



SUMMARY TRANSCRIPT

Roundtable Session: COVID-19 Vaccines and Therapeutics, and Inside Look

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Medical News on Vaccines – mRNA Technology Advances Are Huge!

I thought I would highlight is just very quickly the medical news that I think a lot of people have read about my views on what will likely play out operationally over the next six months, nine months, uh, and then maybe some broader context about what this means.

I will focus on what you don't read in the media since when you're an insider and you read stuff about your industry and the media, it's just sometimes kind of surreal how silly or ridiculous it sounds, but I'll try to focus on that. A lot of the year has played out like a lot of us in the industry imagined at the beginning of the year with really only one exception so far.

Initially when you have a new disease and this is broadly true, not just in pandemics, there's a ton of confusion and often very high fatality rates for severe diseases. And most of the progress is made not with therapeutics, which often take years to develop—with COVID, it's a really exciting exception, but actually basic block blocking and tackling as physicians and hospitals and emergency rooms figure out what is the best sort of standard of care and best practice. And you see that playing out over the last nine months—when to intubate and how to treat patients has contributed probably much more than any therapeutic to the very strong decrease in case fatality rates.

Since the beginning, we expected vaccines likely would work because as a number of immunologists pointed out, this is kind of a dumb virus. Its effects of course can be quite unusual, but it's not like HIV, which hides in your immune system. And, therefore, it's very difficult to develop a vaccine against. It's not like some other infections or viruses where they hide their signature proteins that are easy to target. This one hangs out in the blood. Its spike protein is a really obvious, really easy target and it makes it really available. We thought there would be a pretty good chance that vaccines would work. We're pretty lucky that in the last 10 years mRNA technology has advanced and is a little bit faster than with traditional vaccines. If there's any one surprise it's at the initial data from the MRN vaccines, the Pfizer and Moderna vaccines are probably everybody's read about, exceeded expectations. Nobody knew, we were all hopeful, but it really did exceed expectations.

Expect Efficacy Rates to Drop, But Don't Worry... They Always Do

One thing you don't read about in the media, there's kind of a fairly sizable caveat that this is very early data, meaning you're looking at people like four weeks after they got the vaccine that's at the time when their resistance, the troops that you create inside their blood to fight bad guys, are at the absolute



highest. They always decline after that. What is unclear is what will the rates look like after two months after six months after a year? We don't know, we don't have that data. Almost certainly the numbers will go down. What you should keep in mind is don't worry if they go down, it's not a big deal. We have vaccines that are very effective at much lower numbers.

Optimism With Vaccine Progress - #s and Efficacy

What else haven't you heard about in the media? Oddly people don't mention the third good piece of data, which was the Russian vaccine showed encouraging results with a somewhat smaller sample size.

The one thing you read about in the media the most is the vaccines. It's very encouraging for many different reasons. This is just the first two of about a dozen vaccines that are coming up in the next six months. There are a total of 200 vaccines in development. The industry has never seen anything like this ever in the history of drug development, which is one of the reasons, many of us, including myself, we're optimistic. We've essentially cured hepatitis C a couple of years ago with roughly 1000 times less resources that have been devoted to this problem.

So that's why a lot of us were optimistic. It's playing out well, a couple of hundred vaccines in development. You'll see data very, very soon on many more. I think we will have and be faced with a very interesting choice of many possible vaccines. The first two, the mRNA ones, are very encouraging because they target that same kind of obvious protein target. But they're not the most convenient cause they require a lot of storage and they're a little risky on the manufacturing side.

Promising Advancements in Treatments

I'm optimistic, not only about the vaccines, but just as much about the treatments, the drugs that you get when you got the virus. Those take a little bit longer to develop, but the first two, from Regeneron and from Lilly, there's a lot of reasons to be excited about them.

Regeneron in particular is a very experienced company. They really know what they're doing. They develop the same kind of technology for Ebola. Lily is newer to this. But I have a lot of confidence in the Regeneron drug. That's actually what they gave President Trump when he got ill. We're going to get data from that very soon. And I think that will probably be the first major contributor on the therapeutic side to reduce in case fatality rates. So all that will play out in the next several months.

Operational Challenges to Distribute and Decide Who Gets What/When

On the operational side, I'm optimistic about one thing, a little concerned or pessimistic about another. I'm optimistic about the manufacturing. I think never in a drug launch in industry has anyone ever invested this much in manufacturing at risk before data. I'm actually optimistic the private sector companies that are doing this. This is what they do for a living, logistics on a global scale. This is like there, if anybody's inside, it's just an incredible feeling. This is what you live for to make a difference in the world. This is why you joined the company. People are as fired up as they've ever been inside biotech or pharma deep inside these companies. This is your reason for existence. This is your moment in the sun. Sometimes Pharma gets a bad name in the press, but not anymore, not when you can save a billion lives or treat a billion people, prevent a horrible disease. I have a lot of I'm optimistic on the manufacturing side.

There are some serious logistical challenges with the really cold refrigeration needed for these early vaccines. You won't have that for the ones that come next year. But I feel good about that. Where I'm somewhat concerned or pessimistic is with the early months of distribution. You know, you might have 70 million doses from these first two within the next month or two, which is fine. But again, that's only treats about 30 million people because everybody gets two doses. So you won't have enough for everybody. The logistics of how you decide who gets what, that's a federal and state government thing. I think the federal government has demonstrated, really convincingly, that they're not very good at this over the last year, not the current federal government. I'm somewhat concerned about that between now and March or April, when things are sort of rolling out, it's going to be a real unpleasant mess about who gets what. To the extent that federal and state governments are involved, which they will be, how do you validate who gets it and who not? It will be unpleasant, but it'll be over probably by March for April when the vaccine will be up to supply and you won't have these issues.

History of Treating Disease – An Incredible “Leap” in Tech Changes Everything in Last 6 Months

On the bigger picture I can tell you what I'm sort of personally excited about. I've spent a lot of time on history of science and how that impacts future kind of crazy ideas in science and development. What is kind of missing from the story is the fact that what we've seen actually just in the last two weeks is something pretty historical. For roughly 10,000 to 50,000 years of human history treating disease meant reaching for a plant like Willow bark for pain or opium for other stuff. About 200 years ago, when we really started to develop chemistry and being able to extract those chemicals from plants, then we created the pharmaceutical industry. That gave one of the earliest ones, aspirin, which was an extract from Willow bark.

About 100 years ago, there was another big change where we said instead of taking these little chemicals you inject or take orally and they, they they're like little locks that fit inside these giant protein keys and stop them from doing bad things inside your body. That's essentially all of pharmaceutical. About a hundred years ago, we realized that we could use proteins as drug. Those are those big molecules that actually do something in the body. They take action in the body. They're responsible for cells moving or growing or dividing or healing themselves. And we realized with the discovery of insulin that we could actually inject proteins into people, and that was a new kind of drug. So that was pretty exciting, but it was kind of a challenge because you had to kill pigs or kill cows and suck insulin out of their body and give it to human beings.

That worked, but it was kind of tricky until the 1980s and we had this third huge wave. About 40 years ago there was another really big change with genetic engineering and the biotechnology industry being created. We realized, “hey, you didn't need to kill pigs and cows to suck up their insulin and inject it into people to treat diabetes.” We learned we could grow insulin in a lab synthetically. That created what is now a half-trillion-dollar industry in the biotechnology industry. It made incredible differences in treating patients and led to many of the most important therapeutics that are now protein drugs. That is kind of where the field has been.

There've been all sorts of interesting new developments, but mRNA is another revolution. It means instead of growing proteins in a lab, you have to put out all these dishes and get these cells and it is incredibly time consuming and expensive, you genetically engineer them to synthesize insulin or other proteins. You just essentially program the genetic code, press a button, it comes out of an apparatus and then you inject it into the cell where it goes into the cells, DNA, your own body's cells. Essentially you

are reprogramming your own body cells to be a factory. So you've moved from growing proteins in the labs as drugs, you skip that whole thing. You are going to grow your own drug. And that's what the two vaccines we are hearing about first, Pfizer and Moderna, are using. They just tell the body's own cells, "you guys make your own drug."

It really is another leap, like a fourth wave. It bodes well, not just for COVID, but for almost any infectious disease we might see in the future. I mentioned, I wrote a book called Loonshots. It's one of those crazy ideas that was dismissed. There was a woman named Dr. Katalin Karikó, who I spoke with briefly in 1995, she suggested this idea. She was a professor at the U Penn Medical Center. She was on tenure track and they denied her tenure because they said it was such a crazy idea. No hope. Eventually she left. She's now a senior VP at BioNTech, but she deserves a Nobel prize for her persistence. You read in the Journal or the Times about the biotech companies. I used to run a biotech company. Honestly, they're a dime, a dozen—all you need is a venture capitalist gives you money and you license a technology. This woman and her collaborator, Drew Reisman, are the true heroes. They came up with this crazy mRNA idea. They persisted. People told them for two decades, it's a nutty idea would never work. I still heard people saying that as recently as six months ago, "man, I don't think this stuff will ever work." They persisted and persisted. It's like the best example of persistence, what you see in summit and business. By the way, when I talk to businesses and executive teams, I talk about nurturing crazy ideas and businesses.

Leadership in Crisis Means Transparency and Solutions

During crisis time, when there's confusion and uncertainty, people want visibility and they want facts because facts have certainty. They don't want a lot of opinions. They don't want, "things will be great." People you want to be visible and you want to just talk about facts.

The reality is I think through this we will have learned a lot of extremely important lessons. I think number one is the role of the federal government. Biological threats should be considered the same as nuclear threats. You don't rely on the private sector to defend you against a nuclear attack. You invest as a federal government against that. What people don't realize is that SARS COVID 1, the virus that came here 18 years ago, is 80% genetically identical to SARS COVID 2, which we have now. We just stopped the research. The drugs that we developed 18 years ago, very likely would have helped us avoid the problems that we're facing now. But we didn't understand that with biological threats there's a market failure, no company can afford to invest in stuff that they don't understand or see there's no return to shareholders. That's why federal governments exist, to invest in things that are market failures. And so what I hope the federal government will take away is the need to invest and prepare better for the next one, which I think should be very obvious.

Second is the need for simple solutions. One of the simplest things that could have prevented this ridiculous spread in the United States is these like home pregnancy tests, the rapid test. If everybody could do that, you really would not have had the level of outbreak. There was just total paralysis in Washington against us. It was very sad to see and I hope we'll learn that.

For leaders just reassure your people with facts, with data. This stuff is coming. It's working really well by March. There'll be a "not-so-positive" show initially, kind of a messy show, probably over the next three months about who gets the virus and that's okay. The numbers like 95% are great. They will come down and that's okay. We have 200 vaccines and so many therapeutics. We will be fine by kind of the end of the likely the end of the first quarter next year. Just hang in there.

Most Reliable Online Resources

There are some great COVID tracker sites—vaccine sites on BioCentury (<https://www.biocentury.com/>) or STAT news (<https://www.statnews.com/>). Those are probably the only two things you should read. And Michael Milken's website (<https://www.mikemilken.com/>). He actually has a very, very thorough a website. So those three sources, probably the best sources.

And I actually am optimistic about the change in federal government, because it's going to bring back using science and experiments rather than opinions.

DR. TAMARA SHEFFIELD

Medical Director, Community Health and Prevention at Intermountain Healthcare

Basics of Immunology – The First Step to Building Confidence in A Vaccine

If we are going to get individuals to receive the vaccine, once we know that it's safe and effective, we need to have thought leaders who are very confident about the vaccine who can understand what the vaccines do and help those that you are responsible for. If we can help you to be confident about it then we've actually been able to take a step towards communicating to those who will need the vaccine the importance of it.

I'm going to actually go and take a step back and give you just a little bit of basics on immunology. There are various types of vaccines that are being developed, but they all have a common thread. It's the spike protein and a portion of that spike protein is what everyone is using as their antigen. Some are using it for that mRNA technology where your own cells will produce that protein. Others are attaching it to another cold virus and adding a virus or two, or they're creating it in the lab in other cells in that recombinant technology. There are various ways they're making this protein, but that protein that we call an antigen is different, it is not a protein that is regularly inside of your body. So your immune system recognizes it as not right and then creates antibodies, which are a Y-shaped protein that do that lock and key and fit against that antigen.

And there's two things it does. One is a binding antigen. They present themselves with that bound protein and the antigen to their immune system and say, here we are—it takes the killer cells, get rid of this. This is not, this doesn't belong in our body.

The other thing though is you have antibodies that can become neutralizing antibodies. And what those do is that's why they've chosen the specific protein on that spike. The spike protein is the thing that helps the virus inject itself into yourself and infect you. The antibody binds there and prevents the spike protein from infecting yourself. So not only does it present itself to be killed by your immune system, but it prevents the virus from actually doing what it wants to do to infect you. So that's the neutralizing antibody.

You're going to hear about binding antibodies and neutralizing antibodies. And that's the beauty of the technology is that we are seeing new neutralizing antibodies being produced broadly in individuals who've received these two first vaccines.



The First Two – BioNTech/Pfizer and Moderna

The two we've got are the BioNTech/Pfizer and Moderna vaccines, which they are planning in the near days to be presenting their data to the FDA for emergency use authorization. Once it goes through that emergency use authorization, simultaneously the CDC is going to be receiving data as well. They have an advisory committee on immunization practices that, will provide us, the providers, the recommendations of who to vaccinate, how to vaccinate them, what clinical considerations we should have, and who should not be getting the vaccine. We know right now that it has not been tested in children, so it's going to be a vaccine for adults, for non-pregnant adults, because it has not been tested during pregnancy, and for those who have an intact immune system so that their immune systems should work with this vaccine. Those are the individuals that we know it's being tested in currently. There may be other factors where they would say these other individuals should or should not be vaccinated. The CDC has been tasked for the prioritization who should get the vaccine.

On these two vaccines, they are two-dose vaccines. What we found is that the antibodies that you want to produce, when you get the illness itself in your blood, you'll see antibody levels that are then become protective. With one dose of these vaccines, you get up to kind of a moderate level of those antibodies. But with two doses, that's where we're seeing high matching in terms of those who have a high response in their serum of antibodies that we need to protect us. Those two doses are what we need, and we separate those by three by three weeks. It's 21 days for the Pfizer product. It's four weeks for the Moderna product. When we're talking about doses coming out, we have to be looking at the fact that it's really half the number of people to those doses, because they're going to need to have them both.

Where we provide these vaccines is really determined by a vaccine itself. In the Pfizer vaccine they are going to be sent in lots of thousand doses that have to be ultra frozen— that's really cold at a negative 70 to 80 degrees centigrade. They come on dry ice and then have to be put in specialized freezers. So we have some research freezers, but those are very few and far between and they're in communities. And usually are only in large healthcare research centers. So you'll have to have the ability to give a large number of doses in a very quick amount of time, um, and keep it stored at a, at a, at an ultra temperature. So there are real difficulties in terms of the logistics with the Pfizer vaccine. It becomes easier once we get Moderna vaccine, which can come in a hundred dose package and just be kept in your regular freezers that you would also store your other medications in.

Distribution Plan Realities – Next Summer Earliest for Broad Access

There will probably be some predelivery through our health departments, to these sites prior to FDA emergency use authorization and prior to the CDC recommendations, so that once those things hit and we have the green, green light, we can start vaccinating immediately. In December we'll probably have enough vaccine to vaccinate about 1% of the population with only one dose. And then in January, they're estimating one to 2% of the population, February one to 2%. This is either giving this second dose to that first 1% of people or a whole new group of individuals as well.

They have three types of three phases within their distribution. One is this highly controlled to a very small subset of individuals. They will have to be in those closed settings that can handle the number of doses and the type of vaccine and a storage helping to coordinate this. They're focusing on at very first as those in healthcare who are day in and day out in the ICU working with COVID patients on those floors, working with individuals who are infected, testing, the individuals who are coming in and actually



doing all the procedures on these people. These are the individuals who need to be protected first and also they're in settings where we can bring them in quickly and get them vaccinated in these kind of closed delivery settings. They'll then move into broader numbers of healthcare providers, so individuals in clinics or other facilities, pharmacists, etc. Then to those who are living in long term care settings and then also your first responders. These are the types of individuals who will be getting into that next first phase.

When we can start giving it out beyond these closed settings in public health sites, pharmacies, other healthcare settings, we can expand to people who have high health risk conditions, high risk workers, people who are aged 65 and over. The CDC is working on these plans. They really have been looking for rules of fairness and equity, to make sure concepts of equity or rural and urban equity, low-income high-income equity, racial equity, etc. This is all to make sure we are taking care of those who can be at the highest risk, but also taking into consideration that we don't leave behind certain populations in the process.

We are expecting towards late spring and summer when we will have sufficient supply enough types of vaccines out there to be giving it to the general population. That's when you'll be getting into regular healthcare settings on a much broader scale.

Myths About Vaccines – Of Course Your Immune System Will Activate and Cause Fever/Aches

The thing that would be really interesting is to see, we always have, when there's constrained supply we have large demand. As soon as supply opens up, demand seems to drop on us. Part of what we'd like is for you to help in developing the patience and confidence in the vaccine, and then understand as well, how, when you get a vaccine, there's a normal immune response. That immune response tends to be people get a fever for about a day. They have the aches and that feeling of illness. If they aren't infected, it's their immune system turning on the way it's supposed to do to produce the antibodies. Those are the symptoms or the responses in your body that normally come along. We have to help individuals realize we're not giving them something that's making them sick. We have to give them time off of their work to have that day after their vaccine to get to feel better as well.

We're working in healthcare because fever is a problem for us in a healthcare setting. It's an indicator of COVID. How do we vaccinate our healthcare workers, understanding that we may have people that we have given it to, that are taking care of him in the ICU, that all of a sudden have a fever, but we don't want them in our facilities because are they ill or not? We're going to have to work through those concepts as employers. How do we help our individuals have the time off to get the vaccine and have the dates that they need to recover from that there for their bodies normally have their process to have those symptoms that'll make them protected?

If everything is lined up the way that we're hoping, then we're looking to have the availability to broadly immunize the population through the summer. It's all dependent, though, in terms of community spread of virus. It is about how many individuals have antibodies, whether they get it from getting sick from the COVID and then having those protective antibodies, or they've been vaccinated. The great news on this is it depended on how effective the vaccine was at creating those antibodies. If we have a very effective vaccine, then fewer individuals have to be vaccinated to start keeping the spread down. It is all about us helping others to have enough confidence that we can get herd immunity by enough people accepting the vaccine. If the people don't accept the vaccine, all the work we've done will not make a difference



because you have to have a high enough level of protection that we're not having individuals spread it to each other. The spread has to be stopped in order for this to be an effective strategy.

DR. BRANDON WEBB

Chair, COVID-19 Therapeutics Committee at Intermountain Healthcare

What Works, What Doesn't – This is How Science Works

Thank you for the opportunity to be here. This is really a treat to be able to address this group. The reason I say that is because, independent of what's happening on the political landscape as we have been in this battle and in the trenches over the last year, we've recognized the importance of our community leaders and, in particular, the business community as such a powerful asset because of voice you have and the influence that you have with the public. This has been a remarkable thing to watch over the, over the course of the last year. We have seen a greater explosion in knowledge gain than I would say has ever exploded during the history of mankind. The knowledge gained importantly has actually been on both sides of the coin. I would actually submit that we have learned more about what doesn't work over the last 12 months than we've ever learned about what doesn't work for a disease than ever before. And that's really important because from a scientific perspective, we stand on the shoulders of knowledge about what does not work to find out what does work.

This is how science works. I think that's a really important point is that very frequently what we try doesn't work. And for someone like me, who's spent my entire career treating viruses, doing research, we knew right from the get-go that Corona viruses as a family are very difficult to treat. They are genetically difficult to treat. They behave in a way that makes them difficult to treat. Because of that, we have looked through a lens of very healthy skepticism and cautious optimism. The reason for that is that we know that it is very unlikely that these repurposed drugs are going to be effective. We knew that out the gate.

Treatment Lessons – Early Treatment Extremely Important, Target Toxicities Later

What we've seen over the last few months is that with good quality scientific trials that are conducted carefully, we've learned that targeting the virus early on in the disease is very important. And we're now starting to see a pivot towards therapeutics that really are targeting patients very, very early in the disease course. In fact, as soon after they're diagnosed as possible is really going to be a very, very important window of opportunity. And then we've learned a lot about what to do with patients who are more advanced in their disease, where the effects of the virus are actually far less important than the excessive and inappropriate effects of the immune system.

Not surprisingly, you've probably seen in the media a lot of reports about these drugs, like remdesivir or even that Lilly compound failing in the hospital setting. That's not surprising because by the time someone's in the hospital they are seven, eight, nine days into their course. The cat's out of the bag that the virus has done its work. Now there are toxicities related to the immune system and to organs being injured. And we target those late. Combining that really rational framework we've actually been able to make a dent in our outcomes.



DR. TODD VENTO

Medical Director, Infectious Diseases at Intermountain Healthcare

Business Need to Lead Out On COVID-19 Facts

I look at everything as being an opportunity for leadership. I understand part of that's my background in the military having witnessed courageous leaders in really rough environments, in combat, in Liberia with Ebola. I was there and had some great leaders such as the president of Liberia who was actually out in front of the community every single day, visible, same message, good, bad, or ugly. She shared the message. Why am I even starting a conversation like this in the setting of a group of business leaders? Because you're leaders.

First off, if you don't think it's real, I don't know what to tell you. It's real. Those scenes of what's happening in our hospitals are real. Why are we begging and pleading? Why are we national television shows saying, here's, what's going on in Utah? It's just putting it out there to try to get as many people to believe and then to hear the simple messages.

What I think as organizational, business, or any leader is that because you have a captive audience as employees, you set the tone at work. In an organization that tone carries into their communities. We don't have that opportunity with many people who are out in the community and don't have that connection. I would say, that's where the money's at. I think we can make a dent in our transmission of virus and slowing, really slowing, community transmission, helping what's happening in our hospitals, right as we're about to go into the flu season. We're already at capacity and over capacity in our hospitals.

Bad News Does Not Get Better With Time + Hope is Not A Viable Plan

I just put that out first, two things I learned from being military brainwashed on risk communication. Bad news does not get better with time. Just say it. This is what is going on. This is what we know. This is what we don't know. This is what we're going to do. Hope is not a viable plan. That's why you say, here's what we're going to do when we learn the next piece, we're then going to adjust fire on our messages for that and our actions. That's it.

I think I notice a lot of people being afraid to tell like the truth or, or because they don't know what the answer is. The answer is we do know simple things work. We learned, what, a thousand ways, how to not make a light bulb, right? That's what we've learned from Edison.

Yes, Masks Work... Repeat... Masks Work

What we have learned is masks absolutely work. If you have a mask on, I have a mask on, and one of us has the virus, we're likely not going to get COVID. Odds are we're not going to get COVID, that's it. If you can, can remember one message, share that message with all your managers, other leaders, employees, and then have that message just spread like a virus, no pun intended, get out there to everybody. Go viral as it were.



Social Gatherings Are the Biggest Spreaders

I will take away some fears and I'll say this, we haven't seen as much transmission in workplaces. That's awesome. We actually, haven't seen as much transmission in schools as we thought we would. And that's not entirely unexpected if you have more people wearing masks, more teachers and authorities watching, especially in elementary school level.

Now, when we get socialization in older groups, we tend to see more in the 15 to 25 and 25 to 35 year range, because there's more activity. You go to the soccer game and you play, but you hang out for 10 minutes afterwards to socialize without a mask on, and then you get infection. And then what happens? One of you goes to your grandmother's house and then she gets infected. And then she ends up in the hospital two weeks later on a ventilator and possibly dies. Again, not scaring, just reality. That's exactly what we've seen around the country. It's all about the gatherings beyond your nuclear household and your bubble.

Promote The Facts, Relentlessly

So those are two concepts. I think that leaders in business and other organizations have a great opportunity to push the right facts and information, which is that simple things work, distancing and mask.

Another thing that is important is to squash disinformation. We have a role as leaders to squash this information. I personally like seeing my leaders and commanders out in front of public health saying, uh, that's not true. This is the science, here's my scientist. I want to do this. And then putting down messages that are distracting from that, and actually causing hospitalizations and death.

If you want to go to resources for truth, I say always know what's in your immediate area of operations, right? Go on your local health department website and know what's happening in your immediate area.

Number one, know what's happening on your department of health site for your state.

Number two, the centers for disease control. I will say they are a national and believe it or not, they are a beacon internationally. For background, when I was in Liberia on the emergency operations team for the president of Liberia the CDC was the one feeding information and controlling the outbreak, even more than any other organization. They have gotten kicked in the face for lots of reasons. A lot of it is politics in particular. I met with Dr. Redfield and Dr. Brix a couple of weeks ago when they were here. We talked about this. I do believe that the transition for White House task force leadership and the approaches are going to be good. I also think that they don't support massive shutdown as a general rule and that they look at these ways to be very tactical and targeted on, on where we can stop the outbreak instead of saying shut down everything. So they do understand that. So it's not an all or none.

Simple Messages That Need To Get Out

I would say number one, it's masks. At 10 months into a public health emergency that is a pandemic, by definition worldwide in every country, facing a virus we didn't even know about in December of 2019, so almost a year, and we're still arguing about masks. We know how we might've gotten there. We know why we might still be that's number one. You should, if you want to beat one message, beat that message into the ground. A vaccine is not our magic bullet and we're done. And you saw the timeline anyway. We expect COVID will be here for a long time. Therefore, we should get good at mask.

Dealing with Disinformation

DR. VENTO – Masks Are Not Cultural, We All Have to Act

I did a lot of pandemic planning for foreign militaries in Asia in flu planning for Vietnam and Korea, and a few other countries when I was in the army. A lot of people in America want to say, Oh, it's a cultural thing. It's not a cultural thing. It's a memory thing. They remember that grandma died of avian flu, or a brand new flu in SARS and MERS and all the other viruses that happen to start there. That's why they're good at it. So when they see there's a new illness, they think it might be new virus there. They don't have to be told twice to put on a mask and watch their distancing. Look at Taiwan. Look at Hong Kong. Look at Singapore. Taiwan right now has basically back to normal. They've had minimal deaths, minimal cases because everybody did the same thing.

The misinformation is about the two sides of the same coin on mask. They work and do it. And then don't let folks talk about why it doesn't work. I don't want to get too political there because you're not going to, I think, win the argument about why wearing a mask is taking away your personal freedom, etc. I don't know what to tell folks about that. I've also have a public health degree and was a public health officer and studied public health law. Why do you think we don't have smallpox in our country and malaria in our country anymore and all these things? Why? Because we have executive authority in public health emergencies to control things. Not because we're torturing the people because we love the people and we want to protect them because we have an obligation and a sacred duty as political leaders. And I'm not running for office, but that's just my, my comment there.

DR. WEBB – Slowing Spread Makes Vaccine Support to Herd Immunity Faster/Easier

I think just to follow up on something that is not well understood. This concept of herd immunity is a concept that depends on two really important things. One is how long do you, how long does the immunity that you generate, whether from getting the virus or getting a vaccine, how long does that last? We know that from getting infected that immunity only lasts for between three and nine months. For most people it'll will be less than six months. We hope that the immunity generated by the vaccine is longer lasting than that, but that's only part of the equation.

The second part that determines how much of a population need to be immune to have this protection, to be able to control the virus, depends on how rapidly it's being transmitted in the community. That depends on our behavior. If we do nothing to control the virus, and heaven forbid that's the case, but right now in a lot of parts of the country, the rate suggests very poor control. If we continue at these rates of spread coverage with a vaccine will have to approach 90% in order to control the virus—that's going to be really challenging. But if we're able to really get engaged and change behavior we can modify the transmission such that we can control the virus with much lower vaccine coverage at 70% or even 50%. If we were able to get the transmission rate down to close to 1.1, we could control the virus with 30% vaccination coverage. And that all depends on behavior change.

The vaccine and our behaviors work absolutely hand in hand. They have to work hand in hand because if one is poor, the other one has to pick up the slack. That would be my message. We can do this, but we can't do it if we're looking at any single layer as definitive. We've got to layer everything we've got against this thing.



DR. SHEFFIELD – Talk About Response to Vaccine NOT A Reaction to Vaccine

One of the key misconceptions that people may have about the COVID vaccine is exactly the same as what we see with the influence of vaccine is that individuals are concerned. They say, because they don't understand how the immune system works, which is why we try to explain it a little bit is they think, "Oh, I got, I got a fever after this vaccine." Or, they say, "I had, I had some symptoms. Therefore, the vaccine made me ill."

That is the thing that we want to really stress is that the vaccines cannot give you this virus, they cannot make you ill. Part of it is our terminology. We should not be saying, "Oh, you had a reaction to the vaccine." We tend to use that terminology all the time and it indicates something negative. We should be saying "you had an immune response to the vaccine. You've had a response, and that response gave you some symptoms, hallelujah." Your body's doing what it's supposed to do, and we need to have that positive messaging. "You're feeling some symptoms. Great. That's what we're hoping for."

Combatting Cynicism and Lack of Trust

DR. VENTO – Repetitive, Consistent Messaging and Honesty Works

It's leadership, it's leadership at all levels. It's not one person out front. And that means at the County, at the city, at the town levels; it means in businesses and communities. If each person who runs the company, for example, is living this model and stating even simple messages we will get there. Not like here's what's going to happen with a vaccine, forget that that's going to happen. We're optimistic, but we have got to do other things. I think having those messages come out from everybody over and over again makes a difference.

Think about this... in Liberia individuals thought that doctors were bringing you Ebola and that's what was killing people. They killed people who were bringing vaccines in Sierra Leone because they thought they were bringing you Ebola as well.

President Johnson in Liberia, she got out every single day. She did her own talk show and took questions from an entire country— you could not NOT see her. I know I'm using that as a very specific example because she always said, "no, no, no, no, this is not true. This will happen if you eat monkeys, this will, that's not true. Doctors don't have it. Here's why." And then she kept it up. She convinced people who didn't believe who, culturally and traditionally, wanted to spend time with a dead body for days and days and days. You've seen those scenes where they infected 70, 80 people. She convinced people to go to a crematorium and change behaviors by constantly saying the same message and never wavering.