to die because of this decision, but the economy is going to do better.

[02:00:04.760]
No, we're going to say fewer of you will die. We're calculate, yes, you could do that or you might even do the calculation and say, look, actually, we've done the calculation and we would lose 40000 people due to the economy being tanked. Versus 30000 lives due to covid, and so I had to make the difficult decision as your governor to keep the to not issue these stay at home orders to two, because this will result in more saving lives or not, say, actually, if we if we if I issued stay at home orders, we would prevent thirty thousand covid deaths.

[02:00:41.230]
And if I don't issue stay at home orders, we would we would we would pay those thirty thousand deaths from covid but we would have twenty thousand deaths from the economy. I'm mixing it all up now because I'm moving too fast and I hope listeners get the gist of it. The point is, is that their, their lives on both sides of the ledger and if you tally up those lives and you decide this is what you're going to do and you're honest with people, I have less of a problem with that.

[02:01:05.500]
Now, Nicholas, if I gave you a magic wand and I said, you're the king of the world, tell me what to do. If you could if you could be the person. You've studied this obviously very deeply to write this book probably more deeply than most.

[02:01:19.900]
What do you think should be done? What step by step strategy to both preserve the economy and preserve the maximum amount of people's health?

[02:01:28.720]
I don't think we can fully preserve the economy, and I don't think we can prevent all deaths. So we have to accept that both are going to suffer.

[02:01:35.710]
I think we can do better as a nation by giggling and jostling to to implement a variety of slices of Swiss cheese that we discussed earlier, that if we collectively implement mean we can protect more businesses and protect our schools so our kids can go to school. I'm not saying that it's one hundred percent sure that we can do that. We might still have to close schools and close businesses. But if we did more testing, more masking, more physical distancing, if we if we limited gathering's, if we had better messaging.

[02:02:08.440]
So people said, you know what, I if I don't have Thanksgiving gatherings, then I can keep the businesses open and I can keep the schools open. And so I think it's just immature to think that we could just go about life as it was before, because our world has changed. It's just not the same. We have to accept this, at least for a while. If we do those things, I think we and we and we have better messaging from our leaders.

[02:02:32.260]
I think we can we will emerge from this pandemic as we will inevitably in a couple of years, because plagues always end.

[02:02:41.110]
We are going to see the other side of this. We will emerge with it relatively less, relatively more unscathed, that is to say, with fewer deaths from the disease and fewer and less damage to our economy. But there's no way, unfortunately, to fully avoid death. And of course, of course, there's no way to avoid that. We're in it. Right. So but would you institute a nationwide mask mandate? I don't think legally that's allowed, but I think if the nation were able to do that, I think we would we would greatly reduce the transmission of this germ.

[02:03:14.500]
We would save lives and minimize the other hardships that we had to implement. Yes, I think masks is the simplest thing.

[02:03:20.530]
I mean, look, I can just put on I can put on this mask. You know, and if I do that thing and we all do that thing, we don't have to do other, more difficult things, why wouldn't we?

[02:03:32.790]

It's the simplest thing you can do is to put on a mask. And the second simplest thing you can do is minimize your social interactions. These are much easier and your distance that you keep from other people.

[02:03:43.530]
You know, for example, might in my household, we try to make a shopping list and we go out shopping once a week instead of twice a week.

[02:03:50.190]
I mean, we're having our social interactions were thinning out the crowds at the grocery store. We still buy the same amount of groceries. We're just not buying it. We're not having as many as many crowds. There are many common sense, basic things that we can do as a nation, which if we did, would actually allow our grocery stores and restaurants and other places to, you know, fare better. So, I mean, that's that's what I would recommend.

[02:04:12.360]
Yes.

[02:04:12.840]
One of the things that people are really terrified about, particularly my friends that live in New York City, is that it's never coming back. There's a lot of my friends that are experiencing so many of their friends moving out and so many businesses go under.

[02:04:25.440]
They're really terrified of that, that New York City is so big and it's such a massive machine that to take out a giant chunk of it due to the pandemic, to have all these businesses go under, to have all these apartments that are available for lease, all these businesses available for lease, I don't see any strategy on the table to bring that back. I don't see that being discussed. Is this something you considered when you wrote the book?

[02:04:55.080]
Yeah, no, I think those will come back. I mean, I think, first of all, we're seeing an exodus from cities to rural parts of the country that has been seen with every plague for thousands of years. There's nothing surprising about the fact that in times of plague, people flee the cities, but the cities always come back. So I have no doubt if I were a very rich person.

[02:05:18.750]
And. I would I would be buying, you know, Manhattan real estate in a year or two, you know, not now, though. Why not now and a year or two?

[02:05:29.610]
Well, I think it's still going to go down for a while, right? I mean, people are still leaving the cities and, you know, it takes a while for the market to clear. I'm no expert on Manhattan real estate. I made up that example. I'm not exactly sure.

[02:05:38.790]
I'm not giving I'm not giving this. But the gist is clearly our economy is reshaping and people are moving to more rural parts.

[02:05:47.390]
Anecdotally, we see rising house prices in rural parts and in suburbs, also with a working from home. People are beginning to realize, you know, I can do my job from home. Why should I be in a two bedroom apartment in Philadelphia when I could just as soon live on a big farm in rural Pennsylvania and do my job from a distance and I'll get much more space for myself and my family and so on.

[02:06:10.740]
So so I think we're seeing that, I think but I do think the cities will come back because the intrinsic

appeal of cities is so great and they have always come back in the past. So eventually I think the cities will return. But, you know, but a lot of businesses are going to have gone out of business and will go out of business. And and this is awful. And let's not forget, I forgot the unemployment figures. Maybe Jamie can look up.

[02:06:34.380]
I don't have them handy right now.

[02:06:35.610]
But like like 30 million Americans have lost their jobs.

[02:06:39.000]
I mean, many people are unemployed and let alone the loss of life. And I don't think, as I said, we're not through with this yet. So I think, you know, I think this is a big shock to the airline industry, the hospitality industry.

[02:06:52.140]
You think Boeing is selling a lot of planes right now, the travel industry and incidentally, the travel industry is going to take a while to recover because now all of us have realized that, hey, I don't have to fly.

[02:07:03.660]
You know, I mean, I think doing business face to face is not going to stop. I think there's something extremely important about face to face or business.

[02:07:10.770]
And I hope the next time you have me on the show, I'll come down to Austin and we'll see each other and have a drink. It'll be totally a nicer experience, although this is great as far as I'm concerned.

[02:07:19.770]
But anyway, but many, many cases on the margin, people will say, why should I fly across the country to sign this contract or have some kind of a give it, you know, have a routine meeting, skip it.

[02:07:32.640]
We'll just do it by zoo.

[02:07:34.020]
So I think that's going to be persistent and that's going to have an effect on our economy, I think benefit the change, Joe.

[02:07:41.880]
I think there's going to be a change in women, in sort of gender, some of the gender dynamics because. So if you look at the typical like the stereotypical heterosexual couple in this in this country, so there are, of course, homosexual couples, there are single family, single head of household families, you know, single moms, single dads, much less common raising their children. But if you for most households are are heterosexual couples. And furthermore, it's stereotypic still typical that men earn more than women in the labor market.

[02:08:16.980]
Not always the case, so not all households are heterosexual. Not all households as the man more than women, but the predominant the model, as we say pattern is still that in our society. So when the market when the economy is tanking, as it is many and schools are closing, many families sit around the kitchen table and they're deciding how to cope and they say, well, the man is making more money. He should remain in the labor market and someone needs to watch the kids.

[02:08:45.330]
So the woman is going to quit her, let's say, job that wasn't paying as much as the husband. And and

anyway, women might have, on average, a preference for being with her kids compared to men. So we should absolutely allow individual households and families to make their own decisions about how to manage their own lives.

[02:09:00.360]
But when millions of families reach similar decisions, we might find that the that the labor market gains that women have made over the last 10 or 20 years might have been reversed by this pandemic. That is to say, a few years from now, when we look at the labor force participation of women, we might see a changed landscape as a result of this virus. So there all kinds of things that will persist. You know, that the world will have changed in some ways and working from home, women's labor market participation, the travel industry, schooling, you know, colleges, for example, a lot of colleges now have gone to develop the infrastructure and and the bureaucracy for online learning.

[02:09:45.170]
And some colleges will say, you know, we can actually offer an online degree much more easily what we were forced to do it health care insurance companies, insurance companies used to not pay for.

[02:09:56.990]
You know, why did you have to go to your doctor to get a prescription refill? This is ridiculous. It's a stupid. Well, now, you know, everyone moved. People didn't want doctors didn't want to see patients for such silly things. And we didn't want patients coming to hospitals and getting infected or infecting others. So we made an exception and we said, oh, you can doctors can refill prescriptions without physically seeing the patient. You think that's going to come back?

[02:10:20.270]
I mean, people are going to, you know, for two years they will have been easily getting their prescription refilled and now no. So they're going to be persistent changes in our society from all of these things. One of the things that disturbs me is that the stimulus package that checked the people got the twelve hundred dollar check was one check and it never it never repeated. And that was it. It was it was crazy. Like it didn't make any sense.

[02:10:45.280]
I can't imagine they thought that that it really helped people, especially over the long term. What? If any effort has been put to try to increase that and try to send more checks out, and this has got to be a part of the response that the government has, like Andrew Yangs Universal Basic Income idea, really made so much sense during this pandemic. Like this is a real example of when something like this is absolutely necessary.

[02:11:15.330]
Yes, I think another example and then I'll come back to that, although I'm no expert in this topic, is why health insurance is tied to your employment in this country.

[02:11:25.650]
And it makes no sense. Right? I mean, I don't want it. If you lose your job and you can't get health care for a contagious disease, you're going to be out and about spreading this contagious disease. Or why are we don't have sick leave policy for hourly workers? That also doesn't make sense. In other words, many hourly workers kept going to work when they were sick spreading the virus. This doesn't make any sense. We don't want that.

[02:11:51.240]
So I think they're going to be changes in how we couple insurance to employment and sick leave policies because having a contagious disease illustrates some of the demerits in the existing system. Now, same goes with universal basic income. Now, I'm not an expert in this area, but I think that the way the government handled the way which is pumped out money and I think there was also some corruption and like, who got the money? I didn't track all this in detail.

[02:12:19.800]

You may know this more than I do. I think we're going to have to rethink that.

[02:12:23.700]
And I don't think we're done, unfortunately, with with with restructuring and rethinking the unemployment benefits. I do think we're going to have to do do more to provide for people, because all of that stuff is about to end. And I think people are you know, there's going to be a wave of mortgage foreclosures and other financial hardships that people are going to experience.

[02:12:45.900]
Yeah, no, I agree with you. Listen, Nickless, next time we do this, I do hope we do it in person, in person. But please tell people you have a copy of your books.

[02:12:53.490]
You can hold it up. I do have a copy of the book. Hold on, I put on I had I had it. Has this not a matter? Yeah, I put on the mask because this was swag that my that my publisher sent me, which I thought was really cool swag. So I have a limited of five of those masks.

[02:13:11.170]
What is where what is the name Apollo's arrow. It comes from. It's a nice thing to finish on. Hold it up so I can see the spelling of it. Apollo's arrow, OK? Yes, and it comes from a story at the beginning of the Iliad. So the Greeks this was events three thousand years ago. So this The Iliad, which is a Homer's story about the Trojan War, describes events that took place three thousand years ago. And the book begins with a plague.

[02:13:41.020]
What happened is, is the Greeks were laying siege to Troy and they were periodically going on raids and sacking vassal states of Troy. And they would they would kill all the men, take all the treasure and enslave the women and children and bring them back to their camps and divide up the booty. So they had sacked a nearby city and there was a maiden girl by the name of crisis who was given to Agamemnon, the the principal king of the Greeks, as his prize and crisis.

[02:14:11.350]
His father crises was was a priest of Apollo. Apollo was the ancient Greek god of healing and also of illness and disease. And so crises comes to the Greek camp to ransom his daughter. He brings a big treasure and he goes to Agamemnon's Tent, the king of all the Greeks, and he falls on his knees and he begs him, he says, please release my daughter. And not only does Agamemnon say it will not release the daughter, but he treats this man extremely rudely in front of the Greek army, treats this priest as important priest, and he says a way with you, not only will I not give you my daughter, but she will grow old in my house, in my bed, you know, basically working as a slave for me.

[02:14:53.320]
And if I see you lingering around the ships, you know, I will kill you. And he just smacks the man and sends him away. So the priest goes back down to the shore and he says a prayer. He says to Apollo, If I have ever served you, if I have ever given you sacrifices that have honored you, hear me now and come and punish the Greeks. And the prayer instantly goes to Mount Olympus and Apollo hears him and Apollo is enraged and he picks up his big.

[02:15:20.200]
I know you like archery. He was also the God of archery, picks up his big silver bow and he comes flying through the air down among the ships that were encircling, you know, on the beachhead and circling Troy. And he crouches among the ships. And in the ancient Greeks thought of diseases as Apollos arrows, you know, invisible. You were just stricken by an invisible arrow. And he crouches among the ships and the and the. And the book goes the story goes of Apollo's arrows at the beginning of the Iliad goes first.

[02:15:52.120]
He killed the running dogs and the horses, and then he began to kill the men. Nine days through the

army go the arrows of the God and the funeral pyre burned day and night from the dead until finally Harra. The Queen of the Gods took pity on the Greeks because she saw them perishing and she whispered into Achilles's ear. Achilles was another great king and warrior, whispers into his ear, called the Greeks to muster return the girl to the priest so that the plague will end.

[02:16:25.750]
And it turns out that then Apollo Agamemnon was forced to return this girl back to her father and he had to pay a ransom. But he was his pride was so wounded that he then set into motion other events that ultimately led, you know, that the last year of the war on Troy.

[02:16:48.100]
Well, that makes a lot more sense, because I was wondering, I thought it was one word, Apollo zero. That's what I thought you were saying. So it's like, how is that spelled there? We see we see the book now. It's on the screen. Nicholas, thank you very much. Good luck with the sales of your book. Thank you very much for writing it. Thank you very much for having such a reasonable and objective perspective on this.

[02:17:08.560]
And I really appreciate you very much, Joel.

[02:17:11.410]
Thank you for everything you do. And thank you for having me back. And I look forward to doing this in person in Austin in a year.

[02:17:16.900]
Absolutely. Thank you. Take care of my brother. Thank you, friends, for tuning into the podcast. And thank you to express VPN hiding all your dirty business online. Go to express VPN dot com slash Rogan. You can get extra three months for free on a one year package.

[02:17:35.620]
That's x p r e s. S vpn dot com slash Rogen rated number one by CNET Wired the verge and countless more express VPN Dotcom Rogen. Go there and learn more. We're also brought to you by Toshie.

[02:17:57.850]
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[02:18:33.330]
Check out movement's biggest sale of the year with fast free shipping and free returns by going to em the empty dot com slash Rogan and were also brought to you by the motherfucking cash app. The motherfucking cash app. The number one app in finance in the known universe. Download the cash app from the App Store or the Google Play store today. And when you do download the cash app, make sure you use the referral code. Joe Rogan, all one word.

[02:19:06.180]
You will receive ten dollars and the cash app will send ten dollars to our good friend Justin Rends fight for the forgotten charity building wells for the Pigmies in the Congo and Justin will be on soon. We'll talk about this program and how much good it's done. We're really proud to be a part of this and proud to be working with a company that's as good as the cash shop there. They're great people and just the ethics and the values of the company.

[02:19:32.250]
I love them. I really do. So please download cash app, use the referral code. Joe Rogan, all one word. You get ten bucks and ten bucks also goes to an amazing cost and the app is just fantastic. All right.

We did it. We got to the end. Thank you very much.

[02:19:46.800]
Tuning in much. Love to you all. Bye bye.