

Transcript of NBHP COVID-19 Vaccine Event with Dr. Peter Hotez, MD

(Recording begins as meeting is in progress)

Andrea Usanga, NBHP (question not recorded): *What was the process for the development of the Pfizer/Moderna vaccines? How many trials were conducted? Was the process sped up in an unsafe manner?*

Peter Hotez, MD: (beginning of answer not recorded): [Vaccine research on coronaviruses has been going on for 10 years. This is not just something that started last year]. Remember where that comes from. That comes from the company CEOs who are writing press releases and making statements not for you and not for me, but for the shareholders. But, the fact is this is a decade-long development program that's been going on a long time. What you're hearing about is from the company's CEOs is more of a culminating event from a lot of hard work that went in for the last 10 years rather than something that sprang out of nowhere. This has been one of the problems with the Operation Warp Speed coming out of the Federal Government is, first of all, Operation Warp Speed is a terrible name. The minute I heard that name, I said, "My god, what are they doing? This is going to create a lot of confusion and turn a lot of people off," and then they didn't have a communication strategy, they left it to the company CEOs who only piled on a lot of misinformation. This, we've been playing catch-up ever since.

The program has been a decade long in existence, and then we've had the clinical trials underway, and I think the other thing about the clinical trials we have to remember is these are very large well-done clinical trials in 30,000 people for the Moderna vaccine, 44,000 for the Pfizer vaccine, very carefully done, a lot of scientific rigor and integrity. The only piece that's really "warp-speedy" is the fact that, once we had the results for showing that the stuff worked, the question then is, "Then what?" because usually when the FDA licenses a vaccine, they want to collect a full year of data to determine length of protection for the vaccine and to confirm all of the safety findings. The problem there is if they waited a full year, you do the math. At 4,000 deaths a day times months and months and months, you could be looking at a million lives lost, and nobody wants that to happen. That's why they released the vaccines through emergency use authorization so we can get them ready to start vaccinating the American people now, knowing that we're still going to follow up with safety and everything else.

The good news is, in those 44,000-person trials, 30,000-person trials, there were no really common adverse safety events. It's not to say that there aren't going to be rare ones as you scale up from 44,000 people to millions of Americans. Other safety events may emerge, but they're not going to be common. They're going to be rare. I think the one thing that's happened that's a little higher frequency than I would have thought is the severe allergic reactions. Usually, for the influenza vaccine or HPV vaccine, it's around one to two per million. For the measles, mumps, rubella vaccine, it's about one per 300,000. With this one, with the mRNA vaccine, at least the Pfizer one, it looks like, and probably the Moderna as well, it's more like 1 to 50 to 100,000 for severe allergic reaction.

Still a rare event, but a little more common than some of the other vaccines that we're used to, and that is going to have to be managed as well. The key is now scaling this up and hoping the other vaccines will follow.

Andrea Usanga, NBHP: *As far as both of them have high efficacy, what are the main differences between those two?*

Peter Hotez, MD: They're more similar than they are different. They're both mRNA in a lipid casing, they both work by the same way. They get taken up by your cells. By the way, they never go into the nucleus of the cells, so it's not as though it's genetically modifying your DNA, so one of the big anti-vaccine tenets is that they say they're creating this term they use called "genetically-modified humans". It's garbage. We have very aggressive anti-vaccine lobby, which unfortunately really began in Texas starting in 2015, and that's when it really started accelerating. It was linked to the extreme political right, and under this banner of health freedom, medical freedom, and that's when you saw groups like Texans for Vaccine Choice form.

They're very aggressive and they throw out a lot of misinformation and disinformation. One of them is that vaccines genetically modify our DNA. They don't. It's RNA; not DNA. It doesn't get made into DNA and doesn't get taken up by the nucleus, but that's how they both work. They get made into protein by our own body's cellular machinery, and then that gets expressed to the immune system, and you create a very vigorous antibody response where they're called virus-neutralizing antibodies.

One of the things that it does do is that it does stimulate a lot of inflammatory response in your immune response, and you feel it. After I got my first immunization, I got the Pfizer vaccine, I felt body aches, and muscle pain, and pain at the site of injection for about a day, maybe even a low-grade fever, and then after the second injection, I was fine for about 24 hours, and I started having some shaking chills for a few hours at night that I took Advil for. It's more than usual vaccine, although my Shingrix vaccine was pretty bad as well. But, overall, tolerated it quite well, and that's going to be the case for most people.

Andrea Usanga, NBHP: *For the trials, we know that the vaccine has been affecting certain populations, particularly those of color, disproportionately. Did the trials adequately reflect the diversity of the country? Because, that's one concern that a lot of people of color have.*

Peter Hotez, MD: In the beginning, no, but the companies responded to that criticism, and they quickly became more inclusive. Pfizer actually expanded their 30,000-person study to a 44,000-person study, and you're absolutely right. The big concern that I have among the Hispanic and African-American communities is there's a higher hospitalization rate. First of all, it's a higher exposure rate, especially when you live in low-income neighborhoods. You're not working from home via Skype and Zoom, right? You're in family-owned businesses or on construction sites, so you have your essential workers, so you have a higher rate of exposure, and then the hospitalization rate seems to be higher, and the really scary part is the way the deaths are occurring in the African-American and Hispanic community.

Among non-Hispanic whites, according to the Center for Disease Control, 13% of the deaths are under the age of 65, but in the African-American and Hispanic communities, it's 30 to 35 percent, so three times higher. That's the worry. It's all these mothers and fathers in their 40s and 50s, early 60s that are getting hit really hard. That's why I didn't like that 65-year-old age cutoff. That doesn't apply to the Hispanic and African-American communities. I actually think the state made a good decision about opening it up to people -- anyone over the age of 16 with underlying comorbidities. I think that captures a lot of it, but that's the real worry.

Andrea Usanga, NBHP: *For the vaccine, folks have been asking about whether it actually reduces the chance of -- if it just reduces the chance of contracting COVID-19, or does it just make symptoms milder if you do contract it, and can people still be a carrier of it if they've been vaccinated?*

Peter Hotez, MD: We don't know all the answers. Here's the way that trials were done. If you're enrolled in one of the trials, if you started feeling sick, and there was a list of symptoms to look for, everything from cough, to fever, to body aches, fatigue, you were tested for COVID, and if you were found to be positive, you were a case. Therefore, the trials only looked for people with symptomatic COVID and severe COVID, and we know there's 95% protection against symptomatic and severe COVID, which is great because now you know, if you get vaccinated, once you get your two doses, you will not go to the hospital with COVID, you will not go to the ICU with COVID. It will save your life, and that's really important.

What we don't know yet is whether it stops asymptomatic infections, and the Centers for Disease Control find that about half the COVID infections are without any symptoms at all, so it's possible that you're still carrying the virus for a period of time after exposure and shedding it in your nose and mouth and infecting others. I think that probably doesn't happen. I think the vaccine does have an effect on stopping asymptomatic transmission as well. We just don't have the data to support it. That data's forthcoming, there are clinical trials underway to specifically look at that. But in the meantime, the thinking is, "If you're vaccinated, you potentially still could carry the virus and transmit it to others."

Let me give you an example. I was vaccinated before the rest of my family was, so when I was first vaccinated, potentially, if I was out and about in the community, I could be infected, be asymptomatic, and bring the virus home to my wife, and infecting her who is not vaccinated. As a consequence of that, even after I was vaccinated, I really didn't change my behavior at all. I was still mostly working from home and taking lots of precautions. Until we sort that out, that's going to probably be the case.

Andrea Usanga, NBHP: *I think that's a good point, and just for clarification, because there have been some reported cases of folks who have received maybe one dose of the vaccine who have then tested positive for COVID-19. Can you explain that to folks why that's the case?*

Peter Hotez, MD: When you looked at the early clinical trials, one of the things we learned over the last 10 years is that to make an effective immune response to COVID-19, you needed to get what are called high levels of virus-neutralizing antibodies, the type of antibody that binds to the virus and prevents the virus from replicating or binding to our host tissues. What I noticed for all the vaccines, pretty much, except maybe the Johnson & Johnson vaccine is you needed two doses in order to treat that high levels of virus neutralizing the antibody. I started to say, "You know what? Just not going to be single-dose vaccine. We're going to have two doses."

After the trials were done, people looked at some of the data and noticed that there was some level of protection, more than expected even after getting a single dose. But, it's not very consistent, it may not be very durable, so that's why we're still going to need two doses. The point is even after you get a single dose, the level of virus-neutralizing antibody in your system may not be enough to confer protection. Once you get a single dose, you still have to behave as though you weren't vaccinated at least for the following month, or three weeks, depending on the vaccine to get the repeat dose.

Andrea Usanga, NBHP: *I would say, then, it's very important for folks not to just say, "Oh, well I got one dose, and I'm not going to go and get my second one because that's not really giving them that level of --"*

Peter Hotez, MD: Get that second dose, and unfortunately, there's a lot of press now about all of these people who want to -- in order to save doses, they're saying, "Let's just give one dose to the American people, and we'll worry about the second dose later," and I've really pushed back hard against that saying. It's a really bad policy because we have no idea of the level of protection for that one single dose. Now, the FDA has come out with a statement agreeing with me, and then Tony Fauci agreed with me, so I got that going for me. That's really important.

Andrea Usanga, NBHP: *Let's move on a little bit to talk about some of the safety and side effects of the vaccines. Do you know of any of the short or long-term side effects of either of them? There are rumors about them causing Bell's palsy.*

Peter Hotez, MD: Clearly, when you get immunized, within 48 hours, you can feel sick. You can feel like you have a fever. You can feel like you may actually have some fever, and arm soreness, and muscle aches and pains, and that can happen with any vaccine. It certainly happened when I got my Shingrix vaccine for zoster. But, it can happen with any vaccine. It tends to be a little more frequent with these, so that's something to keep in mind. Severe allergic reactions are still really rare, like 1 in 50 to 100 thousand, roughly, but it has happened. That's why, now, they're asking people to wait around, after you've been vaccinated, for 15 minutes to make certain you don't have any untoward reaction. I think that's really important.

That's the short term. This idea of Bell's palsy. What that is is it's a weakness of the facial nerve so that you have a droop on one side of your face. There were a few cases noted in the group that got vaccinated, over 40,000 people, and there was even one or two in the placebo as well. The point is Bell's palsy is something that occurs in people from time to time. It's a rare event, but it does occur. It looks like it's a little more frequent in the vaccinated group. It usually tends to be temporary and then resolves, but it's still a rare event.

There was a vaccine produced by a Swiss company about 10, 15 years ago for the flu where you gave the vaccine through the nose, an intranasal vaccine, and that was clearly associated with facial palsy. It's possible this one does, but it's, again, pretty rare. Of course, you've got this whole aggressive anti-vaccine lobby that's really playing this up, and they're digging up any picture on the internet they can find of somebody with Bell's palsy, and you know how this works. They're saying this person got it, he's ruined for life, and it's really unfortunate they're doing that. It may occur with a higher frequency among the vaccinated group, but a rare event, and usually temporary.

Andrea Usanga, NBHP: *What about adverse reactions for certain people or a thing about people who shouldn't take the vaccine, like if you have allergies, HIV positive, and immune-suppressed folks, autoimmune diseases, high blood pressure, diabetes. Is there any disproportionate impact on those folks?*

Peter Hotez, MD: Remember, most of the vaccines are meant for people with underlying conditions because you're at greater risk of getting severe COVID. Right now, remember, for the first two vaccines, the Moderna and Pfizer, these are non-live virus vaccines. These are mRNA vaccines. Even if you're immunocompromised, you should be able to take them. The only specific contraindication for getting these vaccines is if you're known to be allergic to any of the specific components in the vaccine. So far, the only one that may be a specific problem that we think is there's a substance in the vaccine used to stabilize called polyethylene glycol, or PEG, P-E-G, and it's used sometimes as a food additive and things like that, and some people have known allergies to it. If you have known allergy to PEG or any of the vaccine components, then you shouldn't take it, but that's a really small number of people.

My wife's on Humira, takes Humira. Absolutely, she should get the vaccine. Even people who are immunocompromised, HIV/AIDS. There's no reason why you shouldn't get the vaccine. You should still go ahead and get it. Then, the question comes up, "What about pregnancy or breastfeeding?" For pregnancy, for the clinical trials, people who are pregnant, who knew they were pregnant, were excluded from participating. However, during the trial, several women became pregnant after vaccination, and they did fine. There were no issues.

Right now, that hasn't really been specifically studied in pregnant women in terms of fetal outcomes and other measures. But, given the fact that COVID-19 can produce such severe disease during pregnancies, so pregnant women who get COVID-19 do not do well, they have very high rates of hospitalization, and ICU admissions, and even deaths, so the risk of being pregnant and what happens if you get COVID is very high. It's like having almost an underlying comorbid condition, so you want to get vaccinated.

Now, the ACOG, the American College of Obstetrics and Gynecology, is recommending that pregnant women get vaccinated, and the society for maternal fetal medicine is recommending that pregnant women get vaccinated. Then, for breastfeeding, there should be no issue at all.

Andrea Usanga, NBHP: *Just a couple more along those lines. Folks, if they've had an allergic reaction to the flu shot, or a severe allergic reaction to the flu shot, or other medication allergies, and I think someone said, "What if you're on blood thinners?"*

Peter Hotez, MD: It should be okay. All those things should be okay, but if you have any questions at all, this is why you have a doctor or a healthcare provider, have that conversation. Because, remember, the risk of what happens, there's so much COVID transmission right now, it's really at a screaming level, that's a big risk, and so you want to protect yourself against COVID.

Andrea Usanga, NBHP: *You already talked about the half dose conversation, so hopefully those, we're dealing with that. It sounds like you're saying that there's no reason, right now, unless you're allergic to a specific component of the vaccine, not to get vaccinated.*

Peter Hotez, MD: That's right.

Andrea Usanga, NBHP: *I'm going to go to -- just making sure of other questions.*

Peter Hotez, MD: By the way, there's going to be other vaccines that follow.

Andrea Usanga, NBHP: *Yeah, that was the question.*

Peter Hotez, MD: That's another question to realize that that's something we're going to have to begin looking at is the other vaccines. The next one's probably coming up. The adenovirus ones are live virus-vectored vaccines, the one from AstraZeneca Oxford, and the one from J&J. Their immunocompromised individuals, we'll have to see what the data says and what the FDA recommendation's going to be.

Andrea Usanga, NBHP: *Do we have a timeline on when those -- do you know where they are in the trials?*

Peter Hotez, MD: I'm hoping, by next month, that we have released one of them, so we're going to need those vaccines to vaccinate the American people.

Andrea Usanga, NBHP: *We're going to get to some of the rumors in a little bit. First, do you know about -- most of these, for one vaccine, it's 16 and up, and then for the other, it's 18 and up. Do we know where we are in the process of developing one for children?*

Peter Hotez, MD: All of the vaccines, eventually, will be tested in, first, adolescents, and then in children, because to get the three-quarters of the U.S. population vaccinated, we're probably going to have to vaccinate at least adolescents and maybe younger children as well. Those clinical trials are now underway, and hopefully we'll get some answers in the next few months regarding both efficacy and safety. The hope is, I think, that we can have kids vaccinated in time for the fall school year this year. I think that would be the best. The most important for me is protecting the teachers, and the bus drivers, and the school staff, and the parents because they're the ones at greatest risk, but we still see some adolescents and kids get severely ill, so getting them vaccinated is going to be important.

Andrea Usanga, NBHP: *What about the -- looking at more safety, are we thinking it's about 75% of the community needs to be vaccinated in order for it to be --*

Peter Hotez, MD: I think so --

Andrea Usanga, NBHP: *-- that herd immunity.*

Peter Hotez, MD: As I say, that's a high bar, so let's say we're talking about 3.6 million residents of Harris County, so let's say we want to do it over six months, that should be really aggressive. That would be 600,000 a month, so 20,000 a day. We just don't have that bandwidth. The problem now is it's still all about calling HEB and seeing if there's a vaccine for your mother, or father, or calling Krogers, or Randalls, or CVS, or Walgreens. That's not the way to do it.

Now, we're starting to get the city health centers up to speed, which are great, because especially for the low-income neighborhoods, a lot of them are pharmacy deserts and supermarket deserts. Having the community health centers is going to be really important, the hospitals. But, even with all that in place, I'm concerned it's not going to be adequate. I think we're going to have to do something bigger, and I saw the mayor tweeting about opening up Minute Maid not as a mega-center, but as a larger place to get

a lot of people vaccinated. I think we're going to have to start doing things like that because we need high throughput.

Remember, we've punted on every other approach, especially here in Texas where people have been very defiant of social distancing, and even masks, and as a consequence of that, we're backed into a corner. Vaccinating Texans has to be a big priority.

Andrea Usanga, NBHP: *How long does it take for you to develop immunity after your second dose of these two shots?*

Peter Hotez, MD: Roughly about a week after the second dose. I got vaccinated on my second dose on Tuesday, so the hope would be, after this weekend, that's my get-out-of-jail-free card. I'm immunized, not everyone around me, so that's still problematic.

Andrea Usanga, NBHP: *Should you continue wearing a face mask even after you have your second dose?*

Peter Hotez, MD: I will. I've been mostly working from home. I'm going to start going into the office a couple of days a week, and I'll still have my mask on while I'm in the office. Maybe if my door's closed in my office, or I'm on a Zoom call, it will be off, but generally, as I walk around the hallways at Baylor College of Medicine or into the lab, I'll have my mask on. Then, as more and more people get vaccinated and we actually show evidence of that interrupting transmission, eventually, towards the end of this year, the masks will come off.

Let me give you another on my way out. My wife got her first dose of vaccine, and she's waiting for the second one. She gets her second. Her mother lives up in New Jersey, she hasn't seen her in a year because no one's traveling, so she's going to visit her, but she hasn't been vaccinated yet, so what do you do? She's going to, one, is either to wait until she gets vaccinated, but even if she does, while she's on the plane or going through airports, she'll have the full mask on and everything else. This is the kind of way to think things through. It gets confusing for people, because people understand what to do. After we stop transmission, people understand what you did before the vaccine came along, but during this interim period, there's a lot of confusing elements, but the bottom line is when you're out in public, even if you've been vaccinated for now, just behave the same way you did if you weren't vaccinated.

Andrea Usanga, NBHP: *I'm going to talk a little bit about the disinformation, misinformation out there. Social media posts talking about microchips and magnetic links, is there any truth to that?*

Peter Hotez, MD: Yeah, none. The microchips would be too big for the 25 gauge needles that are used for the vaccines. That's one point, and there's just a lot of conspiracy theories out there. It's me, or Bill Gates, or Tony Fauci, we're sticking microchips into people, and there's one that says I'm doing this with Bill Gates and Tony Fauci in a special secret lab out in Area 51. You just couldn't make this stuff up. It just goes on and on. But, the amazing thing is a lot of people believe it, and the problem is we don't have a good system of communication to counter it.

The fight I've been having with the HHS agencies and the Federal Government is they're all about, "Okay, we've got to fine-tune the message, we've got to deliver the message, we've got to do public

service announcements, and that." I said, "That's all great, but that in itself is not going to be adequate because the anti-vaccine lobby is so aggressive, they dominate the internet." If you go to the Amazon.com website, and I know everyone's done this, if you put books up at the top and you press return, you'll get a scroll-down menu to the left, and scroll halfway down the page to health, fitness, and dieting, you click on that, you'll get another scroll-down menu that says "vaccinations", you click on that, it's all fake anti-vaccine and COVID conspiracy books.

This is what people are reading, this is what we're inundated with, the disinformation. I'm of the opinion that we've got to start taking down some of this stuff. The other piece to this, talking about the African-American community, some of the surveys, including surveys we've done have shown a very high rate of vaccine-hesitancy or resistance in the African-American community, and the reasons ascribed to it are historic and structural racism. I get all that, but up until a couple of years ago, I've never really thought of the African-American community as so defiant against vaccines. To me, this is something new, and I started to look into it, and one of the things we've realized is the anti-vaccine groups have been specifically targeting the African-American community. They did this with the Orthodox-Jewish community in 2018. They started writing these pamphlets, and doing town hall meetings with Orthodox-Jewish community leaders saying that vaccines are the next Holocaust, very inflammatory language, and they caused that measles epidemic in the Orthodox-Jewish community in New York in 2019 that landed 18 kids in the ICU.

Then, those same anti-vaccine groups started staging rallies in Harlem, anti-vaccine rallies, and a lot of it was led by Robert F. Kennedy Jr., who heads this anti-vaccine group called Children's Health Defense. They even organized their rally in the Riverside Church, which is one of the iconic churches of the Civil Rights Movement where Reverend Sloane Coffin was a huge civil rights champion. I think some of this, I can't tell you which component of it is there's deliberate targeting of the African-American community, and you know what language they're using, right? They use Holocaust language for the Orthodox-Jewish community, for the African-American community. It's all about Tuskegee. The vaccines are the next Tuskegee experiment.

Up until recently, you never heard that coming out of the African-American communities - only in the last couple of years. I think a lot of this is deliberate targeting by the anti-vaccine groups, and it really gets me angry, so I'm trying to launch this counter-offensive, and I've been trying to talk on some of the African-American radio shows: the one in Chicago a couple of weeks ago. I think I'm doing one tomorrow morning, in fact. Hold on. I think it's with the Texas Southern, their radio station. [mumbling to self]. Live KTSU Radio, Saturday morning at 7:20. Hosts, Donna Franklin and Chris Johnson, invited me for tomorrow morning, and I'm going to go on that because I'm really worried. We're seeing a lot of -- even among African-American healthcare providers, you're seeing a lot of resistance. We're seeing this, and they're in such risk, especially as we're working in ICUs and emergency rooms. This is going to be a real challenge.

Andrea Usanga, NBHP: *Agreed, and just a quick point being an African-American, and I do understand I have a higher rate, if I contract COVID, of dying --*

Peter Hotez, MD: Right.

Andrea Usanga, NBHP: *-- than my Anglo counterparts.*

Peter Hotez, MD: 2.8 times hospitalization.

Andrea Usanga, NBHP: *I do not need COVID, and then when we talk about some of those healthcare disparities, a lot of times when it's targeting the African-American community, it's because things are being withheld from us. Even when you look at Tuskegee, they withheld the cure for the syphilis, right?*

Peter Hotez, MD: That's right.

Andrea Usanga, NBHP: *They wouldn't give it to them. They knew what would help them and wouldn't give it to them. When you think about pain medications, the data today talks about, "Okay, well African-Americans aren't given the same level of pain medication to relieve their pain," so that's a lot of what the disparities are that we're dealing with in healthcare for the African-American community, is withholding from us, and this vaccine, across the board, it's saying, "It's there for you, it's available. It's available for me, it's available for you."*

Peter Hotez, MD: I'm going to use that tomorrow morning. I'm totally stealing that from you tomorrow morning.

Andrea Usanga, NBHP: *Please, take it, take it, because I deal with it. Even though my sister deals with vaccinations, I have family members. I know you're headed to another appointment, so we're going to wrap this up. I'm trying to get to as many questions. I'm sorry, folks. We will post a recording on this, if it's okay, with Dr. Hotez, but someone's asking, just to make sure, yes, you need to get both doses of this vaccination. Do not stop at one dose. You need to get both. If you do contract it after the second shot, then you will most likely not be hospitalized, and it will be milder symptoms.*

Peter Hotez, MD: It'll save your life.

Andrea Usanga, NBHP: *Is it something that we're going to have to take annually?*

Peter Hotez, MD: We don't know. Because we had to release it after a couple of months of data, we don't know how durable the protection is, so that's an unknown. Is it three months, three years, 30 years? Then maybe, it may not be the same for the Pfizer or the Moderna vaccine, so we don't know which one is which. What I've been saying is look, don't cherry pick it. Don't wait to say, "Okay, this is the vaccine I'm going to take. Take what you can get, and if it turns out the vaccine you got is not the most durable, you know what? Get a boost later on, a third dose either with the same vaccine or a different vaccine."

That's another really important point, the level of communication we're going to need around this is unprecedented because a lot of this stuff's going to come up, a lot of things are going to happen, and so people need to be informed that we don't have a good system in place yet for that.

Andrea Usanga, NBHP: *I don't want to keep you late for your next appointment, Dr. Hotez, but we are so, so very grateful. We know how busy you are. Thank you for taking the time to spend with us.*

Peter Hotez, MD: Thank you for doing this and getting the word out. By the way, if people want to email me, they're more than welcome to. It's just my last name, H-O-T-E-Z @bcm - that stands for Baylor College of Medicine - .edu, hotez@bcm.edu.

Andrea Usanga, NBHP: *Wonderful.*

Peter Hotez, MD: I'm not as quick on the draw as I used to be for answering emails because of all the craziness, but eventually I'll try to get to it.

Andrea Usanga, NBHP: *Okay, I just put that in the chat. Thank you again, Dr. Hotez, and for everyone else, we will be sending a recording of this because I'm not great with technology. It started a little late, but there's plenty of good information in there, nonetheless. Thank you all and have a great morning.*

Peter Hotez, MD: Thank you so much.

Andrea Usanga, NBHP: *Thank you, take care.*

Peter Hotez, MD: Bye-bye.