# Episode 53: Two Doses of Vaccine and One Dose of Humility

**Chris Dall:** [00:00:00] Support for this podcast comes from the Longer Life Foundation, a collaboration between Reinsurance Group of America and Washington University in St. Louis School of Medicine, conducting scientific research to discover groundbreaking insights for longer, healthier lives. Visit LongerLife.org, on Twitter at @LongerLifeOrg and on LinkedIn at Longer Life Foundation. Hello and welcome to the Osterholm Update: covid-19, a weekly podcast on the covid-19 pandemic with Dr. Michael Osterholm. Dr. Osterholm is an internationally recognized medical detective and director of the Center for Infectious Disease Research and Policy, or CIDRAP, at the University of Minnesota. In this podcast, Dr. Osterholm will draw on more than 45 years of experience investigating infectious disease outbreaks to provide straight talk on the covid-19 pandemic. I'm Chris Dall, reporter for CIDRAP News, and I'm your host for these conversations Each week here on the Osterholm update, we try to answer one or two email questions we received from our listeners about various aspects of the covid-19 pandemic. This is just a fraction of the queries we receive, and we often wish we had more time to address the great questions that our listeners send to us. So for this April 29th episode, we've decided to do a special mailbag edition and the Osterholm Update where Dr. Osterholm will do his best to answer several of your questions. We'll dip into the mailbag after we get an update on the current state of the pandemic and where it's headed in the United States and the rest of the world and discuss the latest developments in the vaccine rollout. We'll also highlight the latest act of kindness from one of our listeners. But first, as always, will begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:01:47] Thank you, Chris, and welcome, everyone, to this week's edition of the podcast. As I say each week, thank you so much for being with us. We appreciate it very much. And again, this was one of those weeks where we received many, many responses to last week's podcast, ideas, thoughts, questions, concerns. I wish we could do more to answer all of them for you. We're surely going to try this week to at least hit a couple in the mailbag section of the podcast this week. As I do every week, I just want to remind everyone that today I'm going to be talking about a lot of numbers. But in every instance that someone's loved one. That's someone's brother,

sister, mother, father, daughter, cousin, co-worker, neighbor. And I think it's just really important that we never forget that. The second thing I'm going to do right now is I'm going to make a plea to you, a challenge that I will reiterate again at the end of the podcast, is we need every one of you listening today to go find two people who have not yet been vaccinated and help them get vaccinated. And if we did that every week and then we could turn them into helpful vaccinator assistance, my oh my, what difference we could make. So this is your challenge this week. It's the only price you have to pay for being part of this podcast. We'll give the rest of it to you for free. But we need you to go out and help us get people vaccinated. Let me start out with the dedication this week and explain to you that this is one that I wish I could further define who it is I'm talking about. But you know who you are. And that is the fact that we have had so many questions that have been sent to us around this group that I'm dedicating this podcast to this week asking 'help us please understand what is our status?' The population I'm talking about are those of you who are immunocompromised. In some way or another, your immune system is not functioning fully in the way that we would like it to do in order to fight off this virus and to respond to the vaccine. Immunocompromised individuals can really be defined in several categories, but this is pretty mushy as we have so understood. There are those who are immunodeficient, this is a state in which the immune system is really compromised or entirely absent, making it difficult or impossible to fight off these infectious diseases, cancers or respond to vaccines. Immunocompromised individuals may have a variety of reasons for why they are in this state, and in clinical settings immunosuppression is important. This can occur by some drugs such as steroids, or either be an adverse effect or an intended purpose of the treatment itself. One can be immunosuppressed for a number of different reasons. They could very well be an organ transplant recipient on anti-rejection medication, a cancer patient receiving chemotherapy or even other conditions that require treatment with immune suppressing drugs such as inflammatory bowel disease, rheumatoid arthritis, lupus, psoriasis, Crohn's disease, the list goes on. And there is a third category that is very important to this entire discussion of covid-19, and that is those who are experiencing immunosenescence. This is a change in your immune system associated with age. And as we have well documented in the past, this may mean that your immune response to vaccines is not nearly as strong as someone who is younger than you and may mean that the vaccines will not work nearly as well. We estimate today that there are anywhere between eight to 16 million individuals in our country who are experiencing some form of immunocompromised status, and that does not even include

those who are experiencing immunosenescence. So it's to you who have still many questions left for us, questions we can't answer. Only now are we going to do trials looking at the actual effectiveness of the vaccines among those who are in this category. Vaccine trials have historically excluded those with immune disorders as part of the trial. But this week, the NIH announced that covid-19 vaccines are being studied in people with immune system deficiencies or irregularities. The single site study is led by researchers from the NIH and aims to enroll five hundred people, four hundred with primary or secondary immune system disorders and one hundred without such conditions. And from this study, they hope to be able to determine how well do vaccines actually work and in such individuals and for how long that protection might last. So this podcast is dedicated to you because I know many of you are very, very concerned and nervous about even though you're vaccinated, even though you feel like, you know, I've done everything I possibly can, what can I really do that doesn't put me in harm's way? I don't want to be one of those breakthrough cases. I don't want to be somebody who become seriously ill. And we will do everything we can to provide you with as much information in the days ahead about what you must consider or think about. You know, our hope is, is that there's going to be much more protection among many of you than we might now know. But at the same time, you need to know. And so this is dedicated to you and what you go through every day wondering, am I really increased risk despite being vaccinated from becoming infected and having a serious infection? As part of my opening, as always, I want to share with you of that very, very good news about light. But I do have one comment to make that I want to thank several listeners who have written in and shared with us that my terminology wasn't working so well. And for whatever reason, as much as I knew this to be the case, I kept saying over the recent weeks how much sunlight we've gained since the vernal equinox, which is in fact what happened in March, not the winter solstice, which occurred in December. And I've been giving you the sunlight hours for December. So I want to thank Scott from Illinois, amongst others, who wrote in and said, "I think you've got that wrong". And they were right. I have been saying it wrong, even though I knew better. So let me just report today, April 29th, we will have 14 hours and 9 minutes of sunlight in Minneapolis/St. Paul. That's 18 minutes more than we had last week when we recorded this podcast. We now have gained 5 hours and 22 minutes of sunlight since the winter solstice. Thank you, Scott. And we keep looking forward to more and more sunlight between now and the summer solstice. I also want to offer our support to those in the Southern Hemisphere. We're sending light down to you as best we can. And again, I'm making

these deposits in that sunlight bank so you can return them next fall and winter. So thank you again for being with us. We appreciate this very, very much. And to all of those that we dedicate this podcast to today, we're thinking about you. We understand the challenges you have and we owe you as a scientific community much more information than you have now.

**Chris Dall:** [00:09:08] Let's start with what's going on in the United States, where it appears that new daily cases have declined nationwide over the last week, notably in some of the states in the Midwest and Northeast that had been in the midst of surges. At the risk of sounding overly optimistic, Mike, is it too early to suggest that maybe the B117 variant isn't going to have as big an impact here as feared?

**Michael Osterholm:** [00:09:31] Well, first of all, let me just start out by saying that I will speak with all the certainty I can, but as you will see from my comments today, there is more uncertainty than there is certainty. The first thing I want to do to start out with, though, is frame for you where we're at in this pandemic, per an article that appeared in The New York Times this past week by Denise Lu entitled How COVID Upended A Century of Patterns in US Deaths. And I just want to share this, because this is an incredibly sobering article that I urge all of you to go read. And what it did is it looked at the issue of death rates above and below normal in the United States for a period dating back to 1910. Meaning that, in other words, obviously every year we would expect an average number of deaths, some years up, some years down. But what they found in 2020, the United States saw the largest single year surge in the death rate since federal statistics became available. And that rate increased 16 percent from 2019 even more than the 12 percent jump that occurred during the 1918 flu pandemic. Think about that. This is more than we actually saw in 1918. And if you look at this article, you'll get a sense for the fact that there were surely more deaths occurring each year back in 1918 because people died younger at higher death rates. We've seen a falling death rate over time. But what happened in 2020 was such an anomaly. And I only point this out to you because I can't tell you how many times I still hear from people who want to minimize what's happened with covid-19 by suggesting, "Well, this wasn't any worse than a bad flu year". I mean, just this past week, I've received a number of e-mails from people, you know, really upset because somehow we've blown this whole thing out of proportion. And I think it really is a very important article in that it helps us understand exactly what we've been up against. And this is in itself almost a big one unlike 1918.

And it surely didn't kill as many young people as it has parts of our older population, but it has had a very substantial impact on the public's health. So I just want to start out framing that, that I'm coming into this with the idea that this has been an incredible challenge. Now in terms of where we're at right now, over the course of the last 8 to 10 weeks, we've been watching B117 virus, that variant that I've been talking about that is much more infectious, 50 to 100 percent more infectious than the previous strains that we dealt with and more likely to cause severe disease. And everything I've seen here in Minnesota and surely in the upper Midwest supports that. We already knew from the situation in Europe what this could be like. But let me just share with you where we're at now and say, I don't know where we're going to go. I don't know what's going to happen. As I shared with you in January, I thought we were going to have a much larger surge with B117 activity in the United States. And to our good fortune, it has held off largely with the exception of Michigan and a bit states like Minnesota. And in the meantime, we have far, far exceeded the rates of vaccination that we had anticipated. Remember, it was just 100 days ago right now that there were challenges by a number of individuals, could the administration get out 100 million doses in the first 100 days? And some people thought that that was a far, far too aggressive projection. Well, here we are 200 hundred million doses after one hundred days. So we far, far exceeded the delivery of vaccine, which I give great credit to the administration. I give great credit to local and state health departments, to medical care delivery system, to the private pharmacy networks, the community clinics. All of those groups have really done an amazing job. But let's just put this into perspective where we're at. And what does it mean by this B117 situation? Well, right now, cases over the last 14 days in the US have declined by 20 percent, while hospitalizations are up two percent, that lagging indicator. If you look at the 7 day moving averages for cases over the past week, it's down 16 percent. It's declining in 41 states and the District of Columbia. If you look at the 7 day moving average for hospitalizations over the past week, that too is down by 8 percent. It's declined in 36 states and the District of Columbia. Even Michigan now is seeing a drop in cases with the 7 day average declining by 31 percent over the past week. Hospitalizations for the first time in the state are also on the decline. Unfortunately, deaths have increased in Michigan during this past surge. The current 7 day average of 65 daily deaths remains well below, however, the December peak average of 129 deaths. So these are all lagging indicators supporting the fact that even now the case numbers are starting to come down. We are still hearing about horrible stories in Michigan and the overcrowded hospitals, but it looks like things are in the right

direction. The same thing is true here in Minnesota. We're seeing still substantial activity, but it appears it has leveled off and come down. Now, I cannot explain to you why Michigan and Minnesota and a couple other states with just moderate increases in cases would occur like they did without the rest of the country being involved. I don't know of a single respiratory pathogen of any kind that has ever occurred in a major outbreak setting in a state, in this case, Michigan, where they literally were equivalent in the number of cases and issues around transmission as they were last fall, and not to see it in many locations in the country. I've never seen an influenza outbreak in any given season, or for that matter, the 2009 influenza pandemic do that. The 1918, the 1957 and 1968 influenza pandemics didn't do this. And so it leaves us all puzzled. Why did this not spread further? And I'll tell you right now, I believe no one can answer that except Mother Nature. I do want to point out at this point, however, that again, what Mother Nature does with this virus is in of itself, out of our control. And what I mean by that is we surely, with our public health mitigation strategies, our distancing and all the things we've talked about, can limit the kinds of increases and decreases we see with this virus. But generally speaking, as you've heard me say so many times and are tired of hearing me saying, we're not driving this tiger, we're riding it. And I think that's exactly what's happened in Michigan. I don't think we're done with B117. We already know that this is a much more infectious virus and I'll share some more data with you in a moment about that. And if we look, though, however, you can say, "Well, vaccines have had a major role here". Make no mistake about it, I am the biggest fan of the world of these vaccines. Please get vaccinated. I've already put my plea out there to you to help become enhanced vaccinator support systems. But let me just share with you where we're at right now to give you a sense of what I think is happening. Are we, in fact, seeing a protection across the country inferred by vaccines that many have suggested that, or they've suggested seasonality is changing? And let me just, I want to just upfront and say, no one has shown me any convincing data anywhere, any how about seasonality. And particularly if you look at the difference between the northern and southern hemispheres right now. If you look at the occurrence, whether it be in Europe or the United States, whether it be in Asia, there's just no evidence of this seasonality yet. It very well may get to that point one day. But if you look at vaccines in this country, again, I want to congratulate this administration and everybody associated getting vaccines out, what a great success. If you look at the total number of people vaccinated to date in this country, 29.1 percent have been fully vaccinated, 42.7 percent have had at least one dose. And since most of the vaccines have been Pfizer and Moderna, it's a

two dose approach. If you look at those 18 years of age and older, it's 37 percent have been fully vaccinated, 54 percent with at least one dose. And of course, that really important number of 65 years of age and older, 67.9 percent have been fully vaccinated, 81 percent have had at least one dose. We still are hurting with 20 percent of those 65 years of age and older not yet vaccinated. But if you really start looking at this carefully and trying to break it apart, remember that when Michigan first really became kind of a house on fire situation, they had vaccinated about 33 percent of their population with one dose and 20 percent of their population was fully vaccinated. This was in March. If you look today, we have had some great successes. But even if you take the top 10 states for fully vaccinated and you look at those with one dose, let me just share this with you. Fully vaccinated: New Hampshire- 29 percent, Massachusetts-34 percent, Connecticut-37 percent, Vermont-36 percent, Maine-37 percent, Rhode Island-35 percent, Hawaii-34 percent, New Jersey-34, New Mexico- 36, and Pennsylvania- 30. Now compare that to the 20 percent. Surely higher, but not that distant from where Michigan were when they all took off. If you look at with one dose, this is where they surely shine better. The same states, I'll just read them down quickly: 60, 54, 54, 53, 53, 52, 51, 50, 50, and 48. Now that is definitely higher than the 33 percent that Michigan had in late March. But let's go to the States on the bottom end. If you look at the bottom 18 states, their high for one dose vaccination is 39 percent. And everything else is from there to 31 percent. Really not significantly different from what Michigan was. If you look at their fully vaccinated, that ranges actually from 22 percent up to 29 percent, not different than where Michigan was. So I know that we are having an impact with vaccination. But what I also am wondering is how much of the lack of activity we're seeing in these states right now is due to vaccination and how much of it is due to the fact that these trends of surges, which we have no understanding why they occur, actually have also been responsible for that and could change overnight? And so I just want us to be cautious here. I know others will say it's not going to surge, I'm blowing this out of proportion. But you look at the numbers yourself. And when we look at this, we see in so many instances the situation where we do have substantial gaps in vaccination. And what's happening right now is we're watching vaccinations drop precipitously in terms of new vaccinations. For the last 4 or 5 days, we have had more people in this country vaccinated for second dose only as opposed to first dose, indicating that the numbers are coming down. On April 13th, we delivered 3,384,000 doses of vaccine. On April 26th, we delivered 2,741,000 doses of vaccine, a 20 percent drop in two weeks. And we're continuing to see this vaccine hesitancy, vaccine

resistance occurring. And we know with the numbers I just gave you here, we've got some big holes out there yet. And I keep coming back to this one simple fact. If Michigan could have the problem it had with the vaccination levels it had when that problem began to develop, and you look at the holes that we have, particularly in the southern states in this country. If I had to read these states to you, you can tell me. But it's in the the bottom number of states. It's basically Oklahoma, Texas, Missouri, South Carolina, West Virginia, Indiana, Arkansas, Georgia, Tennessee, Wyoming, Idaho, Louisiana, Alabama, and Mississippi. Certainly some in the northwest where we're seeing vaccine hesitancies, others in the south where we're seeing vaccine hesitancy. So I just raise this point right now that I think we have to be careful to assume we're done.

**Chris Dall:** [00:22:44] Looking at the global situation, India remains a house on fire with more than a week of days with over 300,000 new infections and hospitals across the country running short on oxygen. Mike, is India nearing the peak of this wave? And is India an outlier?

**Michael Osterholm:** [00:23:02] Let me begin by just providing perspective on the global update. As I've been sharing with you week after week, the concern that we are going to be hitting this darkest days of the pandemic and each week gets darker and darker. This week, we hit an all time high of 5.7 million cases reported per week. That's up 420,000 from the previous week, which is the third consecutive week we've now surpassed that previous high number of cases from last January. And this number just is going to continue going up. We know that death is a lagging indicator and also one where we're seeing an increasing challenge getting cases reported as well, as the deaths hit 88,000 deaths this past week. When we look at what's happening in India, as WHO Director Tedros stated, the situation in India is beyond heartbreaking. I'm going to come back to that because I want to be sure we don't under appreciate the fact of what else is happening in the world with this virus. But right now, India surely is leading the world in the average number of new daily deaths, accounting for about one in five deaths reported worldwide each day. Of course, that is in part influenced by their large population numbers. And while India's rise in confirmed cases and deaths is already staggering, reports indicate that a very significant number of cases and deaths are going unreported. That has been reported by multiple individuals. I just had an opportunity to have two conversations with people in India who are involved with this

response, and they have confirmed that. The country's average test positivity is 15 percent. But with some cities such as Delhi, they're now seeing positivity rates greater than 30 percent. Even prior to the pandemic, India faced challenges related to the registering of deaths. And so I think any death data that we do talk about, we know is quite incomplete. We now are seeing makeshift crematoriums being built in parks and parking lots in the city of Delhi. We've had major oxygen shortages, as has been stated over and over again with at least two Delhi hospitals having completely run out of oxygen and deaths numbers soaring. While we're seeing a crisis in India prompting countries to send supplies and offer support, we've also seen people say it's too late to get vaccine there to really have an impact on what's going on. Just as happened with our response to Michigan. It's really all about the public health measures we can take to create distancing, to avoid any kind of large crowd contact that will facilitate transmission. This is going to continue. I don't see this really turning around for weeks. And that's based on people on the ground in India reporting that. And again, it points out the unpredictability of this virus. Why did India go for weeks and weeks and weeks with minimal activity, making everyone think we'd hit herd immunity or we'd done these kinds of things that would keep this from coming back and then all of a sudden it took off? We don't know why. We just don't know why. We're now seeing also major upticks in cases in adjoining countries. Nepal, Sri Lanka, Pakistan are all reporting major new rises. As far as the rest of Asia and the Middle East, we're seeing Iran and Turkey are continuing to battle the largest surges they've had throughout the pandemic. The Turkish president announced this past week that the country will enter a full lockdown from April 29th to May 17th. The good news, meanwhile, in Israel, which has led the world in vaccine distribution and did their major lockdown, continues to decline. The 7 day average for new cases in Israel is 127. This compares to their peak high just on January 14th of 8,400 cases there. Their 7 day average for new daily deaths is down to 1. So I think this is an example of what can be achieved and what we need to keep striving for. If we look at Europe, overall cases and deaths are decreasing in Europe as a whole, although some countries in the region are still reporting notably high cases per capita. If you look at the Washington Post Global Dashboard, 5 of the 10 countries that have the highest cases per capita in the world are located in Europe. And the number 1 is Sweden. Remember that country that, again, so many times was laid out there as the model for how to respond to this. The other ones include Croatia, Netherlands, France and Lithuania. Germany is still dealing with its third covid surge, reporting an average of more than 20,000 cases a day over the past week. And the federal government has

now required the implementation of certain mitigation measures in areas that exceed the incidence thresholds. Another piece of good news is that while vaccination campaigns in many countries of the European Union got off to a very slow start, much slower than expected, officials stated on Sunday that they're confident that 70 percent of the EU's adult population be vaccinated by mid-July. We'll see how vaccine hesitancy plays out there. Let me move now to Latin America, an area I think that's very important that's being missed right now in terms of the significance of what's happening. Brazil has reported a decline in cases and deaths over the past couple of weeks, but activity remains very high there, with over 56,000 cases reported a day and over 2,500 deaths. But what is important is there's a number of other countries in the region that are also dealing with major searches, including Guyana, Paraguay, Argentina, Colombia and Ecuador. In some of these countries, among the highest rates in the world per capita. And we're not talking about it because India has basically taken up all the air in the public discussion about this. This is not something that is just hitting one area of the world. There it appears the P1 variant continues to be considered the key factor in these record breaking surges. However, we still have incomplete data of just which of the variants is really important. In Canada after reporting their highest ever cases up to this point in the pandemic, it appears that they're starting to see a slight decline, although the overall numbers remain very high. While cases appear to be decreasing in British Columbia, Ontario and Quebec, and the declines are surely welcomed news, situations in some provincial hospitals continue to be extremely difficult. For example, three days ago, hospitalizations in British Columbia reached an all time high. And in earlier this week, Canadian federal officials actually deployed military members and the Red Cross to a number of Ontario hospitals to help support the patient load. So at this point, it's fair to say that the international picture continues. Why India took off like it did, as I said, none of us can say. You can say it was because crowds came together or whatever. Again, this is what is going to be one of the important lessons learned in this pandemic with this coronavirus is that it is doing what it's doing. And we have, at best, only limited ability to change that short of vaccines. With vaccines. And if we could vaccinate the world tonight, it would surely be a different situation. But we can't.

**Chris Dall:** [00:30:22] So speaking of vaccines, the CDC and the FDA last week resumed use of the Johnson and Johnson vaccine after the Advisory Committee on Immunization Practices voted to end the pause that was implemented because of concerns over blood clots. So even though ACIP concluded that the risk of blood clots is

very low and that the benefits of the vaccine far outweigh that risk, are you concerned that people are going to be wary of the J&J vaccine and what that could mean for the US vaccination effort?

**Michael Osterholm:** [00:30:52] Well, this is going to be a debate that will occur probably for the next several decades, what happened here and what is the right call made by federal public health officials to initiate the pause. I think everyone can be an armchair quarterback and say you shouldn't have done it because, in fact, you brought the vaccine back. But if we hadn't done it, the question would have been by the public, I think, what are you doing with safety and how do we know that you're really monitoring that? And there's everything in between. You know, could we have shortened the pause from 10 days to 3 days? Could we have done more to provide guidance after the pause was lifted to make sure that the public knew exactly what we were saying about vaccine, particularly for women between 18 and 49, etc. Of initial poll data coming out right now suggests that there has been a real loss of confidence in this vaccine in this country. And that's going to be a challenge in of itself in terms of trying to reach people on that single dose approach that we felt was a very important vaccine for that reason. And so we're going to have to wait and see. But we do know that vaccine hesitancy is increasing. Right now, as of last week, more than 5 million or about 8 percent of those who got a first shot missed their second doses. And remember, I had all along supported delaying second doses for the purpose of getting more people vaccinated, but always knew that second doses were critical and important to get done. The British data has recently demonstrated that. When we look at why we're seeing vaccine hesitancy, it's a combination. It's some people reporting side effects from first doses or they know about people who have had what they consider to be tough side effect situations and don't want to get it. Some people are now feeling one dose, they are sufficiently protected. They don't need two doses. After all the J&J vaccine is a single dose. And even though Moderna and Pfizer were never approved for that, so be it. Some feel challenged to get the same manufacturer's dose, meaning they signed up for Moderna or Pfizer and they go back to their clinics and all they have is the other company's product. And so they don't know quite what to do. And then in addition, a number of people feel like it's just a lower risk situation. And, you know, they're right if they actually look at the numbers and they're just saying, "I don't need to get vaccinated now it's going away". Which, of course, I hopefully just a couple of minutes ago persuaded you that it might not have yet gone away, as others think it has. And now,

really, all the issues around the politics of this vaccine are coming to bear. We continue to see survey data that supports, in fact, individuals of certain political persuasions, Republican men in particular, we're seeing it in certain socioeconomic status areas, essential workers, etc., we're all feeling that this is not something they want to do. They feel like that there's bigger problems with the vaccines than there is with the disease itself. We do have a new CBS News poll that says 6 out of 10 still will get vaccinated that haven't. But 4 out of 10 say maybe or no. It's pronounced in the rural areas of the country. It's pronounced in the southern states. I just went through those data with you showing you where it is really low, low vaccination rates compared to other states. And if we don't improve in those areas, I think we are still ripe for more surges of cases. Not at all like they would be if we didn't have vaccine. I mean, if we didn't have vaccine right now, I think we'd really be in trouble. But nonetheless, I think still significant surges can occur. So vaccine hesitancy is going to continue to be job one for us. As I said back in a podcast last fall, to me, this is all about the last mile and the last inch. And fortunately, we did a lot to supply the vaccine through that last mile and get it out to the people. But we still have a lot of work to get that needle in the arm, that last inch to get this group of vaccinated.

**Chris Dall:** [00:35:05] Ok, so now to our mailbag segment, and we've got several good questions here, so I'll get right to it. The first question is from Matt, and it's a timely one because there was announcement on this topic from top U.S. health officials this week. Matt asks, "There have been increasing calls from many respected epidemiologists for relaxing or canceling the guidelines on outdoor mask wearing. Do you have an opinion on relaxing outdoor mask wearing guidelines?"

**Michael Osterholm:** [00:35:30] I not only have an opinion, but I very strongly support the action that's been taken by CDC this week. This is something I think that is overdue based on what science we have, and it's one that I think will provide additional incentive for people to get vaccinated. I do think that it's a little bit of a complicated recommendation that I think could be simplified. But let me just give you the gist of it. If you are fully vaccinated now, that means both doses, Pfizer/Moderna or one dose J&J, you can without a mask, walk, run or bike outdoors with members of your household, attend a small outdoor gathering with fully vaccinated family and friends, attend a small outdoor gathering with fully vaccinated and unvaccinated people. Small outdoor gathering at that point, as is noted. Dine in an outdoor restaurant with friends from

multiple households and attend a crowded outdoor event like a live performance parade or sports event, where there now you still have to wear your mask. All the other ones, you can do it maskless. If you're unvaccinated, then you can still do those first three categories walk, run or bike outdoors with members of your household, attend a small outdoor gathering with fully vaccinated family and friends, or attend a small outdoor gathering with fully vaccinated and unvaccinated people. Again, a small outdoor gathering. It would be a less safe, kind of a yellow light, dining at an outdoor restaurant with friends from multiple households and a red stop sign for attending a crowded outdoor event like a live performance parade or sports event. I think this is probably the best we're going to get right now. I think the thing I worry about is how it's going to be received by many who are of the mind I don't want to wear a mask, I'm not going to wear a mask. And others thinking, why are you not wearing a mask? And so we need a lot of education right now. It doesn't just need to be US public health, quote unquote, experts talking to each other and talking to our public health communities. But how do we talk to the community, we're going to see more and more active in our communities where masks are not part of everyday life. And it's not a political statement being made at that point. So when I'm out for a walk in a park with my partner and we walk by people, if I don't have my mask on, it is still that possibility that they'll look and say, "Oh, how responsible", when in fact the recommendations have changed. So this is great news. And thank you for the question. I hope this was the answer you were looking for.

**Chris Dall:** [00:38:04] Next, we have Jane, who wants to know when we will know when we have hit herd immunity.

**Michael Osterholm:** [00:38:11] Well, let me start out with the provocative answer and then I'll go from there. We're never going to hit it. We're not going to. Straight forward and simple. What is it? What is herd immunity? This is a term that keeps getting thrown around by so many people and, you know, I surely don't want to come off as some egghead epidemiologist, arrogant academician type. But, you know, those of us who have studied this over the years recognize that it's a concept that generally is misunderstood and oftentimes not appreciated for the complexity of it. It's not just that simple. Herd immunity is the concept in general of enough immune people strategically placed in the population. In a sense, it puts an immune rod in the virus transmission reaction, and it varies according to a number of different parameters of the population and of the virus in this case, as opposed to another infectious agent. So it is also one, it

is not a stoplight that's green or red. It's one that basically is defined by when transmission drops below an R of one, meaning the fact that more people getting infected for every person infected are fewer people getting infected than 1 for every one infected. And the way you can think of that is you're on the airplane, you're 30 minutes out and the pilot comes on and says, "We're beginning our descent into Minneapolis/St. Paul International Airport". Well, you're dropping the whole time down, but you didn't stop. What we're talking about with herd immunity is when enough people are immune for whatever reason, natural disease or vaccination, that then the number of new cases drops with each successive individual. Now, that's important in understanding this, because there are a number of factors that can affect that. First of all, if we look at estimates that had been used before by, I think, some of the really well informed modelers and epidemiologist who then basically that information was taken by people who really have never studied this or understand the theories behind it and suggested it might be 60 to 70 percent with basically the model of what we have looked at in transmission last spring and last summer. But then along came B117 where we know this is a much more infectious agent. And I can tell you personally from my own experience in just the last six weeks dealing with this issue in kids, this is acting much more like a measles-like virus than an influenza-like virus. With influenza, we know that it's infectious, but not nearly as infectious as measles, which it's estimated we need anywhere from 93 to 96 percent of the population to be immune. And it's got to be randomly immune through the population to really result in herd immunity. And what I mean by randomly, I have worked up outbreaks of measles right here in Minnesota where 90 plus percent of the population were vaccinated, protected, but that small, several percent all lived in one neighborhood or one housing project. And we had sizable outbreaks of measles, even though we had this entire state vaccinated as well as it was. And so the mixing piece becomes very important. And we've already seen with this disease that there are social networks where the same people go to the same bars or do the same kinds of sports activities or have other social events hang around together. And they wouldn't be the same people that might be hanging around with people who don't go to the bars or who haven't had major social interactions over the past 14 months. And so if we look at this, the consensus among the three people I really most respect in this business is we all agree that this is at least 90 percent now. At least 90 percent. Now take into effect that if with a 90 percent number, we likely need for herd immunity. You, first of all, have a vaccine that at best is 90/95 percent effective. Remember, 90 to 90 percent is based on those efficacy studies we do where individuals

are selected as not having underlying health problems, really the healthiest of people to participate. And this is where we always get the highest estimates of how well the vaccine works. When we actually take it into the community, we get a thing called effectiveness data where in the real world, how well does it work? And it's never quite as good as the efficacy data. These vaccines still appear to give us really quite remarkable numbers. So I don't want anyone to be mistaken in that I'm suggesting that these aren't great vaccines. They are. But they're not 95 percent or more. Over time we're seeing breakthroughs. I've been somewhat challenged over the past week for what I think has been a bit of a euphoria around the breakthrough data. Number one is with this reporting of little over 5,000 number of breakthroughs, at first, people were shocked and realized, wait a minute, if you're vaccinating millions of people, that shouldn't be a surprise. But first of all, remember, number one, that was not a complete record of who's out there. Our own state here in Minnesota contributed a very, very high proportion of those cases just because we have a more active system here for picking them up. It meant that a lot of other ones were being missed. The second thing I think that's important is this vaccine better be acting this well with only 3 to 4 months worth of data. Meaning that it's only been 3 or 4 months since most people have been vaccinated. What will it look like at 6 months, at 10 months, at 12 months at 18 months? Then we're going to get a better sense. So make no mistake about it, these are great vaccines, but it's still not quite as good as I think people would want or need for this herd immunity. If you look, I already commented on the fact that we have between 8 to 16 million people who are immunodeficient or immunosuppressed, and that doesn't even account for immunosenescence that's occurring among many of our older populations who are vaccinated. We don't have children's vaccines yet. Now, that will change over time. But that surely is a challenge right now. And then finally, when you look at the issue of vaccine hesitancy, there's no way we're going to get close to 90 percent of people being vaccinated, even if we had 100 percent effective vaccines. So when you add that all up and then you sprinkle variants all over it, and we don't understand yet what the variants will do themselves yet, will we really see a significant or even a meaningful reduction in vaccine effectiveness with some of these new variants? So, you know, let's just move on. We need to get the world vaccinated. What we can't count on somehow this going away with herd immunity. I get really frustrated, frankly, and you don't hear me say that very often. I get media calls all the time who want to talk to me about herd immunity. When I explain this to them, they say, "Well, that's not right. I will find someone who'll tell me what herd immunity is and what the

number is". And it's somehow like if you don't have the number, you don't know what you're talking about. So I'm going to make the declaration a statement right now. Anybody who keeps talking about herd immunity, it's going to happen. It's simply not going to happen. It doesn't mean we aren't going to have major impact with vaccines. It doesn't mean that we're going to not need to keep vaccinating people. But what it means is, is that you've got to be prepared for the long haul here. And these kinds of challenges of these pockets of people who are not vaccinated, of these situations where we are still seeing ongoing transmission are going to continue to occur. We can't let our guard down. And by using the concept of herd immunity it somehow, I think, leaves people with the sense we can do that.

**Chris Dall:** [00:45:58] Here's a question about vaccines for Peter, and Mike, you mentioned this a few minutes ago. Peter asks, "Can people mix the two vaccines safely and get a strong immune response?" And I assume he's talking about the two mRNA vaccines, the Moderna and the Pfizer.

**Michael Osterholm:** [00:46:14] I assume the same. At this point, we don't know. I personally believe it's likely going to be just fine, but we need the data. And so I would tell everyone to wait and let's get the information. There are studies ongoing right now looking at the mix and match combination. In the meantime, however, if you need your second dose and you can't remember what you got and you don't have your record anymore and no one can seem to find it. Or you are in a place where the only access you now have is to the other vaccine and you want to get vaccinated, I would say go ahead and do it. The ACIP and the CDC do not recommend that yet. I would truly not recommend it as standard course. But I think in the end we're going to be OK if you're mixing and matching mRNA vaccines. And so we'll have to wait and see. But I definitely would not go without getting your second dose for that reason.

**Chris Dall:** [00:47:10] Here's another vaccine question from Bill, who writes, "My wife, daughter, son-in-law and I will all soon be fully vaccinated for covid-19, but our four year old grandson will not be vaccinated. Can we get together as a family indoors and unmask? I worry about the B117 variant and its impact on children. I really want to pick my grandson up and carry him around, but I don't want to put him at risk. What can we safely do?"

**Michael Osterholm:** [00:47:32] Well, I think this is an interesting turn of events here. I think it's much like when you have your mobile phone and you're taking a selfie versus taking a distant shot or something where you're basically turning the screen around. I hate to say this, Bill, but you know what? My concern is not you transmitting to your young grandson. It's the potential if he were in day care or preschool, being infected in your presence. Meaning that I have confidence your vaccine will likely work. But right now, when you look at transmission in the community, you're not the one posing the risk to your grandson. He's posing it to you. So having said that, I would still feel very confident and comfortable with you all being vaccinated. The chances of him infecting you are extremely low. Can't say it's zero, but I wouldn't worry about you in transmitting the virus to your grandson at all.

**Chris Dall:** [00:48:25] Next, we have Karen, who asks, "I have friends who fear getting the vaccine due to concerns about mRNA and fears that this messes with human DNA, how can I explain this to them?"

**Michael Osterholm:** [00:48:37] Well, the good news is, is that for it to mess with your genetics, the actual genetic material has to get into the DNA of your cells. And it doesn't. It gets into the outside fluid of the cell, and that's as far as it goes, and then expressed outside the cell. So in this case, there is no connection between your genetic material and that of the vaccine. And we have confirmed that over and over and over and over and over again. So I know that this is a very real concern and it's a legitimate concern for those who don't understand it. But I'm happy to report to you there is no concern at all.

**Chris Dall:** [00:49:21] Here's one from Sherry who writes, "Can you help me work through this? I'm fully vaccinated, but high risk. I planned to go back to church last Sunday, got an email late Saturday night telling us 10 people who attended last Sunday tested positive for covid. We didn't go. My husband says we should be safe and I need to jump in. I feel like that is risky with my health issues. How do we ease back into normal? Is it risky to be somewhere where we know how to cluster?"

**Michael Osterholm:** [00:49:48] The answer is absolutely yes, it's risky. Wherever that church service was held, it was clear that they were not, I guess I would say, consistent with what is good public health practice at this point, given you had that many infected

people in the church. Remember, if you're at high risk even being vaccinated, you have to understand that that vaccine is not going to be 100 percent effective. And if you're at high risk for serious disease, that's a real gamble. And I've used the analogy in the past that think of these vaccines as 90 to 95 percent protective fire suits. And if you're someone responding to put out a fire, boy, those are wonderful to have. But you would never intentionally walk into a 10 foot wall of flames with your 90 to 95 percent effective fire suit, assuming that you might not be in any harm. You would avoid that 10 foot wall of flame. Well, your church is a 10 foot wall of flame based on what you just told me. And so I think until either the membership is vaccinated or evidence of previous infection, I would be very, very cautious about going back there. We have had so many events associated with churches and social events like this in facilities, like churches that have not only resulted in people becoming infected, but also dying. In this case, you have used very wise judgment and I would be very concerned about going back there until there is sufficient activity at that church to limit the number of people who might be coming to the church infected or in this case, that very large number just really sticks out as something wrong went on there if that transmission occurred because of the church.

**Chris Dall:** [00:51:36] Next, we go to a question from Julie, who writes, "I have a friend who's twenty nine year old twin daughters are refusing the vaccine as they both hope to get pregnant in the next few months. Their husbands are refusing for the same reason. They say they would consider changing their minds with science-based information on this topic. Are there any studies available now or soon to be so that you can cite?"

**Michael Osterholm:** [00:51:56] Well, first of all, let's distinguish the fact that they're not yet pregnant. And if there was ever an ideal time to be vaccinated its before you get pregnant. You want to have that antibody on board from the very first moment that you do conceive and are pregnant. Don't forget that the real risk to you during the covid pandemic and being pregnant is getting infected with COVID virus. That is the big risk factor you have. There is what I would call it, quite complete, but not definitive information supporting the real safety for these vaccines. And in fact, there is a wonderful piece written by Rochelle Walensky, a mother, director of the CDC, that was in this past week's issue of What to Expect April 23rd. And the title is 'What to Expect When Considering the Covid-19 Vaccination while Pregnant'. And Rochelle explains this as a mother and as a really incredible professional in a way that, you know, I can't fully

appreciate. But the bottom line is do get vaccinated as soon as possible and even if you get vaccinated overlapping with pregnancy. There was a study published just a week ago yesterday that adds to the mounting evidence supporting the vaccine is as safe for pregnant patients as it is for not pregnant individuals and their unborn babies. The American College of Obstetrics and Gynecologists, a leading professional medical organization, recommends covid-19 vaccines not be withheld from pregnant or breastfeeding patients. And in your case, the two twins are not even pregnant yet. So please get vaccinated now. Fully protect that very precious cargo that you're going to carry for nine months and who you're going to make many, many people in your family very happy with. And now is the time to do that.

**Chris Dall:** [00:53:46] Finally, we have this question from Andrew, who writes, "I was just wondering when the FDA will go back and remove the emergency approval of the vaccines to make them approved under the standard process?"

**Michael Osterholm:** [00:53:58] Well, first of all, the FDA doesn't remove that classification without the companies actually applying for formal approval as a fully licensed vaccine. And that process is ongoing as new information is collected and supplied to the FDA. That consideration is there. If I had to give you a ballpark estimate, I think that by mid to late summer, both of these vaccines will be fully licensed, they will no longer be emergency use authorization vaccines. And so we can count on it probably sometime around them.

**Chris Dall:** [00:54:35] And thank you to everyone who sent in an email question for our mailbag segment. Those are great questions and just keep them coming. So now our latest act of kindness from an Osterholm Update listener in Florida. This one involves kids, which I know always brings a smile to your face, Mike. Can you share it with our listeners?

**Michael Osterholm:** [00:54:54] I can, and I'm very happy to do so. This is from Jaycee and she's writing about her daughter in a very special act of kindness. "Good morning. For a pandemic act of kindness, I'm writing to you about my daughter, Sydney Rose, age 14. When the pandemic first took hold, Sydney was greatly concerned about her uncle, who is an anesthesiologist working on the front lines, intubating covid-19 patients at an area hospital. Sydney rightfully sees her uncle and the entire hospital team as

people taking great risk every day, making them some of the many heroes of the pandemic. Sydney decided to call the hospital and find out if it would be OK for her to send letters of appreciation to the hospital team to hopefully bring smiles to their faces. The hospital was very receptive to the gesture and told Sydney to please send the letters. Sydney is a very artistic child and once the idea was approved, she spent days preparing her own art, saying thank you to everyone at the hospital. Sydney sent off tens of carefully crafted drawings to the hospital team, including maintenance people, hospital administrators, the staff, the nurses and the doctors. However, she did not stop there, as Sydney wanted to make her mission of gratitude an idea in which others could share. So Sydney came up with the name for a campaign of thanks which she called Letters to Heroes. She took the program to her school. The students at Sydney's school stepped up and helped in the campaign, resulting in hundreds of letters being sent to those most deserving heroes. Sydney did all of this while dealing with serious health challenges of her own and developed during the pandemic. When Sydney makes up her mind to do something, she is a force to be reckoned with. Her wish to show appreciation for the medical personnel on the front lines was a focus that led to a viral campaign and a great showing of community appreciation. She showed an example of compassion and caring for her community in a time of struggle by helping children to say thank you and allowing hospital staff to see the difference they make each day. Thanks for your consideration of Sydney Rose for the Pandemic Act of Kindness, Jaycee." Thank you, Jaycee, for this incredible act of kindness. Please extend to Sydney Rose our deepest gratitude and respect for what she did. What an act of kindness. And I must honestly say she sure has a wonderful parent too.

**Chris Dall:** [00:57:22] And just a reminder to our listeners that if you want to share your Pandemic Act of Kindness with us, please email us at OsterholmUpdate@umn.edu. Your closing thoughts today, Mike?

**Michael Osterholm:** [00:57:33] Thank you again for spending this time with us, as I say each week and say sincerely. I realize you have many, many potential sources of getting your information on the pandemic. And so we appreciate you being with us. I also just want to reiterate a point I made earlier about please help us get more people vaccinated. I want all of you, if you would, as your act of kindness, your act of commitment to talk to those around you, people who may be reluctant or hesitant to get vaccinated and to do what you can to help be maybe that motivating moment that will

move them forward. I also hope you heard today, one, that these vaccines are remarkable. And while they're not perfect and they're surely not getting in everyone's arm, they're the best get out of jail card we have for this entire pandemic. And so I come back to the fact over and over again, this is about two doses. We got to get two doses in. The J&J vaccine, if you take that, the one doses is fine. The other thing I hope you heard today was in my discussion of what is happening right now and what might happen in the future, that you take that with the dose of humility that I meant it to be shared with. I don't know. And that's nothing worse than wanting to share information that's useful and helpful. And the only answer you have is I don't know. But I'm telling you that this virus is one that is doing what it does in a way that we as humans yet haven't really fully understood. And we'll find out over the course of the next days and weeks and months and even years what its plan is for us and what we can do about that plan. So I just take that, you might say, two doses of vaccine and one dose of humility. And it's one thing, though, that I want to close with in that regard. We can't stop right now. We've got to keep doing what we're doing. We got to keep taking this thing on, whether we're in India, whether we're in Latin America, whether in the United States or wherever. And so I picked one of my very favorite songs of all times. This is a song written by Christine McVie in 1977, a member of Fleetwood Mac and sung by her and Lindsey Buckingham that was on the 1977 album Rumours. It got to number 3 on the Billboard singles in October of 1977. The song is Don't Stop. 'If you wake up and don't want to smile, if it takes just a little while, open your eyes and look at the day, you'll see things in a different way. Don't stop thinking about tomorrow. Don't stop. It'll soon be here. It'll be here better than before. Yesterday's gone. Yesterday's gone. Why not think about times to come and not about the things that you've done? If your life was bad to you, just think what tomorrow will do. Don't stop thinking about tomorrow, don't stop, it'll soon be here, it'll be here better than before. Yesterday's gone. Yesterday's gone. All I want to see is you smile if it takes just a little while. I know you don't believe that it's true. I never meant any harm to you. Don't stop thinking about tomorrow. Don't stop. It'll soon be here. It'll be here better than before. Yesterday's gone. Yesterday's gone. Don't stop thinking about tomorrow. Don't stop. It'll soon be here. It'll be here better than before. Yesterday's gone. Yesterday's gone. Don't you look back, don't you look back, don't you look back. Don't you look back.' Thank you again for spending your time with us today. It's always very special. We welcome your cards, your your emails, your wonderful communications that you send to us. And thank you for the questions that came in today. We have many of them. I wish we could answer all of them. Most of all, I

just again, encourage you to be kind to be patient, to realize that these are very complicated days and that we have so many mixed signals coming. Also know that for those of you who we dedicated this podcast today, we will do whatever we can to keep you informed of new information that comes out about your health status as someone who may have immunocompromised condition. So thank you. It means so much to have you with us. Be kind. Be patient. Thank you.

**Chris Dall:** [01:02:21] Thanks for listening to this week's episode of the Osterholm Update. If you're enjoying the podcast, please subscribe, rate and review. And be sure to keep up with the latest covid-19 news by visiting our website CIDRAP.umn.edu. The Osterholm Update is produced by Maya Peters, Cory Anderson and Angela Ulrich.