# Episode 52: A Balancing Act Continued

**Michael Osterholm:** [00:00:00] Before we begin this podcast today, I'd like to say a few words about the events that have unfolded here in the Twin Cities metropolitan area, not only just over the recent months, but frankly, over the recent years. As you may recall, last May, I started out a podcast by saying, "The Twin Cities community has witnessed the worst of times, many would say the darkest times that have occurred in our modern history. The tragic murder of George Floyd has left us in a state of shock and pain. My deepest sympathy goes out to his family." As you know, on Tuesday, we learned that former Minneapolis police officer Derek Chauvin was found guilty of second degree unintentional murder, third degree murder and second degree manslaughter. While we hope that the jury's verdict represents a measure of accountability and comfort for George Floyd's family, his loved ones in the communities that have been impacted by his tragic death, and perhaps a very important departure from instances where there has been no accountability at all. But I want to make it clear that my comments today are not just about what has happened to George Floyd. As absolutely critical and important as that is, this is a bigger issue. I do believe Tuesday's verdict is an important step forward for justice, not just hopefully in Minnesota, but throughout our world. As Governor Walz said on Tuesday, "The trial is over, but our work has only begun." On a personal level, let me just share that over the recent months, I've opened my mind and my heart to what I think has been a learning experience that I should have done a long time ago and didn't. I accept that responsibility. What I didn't do and should have is understand and respond to the role of systematic racism, not just in society specifically, but also in our health care and public health issues. I've learned a lot in recent months, I have a lot more to learn. I can promise this audience that we at CIDRAP and I personally am committed to putting whatever I have out there to address this issue. It's painful to think of what so many of our society have to go through day in and day out, and I have learned a lot about that. This is not an issue of just inconvenience. This is not an issue of disparity that's just about money. Why do black children in this country have two strikes against them when they're born relative to perinatal outcomes? Why do we see so many issues involved in our health, both at an individual level and a population level, that we have not addressed? And so I just want to leave the audience today with a commitment that what happened to George Floyd should never happen again. What happens with systematic racial inequality in our health care and public health systems cannot continue. And we will do everything we can to address them. As a regents professor at the University of Minnesota, I appreciate the responsibility that's been given to me. And I will use every power I have to address these issues. Thank you.

**Chris Dall:** [00:03:42] 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. If you needed any reminder that the covid-19 pandemic is far from over, it came earlier this week in a briefing from the World Health Organization which reported that the world set a new weekly high last week with 5.2 million new coronavirus infections, the eighth week in a row of rising cases. Deaths also rose globally, passing the 3 million mark. Globally, the covid-19 storm is still raging. Here in the United States, meanwhile, cases continue to remain at a high plateau as the vaccination effort tries to stay ahead of coronavirus variants. But with covid-19 vaccines now available to all adults, there is concern that reduced demand and vaccine hesitancy could make it difficult to reach herd immunity. On this April 22nd episode of the Osterholm Update, we're going to discuss the current state of the pandemic in the United States and the rest of the world, taking a closer look at India, which is currently exploding with cases. We'll also get an update on the blood clotting issues linked to the Johnson & Johnson vaccine, discuss concerns about vaccine hesitancy, and answer listener emails about vaccine breakthrough cases. And we'll celebrate a life lost during the covid-19 pandemic. But first, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:05:31] Thanks, Chris, and welcome to all of you for another episode of our podcast. I want to say at the outset that we appreciate your being with us so very much. Each and every week I am astounded at the kind of communications we get from you. They are so thoughtful, kind, and often with great questions that we can't answer in terms of the science and the factors related to the pandemic. But most of all, it's clear that there are many, many, many good people who listen to this podcast. And we thank you so much from the bottom of our hearts. To start out today, I just want to take a moment as a sober reminder of where we're at in this pandemic. And for this moment, I've completely taken my science hat off and put on my hat as a grandfather, father, brother, sister, friend, colleague, all of those things that make us who we are individually, and just remind ourselves that these numbers we deal with, we consistently deal with numbers, are really all of those same people that we are to everyone else. They're brothers and sisters and mothers and fathers. And I think it's very sobering this week, as Chris, you noted, about the increase on a global level and what's happened. If one just looks in the United States, we're now at 564,292 recorded deaths. If you were to say an individual's name respectfully every three seconds who has died at covid, it would take 19.6 days nonstop to do that. Think about that. That is sobering. And on a global level, we know there's been a major undercounting of cases. It's at 3,025,835, which if you did the same thing, say respectfully each one of these death's name, who they are personally, it would take 105 days to state everyone's name who's died of covid-19 in the past year. And to give some sense of these numbers, just remind ourselves that it took nine months from the beginning of the pandemic to accumulate those first one million cases. It took four additional months to accumulate the next one million cases, and it only took three months for the third million. That should give one a sense also of what's happening globally. Today, my dedication will be about those who have died, but not those who have died from covid. Rather, it's all those who have died of other causes, in many instances, having to die alone or in the absence of family because of covid restrictions. These were, in many instances, very lonely deaths where family, friends, colleagues could not be with that individual. And so today, for all the families who have experienced deaths this past 14 months and they were not able to be there, they couldn't experience those days, hours before death, we dedicate this to you and the pain that you've gone through in the past year to live through those experiences. Now before I move on, of course, we wouldn't be complete with our opening without commenting on our light situation. I'm very happy to report on here on April 22nd we've gained 20 minutes of sunlight since last week. We now have 13 hours and 51 minutes and 10 seconds of sunlight here in Minneapolis/St. Paul. We now have gained 5 hours and 4 seconds since the vernal equinox and the days just keep getting lighter and lighter and lighter. Oh man, do we love that. And to our colleagues in the Southern Hemisphere, we're it bottling up, we're sending it to you and we expect that reciprocity next winter. So everyone become more enlightened with the light, enjoy it and just know that there are better days ahead.

**Chris Dall:** [00:09:50] I wanted to start with the international situation because many parts of the world are still dealing with the Category five hurricane that you've talked about previously. Foremost is India, which has been reporting well over 200,000 new cases a day for the past week. Mike, what has happened in India?

**Michael Osterholm:** [00:10:07] As you noted, Chris, we really are in that Category five hurricane with regard to the international aspects of this pandemic, which by definition, that's what a pandemic is, a worldwide epidemic. And as you've noted, we've now hit that 5.2 million cases per week reported for this past week. This obviously is a real challenge. And based on what we're seeing happen around the world, we expect this number to increase quite substantially. Unfortunately, global deaths are also on the rise with more than 83,000 reported just this past week. We know that deaths are underreported in many countries. To begin with, let's take a look at what's happening in Asia and the Middle East, particularly focusing on India. And I point this out to you because I think this is a very important lesson for all of us, over the course of the past year, I've heard many times over and over again that if we just did it like India did it, they had somehow achieved this concept of herd immunity based on the fact that we're not seeing large outbreaks, they were not experiencing the need for these "lockdowns" and that we just weren't doing it right. And, you know, I was often confronted by individuals that just said, you know, I'm neglecting to tell the whole story here, that there are countries that know how to do this and if we just follow their lead. And of course, my pushback was, no, that's not the case, there are still many, many, many people in these countries who have not yet been infected. And why, at the moment, they're not experiencing increased numbers of cases, outbreaks, regional epidemic situations, I couldn't explain why. I didn't know why, but I just knew that it wasn't because of the fact that through wishful thinking that somehow they had hit this herd immunity. Well, I think India right now is by far the best example we have of that very issue. If we look at what's happened, they now have the highest average number of new daily cases in the world, with more than 200,000 cases reported every day for the past week. Just for some perspective on that, just one month ago on March 20th, India reported less than 44,000 daily cases. One in three infections reported every day globally are now from India. Daily deaths have reached record highs and are continuing to rise. Some are speculating that this explosive growth is largely driven by the new variant that was identified in the country known as B1617. Although this really does remain to be seen. B1617 does have two mutations on the spike protein, that famous E484 as well as one called L452R. These mutations are similar to those found in other variants of concern and including variants of interest. However, at this point, I don't think we have the evidence necessary to determine what role B1617 is playing in the surge. We have some data that says B117, the variant that we're dealing with here right now in North America, also is potentially playing a role. So we have a challenge getting more information from India, in part because of a lack of robust sequencing and data, somewhat what we're experiencing here. Lockdowns are being implemented at local levels, and cities and states short on hospital beds and oxygen. A weeklong lockdown was implemented in the capital city of Delhi, with the city's chief minister reporting that Delhi had almost no ICU beds left and is facing a huge shortage of oxygen. Positivity rates in Delhi recently reached 30 percent. And at that time, there were less than 100 ICU beds open in this city of 20 million people. A similar 15 day lockdown was also announced for the state of Maharashtra, which is the home to Mumbai. The state's chief minister urged the country's government to airlift oxygen cylinders to the state to help meet the high demand. Now, remember, again, just a year ago, as I pointed out, India was, in a sense, the poster country for how to do it right. And it just should remind all of us of this need for great humility. This virus is going to do what it's going to do when it decides to do it. And our job is to basically try the very best we can to minimise that impact when it happens. And today, the most important thing we can do, obviously, is vaccinate our populations to avoid this kind of situation. In terms of other countries that are experiencing major upticks, if we look at Turkey and Iran, they've also seen substantial activity in the region reporting record highs that have grown exponentially over the past several weeks. If we go to Europe, we have another poster country example. Sweden today is continuing to see an increase in cases now having the world's fifth highest average for new daily cases per capita. The country's approach to the pandemic was once again criticized in a paper published in The Lancet this past week, which highlighted large inequalities in covid-19 deaths across income, education and origin of birth in Sweden. Despite more than 75 percent of the cases in Sweden likely being B117, the country recently moved to reopen schools on April 1st. Again, I can't emphasize enough that this was the country, remember, that knew how to do it right last year. And what they did was at one time hailed as the best example. And they did go for months with very low levels of cases. Again, this re-emphasizes the point that this virus is going to do what it's going to do. We're riding this tiger. We're not driving it. And at this point, in the absence of lockdowns, which is the one limiting factor that has reduced transmission, it's all about vaccines. If we look further into Europe, Germany has now reported more than 80,000 deaths from covid-19 as daily cases remain at high levels. With 1/5 of the population have received at least one dose of vaccine and only 6.7 percent fully vaccinated, Germany is hoping to significantly speed up vaccinations in the coming months. Now an example of a country that has done much to earn its current position in the covid world, the United Kingdom recently relaxed restrictions on pubs and restaurants, allowing for outdoor meals and drinks. The UK's seven day average for new daily cases is below 2,500, their lowest level since last September. And the seven day average for daily deaths is at 25. On April 19th, the country of England reported just one death in the country. As a reminder, the seven day average for new daily cases during the UK's January peak was 60,000 cases a day. Now there at 2,500. And their seven day average for daily deaths was 1,250. This past week they actually reported a day with just one death. Why did this work? Because first of all, at least 50 percent of the UK residents have received at least one dose of vaccine, 15 percent fully vaccinated. And they did a major three month lockdown which allowed them to reopen like this. And while this is a very difficult issue to address, the Brits have shown what it takes to drive this virus down. If one looks in South America, Brazil is still facing major challenges reporting an average of 65,000 cases per day and over 2,800 daily deaths. Last week, an average of 3 people died from covid every minute in Brazil, which still has the highest daily death toll in the world, still exceeding that of India. Although cases are starting to drop in Uruguay, they continue to have the world's highest average of new daily cases per capita. Argentina is also in the midst of a record high surge in cases with hospitals under major strain in Buenos Aires. A federal order set to close schools for 15 days in the capital city was recently overturned by a judge placing kids back in school this week. Now closer to home in Canada, our sister country, several provinces in Canada are still fighting a new wave of cases. In Ontario, federal health care workers are being sent to Ontario to help provide care for a record high number of ICU patients. The province has extended to stay at home order until at least May 20th. In British Columbia, cases there are showing signs of decline, which is great news although they're still near record highs. Hospitalizations in the province remain very high. We're still keeping an eye on the variant activity in the province, which has reported 3,900 cases of B117 and 1,800 cases of P1 to date. There's a lot we still don't know about some of these variants, including P1, the one originally identified in Brazil. And we need to continue to monitor the variant activity. In short, on a global basis, several things can be said. One, transmission is at an all time high, we are in the darkest days of the pandemic on a global basis. Two, we are seeing countries that had been spared large waves in the past now experiencing these waves. How and why? We don't understand. Anyone who does have an explanation for this, as I've said multiple times on this podcast, be careful. They probably also have a bridge to sell you. We just don't know why this is happening. The key factor is going to be vaccine, vaccine, vaccine. And yet, as we already are seeing and we'll talk more about this in a moment, vaccines are not forthcoming in many of these countries and won't be. And so the concern we continue to have is not just for the cases that occur in these countries, the individuals who die from this infection, which are front and center and obviously important. It's also the fact that these are where we're going to see the variant spin out of case occurrence. And these are the variants that could very well challenge the actual effectiveness of our current vaccines.

**Chris Dall:** [00:20:07] Here in the United States, we're still seeing a slow rise in cases after the big drop off in February and March, but the vaccination effort continues at a pace of about 3 million doses a day. So, Mike, where are we in that race between the vaccines and the variants? And do you have a better sense of the trajectory that this fourth surge is going to take in the US?

**Michael Osterholm:** [00:20:28] First of all, let me begin with a disclosure, one that I've shared with you before on this podcast, but one that really is front and center today. And that is, I think I know less about covid-19 and in particular sars-cov-2 virus than I did six months ago. The more I learn, the more experience we have with this virus, the less I can say that I can comfortably tell you what's going to happen next. So take whatever I have to say to you, I guess, in that light. One of the issues I just have to address and one that just seems so obvious to me is the fact that we are getting used to lots and lots of cases of covid-19 in our communities and the deaths that result because of it. In the US, we're now averaging about 70,000 new cases per day. The current 14 day change is up 4 percent for cases and hospitalizations are up 10 percent. Over the past week, the positivity rate was about 5.6 percent. Again, the number of tests have fallen from previous weeks, so it's unclear just exactly what that positivity rate really means. I think we seem to be somewhat in a holding pattern with the regional trends we've talked about the last couple of weeks to largely playing out. Most of the states seeing higher levels of cases per capita are in the Midwest and the Northeast, although some of the states might be plateauing or showing signs of decline. Some outliers to this regional pattern continue to exist and I think are really worth keeping an eye on. For example, if we look at the last 14 day changes, Florida is up 25 percent in cases, up 15 percent in hospitalizations. Colorado is up 18 percent in cases, up 36 percent in hospitalizations. Oregon is up 60 percent in cases, up 28 percent in hospitalizations. And Washington is up 9 percent in cases and up 34 percent in hospitalizations. We have to, in every instance, keep looking at Michigan as a lesson to be learned. They continue to be the hottest spot in the US, although there is some hope that the cases might be peaking. But it's important to remember that Michigan has been seeing cases increase since February 18th, two months. So hitting this peak right now shouldn't be a surprise if one thinks about the number of infections that have occurred during these two months and adding to hopefully that from vaccination would get you to a place where you would see fewer infections because of some reduction in the number of people susceptible. Hospitalizations reached an all time high in Michigan and deaths are still on the rise. On Monday of this week, there were 8,574 cases reported that day, including 61 deaths. The seven day average is about 6,598 cases. Now, when you think about that, remember that Michigan has had 45.2 percent of its residents having at least one dose of vaccine and 30.8 percent fully vaccinated. Now, let me compare Michigan to another state that I happen to know a little bit about, Minnesota. The Minnesota data as of April 19th, beginning of this week, the statewide rate of new cases reached 38.1 daily cases per 100,000 residents. Again 38.1 daily cases per 100,000 residents. There were 14,760 newly diagnosed cases over the past week, a volume last seen in late December 2020. Statewide positivity remained elevated at 7.4 percent, even as the testing rate surpassed 400 to 417.5 weekly tests per 10,000. All regions in the state had positivity rates above 5 percent for over the week. Hospital admissions increased 69 percent over the last two weeks, reaching 14.3 weekly admissions per 100,000, and ICU admissions increased 75 percent over the same time period to 2.7 weekly admissions per 100,000. What this is telling you is that we still have very substantial activity occurring in Minnesota. It is not nearly as severe as we've seen in Michigan. But the question is, will that happen? Well, let's take a look at Minnesota's vaccine data. I mentioned before in Michigan we are talking about about 45 percent of the residents having at least one dose. In Minnesota that number is 52 percent. We talked about 30.8 percent were fully vaccinated in Michigan. In Minnesota, 37 percent. About 52 percent of our residents 16 years of age and older have had at least one dose. At least 85 percent of those 65 years of age and older have had one dose. And yet look at the activity we're seeing. I believe that Michigan and Minnesota are very important examples for us to look at carefully if we consider what else might happen in the rest of the country. So if we look at a national perspective right now, vaccination rates range from about 58 percent of the population, given at least one dose in New Hampshire, down to 29 percent in Mississippi. 33 percent of the population of Maine is fully vaccinated, compared to only 19 percent in Alabama. And if you look at these numbers, you can see where the south is just set up for a potential increase in cases in the weeks ahead, and don't tell me it's not going to happen because of season, because last July it happened. So if we look right now, Mississippi, 29 percent have had at least one dose in that state, 30 percent in Alabama. 31 percent in Louisiana. 32 percent in Tennessee. These rates clearly put people in those states at a 'at risk' category for this to take off. Now, why hasn't it taken off? I can't tell you. I don't know why. The other thing we are seeing happen, though, is I think good news is a reduction in the deaths, at least in the older age population. And I think this is directly attributable to the work that's been done in the long term care facilities. The age of death in the United States has changed. In December of this past year, 62 percent of the deaths were in ages of 75 years of age and older. In March, most deaths, 52 percent, were under age 75. So we're seeing fewer deaths, grant you, but we're seeing more deaths in that sense in the younger age populations by incidence as opposed to just by proportion. So to summarize where we're at, I don't know. I think that the potential for these other states I've just mentioned, at least 12 to 15 states where things could take off and be as bad as Michigan are right there. If we don't change the level of vaccination beyond where it's at right now in those states, I don't know why there won't be transmission there. And as we see in Michigan, it could be substantial. So at this point, it's anybody's guess. And anybody who tells you they know what's going to happen, again, be careful, I know they have a bridge to sell you to.

**Chris Dall:** [00:27:45] Last week, the CDC and the FDA paused vaccination with the Johnson and Johnson vaccine while officials reviewed data on severe blood clots linked to the vaccine. And the CDC's advisory committee on vaccines will meet again at the end of this week to make a decision on how to proceed. Mike, do we know if any additional blood clot cases have been reported? And with some time now to reflect on it, do you still think the pause was the right decision?

**Michael Osterholm:** [00:28:10] We have not received any new information from the US federal government as to the current status of the cerebral venous sinus thrombosis situation with the J&J vaccine here in the United States. However, on Tuesday, the European Medicines Agency, the EMA or the what is known as the FDA of Europe, did issue a report in which they looked at the cases here in the United States. And as we had some hint of that there were now eight cases reported from the US, they did confirm that in their summary report that they put out. And what they basically did was look at this from the perspective of also looking at the AstraZeneca vaccine, which had a very similar kind of picture with the thrombosis. The EMA safety committee, known as The PRAC, concluded that a warning about the unusual blood clots with low blood platelets should be added to the product information for the covid-19 J&J vaccine. They basically reported on 8 cases from the United States of serious illness, this is two more than we had from before. And they indicated that what data they had, all cases occurred in people under 60 years of age, within three weeks after vaccination, the majority in women, meaning that, of course, now one of the additional cases or both were of men. Based on the currently available evidence, the specific risk factors could not be confirmed. So they did not make a recommendation about limiting vaccine use to one or more categories of individuals, meaning that no one was told not to get it, such as had been possibly suggested in the United States with women between the ages of 18 and 49. They did reaffirm that the vaccines offer important benefits with regard to preventing covid-19, reducing hospitalizations and deaths. As we talked about before in the initial data set when there were 6 cases in the United States among women between the ages of 18 and 48, and because in that group only about 1.5 million doses were administered, we could come up with the incidence of disease in that group. And for women, it was about 0.4 cases per 100,000 people. Let me just emphasize that again, about 0.4 per 100,000 people. We know with natural covid-19 infection, the risk of CVST is about 4.5 to 20 cases per 100,000, substantially higher than the risk it is from getting the vaccine. So from their perspective, there was still great benefit in getting the vaccine to individuals over the risk of covid. Also, they were very clear in the need to educate physicians as to the warning signs. The EMA emphasized the importance of prompt specialist medical treatment. They were very clear that by recognizing the signs of the blood clots and low blood platelets and treating them early, health care professionals could really help those affected with the recovery and avoid complications. In this case, of course, we're talking about not using heparin, but rather I.V. immunoglobulin, which would be the appropriate treatment in this case. I believe by the end of the week, the ACIP will make recommendations that may limit who we recommend the vaccine for. Meaning that they may suggest that women of certain age groups not get the vaccine. And also make it clear that if individuals do have signs and symptoms suggesting of a blood clot within three weeks of the vaccination, that the cases be handled in a certain manner in terms of reducing the risk of severe clinical disease. So this is an important vaccine, we need it. The risk/benefit is surely there to show that it is actually one that many, many more people could be saved from having the CVST situation occur by getting the vaccine than by because of the vaccine. And I don't think we've communicated that very well to people. And I think now is the time we have to make sure that we understand that preventing covid and all of its potential risks, whether it be CVST or any other health problems, surely outweighs the risk at this point of CVST. And now with what we know about CVST, we can treat it much more effectively.

**Chris Dall:** [00:32:46] So obviously, there's been a lot of focus on Johnson and Johnson and AstraZeneca with the blood clotting issues, but have any blood clotting issues been reported with the Moderna and Pfizer vaccines?

**Michael Osterholm:** [00:32:56] At this time, we have not seen any additional reports of any of the blood clotting type of conditions occurring with the mRNA vaccines, namely Moderna or Pfizer. There has been recent discussion this week of possible myocarditis, of pericarditis, inflammation of the heart or the area around the heart. And we have to be very careful even suggesting that that is real. It could be. None of these have been life threatening or in that manner, serious illnesses. But it surely could be an immune reaction that could occur as a result of the vaccine. But at this point, I think the safety profiles overall for both of the mRNA vaccines has been quite remarkable. And surely we do not at this point anticipate any, any change in the current recommendations for using those vaccines.

**Chris Dall:** [00:33:51] I want to talk about the vaccine hesitancy issue, because while demand is high right now, there has been some reporting on growing numbers of vaccine slots available in southern states. And you discussed earlier some of the low vaccination rates in those states. There's also concern that at some point in the coming weeks, supply of vaccines across the country is going to start outstripping demand. Are you concerned about vaccine hesitancy and what it means for our ability to get to herd immunity?

**Michael Osterholm:** [00:34:18] Well, let me start out by saying that from the standpoint of herd immunity, I, for one, couldn't tell you what that means. I don't know what herd immunity is with this virus. And I've seen many, many people, again, who have pontificated on this as if somehow they had a sense. Remember, herd immunity is a concept that says if you have enough people who are immunologically protected from infection, much like rods in a virus reactor, then you could, in fact, slow down transmission. Remember, herd immunity doesn't stop transmission. It's slowing it down. And in fact, it's very similar, I think, to when you're on the plane, for those few who are flying today and the pilot announces, "We're now beginning our descent into Minneapolis/St. Paul International Airport and we're still half an hour out." That's when we're losing altitude. Well, that's what we have with herd immunity, you start slowing down transmission. When one considers herd immunity, you consider how many people are immune from having had natural infection and having that residual immunity or from being vaccinated. And very rarely do we talk about in herd immunity, the concept that once immune doesn't mean always immune. And so therefore you could actually see people come in and out of that waning period. And you all heard this past week and a half executives from the mRNA vaccine companies, both Pfizer and Moderna, as well as some in our federal government, suggesting that a booster dose may be needed at a certain period of time. Now, I want to clarify that, because it was never really made clear to the public what we mean by a booster dose. Typically when we think of a booster dose, we're thinking of the same vaccine just to help, you might say, gin up the antibody response or the other aspects of the immune response, including t cells with the same vaccine. That's a true boost. If you're looking at having to vaccinate with a newer vaccine to account for the mutants or the variants, that's really not a boost. That is actually, in a sense, a new vaccine, much like we think of influenza. Nobody talks about going in and getting your booster shot for influenza this year when it's a different vaccine. And so we're not clear yet just how long this immunity of natural infection and vaccine last. So that's first of all, we just have to acknowledge that fact. The second thing is when a virus is more infectious, then it also means you have to have a much higher level of protection in that population. So when B117 came along and we see anywhere from 50 to 100 percent more transmission than previous strains, that automatically had to move herd immunity levels up to accomplish the slowing down of transmission. And we don't know what that is. I can truly tell you, as an epidemiologist in the trenches for 46 years, B117 is much more infectious than the strains we dealt with 6 months ago. But I can't tell you with any certainty what that means. So let's just at the outset say, you know, we'd all like to try to achieve concepts of herd immunity, but I don't know what they are. And I can only hope that we can slow down transmission. But I don't have a sense that by itself will ever stop it. In terms of looking at vaccine hesitancy, there was a very good article published this week by Kaiser Health title of 'Supply versus Demand- When Will the Scales Tip on Covid-19 Vaccination in the US?' And this is really a very thoughtful overview that really talks about the fact that now here we are in this week of April 19th and vaccine supplies have increased significantly and eligibility is now been fully open to all adults in all states. And the main question as they state has become when will the supply outstrip demand? Before we were reversing that, we had far more demand than we had supply. And then as they note, once this happens efforts to encourage vaccination will become much harder, presenting a real challenge to reaching the levels of herd immunity. And in that case, whatever, of course, that herd immunity means to whoever. I think at this point it's fair to say that the polls that have been taken to date to look at who will in fact get vaccinated have shown that the share of adults who have either received one vaccine dose or want to get vaccinated as soon as they can actually has increased some. On March 21st it was up to 61 percent from 55 percent the month before. But 61 percent means 39 percent of the population still is either not likely to get the vaccine without additional support and education or just out there and not going to get it. At this point, we don't really understand what it's going to take to get these additional people vaccinated. As the paper notes, we're probably about 27 to 30 million adults away from being vaccinated before we hit up against what they call the enthusiasm limit. And that means that at that point we may in 15 to 20 days see the number of vaccinations drop precipitously because we no longer can get people in. And I think this is going to be a real challenge. I've already laid out the state numbers for a number of states that I think are at very high risk for seeing major increases in cases. Again, I just re-emphasize Michigan has proven even with sizable immunization rates and even with previous experience with the virus of substantial nature, that we can still have large outbreaks in states because of just the remaining number of people who are not protected from previous infection or vaccine. So this is going to be a big issue, vaccine hesitancy and what it means. Some people have suggested we stop using the term vaccine hesitancy that, in fact, it's just about vaccine education. And I'm not sure how to interpret that, how to split those hairs. I just think in a couple of weeks we're going to find we have a lot more vaccine available than we have people's arms to put it into. And that's going to be the time we're going to ask ourselves the questions about what's happening in various states and will we be seeing a big increase in cases because of our inability to get to 60 or 70 percent of the population vaccinated. So in conclusion of this piece, I have a charge to everyone on this podcast. And I say this with a smile, but I also say it with some certainty. Please help two or three of your friends, colleagues, neighbors, whoever, who aren't necessarily thinking about getting vaccinated right now, help them understand why it's so important to get vaccinated. Number one, the freedom it brings. Remember, I've been saying all along, have those post-vaccine parties. I've had several. I'm so excited. Where several other couples can get together, we're all vaccinated, we don't wear any kind of face cloth coverings, masks. We hug, we kiss, we sit next to each other. We have so much fun. It reminds me of what we've taken for granted that way. So that's the number one reason to get vaccinated. Number two, you can hug your kids and grandkids. Particularly if the young grandkids that can't be vaccinated yet, we still say go ahead and in a single family setting, you can hug them. Third of all, let me tell you, I can tell you, since I've been vaccinated, I don't take it for granted that, yes, we have vaccine breakthroughs. But at the same time, you know what, I feel a freedom I haven't felt before. I feel better. I just feel like I've had a rock taken off my back. So help your friends, neighbors, family, whoever get vaccinated, please.

**Chris Dall:** [00:42:03] So, as you might guess, vaccines remain a big topic for our listeners, and this week we received two vaccine questions that relate to the CDC report last week on breakthrough infections in those who've been vaccinated. You just mentioned that. Kate wrote, "I'm hearing about breakthrough vaccine reports that indicate some hospitalizations and deaths. What do we know about those that have completed the vaccine series, become infected with covid and are now in the hospital or have died? Is this expected in the real world, despite clinical trial data that suggested 100 percent protection against hospitalization and death?" And then Dakini wrote, "I am fully vaccinated, but was a bit concerned to read recently that in the U.S., 5,800 vaccinated people got covid. In all, 29 percent were asymptomatic, 27 died and many were hospitalized. If you could cover this topic, vaccinated people catching covid and under what circumstances, I'd find it helpful." So, Mike, what should people know about these breakthrough infections?

**Michael Osterholm:** [00:43:00] Well, first of all, they do occur and they were fully expected. Remember, a vaccine that's 90 to 95 percent effective isn't 100 percent effective. And when the studies were conducted to evaluate vaccine efficacy, remember, who is chosen to be in those studies? It was largely healthy people who are younger. And it wasn't people immunosuppressed or people who are frail, elderly. And so we've always known that the concept of efficacy, the studies done under ideal conditions with, in a sense, ideal participants is different than vaccine effectiveness, which is what happens in the real world. How does it really work when you kick the tires out there? And so to me, I've always understood that, number one, is that we would see, you know, a number of patients at 5, 10 percent would not be fully protected and could very well have a breakthrough infection. Number two, is we still have to evaluate what is the level of protection of these vaccines with people who have certain levels of immunosuppression, people who may be taking certain drugs that basically dampens down their immune response. We know that in the frail elderly, look no further than influenza, that vaccine effectiveness can be greatly reduced in these individuals compared to what it's like in younger, healthy adults. And so these are not at all unexpected, number one. Number two, is that we do still need to understand more are any of these due to variants that may have the ability to evade immune protection from either natural infection or from vaccination? And we are still way short in this country of doing that kind of work. Now, the CDC is setting up studies right now with state and local health departments for formal investigation of breakthrough cases to try to get those viruses to look and see if they are variants, or if they are just the B117 where we have no evidence that it does, in fact, evade immune protection but just the fact that people still got infected. We need to study these very carefully. This is all the more reason why I keep saying to people, you can get back to a semblance of your everyday life, I just gave you examples of vaccinated people who can get together. But it's also the same reason you won't see me in a crowded bar right now. I don't want to be in crowds because as long as the vaccines protect me, that's great. But if there is a large number of people in a setting that are infected, will it overwhelm that vaccine protection I have? So this is the example I gave before where I think the vaccines today are like a, you know, fire protection suit that may protect me 90/95 percent of the time. That's incredibly helpful to firemen. But if I then voluntarily walk into a 10 foot wall of flames, can I expect that suit to fully protect me? No. And so, why get into the flames? So this, again, is why we get into this level of discussion about, you know, don't count on the vaccines to be everything and all things. They're still going to be really, really, really good. Get them. No one can walk away from this conversation, assuming I don't think these vaccines are important. Now, in terms of advice, we owe people much more information, whether they are immunosuppressed, intentionally or because of disease, if they in fact have had organ transplants, any number of things that would put them at greater risk of, in fact, getting covid even after being vaccinated. We need to help make that information available as soon as possible. And it's still lacking. So with time, I think we'll see that. The final piece is that we've got to deal with long term care facilities right now. I have a real problem with that. We're seeing a number of outbreaks in long term care facilities among the workers. People refuse to be vaccinated for whatever reasons. That is an absolute challenge situation for those individuals who are residents who have been vaccinated. But as frail elderly, in many cases, they aren't going to have the same level of protection from that vaccine that a younger adult would. And so mixing up infected health care workers and long term care with these more vulnerable people, even though they've been vaccinated, is a challenge. And so we've got a lot more work to do in this area, but expect breakthroughs to occur. We have to help you understand why they happened, including the fact that it was a risky behavior that you took and put yourself in harm's way. That fireproof suit didn't cover those 10 foot flames completely. Or, in fact, is it because you have an underlying health issue that makes you more vulnerable and what does that mean in the real world setting of using these vaccines?

**Chris Dall:** [00:47:46] We don't have an act of kindness this week to highlight, but we do have a life lost during the pandemic to celebrate. And Mike, this celebration of life exemplifies what you discussed in your dedication. Can you share with our listeners?

**Michael Osterholm:** [00:48:00] I can and this dedication is really a very, very touching one. One that I felt very, very close to, because during this time I too have had individuals who have died in my life where I wasn't there. I wish I could have been there. And I will regret for the entirety of my life that I wasn't there, but covid prohibited that from happening. This is from Mary, whose email inspired the dedication for the episode of this podcast. And here's what she told us about her father, John, who died in December at age 85. "My dad was a father and a mother to me since my mother suffered a debilitating brain aneurysm when she was 45, I was just 13, and was left physically and mentally impaired. She lived at home with us for a while until insurance could no longer pay for home support and her father, exhausted as he was, could no longer care for her himself while also caring for four children aged 4 to 17 and trying to work a very stressful, full time job. So she was moved to a nearby care facility and lived there for 25 plus years, passing away 10 years ago. Over those 25 years, my dad would visit her nearly every day and bring her to church on Sundays when he still could, and then home to spend the day with us. Eventually, her health and his didn't allow for church and home visits, but he continued visiting her nearly every day. He took his marriage vows to the heart and loved my mother in sickness and in health. My dad was 85 and suffered from a long list of health conditions that left him in a care facility these last few years. Because of that, my siblings and I were not able to visit him or hug him in person for nearly 6 months. Although he suffered from some dementia, he was still able to have conversations on the phone and some Zoome FaceTime visits with the help of staff. He was well aware of the pandemic and understood the precautions being taken and supported them. Starting last fall, we were able to have 1 visitor a week for 20 minutes outdoor, 10 feet away with no touching. That was better than nothing given the circumstances, but the visits could not last long before it was too cold to do that. In November, he had a fall and was sent to the E.R. amid the fall pandemic, where family wasn't allowed to visit at the hospital. His health seemed to spiral down during his stay. His care facility eventually allowed us to come and visit with him once they determined he didn't have much time left. I spent the first day of compassion care with him, staying most of the day, talking and laughing as we always had, and watching his favorite Western TV shows like Gunsmoke. He passed away two days later. The first day that I could truly be with him since the pandemic ended up being his last conscious day. Although I am so thankful for that day, I can't help to think about all the time we missed out on his last year due to the pandemic. It's been nearly 5 months since my father's passing and not a day goes by that I don't think of him. His funny sayings, his sound advice, his love for my mother and the sacrifice he endured to get all four kids through college into adulthood. I'm in my 50s now and have two kids of my own. I cannot comprehend what he went through. I'm so thankful to have known him and been raised by him. Mary." Thank you, Mary. There are no words that I can express that can say more than you did. Thank you for sharing that. Your father was a remarkable man and it's obvious that he's passed on many of those same values to you. And for all the families that have lost that opportunity to spend those last days, those last hours with your loved ones during this pandemic, my heart aches for you.

**Chris Dall:** [00:51:57] And just a reminder to our listeners that if you want to share memories of a special person who died during the pandemic, please email us at OsterholmUpdate@umn.edu. And keep those acts of kindness coming. You can send those to the same email address. Your closing thoughts today, Mike.

**Michael Osterholm:** [00:52:13] I want to, first of all, thank all of you again for being with us. I cannot begin to adequately put into words the appreciation that we have for you as this podcast family at CIDRAP. Your emails, your letters, your cards, your funny little things you send us that make us laugh, are invaluable and are so, so kind. So thank you. We very much appreciate what you do for us. A couple of things. I guess I just want to say, there's a quote that I have kept close to my heart for many years from the late Alex Trebek. A man of great wisdom. He once said, "If you can't be in awe of Mother Nature, there's something wrong with you." And while the awe that I have for this virus is surely one that I would like to see eliminated, it's nonetheless one that is very humbling. And, I think, you heard my words today on this podcast, I'm giving you my best shot. I'm trying to call balls and strikes as I see them. And sometimes I feel like I let you down because I just don't know. And all I can do is promise you that we'll tell you everything we do know and what we don't know. But there are days I feel like I know less to tell you than I should or could. And so I hope that from that perspective, at least you understand we're trying here. And I wish I knew if we were going to see cases blow up in the United States. I knew we were going to see a global challenge. And I think we still are not out of the woods yet here in this country. And so I'm sorry we can't give you more information that way. But it's at that light that I also bring my final words to the microphone here. I'm back into the oldies, golden oldies time, again. These are the lyrics to a song that I used in Episode 11, Driven by the Data back on June 10th, almost a year ago. This was a song written and recorded by Bill Withers. It was released in April of 1972. It was a single from his second album Still Bill. It was a number 1 single on both the Soul Singles and Billboard Hot 100. Billboard listed this as the 7th most popular song in 1972. Rolling Stone in 2008 determined this song to be 208 of the 500 Greatest Songs of All Times. Bill Withers and Lean On Me. 'Sometimes in our lives, we all have pain, we all have sorrow. But if we are wise, we know that there's always tomorrow. Lean on me when you're not strong and I'll be your friend, I'll help you carry on. For it won't be long till I'm going to need somebody to lean on. Please swallow your pride. If I have things you need to borrow for no one can fill those of your needs that you won't let show. You just call on me, brother, when you need a hand, we all need somebody to lean on, I just might have a problem that you'll understand. We all need somebody to lean on. Lean on me when you're not strong and I'll be your friend. I'll help you carry on. For it won't be long till I'm going to need somebody to lean on. Just call me brother, and when you need a hand. We all need somebody to lean on. I just might have a problem that you'll understand. We all need somebody to lean on. If there is a load you have to bear that you can't carry, I'm right up the road. I'll share your load if you just call me. Call me if you need a friend, call me, call me. Call me when you need a friend. Call me if you ever need a friend. Call me, call me.' Thank you again for spending another week with us. The podcast crew here at CIDRAP very much appreciate you spending that time with us and again for all your feedback. As the song says, lean on me. We all need right now to help people through this time. The questions, the indecision, the uncertainties. This is a time for us to lean on each other. All I can say is, please be kind. Be kind. Right now, we need it more than ever as we have hope that we're going to be out of this pandemic in the United States, at least in a major way if we can just get people vaccinated, if the variants don't descend upon us and create some crisis, we can see a day ahead when we will all be together, not just those vaccinated, few that I know now, but many, many people together enjoying life. And please keep your questions coming in. But most of all. Be kind. Be thoughtful and be safe. Thank you so much.

**Chris Dall:** [00:57:22] 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.