Brent McDonald: I am Brent McDonald and I'm going to get us started. I just want to welcome all who have joined us, we have nearly 500 individual employers or individuals who are participating today, and we're very, very thankful that you can join us and hear some very important updates from our teams. This is our third session like this, and we did not think we would have to have three sessions, and unfortunately we do. And so we're going to share the most up-to-date facts that we can on COVID in general and the Delta variant. We are going to share with you recent science that has come out just as recent as this week and current statistics.

In addition, we're going to share with you some of the things that the VUMC is doing as the region's largest employer to protect our own employees, to protect our patients. So we're going to share some of that information with you as well. Let me introduce please Dr. Tom Talbot and Donna Skupien. Dr. Talbot, you've seen before, I believe, he is an advisor for us. He is our chief epidemiologist at VUMC and has been advising organizations like American Airlines. And Donna Skupien is going to facilitate questions and answers at the end of the session. So please submit questions.

I believe you have methods do that. We will be screening them and hopefully can address the major concerns by the time we're done with this session. So with that, please let me turn it over to Dr. Tom Talbot.

Dr. Tom Talbot: Hey everybody. Thanks, Brent. I guess I'm glad to be here, and I apologize that we have to be here. I was telling a colleague that I feel like we've been on a roller coaster ride and we were getting off, and suddenly we realized, nope, we got another hill to hit. So that's where we are. And I want to walk through some things, but really take some time for questions, to show you where we are. So let's start with the data. Here you see, these are data, and on the right, reflect cases per population. So if a country is in red, that's not ideal, and you see the United States isn't red, as well as other pockets.

We are now, I think, the 28th highest rate of infections. I think for every one infection, US, accounts for one in seven infections in the world right now. You can see there at the bottom right the number of cases are now going up in what we're calling this fourth wave, as are the deaths, though not as precipitously. And we can talk why that may be, if there's a silver lining to this wave as well. Next slide. There we go. All right. Let's go down to the United States. And I'll tell you, I show this graph a lot in our internal updates. And four weeks ago, almost the entire US was yellow and there was some green and we were done, unfortunately, no.

And you see now, there are numerous states across the Southeast and west that are now red in terms of activity. You see the rates there, Florida leading the pack with 130 per 100,000, which is very high, they're reporting. And Louisiana reporting numbers that they had not reported daily at all during this pandemic, so definitely this wave is worse than any other wave. And you see there on the right the case counts. And while the counts per day aren't as high in the US as

they were in December, that trajectory is what's making us all very nervous. Next slide.

Here we are in Tennessee. These are data from March to August, and you could see now the steep uptick of patients in the hospital, so our hospitalizations are going up. We're now ranked 10th in the US, as I mentioned. We've had over 900,000 cases in the state. And you see the daily average. Actually, I think yesterday actually reported back about 3,500 in a day for Tennessee, so we're seeing numbers again like we had seen during the winter spike. We unfortunately have had over 12,780 people die in the state, and you see the hospitalization numbers as well. Next slide.

To give you a little snapshot of what we're seeing at Vanderbilt. I presented this this morning in our command center. Four weeks ago in my medical center, we had 10 patients across all of our hospitals. As of this morning, we hit 100, we had a tenfold increase in these patients. We've seen a sixfold increase at Wilson County, our community hospital. They now have record number they've ever had. And even in children's at Monroe Carell, we're seeing more pediatric patients. And I'll talk more a little bit about that A little later. Over 90% of our patients are not fully vaccinated.

The next thing to say, those who are fully vaccinated, who are symptomatic of COVID, so are sick with their COVID to be in the hospital, almost all of them are the severely immunocompromised patients that we would not expect to have a vaccine response or organ transplants. And so, as we talk about we can protect those around you who cannot respond, those are who we're worried about. We have had two fully vaccinated patients die with the Delta, both were heavily immuno-suppressed liver an organ transplant patients. In the last four days, our cases have almost doubled. So we are definitely seeing that surge. The last time we were at this number of cases at Vanderbilt was January 27th. Next slide.

All right. Let's talk about the variant and the Delta variant. So on the next slide, you'll see that the incidence of Delta, these are data from the last two weeks on the right, 96% of isolates sent to the testing and public health labs have been Delta. And you see there on the right, last week alone, 97% were Delta. Delta is causing this surge for sure. So next slide, what do we know about the Delta variant? You hear a lot about it. And as viruses circulate, they will mutate. And the one mutations that are more advantageous that maybe allow it to spread more further or survive better, will survive. So the parents strain of COVID, of the COVID virus, had what we call an R0, which is the number of people that an infected person will infect, of two to three.

So if I'm sick, I on average infect two to three people. What we're seeing what the Delta variant is much higher, in some studies it's three to four, in some it's even upwards of like eight to nine per person. So this is a more contagious virus, and I'll show you coming up some data from the CDC. It also has a shorter incubation period from infection to symptoms. And what's really striking is that if you measure the virus up in the upper airway of patients and persons who

were infected, the amount of virus from Delta compared to the amount of virus from the virus last summer is over 1,000 fold higher.

So you can see why they'd be more contagious, they've just more virus to circulate. Overwhelmingly, unvaccinated people are at the greatest risk still. And what we are seeing is, as I mentioned earlier, almost all the folks that have infection that drives you to the hospital, a severe infection and deaths are in the unvaccinated. And what we're seeing as well is the age of those folks, because many more of our older population have really good vaccination coverage, they're not getting admitted, they're not getting sick, it's younger folks. We are seeing healthy 30, 40, 50-year-olds now come in, we're seeing pregnant women come in because they're largely more unvaccinated.

And we have these pockets where the vaccine uptake is really low, and we're seeing these very hyper local outbreaks that could be devastating to communities where the virus gets in, it's very infectious, and has a lot of folks it can attack and get sick. You do hear a lot about breakthrough cases, which we'll hit on in a little while, but just to note, and those are cases in folks who've been fully vaccinated. These are very uncommon, but they do happen. We hear about them in the news more than I think we should, because they're not as nearly as frequent as the unvaccinated cases. And overwhelmingly, they're usually not sick enough to get in the hospital.

You may feel cruddy, you may feel kind of mild, but you can get sick if you're vaccinated. And we now know that Delta has changed the game a little bit is that if you do get infected, you can spread the virus to others. So that we've lost a little bit of the vaccine effect with that, but not entirely. Next slide. This slide is a graphic from the CDC that shows you on the upper up and down axis is how fatal and infection is, so higher up, more deadly, so Ebola, bird flu, smallpox, very deadly infectious diseases. And on the X, as you go further to the right, those are the ones contagious that can spread faster.

So compared to the original version of coronavirus, this Delta variant is more transmissible than Ebola, than smallpox, and is as contagious as chicken box. And for those older of us who remember when we were in grade school and you had a case of chicken pox in like a kindergarten class, it got everybody, it got everybody. So this is a very infectious Delta variant, and accounting for why we're seeing more cases. Next slide. The good news is that the vaccine still is very effective. These are data in the New England Journal that showed for both the Pfizer vaccine and the AstraZeneca vaccine, Moderna is the same way, is that if you get fully vaccinated dose one, and then dose two, you are nearly as protected as you were with the Alpha variant, in some instances, the same protected, particularly against the severe disease, the death, the really severe outcomes.

So the vaccines are still working, but we need to get people vaccinated. Next slide. So on that note, let's talk about vaccinations. Why do we get vaccinated? A, you need to protect yourself, reduce the risk of infection, asymptomatic

infection, symptomatic infection. The challenge I will tell you editorially with this is that, the folks that seem to be more at risk to have complications have other underlying health conditions, we're increasingly seeing folks that are healthy and maybe a little overweight that have no prior medical problems that are coming in and they're extremely sick, they do extremely poorly, they have complications, and some die.

And what we don't know is, of 1,000 30 year olds, why did those 30 year olds get so sick? We don't know that. We don't know who it will be, we can't predict that. So just because you're young and healthy, you don't want to be the 30 year olds that are getting sick. You don't want to do that, you don't want to undergo that illness. It will prevent you from getting hospitalized, it will prevent death. You may have heard the long COVID symptoms that folks are suffering through. If you don't get infected, you don't get long COVID as well. And then I think importantly, we don't hear this as much, but we need to protect others, not just the unvaccinated, but those that have gotten vaccinated or can't get vaccinated and are unprotected.

So whether it's transplant recipients, cancer patients, people on medications for other conditions like rheumatoid arthritis, or honestly, our younger kids. And I'll talk about younger kids and what we're seeing with that as well, because we know that even though you can get infected, you will clear more quickly and shed less virus. So next slide. If you look at this slide, I think we need to pause and see how phenomenal this is, that since December 15th, we have vaccinated this country, fully vaccinated, 165 million people. We have vaccinated with at least one dose 90% of our population over 65, which is a phenomenal achievement. Unfortunately, it's not enough, especially with a more contagious variant. Next slide.

Just to emphasize, and I've mentioned this again, but show this as well, that we are, again, seeing nearly all of our deaths, nearly all of our hospitalizations or a huge chunk of our hospitalizations are those unvaccinated. So it really has become a priority. The way we're going to end this and you really get back to normal, normal, normal is to get people vaccinated. I do want to show the next slide because this has caused some confusion, I alluded to it earlier, is you hear stories of breakthrough infections. You hear them in the news. Fortunately, most of them are very mild, but they cause confusion, because I've had people I've talked to say, "The vaccines have stopped working. Why do I need to get it now because they're not working, because vaccinated people are getting sick?"

Or you hear things like, oh, half of our cases are amongst vaccinated healthcare workers, for example. Well, you have to know the population. Right now at Vanderbilt, we have some healthcare workers that are infected, fortunately, very low, not acquired here, but through the community. And about half are vaccinated and half are not, but over 83% of our workers are vaccinated. So two per 83% is a much bigger pool of that risk versus the unvaccinated. It's how you look at the denominator. So when you hear those stories, you've really got to understand the whole question. It doesn't mean the vaccines have stopped

working, it doesn't mean not to get vaccinated, but it is really confusing when you have stories highlighting, "Oh my gosh, some more breakthrough infections."

We'll see those, but they're really proportionately much, much, much smaller than among the unvaccinated. Next slide. This is a study that came out of the CDC a couple of weeks ago from an outbreak and really, again, showed that still, if you are vaccinated, you have an eightfold less chance of getting infected overall and a 25-fold reduced chance of getting hospitalized or dying. So even though the vaccinated can get infected with Delta, it's still much higher risk if you're unvaccinated. Next slide. This is also something that's really important that we've been showing folks. So not only are you higher risk of infection if you're unvaccinated, but if you do get infected if you're unvaccinated or vaccinated, at the early part of that infection, you're as infectious.

So those dots represent a study that looked at how infectious you are by this marker called CT value, which is when we test you, how much virus you have, and how robust it is, and it's been tied to how effective you can spread. And so the higher that up on the curve or really, the lower that value, the more infectious you are. So at the top, that's very infectious, and you can see the green dots and the red dots overlap early on, they're the same. So if you are vaccinated and get infected early on, you're as infectious and can spread just like an unvaccinated. But then notice about five days in, you start to see that the vaccinated group starts to really drop that level pretty fast.

And so they don't linger, and they're not as infectious as long as an unvaccinated person. So that middle section is why, and we'll talk more in a little bit about why CDC is saying everybody should mask, because there is a risk that if you are infected and don't know it, early on, you could be as infectious and spread to folks. Next slide. Slow progress. And that we did really well with vaccination. You saw the curves, they're going down. A little bit of bumps for the adolescents there, but you can now see actually the last couple of weeks, we actually are seeing an uptick in vaccination coverage, a lot in those states that I showed you that have really been devastated by Delta.

So it's unfortunate that folks are seeing people in their community gets sick to drive them to vaccinate. But this is really important. We've got to continue to really answer questions and motivate folks to get vaccinated, to do that. This graph on the right illustrates that if we stay at our current pace, when would we get a percent immunity or herd immunity of the whole population from vaccination? And you see on this number has waxed and waned. At one point last year, it said we'd be of herd immunity, 90%, July 15th, 2021. That was a little ambitious, we didn't make that goal, but now you see that it's next March if we keep at this current pace, but the hope is that we'll pick that up as well.

Next slide. So one big issue with vaccinations and I think confusion is, the vaccines have been approved by the FDA under emergency use authorization. That's confuse some folks. Some folks have called this an experimental vaccine.

That's not true. Experimental means you're in a clinical trial, half the people get a vaccine, half don't. It's being tested and see if it works or it's safe. That's not true, it is not experimental. It has been approved and met the guidance from the FDA to be under emergency use. Now, traditionally, emergency use authorization were for things like medical conditions where you may use up all therapies. So think of cancers and cancer patients, that all the regular chemotherapies are used, they're not working, and now we've got this drug that looks promising and it's not been approved yet, but will allow an emergency use of it because you need it, it may make a difference.

Before COVID vaccines, it was really a rarely used thing. It wasn't something that was given to millions and millions and millions and millions of people. So while the vaccines are under any EUA, the amount of safety data being tracked and followed for this is just overwhelming any other EUA in history. But folks are still concerned and anxious and really want full approval. And so we are hearing now the FDA has got all the paperwork for Pfizer first. Moderna is a little slow in their paperwork in. That we think we'll get full licensure and full approval by early September. And then once that happens, that also will allow the CDC to look at some questions about extra doses, boosters and other things as well. Next slide.

Now, to remind everybody, because if you're not vaccinated, I really want you to get vaccinated, that if you do, it's very common to have side effects, sore arm, feeling kind of achy. That's the vaccine doing its job. It's revving up your immune system to make those antibodies, to make those cells, to have in your immune library the protection so that when you see the real virus, you've already got the things to protect you on the shelf, you just pull it off and you don't get infected, you don't get as sick, So that's what the vaccines do. And so part of that revving up the immune system will make you feel cruddy, and that's to be expected. Next slide.

But, what people really want to know about is, what do we know about safety? I can't recall when I spoke to you all before, when we got the news of these vaccines and how amazingly effective they are and how safe they were in the trials, it really was a home run grand slam at the World Series, like, "Wow, that's pretty lucky." We got far beyond what we thought we would get because like a flu vaccine maybe works maybe 50% of the time, effectiveness. So we've continued to see that same general effectiveness, that same safety across all the vaccines.

There've been concerns about things like infertility, and we're not seeing those signals at all in men or women. The vaccines appear really quite safe in pregnancy and people that are trying to get pregnant and breastfeeding women. We do have a rare risk of anaphylaxis, so a bad allergic reaction about two to five events per million. And to put that in context, your risk of being struck by lightning this year is about one in 1.2 million. So you're close to being struck by lightning with that compared to that adverse event. There is a risk of heart inflammation with the Pfizer and Madrona vaccine that's fortunately been

very mild. Younger men mainly are getting that, but it is there. You see the rates there.

There was the very well-publicized risk of blood clots and low platelets from the Johnson & Johnson vaccine. Still also rare, mainly in women, younger women. And then there may be a signal of the Guillain-Barré syndrome, a neurologic syndrome with Johnson & Johnson. But all of these are very rare, are far more rare than similar complications from COVID infection. And I think if anything, these kinds of signals, the things like the myocarditis, the blood clot, the Guillain-Barré are all part of our safety surveillance system that the CDC uses to look for signals that says, "Are we seeing any harms? Are we seeing any challenges?" So again, to look at that.

We really are still blessed that these vaccines are really, really, really appear to be very safe as well and effective. Long-term side effects are highly unlikely. It's a fair statement to state that other vaccines, there's never been a confirmed side effect from a vaccine after two months after you give a vaccine. There's been some that have been proposed, autism, other things, but never proven scientifically. And when they look at those, they actually find that it's not true. So I won't say there's not going to be a long-term side effect, but if it were to happen, that would be the first one that's proven for a vaccine. That's a true statement.

I do want to emphasize vaccines and women's health. So again, and actually this week, the American College of Obstetricians and Gynecologist, as well as the American physicians around infertility treatments came out again and saying, really, these women should definitely get vaccinated because the risk of if you are pregnant and get COVID is severe. And I mentioned, we are seeing more pregnant women with this wave coming in very ill, some losing their babies. And so it is not a small deal. So if folks are trying to get pregnant, get vaccinated. Even if you're pregnant, go in and get vaccinated. Next slide is a study that's come out of Israel, one of several studies now, we have one with the CDC as well that's showing no increased risk of complications to the fetus, to the newborn, to the mom, related to those who've gotten vaccinated and others matched as well.

We're not seeing increased rates of these complications in very large... these were about 15,000 patients. The CDC has published their study on 35,000 patients followed. So really good numbers to show us that we are not seeing signals of complications in women who are pregnant who get vaccinated as well. Next slide. This is a question that I'm probably asked multiple times a day of, what about boosters? Will we need a booster? Pfizer had come out about a month ago to say, "We've already applied to the FDA for a new booster." Then the FDA came out that afternoon and said, "Hold out. Hold on there, Pfizer. We don't think you need a booster yet."

Israel and some other countries have started a third dose of folks that are higher risk, like the older adults, immunocompromised folks. And so that's a big

question. There's also a larger ethical global question of the vaccines are still doing what we need them to do with complications, and many areas have never gotten their first dose. So how do we as a global community wrangle with that? I think there will be some instruction in the next few months on who needs a third dose as part of their series. Do we need to be giving transplant patients dose three? Who needs to get boosted? I imagine at some point we probably all will get boosted, maybe, I think so. But I don't know the timing of that. And I don't think we'll all be in the same wave, honestly. So more to come.

As I mentioned, the EUA does tie things a little bit, but that's going to be off the table in a couple of weeks. And the CDC has already been looking at indications for third dose and booster as well. So I think you'll hear more of that. I've heard people ask, should I get an antibody test to see if I responded to potentially... We know folks show up at vaccine places and say, "No, I've never had it," to get a third dose. And they check antibodies. The antibody testing that's out there may not test for that spike protein, they may test for other parts of the virus that you wouldn't get to from a vaccine.

And even if you don't have antibodies, it does not mean that you've not been protected. And FDA came out this week and said, "Do not check antibodies, it's not indication at all and should not be checked to assess immunity after vaccination." So, if that's a question you've had personally or some have asked you that. Next slide, a very common question is, what about the kids? We know that adolescents 12 to 17 year old can get the vaccine, Pfizer. This is my lovely 14-year-old daughter who when she was able and they approved the adolescent vaccine, was able to get it, and awesome. My 16-year-old son got his two days after he turned 16 and could get it when it was just 16 and up. For the younger kids, we don't know yet when that will be approved, we were hearing December, January.

The FDA did announce a couple of weeks ago that they wanted Pfizer, Moderna to expand those trials, because they want to make sure they don't see a myocarditis signal in the little kids to do that as well. One thing I will say about kids and just to caveat. We've heard a lot about our kids at risk to get sick, unfortunately, so far, they've not had nearly the rates of complications. Some have, we've had some deaths, we've had some severe illness as well. What we are seeing and hearing with Delta from our colleagues to states west and south of us, they are seeing more sick kids, previously healthy kids, requiring ICU care, healthy kids dying now from COVID. So I think that's a marker of the infectiousness of it.

I think the other thing that we're going to be seeing is that as kids go back to school, which I think is really important that kids are together in school to learn. We learned the downside of people not being together, the psychological impact, but we also have to recognize that kids are going to be more likely to expose each other than they were at all at any point in the pandemic. So we are anticipating we're going to see more kids get ill. And so that's the whole issue about, do you mask? I just got a text this morning of, there's a district in

Arkansas that was a mask optional school district that had over 800 kids now out with COVID. Now, fortunately, I think most are doing... they're just sick.

But again, I think that's the next wave of questions. So it does look like for the vaccine for kids, it's going to be a little while longer for the younger kids. And so my message is, it's all the more for those around those kids to be vaccinated because I don't want my kid to be the kids, even though there's not many that are getting really sick, more are, I don't want my kid to be that one. And again, we can't necessarily predict who that's going to be. Next slide.

So where are we heading? A month ago, I thought we were ready to get off the rollercoaster and be back to normal, but we're not, and that's where we are, and that's okay. I think we can continue to push and motor through this. But I do want to talk about some recent changes from the CDC. So next slide, we'll talk about them. And they did because a little bit of confusion to folks. The CDC a couple of weeks ago, based on that infectiousness data I showed you with Delta, based on the attack rate, based on the surge that we're seeing across the Southeast, and now moving into other parts of the country, is they basically changed the recommendation now that said if you're fully vaccinated, we now recommend, if you're going to be a public indoor setting, in an area where you have substantial or high transmission," which I'll show you that graph in a couple of slides, you should now wear a mask.

If you're like me, I'm fully vaccinated. I've gone through the stages of grief, I was angry, I was sad. I've now accepted it. I now go to Publix and Target and I wear my mask. And I do it, not that I'm as much worried about me personally, because I'm not immunocompromised, I may get a really bad cold and feel really cruddy, which I don't like, but I'm worried about, A, spreading it to those around me that can't be protected. And if I can do anything to prevent this surge from getting worse, that's the thing. Because I will tell you, we are seeing hospital and healthcare systems across the South become overwhelmed to the point of inability to deliver health care to anyone.

And I have a good colleague in Louisiana who made a very impassioned plea to that state, that their hospital at LSU, they don't have the people and the space and the capacity to care for ICU patients right now. So people are showing up needing an ICU care and they can't meet that need. And it's heartbreaking that we're at that point. And so that's why I wear that mask. So that is something that has changed. Next slide, you'll see, other places have started to move to that. Obviously, masking is a very political issue, unfortunately. Davidson County is not going to move to a mandatory masking again, I just don't think that's going to happen.

It's going to be on all of us to do it at our individual areas. And so you're seeing groups like Disney, you're seeing groups really say, "We're going to require mask again." I don't like it, but the harm of not masking and spreading to others and worsening the surge is far greater than any harm of having to wear a piece of cloth on your face. And I think that's truly where we are. And so I think just

where we go... On the next slide, you'll see that at Vanderbilt, we have had to, I hate to say go backwards, but we're addressing the trend and now we're doing what we need to do.

So our masking is now gone backward. We are now requiring it. And so we have to wear that now in clinical areas, public non-clinical areas, were back at it, no matter your vaccination status. We're now moving to more virtual meetings again. And you may have noticed that we actually are... we're healthcare workers. We have people that are vulnerable around our midst. We are like a lot of other medical centers now, we are requiring COVID vaccination for our healthcare workers as a condition of employment. That we really don't feel that if you're going to work in healthcare, no matter who you do or what you do, you could expose folks and cause harm, and we can't do that as a healthcare system as well.

I know Ascension is also doing that as well. And so that's how Delta has impacted us as well. A couple of few more slides, and I know we have plenty of time for questions. So next slide just shows you where are the areas of high substantial transmission that CDC would say, "Strap to mask indoors." Unless you live in Vermont, which has the highest rates of vaccine coverage, and even they're getting a little tricky. You see it's everywhere basically. Last few slides, next slide, what do we need to do? I think I'm going to go to the bottom one first, we have got to get people immunized. And I'll say this, I say I don't like to use the term vaccine hesitant because I think that puts the direction on someone who has a lot of questions, and it is really confusing out there to weed out what's true and what's not.

And I've had conversations with people that they're not anti-vax, they just hear all this stuff and they just don't know. And we've got to get to those people and really give them the facts and really get them vaccinated. We don't want them to be harmed, we don't want kids to lose parents, we don't want parents to lose children. We can't be that way. We've got to get people immunized. It is safe, effective, we have that good data now. It is time, and we're going to get through this pandemic vaccinating.

In the interim, we got a mask where we can, keep your distance. Some of the things we did last year that we call the hygiene theater that we thought would be good, we probably don't need to do as much, like spraying out everything in the world and bleaching your groceries. You don't have to do that, just wash your hands. But some things are really important and masking is one of them if you're in these indoors not well ventilated places as well.

My last side, we show this a lot in our presentations about what will the future look like? Where are we going? What will we learn with COVID? I do still think... Sorry, there was a question? Sorry. On the next slide, you'll see, I do think we'll eventually we'll get COVID-19 under some degree of control. We are not going to eradicate COVID-19. That will not happen. It is here, but I think what you're seeing in fully vaccinated people, it's basically, not to be glib, a really bad cold,

but if you're not vaccinated, it's a really devastating disease or has the potential to be.

So I think we'll move more to where hopefully it's more of a bad cold and we can protect those where it may not be. We're going to have increasing data, I think the robustness of data across the world about variants and other things. We're going to continue to have testing available, and how we use that, I think is not totally clear because I thought for a while, we were getting out of the woods with testing, but we may now more, particularly in folks that are not vaccinated, they may need a test before they can do things or be vaccinated.

We're going to have some more treatment, and we actually can treat COVID fairly well now. We've really made remarkable strides in treatment of what works, what really doesn't work, what's not effective, and we actually may have some oral antivirals we could give to folks before they get sick enough in the hospital. And then we talked about variants and booster, and I think we'll have a better understanding of long COVID, why it happens, how do we prevent it, why are some people more risk to get it.

It can be really devastating in folks that have had this mental fog, cardiac lingering side effects, really, really pronounced for months after their initial infection, long after the virus has gone impact. And I think we have to learn from this is that we really had a really threadbare public health system that we had not really supported as what it really needs to be. And unfortunately, I think in the pandemic, a lot of our really smart public health people are exhausted and tired and many have left. So we need to reinvest in that to help with that, because there'll be another thing.

I plan to be retired when that happens, because this was a pretty long year, but in all seriousness, we have to not forget about those resources for the next time around because we were caught flat-footed because we hadn't supported that infrastructure for so long. But happy to take questions. Hopefully I'm not a Debbie Downer too much, but it's just where we are, we'll get through it, but I think just we need to get people vaccinated. I will take any questions, nothing is too wild. I probably heard. So happy to answer questions.

Donna Skupien: Perfect. Thank you so much, Dr. Talbot. That was very, very informative. We really appreciate the update for sure. We have so many questions and there are definitely the gamut of all different topics. The first one says, how did the occurrence or severity of side effects of the vaccine compared to other vaccines or other commonly used medications?

Dr. Tom Talbot: Let me talk about those expected symptoms, the sore arm, the feeling cruddy that is fairly short-lived. These vaccines in general are a little bit more likely to have those then like say a flu shot, but there are other vaccines, if anybody out there has ever had the shingle's shot, the shingle shot is about twice as much reactive. So it's in the middle of vaccines. I guess one good point about me being over 50 is as you're older, you're less likely to have those side effects. So I just

had a sore arm. But my teenagers, I thought they'd be laid out for days because they're teenagers and would feel cruddy.

They didn't have anything at all, they had maybe a sore arm. So it's not necessarily predictive of that. Fortunately, those were fairly short lived, usually about a day. So I've always tell folks if you're going to get a vaccine, don't have it the day before your birthday party, and hopefully, your birthday party, everyone is vaccinated anyway, so why are you having a party without that? But anyway, because you won't feel well to do it potentially the next day.

Donna Skupien: Thank you. It might be too early to tell, but can you tell us what we know about the Delta vaccine? Is it possible to get that variant twice?

Dr. Tom Talbot: I would say it is possible, because we are definitely seeing folks with natural COVID get reinfected with COVID. So I would assume it would. And actually, I probably should take a step to talk about natural immunity because we didn't have a slide on that, but I'm sure you've got questions about that.

Donna Skupien: I do.

Dr. Tom Talbot: So let me hit on that too while we're on that phase too. What we are learning now is after you get an infection, you do amount some degree of an immune response, both antibodies and cellular that's there. What we're seeing when you compare natural immune response and vaccine response is several things. One is, the level of the really protective antibodies in natural infection versus vaccine, vaccine is overwhelming much, much higher and stronger. And we see more likely folks losing their antibodies faster in natural infection. So that's one.

We're also seeing that the type of antibodies is really important. So there's a part of the virus that is really important to the virus, it's how it sticks to things. It's also the part that's switching in the variants. So that's why the variance, "Oh, I can allude this thing." So with the vaccine, what we're seeing is the diversity of the types of antibodies that can bind that area are much broader so that if it tweaks and changes, the vaccine still sticks to it. Natural infection is much more limited. So it's really limited to the one you saw. And so if it tweaks like with a Delta variant, you lose that ability.

Natural infection has antibodies against other parts of the virus, but those don't appear to be as important as these do. The third thing I'll say is, there was an interesting study that came out of the UK, because they had Delta before us. And they looked at the really important antibodies, the ones that we call neutralized. So they're the ones that if the virus comes into your body, sticks on that virus so it can't get in your airway cells and make daughter viruses and spread. That's what the virus wants to do, it wants to replicate and continue to move on.

So these antibodies stick on that virus when you're exposed to it. And what they did is they looked at three groups. They looked at people with natural infection, and they looked at people that had gotten AstraZeneca vaccine, which is a two dose vaccine. And they looked at people with Pfizer vaccine. And the vaccinated folks for both of those vaccines, if you had one dose, the antibodies you need against Delta, you didn't not make enough to hit the threshold you need to neutralize Delta with one dose of vaccine.

Once you got two doses, everybody had enough, they were well-protected. So there are folks out there that had dose one and said, "Oh, I felt cruddy, I don't want dose two. I'm fine," Delta is changing that. Delta now looks like you need two. If you look at natural infection, if a natural infection also got vaccinated, they had plenty of those antibodies for Delta. If they never got vaccinated, the natural infection folks did not have enough level of those antibodies to protect against Delta. So it looks like what we're seeing is they had antibodies against the older virus at that spot, but now Delta's switched that spot, so your antibodies don't work.

So long story short, it is really important, even if you've had COVID, I'm sorry you did, I'm glad you've done well, you've got to get vaccinated. Delta changing that even more so. I think that's important because I bet you got a lot of fake cases. We are seeing people that have had COVID coming in with COVID again that we presume is Delta.

Donna Skupien: Thank. Just knocked up about five questions. This next question is a summary of thoughts. And what we're hearing from employers is that we have employees and we have people within our lives that get their information from different sources and there's a big gap in what we know, and what we fear, and what we believe to be true. What would you say is the single most trustworthy source of information that you would have folks point to that you feel like is perhaps the least politicized or contaminated?

Dr. Tom Talbot: I'll be honest with you, anything on social media, I would ignore it. And there's some good, smart folks on social media. It's so confusing. I think the CDC is still, even though they've had their stutter stocks, they're still a good, reliable place. I would hope Vanderbilt is a good source of information. And that stuff that's out there, I have talked to folks and seeing what they're getting sent on Facebook and Twitter, it's stunning how... And my wife also does vaccine work and she's actually part of the CDC group reviewing the data. She she's been talking with some folks and she saw some of these things.

She's like, "If I didn't know better, and I got it, I'd be terrified at this vaccine." But the things are out there, absolutely wrong, they're factually incorrect. And so I think find that trustworthy source and try to close out the noise because there's so much noise out there and it's exhausting. It's mentally exhausting. Hopefully Vanderbilt's a trusted source. I think our Metro health departments have been outstanding messenger of that, and they're not twisting things. I

think CDC is as well. I think just other than that, maybe turn off social media for a while. It's crazy out there.

Donna Skupien: I think that's so helpful because I do think... And a lot of the questions, I have to be honest, I can see that coming through. So just that source [crosstalk 00:40:46].

Dr. Tom Talbot: If you think of things like we hear things like, "Well, what about things like ivermectin and vitamin D? And we could use those things." And we hear that. Well, first I would say, if vitamin D could cure this, we would be giving everybody vitamin D. It doesn't, it's not. It's just not been shown in trials to do that. No one wants to be out of this pandemic any faster than the healthcare workers here at Vanderbilt want to, because we are exhausted, we are mentally strained. The impact that spending has had on our healthcare workers, and now with this new wave, that again, four weeks ago, we thought we were good.

We have healthcare workers just in tears that this is happening now and it's happening that was largely preventable. If we could give you vitamin B or give you a pill, Lord, we would do it, no one's going to hold that back. If we thought mask were stupid, we wouldn't be recommending it. It's just we've got to use the science. And so it is confusing, but that's my plea to everybody, just turn out the noise or question it,

Donna Skupien: I think that's incredibly helpful advice. As we're talking to folks, particularly in the workplace, I know that it's been difficult for leaders to really toe the line there. Another question we get a lot, there are some companies that are going with a vaccine mandate, others with some restrictions or incentive programs. You see a lot of employers wrestling with where's their place on this, and what is their industry? What precedent is being set within their group of peers or colleagues?

Knowing that 100% is likely not attainable and even at Vanderbilt, there's some small exceptions that are made for different reasons, what would you say is a good target rate for an employer to shoot for? What would be something they could share with our employees to say, "Hey, here's the number we need to hit as an organization to feel like we've done our part"?

Dr. Tom Talbot: Yeah, that's a great, great question. And my number's higher than it was pre-Delta, truthfully. And again, I'm definitely biased because we're in healthcare. Healthcare as an industry has been doing this for a while for our healthcare workers to mandate a vaccine. It started about 10 years ago with flu vaccinations and then measles and other things, because we've said, "We're a unique industry, we've got folks coming in, we can't expose them." So we really pushed to get as high a vaccination coverage as we can. And so all of our other vaccines, we're at like 95, 96, 90 7% vaccination rate as part of that.

We're trying to get there with COVID as we now roll out our requirement. Other industries have never had to face this for the most part. We know we really do health and wellness, we encourage our employees to do well, we incentivize them, but this is a little bit different. And so I do empathize with that challenge. I do really admire those that are doing it, I think is important, because I think we're at a phase now where I understand the personal choice, but with choice there's things you need to do, maybe it's more restrictions, maybe you're not going to be able to go to that concert unless you get a Q-tip stuck in your nose.

We're going to have more things like that. And so I think to me the number is as high as you can get it, but also you understand that there are some folks that may not be able to get the vaccine. Now, fortunately, medically, there's very few medical contraindications to this vaccine. Someone has a severe allergy, you can't finish the series obviously, but a lot of folks that we would typically give an exemption of things like a measles vaccine, which is a live virus vaccine, we couldn't give you if you had an immune compromising condition, you'd be exempted. That doesn't apply to COVID.

So there's not many medical conditions to do that. The harder one is the religious personal believe exemption pieces of that. You need to allow those and have thoughtful discussion on those. And that's really where I think it's a little bit of a struggle. A lot of the faith organizations are come out with positions promoting vaccine like the Catholic Diocese and things as well, the Vatican, about the importance of vaccination, that helps. I think to me, I will tell you, as we look at these exemptions where I totally respect and believe in devout beliefs as a Christian I want to do X, I struggle that as a Christian because I don't think the Lord wants us to infect other people too.

And so I think it's a hard thing. But you do need to accommodate that. So a lot of companies having never done that, I think it's going to be a ramp up, but I do think...

I said, there may be things that may not be a requirement for mandate, but you may have to do other things like again I said, to go to a concert, it's either vaccination or swabbing the nose. I think that's going to be our reality for awhile. And I think from a public health standpoint, we need to do that. We got to get out of this pandemic, and we'll get back to normal, but that's what we're going to have to do.

Donna Skupien: Thank you so much. That was really, really very helpful. What can you say to parents who want to listen to, obviously the source is the CDC, the new requirements coming out and the recommendations, local schools may or may not be adhering to that. You want your child to be in school when other children are being there. What are the things that you would say to them to try to empower them or to make the most of that situation, that challenging situation?

Dr. Tom Talbot: I think it's a real struggle. I'm advantaged that my two kids got vaccinated. They were eligible too, so a little bit less, but what I would tell parents is that, we learned a lot with the pandemic and we learned things that didn't work and we shouldn't do. And I think one thing we've learned was the potential harm of remote learning in our kids, both psychologically, developmentally, educationally. So I think from that same point, we need to get the kids together. We need to do it in a way that can do it. It can't be normal like 2019, but we need to do that.

I do think that kids should be massed in school, even vaccinated kids right now. And I think honestly, we worked with schools all last year, kids are really resilient. We had three-year-olds that just wore a mask and had no problem with it, and they weren't passing out and falling over, they were fine. The parents were more anxious about the masking, but the kids did fine. Now, there's some accommodations you make for kids learning how to read, they need to see the teacher's face, so where they use a face mask or a clear mass so they can do that. There's ways you can do that and still protect them.

There are some things I don't think you need to do as much anymore. Do we need to, you only you have three kids that you hang out with and that's all you see for the whole year? That's probably not as healthy. But do things that... If you're in a district where mask are not required, I would mask. So my son's school is requiring masking, my daughter's not for everybody. She's going to go in a mask, because she's vaccinated, but we want to protect the others. So that's my advice to that. And I do think if you can get vaccinated, do. Absolutely do. The infection can be really devastating to our kids, and definitely get vaccinated.

Donna Skupien: Absolutely. And parents always have the right to reach out to their school board and to let them know.

Dr. Tom Talbot: Yeah. I think that the hardest thing I think with masking, and again, I'm not going to get political, but I might maybe, but the virus doesn't care who you are and who it infects. And so the fact that masking became like a actively thing that you cannot do, that's so against what we're trying to do, We want everybody back to normal, we want the economy to open up back to normal. And we don't want to lose the traction we started getting in May and June. If it's a piece of cloth on a face, that's not a big ask. It really isn't.

Donna Skupien: Awesome. Thank you so much. Still some skepticism coming through about the actual process, the vetting process that the vaccine went through, a prescription that maybe there were key stages of research that were skipped or averted. Is there something you can say to help alleviate that concern or to speak to how we were able to get the vaccine approved so quickly?

Dr. Tom Talbot: Yeah. This is a really common confusion. And things like Warp Speed, which was great, but that term goes, "Oh, that's really fast." Or things like, "We have a vaccine for this, and we don't have a vaccine for HIV, that makes no sense." So

you hear those things. I'll give you a couple of facts and what's the case, and hopefully reassure you. And again, I'm one voice, but we were really lucky with COVID. We were really lucky with COVID that it was a coronavirus because we had the SARS outbreak in 2003 that was another coronavirus that made people sick, killed people, but you knew who was infected because they felt really cruddy and they had a fever.

So only those that were infectious had a fever. So you can do things like thermal cameras in the airport, and you could catch people and isolate them really easy. But it scared people enough that they said, "This will happen again with maybe a virus that's a little bit more indolent, more hide in the shadows." And so they did research, they understood the virus. They understand how it made people sick, how to treat it. They made vaccines against that SARS virus that some didn't work at all and made things worse and some worked. So they had that science.

So then when it was a coronavirus, now, oh, it's not just fever, you can have no symptoms and spread to everybody. They had that. So that was already done. They then because it was a global pandemic and killing people around the world, the usual way we do vaccines is you take the best ones from science, from the lab and say, "Okay, animal studies." And go, "Those two are the best, we're going to put our money in those two." And you go run through the human trials and do all the things you've got to do, the safety benchmarks. You can't continue to moving.

If it works great, well, we'll have a vaccine, if not, we'll go back to number three and number four. In a pandemic, that process that can take years, we could not do that. So they had to stack the deck. And the way they stacked it was, they amped a lot of money into a lot of companies and said, "You all still have to do all the basic science, all the animal science, but we're going to start you at the starting line to be funded to do it. We're not going to just pick a couple. We're going to give everybody the chance that can do it." And then you still have to go through the same trials.

The length of the trials are the same, the safety parameters of the trials are the same, the phase one, phase two, phase three. Those were no different than trials before, that did not change at all, but more people could get in the line and do it together and do it alone. The other thing was that they also gave money to make sure you manufactured vaccine. Because if Pfizer came out last December and said, "We have a great home run, grand slam vaccine, it's safe, it's effective, yay, yay." And then FDA said, "Great, let's use it." And Pfizer said, "Okay, we need five months to go make a bunch, so we'll come back to you in the spring, hang on."

That's not tenable, we had to start giving it to people. So they paid for folks to make the vaccine sitting in a warehouse. And some vaccines, there've been five or six that have gone through the trials and got stopped and didn't work. They weren't safe, they weren't working. And they were already manufactured and

they threw all that stuff away. So that's why we were allowed to go fast. As part of the EUA, the same safety steps were there, the same parameters. The biggest difference in the EUA and licensure is that EUA allows you to use two months of data after the last dose, and licensure is six months.

So they were able to do it a little bit shorter in that sense, but we continue to follow those safety parameters. So I get that perception of that, I get that as well. The other thing on why do we have a vaccine for this and not HIV, every virus is different and we would love to have a vaccine against HIV, trust me. It's a different beast. And maybe there's something we'll learn from the COVID vaccine that we can apply to HIV vaccine.

Donna Skupien: Absolutely. Thank you. We have so many questions, you would not believe. I think this is going to be-

Dr. Tom Talbot: I'll be shorter.

Donna Skupien: No, no, I'm just saying, I think we're definitely going to have to start writing some of these out. We'll definitely make sure that we answer everyone's questions, but it's impressive. So folks are listening and they're definitely interested in what you have to say for sure. Some practical questions about getting back to work. We talked about masking, we talked about vaccinations. Of course, we want to encourage those most. Tell me about physical distancing and how important that will be.

If folks are sitting at their cube and they're working on their own and they're not collaborating, do they need to keep their masks on or can they remove them? What do we normalize this in a way that we're still being protected, but we're able to do our jobs?

Dr. Tom Talbot: We have said that you're in your space and working, obviously screening people, make sure they're not actively sick and making sure that it's evaluated, because we're really bad about sick people working. But if you're there working in your workspace, you don't need to mask, it's exhausting. But then when you get up to go like a conference room meeting or aggregate, or the break room and you grab your coffee or whatever, put the mask up and do that. In places where you may not... We talk about having your bubble, there's folks around all the time that are your bubble, you may be a little bit more comfortable.

It's not perfect, yes. Could you get exposed or expose others? Yes. But I think we have to pick the strategies that are more likely to cause transmission and break those and layer them. So not work sick, getting vaccinated, those kinds of things as well. And some of that stuff we did before, we don't need to do like foggers throughout the office space at night, you don't need to do that. Yeah.

Donna Skupien: I think that's so important. You talked about hygiene theater and what is important. It's important to have clean hands, but not to have the assault of

cleaners that I think we started out with, that's really important. Can you tell us about the rapid tests? Do you feel like they're accurate, are they able to pick up this Delta variant as well as they were the original strain?

Dr. Tom Talbot: They are. They seem to pick it up. Now, there's rapid antigen, antigens are okay. They're better if you're symptomatic than non-symptomatic. And then there's rapid nucleic tests, which are pretty good. They're good. They're another layer of things that we had there so we know at the time are you carrying virus or not. There can be some false negatives, but it's better than not knowing. And so when you talk about folks, like, do I test someone before they show up and it's within the reasonable timeframe, it's a good intervention to use for sure.

But recognize that you may miss some folks, but it's okay because if you're not doing it at all, you're missing more folks potentially. And I think you have to weigh with the cost too.

Donna Skupien: Absolutely. Thank you so much. What else would you tell employers that maybe we didn't cover? There is again questions, they were undoubtedly going to be phased with a number of questions from their employees. I know some workplaces are able to work remote and others aren't. What would you say as a general piece of advice to employers out there that are trying to navigate the science, but also trying to obviously keep their businesses going and recuperate the months of loss that they've had potentially? Is there anything-

Dr. Tom Talbot: I think don't let perfection be the enemy of the good. I think we know we can't close businesses, that's not an option, just like we can't have all the kids not be in school. So we have to navigate and figure out, "All right, can we do this in a way to continue to maintain, maybe we do some things like you got a mask, so I can be open and mask to help mitigate some of that." Will we mitigate all of it? No. But I think be comfortable with that. There's things we can do that are fairly depending on who you talk to, less burdensome to help with that. I think that's going to be what our new normal is for awhile.

I don't think knock on wood, even with the Delta spike, we're seeing, we're going to get to a place at all. We can't get to place where we will shut down again, that's not an option, that was too detrimental. There was too much harm from that. And so we got to figure out how we can navigate through this. And there may be a need at times to ratchet up or hopefully start to ratchet down. That's my just wisdom. We're dealing with the same thing at the hospitals, manage and navigate that.

Donna Skupien: Thank you so, so much. And thank you everyone for all of your great questions. Please know that we will answer your questions in writing if we weren't able to get to them. I want to thank, Dr. Talbot so much for this information, it is so helpful. I'm going to hand it back over to, Brent.

Brent McDonald: Yeah. Thank you both of you. I really appreciate your candor as we try to go through this. I do have one summary question, it's really a three-part question. I'm a big fan of takeaway bullets for folks. And so let me just ask this, it builds upon what Donna just asked you. Could you just briefly put three bullets together of what are the top three reasons why we're in the bind we're in, whether top three things that we can do to get out of it, and what would be the three things you would say to employers that would be most impactful for their workforce?

Dr. Tom Talbot: Okay. I think the top three reasons the bind we're in is honestly, we didn't vaccinate enough people. We didn't get them comfortable and get them what I call vaccine ready. And I think that's honestly the biggest driver. If we had had more vaccinated, Delta couldn't circulate. And that's not just Tennessee, that's globally, both access and all that. So I think that's the answer with that. I think things to do moving forward, I think, again, broken record. Number one to end all this is get people vaccinated, answer their questions, hold forums. I am serious with this.

I will talk to anybody, individually, because if I get one person vaccinated, it's one less person, because I'm sick of this and I don't want people sick and I want to get through it. And I've talked to three people today, and I know it takes time, but if we need to do that and have questions and sort that out and stop the noise, it's that. I think in the interim, we've got a mask, masking inside to reduce that spread. And I don't think there's a third really, I guess third, try and keep some semblance of normal life while doing it. And then Brent, I forgot your last part.

Brent McDonald: I think you got it.

Dr. Tom Talbot: But that was like nine questions in one.

Brent McDonald: You've covered them. Good takeaways for everybody. We thank you, Dr. Talbot. Donna, thank you very much for your time and facilitating the questions. We thank everybody that participated and listened in today. This is recorded, it will be shareable. If you register, you will receive a link to this. Please share it. Please get this information out to folks so we can deal with real facts and real accurate information on both the virus and vaccinations.

Please email any additional questions you might have to Employer Solutions, email is on your screen now. And sign up if you haven't to our ongoing communications that we send out. We send out updates and information on a fairly periodic time. So please do reach out. I think that's it for today, but we appreciate you hanging in with us, and I believe we will send out answers to additional questions that we didn't get to during the session. Thank you very much, everyone. Have a great afternoon.