

Episode 107: A BA.4 and BA.5 World

Chris Dall: [00:00:00] Hi, everyone. We wanted to take a moment to share a brief message with you from CIDRAP as we near the end of the fiscal year. The COVID 19 pandemic, the monkeypox outbreak, and other emerging worldwide infectious disease developments remind us how critical it is to have access to high quality, authoritative and unbiased scientific information. And that's exactly what you get from CIDRAP, which provides expertise and accurate reporting by email alerts, free access to the latest news and research on our website and this podcast. Please help us provide the coverage you have come to expect from CIDRAP regarding the latest infectious disease threats by supporting the team you trust, respect and depend on. To support this podcast and other news offerings, please visit cidrap.umn.edu/donate. We so appreciate your support. Hello and welcome to the Osterholm Update COVID-19, a 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. Welcome back, everyone, to another episode of the Osterholm Update podcast. A recent article in the New York Times noted that in the three months since the highly contagious Omicron variants launched a wave of new coronavirus cases in the United States, the spread of the virus and the number of deaths from COVID-19 have diverged more than ever before, and that Americans are dying of COVID at a rate close to the lowest of the pandemic. Still, an average of more than 300 people are dying from COVID-19 every day in the United States. At that rate, the virus is killing more than twice as many Americans every day as suicide or car crashes are, New York Times reporter Benjamin Mueller wrote. And many of those who survived the virus are debilitated, some of them for long after their infections. Yet despite more than 2,000 deaths a week and the threat of long-COVID, much of the country is acting like the pandemic is over. Today, on this June 23rd episode of the podcast, we're going to discuss the psychology of this current COVID moment as we assess the current state of the pandemic internationally and here in the U.S. and explore whether we are prepared for the possibility that our sense of complacency could be upended by waning immunity and more dangerous variants. We'll also discuss the FDA's authorization of COVID-19

vaccines for young children, talk about a new report that calls for an overhaul of the US public health system, give you an update on monkeypox, and share a celebration of life from one of our listeners. But before we get started, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

Michael Osterholm: [00:02:58] Thank you, Chris, and welcome to all of you back to another episode of the podcast. For those who are part of the podcast family, we appreciate you participating with us in our now biweekly podcast episodes. And for those who might be new today, I hope that we're able to provide you with the kind of information that you're looking for that's helpful, that adds perspective to what we're all experiencing right now with regard to COVID. If I had to say up front, what I think that the storyline will be from today's podcast it's the intersection between changing baselines, the fact that what is it today that we have as a measure of what's acceptable, what's desirable? Or we're still in the middle of this pandemic? We will make every effort to add some sense to that fluctuating baseline. The other thing we're going to add is perspective. Chris, you noted that in the opening that we're all trying to understand where are we? Well, how do we feel? What do we feel? Why do we feel? And today I will make the case, I hope that this is not like a tornado. This is not like a hurricane. This is not like an earthquake. This is not like a forest fire where we can kind of predict what the end will look like and when it will occur and how we can go into recovery. This, unfortunately, is like a war. We don't know how it will end. We don't know when it will end. We do not understand what the damage will be between now and what that someday tomorrow will be. And so today, I'm going to try to share with you a sense of that. And we talk about are we still in the pandemic or are we out of the pandemic? What does it mean? So I hope that this will add some helpful context. To start out with though today I really want to share with you a very special dedication. It's one that we have in a sense addressed indirectly throughout in a number of podcasts over the course of this pandemic. But today, let's just hit it head on. Today, we're dedicating this to the Juneteenth celebration that occurs each year on June 19th. It commemorates the end of slavery in the United States. The first Juneteenth was celebrated in 1865, when enslaved black Americans in Texas were informed that the Civil War had ended and they were now free, over two years after the Emancipation Proclamation was signed. Texas became the first state to recognize the holiday in 1980 and is now recognized in all 50 states and the District of Columbia and observed as a paid holiday in 18. In 2021, it officially became a federal holiday. Though Juneteenth is a celebration of freedom and

the progress that has been made towards racial justice, I want to take this moment to recognize some of the hardships that the black community continues to face, particularly those challenges related to COVID and health care as a whole. Racial disparities in the number of cases, hospitalizations and deaths have received media attention during this pandemic. But sadly, they are not unique to COVID. Our country's health care system has long had a history of mistreating black patients. A well recognized example of this was the Tuskegee study of untreated syphilis, in which nearly 400 black men with syphilis were not treated for the disease for decades, even after penicillin became widely available. But mistreatment of black patients is not just a historical issue. It is also a current one, too. A meta analysis of 14 studies published in 2019 found that black patients were less likely to receive medication for acute pain in emergency departments than white patients. Another meta analysis of 27 studies published in 2020 found that non-white patients were less likely to receive opioids for chronic pain than white patients, with the strongest disparities occurring in the black patient population. This long history of mistreatment or undertreatment has caused many black Americans to lack trust in the medical system. An October 2020 poll found that less than six in ten black Americans trusted the US medical system most of the time. Seven in ten said that they believe that the health care system very often or somewhat often treats patients unfairly based on race. Black patients may also have more challenges accessing health care altogether due to factors like lack of insurance. According to the Kaiser Family Foundation, over 11% of black Americans are uninsured compared to nearly 8% of white Americans. All of these factors have resulted in black patients having worse outcomes during the pandemic, too. Most of the 52 studies analyzed in a systematic review published in 2021, found that non-white patients were at a higher risk of COVID infection, confirmed diagnosis, hospitalizations and deaths than white patients. A 2021 meta analysis found that from January 2020 to April 2021, black patients had 1.8 times as many infections. 1.8 times as many hospitalizations and 1.7 times as many deaths as white patients. So this week's dedication is to all those who have suffered as a result of these racial disparities during the pandemic and before. While we acknowledge these inequalities, my hope is we can also recommit ourselves in public health, health care and our personal lives to make our communities a more inclusive place. We all should celebrate Juneteenth. Now let me move on to what may be the most important message I have among all of the ones I've shared over the past year with regarding our light. Yes, we all know this has been the week to celebrate. Here today on June 23rd, we are now two days past the summer solstice,

where today we have 15 hours and 36 minutes and 38 seconds of sunlight, only 11 seconds less than we had just two days ago for the 21st. For those others who want more details, the civil twilight for today is actually from 4:49 a.m. to 9:41 p.m.. So in fact, today we have long, long days. For our colleagues in the Southern Hemisphere, yes, we know these are your darkest days. Now, I want to be really clear about one thing. We do have a long journey to get back to December 21st, and we'll go from 15 hours and 36 minutes plus of sunlight to 8 hours and 46 minutes. Please don't go into a funk overnight that we're now on the downward side. We've got some great months ahead of us. But it also is a reminder that just as life comes and goes, so do the seasons. And we should celebrate what we have now and appreciate it and know that our colleagues in the Southern Hemisphere will have that opportunity in just six short months to do the same. But we will also return. Next year, we will be back. So celebrate the light right now. I can't tell you how much I love it. It's incredible. And from that perspective, now is the time to feel the light.

Chris Dall: [00:10:09] Mike, let's start with the international situation. The World Health Organization's weekly updates continue to report a global decline in new COVID-19 cases. But it does appear that some countries are starting to see upticks as the highly transmissible BA.4 and BA.5 Omicron sub-variants establish themselves. What countries are you keeping an eye on?

Michael Osterholm: [00:10:30] Well, Chris, I think one of the challenges we're really dealing with right now is how to interpret and explain what's going on. This is that part of the introduction that I shared with you about perspective and shifting baselines. Right now, we are not done with this pandemic, even though we think we may be in many, many locations. This virus still has more tricks up its sleeve, and it surely does yet pose a significant challenge. So this is not going to be a simple task to share with you what's happening and how do we put it in perspective? We're at a point in this pandemic where ambiguity has seemed to permeate nearly everything. Remember, this is not like an earthquake. It is not like a tornado. It is not like a hurricane. It is not like a forest fire, that will eventually be extinguished and clearly understood it's over. This is more like war. Yes, they still get over. They're still done. But when and how that will happen is yet unclear. So, for example, when we look at what's happening with COVID right now internationally, what lens should we use to view activity? Or to put it another way? How do we gauge so called success? Is it enough to compare a country's current activity to

their previous highs? That's the shifting baseline. As long as they're below these previous highs. Is that success? What about previous lows? Is that a fair metric? What if those lulls were fleeting or occurred at a time when the dominant variant was far less transmissible than Omicron? So there are just some of the questions I think many of us are wrestling with at this stage in the pandemic. And the reality is that depending on the lens used, the interpretation of where we're at, where we might be headed, could be very different. And of course, we have to add in our own perspectives of what we want to be done with this pandemic. So whatever might appear to be good news may actually be used as a basis to say we're done. So where are we at right now overall? Well, as of Tuesday, average daily cases globally stood at just over 556,000, and the death toll was just under 1,400. Now, if you compare those totals to where they were at the beginning of the month, you'll see the cases have increased slightly and deaths have more or less remained stable, largely staying within the range of 1,300 to 1,500 a day. Of course, as you know, I don't put much emphasis on case numbers since testing and reporting remains a challenge. A reduction in the number of PCR tests conducted in countries like the UK and the US alongside more widespread usage of at home tests means only a fraction of the true cases are being picked up. And of course, there's that issue of disease severity. What kind of cases are we picking up? The sniffles and a bad cold-like symptom picture or one where you're in an ICU in a hospital? And you can see that through the latest positivity rates in certain places like the US, where 14% of reported tests are positive, and Israel where nearly 40% of tests are coming back positive each day. So there's a lot of virus out there, Chris, a lot likely, more than at any time in the entire pandemic. However, as you mentioned in your question, the true levels of infection actually appear to be growing throughout a number of countries as of late. And for each of these examples, the common thread seems to be the establishment and rise of the BA.4 and or BA.5 sub-lineages. This isn't all that surprising. As mentioned in previous episodes, both BA.4 and BA.5 harbor a similar set of mutations that have been linked to a heightened immune evasion. In addition, there's mounting evidence of previous infection with BA.1, the original Omicron variant doesn't offer much in the way of protection against infection with BA.4 or BA.5. And then there has been the real world examples of case surges in countries that have occurred around the same time that these sub variants quickly overtake BA.2. Again, in our last episode we discussed South Africa and Portugal, both of which saw average daily cases grow for the span of several weeks before reaching an apparent peak. Now that same pattern is playing out elsewhere as BA.4 and BA.5 gain ground in countries throughout parts of Asia, Europe,

the Americas and the Western Pacific. For example, countries like Australia, France, Greece, Italy, the Netherlands and the UK have all seen rising cases in Europe, and other examples outside of Europe include India, Israel, Hong Kong, Mexico and Singapore. Finally, there are a number of countries in the southern hemisphere like Brazil, Indonesia and now Australia that are also seeing case rises increase as BA.4 and BA.5 grows in frequency. So it's looking more and more certain that BA.4 and BA.5 will ultimately bring about another wave of cases over the weeks and months ahead. And I think once again, we're seeing that this virus still doesn't really fit the pattern of seasonality, no matter how many talking heads or epidemiologists suggest it is. Rather, I see this as more evidence that the variants and even the sub-variants largely determine when and where the surges occur. I defy anyone to find a pattern right out that is different between what's happening in the southern hemisphere in the heart of their winter, and the northern hemisphere in the heart of our summer. Of course, if this does end up playing out across the globe this BA.4 and BA.5 emergence, it means more opportunities for this virus to evolve and more situations where people will suffer from outcomes like long-COVID. So case surges have very real, lasting consequences. At the same time, I think one of the things that remains somewhat undetermined with BA.4 and the BA.5 surges are the levels of severe disease and death that we might expect. Now, make no mistake, infections, unfortunately, we get hospitalizations and deaths. So that's really not up for debate. But the question is how many hospitalizations and deaths will come as a result and what does that mean for the health care system? Like I said in our previous episode, COVID hospitalizations and deaths increased in both South Africa and Portugal during their latest wave. In Portugal, hospitalizations climbed from 1,200 to nearly 2,100, and deaths went from less than 20 a day to more than 40, placing the country in a position that was relatively close to the levels reached during the height of their initial Omicron surge earlier this year. Again, with 86% of their population fully vaccinated and 64% having had an additional dose, some have used Portugal's experience as a warning of what BA.4 and BA.5 could bring about, including right here in the United States. Then, of course, there's South Africa, where the latest surge took hospitalizations from 2,200 to a peak of more than 3,200. However, compared to their initial Omicron surge, where hospitalizations reached almost 9,400 or even previous surges with variants like Delta, where hospitalizations hit 17,000, some of you South Africans experienced to quell anxiety. They've also pointed to the average daily deaths in the country, which peaked at 38 in the latest surge and compared it to the original Omicron surge, which the average surpassed 200 with that surge. So

ultimately, we have these two countries with recent surges and no shortage of different interpretations as to what it means. And to be honest, I'm not exactly sure what to make of it all. What will happen in the United States over the course of the upcoming weeks and months, based on what we're seeing internationally, is in a large way a crapshoot. Again, I think this gets to the ambiguity of where we're at right now. Should we expect BA.4 and BA.5 to cause significant amounts of hospitalizations and deaths? Well, to me, the wise choice would be to prepare for that possibility and do what's necessary to minimize these outcomes. This is especially true for places where sizable portions of the population have yet to receive a vaccine, or might be a year or more out from their last dose. Other places that might have higher baselines for BA.4 and BA.5 to build off could also experience more challenges in those places where activity is low. In fact, there are a laundry list of things that ultimately might shape the size and severity of a surge. Which can vary quite a bit country to country. Regardless, I think most places can and should expect some rise in cases in the near future as these sub-lineages take off and for hospitalizations to grow as well. Again, this is what's happening right now in Israel, which just reported their highest daily case total since early April and has seen the number of seriously ill patients nearly double in the past week, going from less than 90 to around 170. It's happening in the UK where cases have gone from 5,000 a day in early June to 14,000 as of this past Tuesday, while hospitalizations have risen from 3,800 to just over 6,000, and it's happening elsewhere. So overall, this reoccurring cycle of case surges appear to be still in motion. And in addition to all the talk and speculation about what BA.4 and BA.5 could do in terms of severe disease and death, I think we need to ask ourselves, is this really sustainable moving forward? And I think at this point we surely have to consider that.

Chris Dall: [00:20:02] Here in the US, we seem to have reached something of a plateau at around 100,000 new daily cases that we know of, and it's been at that level for much of June. But with the BA.4 and BA.5 sub-variants now firmly established in the country and growing, are we likely to see that number rise again?

Michael Osterholm: [00:20:21] Well, like you explained in your question, Chris, average Daily reported US cases are still hovering around 100,000 per day, just slightly lower than two weeks ago. But as we've continued to emphasize, these are just the cases that are reported and the actual number of daily cases is likely much higher. The CDC's community transmission map remains overwhelmingly red. 81% of US counties

are seeing high levels of community transmission, compared to 76% of counties two weeks ago at the time of our last episode. While it seems like the vast majority of the US population is moving on, which we'll discuss later on, COVID is still everywhere. And in fact, I would say even given my comments in our previous podcast, that I knew of more people having COVID at the time of that podcast than any time in the pandemic. I have to actually update that and say, now I know more people who have COVID in the last 5 to 7 days than at any time in the entire pandemic. As I mentioned in our past couple of episodes, BA.4 and BA.5 will be something very important to keep our eye on. And they are certainly proving themselves to be just that. While BA.2.12.1 remains the dominant strain in the US, it now makes up 56% of new reported cases, down from 62% two weeks ago. BA.4 and BA.5 are not showing signs of slowing down. BA.5 made up 8% of cases two weeks ago and now makes up a quarter of the newly reported cases in the US and BA.4 makes up 11% now, up from 5% two weeks ago. The increasing prevalence of these two sub-variants is concerning for a few reasons. First, there is a higher risk of reinfection with BA.4 and BA.5 strains. This means that we can expect to see more people getting infected with COVID for their second or third time than with any other previous strain. A recent preprint out of Washington University by a group that has done some outstanding work assessing the impact of COVID here in the United States, found that a repeat infection increases the risk of all cause mortality compared to a first infection, hospitalization, and adverse health outcomes. Secondly, this is concerning because in many countries we have already seen BA.4 and BA.5 drive slight increases in hospitalizations. With overall attitudes towards the pandemic becoming less concerned or cautious, in combination with increasing reinfections and a potential for a surge in hospitalizations, we could find ourselves in a pretty challenging situation. I know it doesn't feel like that can happen because most of us know people who have had COVID, who have had nothing more than the sniffles or a severe cold. But in fact, these data do support clearly that reinfections actually can result in very serious illness, hospitalizations and even deaths. Let's look at hospitalizations a bit closer. In the US, hospitalizations are 2% higher than they were two weeks ago, reporting 2.4 new daily hospitalizations per 100,000 and an average of 30 people hospitalized for COVID in a given day, or about 9 per 100,000. I want to remind you that these numbers are much lower than they were during the Delta surge and the winter omicron surges when they were 5.3 and 8.5 daily new hospitalizations per 100,000. Remember, ours today are 2.4, about half of what they were with both Omicron and Delta. ICU numbers are also slightly increasing, with 3,400 patients in ICUs daily for COVID. 11% of patients

hospitalized with COVID are in ICU today, which has been consistent over the past month since May 2nd. Again, let me remind you that this is not what we were seeing during the Delta surge when 25% of patients hospitalized with COVID were in ICU or the winter Omicron surge when 17% of COVID patients were in ICU. Remember today it's at 11%. As of Wednesday, we are losing an average of 289 lives every day due to COVID, which has been consistent since early May. And just for context, we were at more than 2,000 deaths daily during Omicron and Delta, and in January 2021, we actually saw up to 3,000 lives lost every day. But let me remind you, as I'll come back and talk about this in a moment, when we talk about the psychology of this pandemic, this is still almost 2,000 deaths a week that we're experiencing right now in this country with COVID. COVID is everywhere right now. But at the same time, we're not seeing significant regional trends like we have in the past, for example, where we see the entire Northeast light up with cases and hospitalizations while the South remains quiet. The south and the west are seeing slight increases in cases, hospitalizations compared to the rest of the country. But if we look at ten states with the highest hospitalization rates right now we see that four are in the Northeast, two are in the Midwest, two are in the West and two are in the South. Again, I know that I've said this a lot, but these rates are low compared to what we've seen in the past. Hospitalization rates in the US are 22% of the hospitalizations during the January 2021 peak before Omicron existed. This is also the case with death rates. Of the ten states with the highest death rates, we see two in the Midwest, three in the South, two in the West and three in the Northeast. The US has seen 9% of the death rate that we were seeing in January of 2021. The fact that hospitalizations and deaths are spread out across the country rather than concentrated regionally raises questions about the nature of this virus, especially that issue of seasonality. Remember, just several months ago, many people predicted that, again, we would see a major increase in cases in the Deep South because that's where we'd seen the two previous years. My comment to that at the time was even a broken clock can be right twice a day, that there is no clear and compelling evidence that this will repeat itself. Right now we're not seeing that. So I think we have to, again, come back to the conclusion that the variant presence and how it moves is what dictates how cases occur and what we will see in any one region of the country. So right now, it's hard to tell what all this means exactly for the future of the pandemic. We're in a better place than we've been throughout any time in the pandemic with regard to hospitalizations, serious illness and deaths. But as we've just seen with BA.4 and BA.5 in other countries, what we're seeing here in the United States within weeks to months could look very different.

I think that's the challenge we have. Are we in a good place, a bad place? What is our place in the future? And, of course, perspective. Right now we want to move on with this pandemic. And as such, we're in a good place in the minds of many.

Chris Dall: [00:27:20] So that brings us to the psychology of the current moment. As you just mentioned and as we've discussed in recent episodes, it feels like more people are getting infected now than ever before. Yet hospitalizations and deaths are much lower. And for the most part, it seems like people are going about their lives and accepting COVID as part of the new normal. So Mike, are you concerned about this complacency and do you have any sense that there is a plan for dealing with waning immunity, possibly higher hospitalizations as BA.5 and BA.4 become more prevalent and the potential beyond that for more dangerous new variants?

Michael Osterholm: [00:27:56] Well, Chris, let's start with the first part of your question. Am I afraid about complacency? The short answer to this is obviously yes. I know that through the duration of this pandemic, I've had an ongoing reputation for being the bad news guy. I don't mean this to be good, bad or indifferent news. I think we're just at a point, as I've said over and over again, we're not sure how this pandemic ends yet. If in fact all we see for the future are the sub-variants that we're talking about right now, BA.4 and BA.5, then we might have a unfolding into the pandemic that looks very favorable. But on the other hand, with these sub-variants, we still could see a major surge in activity, not like necessarily we've seen in the past, but one that still could be challenging. In addition, we don't know what the next variants will be, what will be pi, what will be sigma, what will be the kinds of variants, and what will they mean in terms of severe illness, hospitalizations and deaths? And from that perspective, you know, this is not a prediction of disaster, but this is also not a reassurance that we're done. And that's hard for people to understand. So if you look at it right now, most Americans do not take the same caution from COVID the way they did a year or two ago. According to a poll released by the Associated Press in NORC about a month ago, just a third of Americans are taking precautions to avoid others compared to over half three months ago. Today, that number is likely even lower. This is in part due to the availability of vaccines and treatments and in part due to pandemic fatigue. Remember again, when you know a number of people who have been infected and the severity of their illness could be at best described as flu like symptoms and more often cold like symptoms people no longer fear this virus. Even if I do get it. So what? You know, it's not a

problem. Now, the challenges we've just talked about is that, in fact, we still see a sizable number of deaths occurring in our communities every day in this country, because while it is true that we are in a much better place in terms of having readily available tools to fight this virus compared to a year ago and especially compared to two years ago, we are simply not done with this pandemic. As we're still seeing an average of almost 300 Americans dying of this virus every day. That's 2,100 deaths a week. That is not an insignificant amount, especially when we remember that these aren't just numbers, they're people. This is a much higher number of deaths than we would expect to see with other common respiratory illnesses like influenza. If you want to take and extrapolate out what we're seeing right now, if things only stay like now, we're talking about based on 2020 mortality data for this country that we would expect to see, as I pointed out, about 2,100 deaths a week. If we look at diabetes in 2020, the average number of deaths a week, 1965. If we look at Alzheimer's, 2581. Even if you look at strokes, we're talking about 3,082 deaths per week. So we're right there where other significant public health challenges are recognized and appreciated. So I think it's really important that we understand that even at the level we're at today is really a significant problem. It just doesn't feel like it compared to where we were in the past. One concern that I have is that this number could start to rise again. As I've said over and over again, even with the protection from our vaccines and previous infection. Breakthrough deaths are becoming more common, likely due to a combination of waning immunity and variants like Omicron that can better evade immune protection. They're especially common among those over age 65, a group that is already at greater risk of severe disease and death. Let's take a look at the data from the Minnesota Department of Health, an organization whose work I greatly admire. They are still reporting information about breakthrough cases. Unlike many states which have significantly scaled back the amount of COVID related information they report. Before the Omicron variant became dominant, fully vaccinated, people here in Minnesota over the age of 65 were nine times less likely to die of COVID than someone unvaccinated over the age of 65. Let me repeat that, fully vaccinated people over the age of 65 were nine times less likely to die of COVID than someone unvaccinated over the age of 65. People over 65 who were fully vaccinated and boosted were 20 times less likely to die of COVID than someone unvaccinated in that age group. Well, if we look at the entire Omicron surge, people over the age of 65 here in Minnesota who are fully vaccinated, meaning two doses of either of the mRNA vaccines or one dose of J&J, but no booster were three times less likely to die of COVID than unvaccinated people their age. Again, this is for the Omicron

surge. People over the age of 65 who are fully vaccinated and boosted were 16 times less likely to die of COVID than the vaccinated people in the age group. But if we look at just the last 60 days, last 60 days, vaccinated people over 65 here in Minnesota without boosters are just 1.1 times less likely to die of COVID than unvaccinated people over 65. Those who are fully vaccinated and boosted are only three times less likely to die of COVID than unvaccinated people in this group. Again, before the Omicron variant, a fully vaccinated and boosted 65 year old was 20 times less likely to die of COVID than someone unvaccinated. During the Omicron surge as a whole, they were 16 times less likely. But in the last 60 days, that number is down to just three times, not 20 or 16. And for those fully vaccinated but not boosted, it is only 1.1 times less likely. This highlights both the issues surrounding waning immunity and of variants' ability to evade immune protection. This is especially concerning since we know the BA.4 and BA.5 are better able to evade immune protection. But even more concerning than these breakthrough deaths numbers and the known concern of BA.4 and BA.5 is the unknown that lies ahead. As I've said already in this podcast and many times before, just as I said a year ago, right now, when I suggest the darkest days of the pandemic could still be ahead of us, which preceded both Delta and Omicron. We don't know if the next variant will do an even better job of evading immunity or causing severe disease. We don't know if the next variant will be more deadly or more likely to cause long COVID. We don't know how much more immunity from vaccines and previous infections will wane, and we need to be honest with the public about this. If we were to see another big surge of severe illness, people will all look and say, Oh, look at you all misled us. You made us think that the pandemic was over. I hope it is. I hope we're not going to see another surge. But as you've heard me say so many times, hope is not a strategy. So we have to be mindful of this and be ready to go. And that brings me to the second part of your question, Chris. Do we have a plan for dealing with waning immunity and the potential for more dangerous variants? The answer is that I wish we did. We should have a better plan. We need to have a better plan. But we don't. We're only getting further and further out from people's most recent doses of the vaccine. As I've said time and time again, we cannot boost our way out of this pandemic. We have emphasized in previous episodes the need for more broadly protective coronavirus vaccines. Well, there is work being done on this, including our own CIDRAP's Roadmap effort. This won't happen overnight. Pi or Sigma could show up tomorrow. For all we know, they could be here already. So we need to find a way to address the growing complacency and pandemic fatigue now. We need people to understand that while the risk of dying from COVID is

much lower now than it's been in the last year or two, there is still a risk. Even for those fully vaccinated and boost it, it is still a risk, especially for those over age 65. It's been over six months since Omicron arrived and changed everything. We don't know what will happen in the next six months or even in the next six weeks. In the meantime, we need to address this unknown and concern for the future, especially as the collective psychology of COVID moves further towards complacency and pandemic fatigue. Maybe this is an impossible job, and maybe what we're asking is not even practical to get people to consider that we might have another surge. I think it is really a critical message to get across only so that psychologically people might be ready to go. If, in fact, we do see another surge. I don't think we'll change behavior now. We're not going to see people suddenly using N95 respirators everywhere they go. We're not going to see people canceling or even keeping people from attending large indoor events because of the potential risk of COVID. But we have to be prepared for the fact that we may very well not be done. And there's one last piece I just want to add to that, because this all then overlays into the workplace. There was a recent survey taken by Angus Reid and the CBC that looked at workers and their sense of coming back to the workplace with this pandemic. While this poll was conducted in March, it indicated that 56% of the respondents that they surveyed said they would look for another job if asked to return to the office with almost a quarter, 23% saying they'd quit immediately. So we still do have this tension going on of what to do and how to do it. We need to be addressing in a major way the psychology of this pandemic amongst our population. And we're not. We're just trying to move on. The media is moving on. They've got other important issues today. Public health wise, our messaging is not about what does today mean. People want to move on and I think we could very well pay a price for that. So to conclude, Chris, my point is we are in a much better place and we need to appreciate that, but we're far from over. And that is a hard message to get across in terms of what does that mean, what do we do, how do we do it, and what our public health community needs to be doing to be ready should a new surge occur?

Chris Dall: [00:38:47] Mike, in what was very exciting news for some parents last week, advisory boards for the FDA and CDC gave the go ahead to start administering COVID-19 vaccines from Moderna and Pfizer-Biontech in children as young as six months old. And states have started administering shots this week. So this was a very long process, too long for some parents. Mike, what are your thoughts on how the process played out and furthermore, what impact will this have, if any, on the course of this pandemic?

Michael Osterholm: [00:39:18] Well, let me begin by first clarifying that vaccine safety has always been front and center in any regulatory action around a vaccine, and in particular for kids. So that the kind of information we needed to support vaccine safety and to the extent effectiveness in kids is the most difficult to achieve because of the level of safety that's required. And so actually, I am more understanding of the fact that it took longer to get vaccines for kids, as frustrating as that is for parents and as a grandparent with children in that age category, I too am frustrated, but I understand why. Let me also add any context to this answer by saying, Remember how many months now we've been talking about the difference between a vaccine and a vaccination? And we go back to a podcast of almost 18 months ago in which I laid out the last inch, the last mile, a concept where the last mile was getting vaccines to the community, but the last inch was getting the needle in the arm. And today, I think this very issue is front and center as we talk about what it means for our kids today to have these vaccines. The news of the past week was great news for a lot of parents and grandparents. We've been waiting for this. And as you noted, Chris, we've been waiting a long time. The FDA and CDC vaccine advisory committees both voted unanimously to recommend these vaccines for children as young as six months of age. We've discussed these vaccines in previous podcasts already in some detail. I think the biggest take home message is are that the risk of COVID is very real for kids, and these vaccines are an important tool. We just need to get shots in the arms and combat some of the misinformation that's spreading. I want to start by reviewing some of the differences between the two vaccines, because this has led to some confusion. We've gotten a lot of questions about this. Overall, the safety profile and effectiveness of both of these vaccines is good. The Pfizer vaccine involves a three dose primary series, while the Moderna vaccine is a two dose. For Pfizer, you get three, three microgram doses, the first one, the second one 21 days later, and the third one two months later. For Moderna, basically it is one where you get two 25 milligram doses, 28 days apart. If we look at the effectiveness data for these two vaccines, it is a bit more difficult to parse. On the surface. The reported efficacy of the Moderna vaccine against symptomatic illness is 51% for children six months to two years of age and 37% for kids 2 to 5 years of age. May not seem significant for many, but as I'll talk about in a moment, it's also about providing children with protection against serious illness, hospitalizations and deaths. For Pfizer, preliminary findings reported effectiveness of 80% against symptomatic illness, but this is based on only ten positive case reports. So

it's really difficult to give a really complete picture of the effectiveness for the three dose Pfizer series. These numbers don't sound as impressive as initial reports from when mRNA vaccines were initially released for adults and demonstrated to be over 90% effective. However, these vaccines for young children were tested in an age of the variants and are likely showing us a more realistic picture of protection and is similar to what we're seeing in adult populations. For parents trying to make the choice between the two vaccines, there's a number of things to consider and for people with questions, I'd recommend speaking with your pediatrician or other health care provider about what is best for your child. I truly think both of them have good safety profiles and will clearly help to protect children from severe illness, hospitalizations and deaths. In our conversations about vaccine effectiveness and breakthroughs, it's important to put these COVID vaccines into context with other childhood vaccines that we rely on. Some who dismiss the importance of these vaccines bring up the imperfect efficacy, and the majority of children recover from COVID-19. But both these arguments misunderstand why we have vaccines in the first place. Routine immunizations for influenza can show low efficacy against a seasonal strain, but are still valuable tools for population health and for limiting severe disease. Additionally, a number of other illnesses we vaccinate children for, including chickenpox, mumps, rubella, are also only rarely fatal for children. However, they're important for us to vaccinate these kids so we can reduce transmission in the community, reduce hospitalizations, and keep kids from getting potential long lasting side effects of the disease. We still know so little about long-COVID and the impact in children. This may prove to be a tool that helps reduce that burden as well. The news of these vaccines brings up the debate around the true impact of COVID-19 on children. We have continued to hear misinformation on this topic since the beginning of the pandemic. Data have shown that older age on average is associated with more severe COVID illness and death. But that does not mean children have been unaffected by the virus. The American Academy of Pediatrics reports that to date, over 13.5 million children in the United States have tested positive for COVID-19. And with asymptomatic infection, the lack of reporting for antibody testing, the actual number of cases is likely considerably higher. Since the pandemic began, over 45,000 children under the age of five have been hospitalized for COVID-19. Let me repeat that. That's an important point. Since the pandemic began, over 45,000 children under the age of five have been hospitalized for COVID-19. 10,000 have had to go to the ICU. Omicron has caused a substantial increase in the impact on young children, especially in the US. More than 1,400 children and teenagers have died from

COVID-19, and more than 400 of those deaths were in children under the age of five. This is not insignificant. For context, these numbers tell us that COVID-19 is six times deadlier than influenza for children. COVID-19 even outpaced flu severity in children in years like the 2009 H1N1 pandemic. Children have also played a role in the transmission of COVID-19. A study from This Week in the BMC Medicine showed that adults who lived with children were more likely to be sero positive for COVID-19 than adults who did not live with children. Those odds were higher for younger children and if multiple children lived in the household. Now, there are a lot of behavioral factors at play here, too. Households with children may have different types of social contacts, work behaviors, hygiene measures, etc., but it does not negate the fact that children do play a role in the transmission of this virus. As I've mentioned before, Chris, my biggest concern that parents are still extremely hesitant to get their child vaccinated against COVID. I am grateful we have this option available to these kids, but we need to make substantial headway on message and outreach to get these shots in arms, especially if we want to impact the coming school year. Young children and their families have been greatly impacted by the pandemic. I'm glad we're able to give them this valuable tool of vaccination. I also hope we don't forget what else we owe as a society to these children. A robust public health system and adults choosing to be kind. Let me just add one last context. Right now, if I think about the 20 million children age six months to five years of age in this country, how many will get vaccinated? Let me put this into context in terms of the older age groups. If we look at the 23 million children, 5 to 17 who have gotten vaccinated, that sounds great. Until you realize 26 million kids in that same age group have not received any vaccine at all. So I think it's an important message. We have got to get our kids vaccinated in terms of trying to reduce severe illness, hospitalizations, and deaths. And we should not accept the fact that it is time to wait for a while to see what these vaccines will do.

Chris Dall: [00:47:56] There was a report issued on Tuesday of this week by a bipartisan panel commissioned by the Commonwealth Foundation that called for an overhaul of the public health system in the wake of the response to the COVID-19 pandemic. Mike, what did you make of that report?

Michael Osterholm: [00:48:10] The panel that you mentioned, Chris, does include experts like former CDC directors and former FDA commissioners, and it highlighted some major weaknesses in our country's public health response during the pandemic.

My initial reaction to the panel report is obviously favorable in that several of the people on that bipartisan panel are dear friends and colleagues, including Peggy Hamburg and Julie Gerberding. But I think that the sense that we have today is that there is something we can do to change our public health system in this country that will be based on good practice, that will be based on experience, and will be based on wisdom. But my concern is, is there really a snowball's chance in hell we can really change the system? Think about this. We've been through 911. We went through the 2009 H1N1 influenza pandemic. We've been through 2015 Ebola. Each and every time, there were panels that were put together following those events that made recommendations about what must change to improve our public health system. And yet we have failed. We sometimes, I think, believe that we are much better than we really are. Think about it. There are 60 countries in this world that have higher life expectancies than we do, which is a measure in part of public health practice. So my first response to this is, is there any chance that someone will listen this time? Someone will actually take the information, I don't know. But let me also add a caveat to this. We have a very fractionated public health system in this country based on our forefathers, the Constitution. As someone who is in state public health practice for almost 25 years, I understand very well that public health is a states rights issue. What that means is it was never specifically laid out in the Constitution that public health was a federal responsibility. So that was automatically assumed that it's not. And so public health remains largely a states rights issue where we in the states are in charge of our public health. There is no great national system mandated by some federal authority. And so you have 50 state health departments out here who all get to determine what they will do, how they will do it. They often have limited resources from state governments themselves with still relying on federal support. But I think people are surprised to learn the CDC cannot just walk into a state during a major crisis to help participate in that investigation unless the state invites them. Think about that. That shows you how fractionated our overall response is. So with that backdrop, let me just give you some of my sense of where we're at with this one. The weaknesses that were identified by this panel and I think they did a great job of doing that, include a lack of organization and coordination between the thousands of state, tribal and local health departments and the federal government, just as I laid out. There is a lack of sufficient and reliable public health funding and a lack of trust from the public in our public health systems. The main takeaway from this report was the call for an overhaul of our public health system with an expansion of the federal government's role in public health response. Currently, as I

said, the federal government in public health response in the US is absolutely limited, though the CDC can and does provide guidance for public health issues, they cannot require the states to do almost anything. There are many other federal agencies involved with public health, but there is minimal coordination between them and most have little authority. A lot of public health response is in the hands of state, tribal and local health departments who in turn have very limited resources. This is why things like mandates and COVID vaccine rollouts differ so much from state to state to state. The panel called for actions that need to be taken by Congress to make a more centralized public health response system a reality. These actions creating a position such as the undersecretary for public health to oversee the development of a new public health system, providing adequate and reliable public health funding, setting clear standards for state, tribal and local health departments, and funding a modern public health information technology system will be critical in learning from this pandemic. Remember, again, in terms of reporting how many times I've talked about on this podcast the absolute obsolete system we have for disease reporting in this country where there are health departments who still can only receive reports by fax machine. That is so outdated. So, Chris, we'll never get back the over 1 million American lives that were lost to COVID. But we can take action now to be better prepared for the next pandemic, and there will be next pandemics. My hope is that taking this action will minimize the death and destruction the next pandemic causes, or, for that matter, the lives that are put at risk day after day from the routine diseases that we have come to have to take on. The panel also did highlight some steps that should be taken by the administration, including establishing a council to help coordinate federal, state, tribal and local public health response and embracing transparency and integrity in our public health decision making. You've heard me say time and time again in this podcast, we are in a pandemic of lost trust. Regaining that trust will be critical in getting us better prepared to fight the next pandemic and to continue fighting pandemics that we still have ahead of us. Finally, the panel called for action from state, tribal and local health departments. These actions assessing what structural and policy changes are needed to support their communities, building connections with their health care systems, and involving community partners in decision making will also be critical to our current and future response. State, tribal and local health departments have been stretched incredibly thin in the last two and a half years. I hope this plan provides them with better support so they can continue to support their communities now and in the future. I again raise a level of skepticism about this that I hope is a reason to incentivize people just to

prove me wrong. But we've seen Congress time and time again pass on doing the kinds of things that could improve the health and safety of the lives of all of our citizens. The partizan nature of so much of what we do today in public health means that it will be a challenge. So I hope that 3 to 5 years from now, this particular report is not just another book sitting on the bookshelf, never, ever to see the light of reality.

Chris Dall: [00:55:30] Now on to monkeypox. We've talked about the monkeypox outbreak over the last few episodes, Mike, and we'd like to give listeners an update on the situation. Where are we with monkeypox?

Michael Osterholm: [00:55:43] Well, let me start out by saying we're at a place where I'm very concerned, very concerned, and I will share with you why I conclude that. But first, let me just give you an update. As of this past Tuesday, June 21st, there are now been 3,157 reported cases of monkeypox in 55 countries and more than 100 additional suspected cases. The majority of identified cases have occurred in Europe, with 76% of confirmed cases being identified in the U.K., Spain, Germany, Portugal and France. The U.K. alone has 793 cases, or 25% of all confirmed cases globally. The US has confirmed 113 cases in 23 states and the District of Columbia. Of 430 patients with information in the European surveillance system, 99.4% were male, almost half were in their thirties, and 98% of the patients identified as men who have sex with men. Ultimately we don't have this outbreak under control at all. And we need to figure out the best way to go about vaccinating and controlling the outbreak. Let me first deal with the outbreak itself, and then I will also deal with and how do we overall address the issue of the ongoing source of this virus in the environment? What we have to understand that we have a lesson that we have learned over the course of the past 40 years that has been painful but real. And that is the lesson of HIV/AIDS. When we look back on what happened with HIV/AIDS in the early 1980s, at a time when we recognized that the transmission of this virus is initially accelerated by certain risk practices by gay men, men who, in a sense, were having multiple anonymous partners over a series of parties or social events. And that that was fueling a great deal of the early days of the HIV pandemic. And in fact, despite knowing how HIV was transmitted and recognizing the safety practices that could be put in place to reduce that transmission, we watched HIV/AIDS deaths go from 13,300 in 1987 to 41,699 in 1995, at a time when antiretroviral triple therapy was introduced, this therapy prevented both death and transmission by lowering viral loads. So from a risk behavior standpoint, there still was a lot of

transmission of HIV occurring before these drugs were available. I fear the same thing will happen with monkey pox among gay men. Now, I want to be really clear, because I find so many of my colleagues and friends in the media all tripping over themselves to be sure they don't stigmatize gay men with these comments. At the same time, we in public health have that obligation to be very specific in our recommendations as to who should be alerted to their risk and what can be done about it. For example, today the vast majority of gay men around the world are not at increased risk for this virus. They may be in steady relationships, limited number of partners, and not at all in the same setting as are those who are now getting infected with this virus. If I could use an analogy and work that I had been quite involved with was working with swingers, heterosexuals who had many different partners over a short period of time, often at organized events. These heterosexuals would hardly characterize the heterosexual sexual practices of the vast majority of people in this country. So we concentrated our early days of HIV prevention messages and follow up with swingers as heterosexuals. The same thing is true today with this outbreak, and I worry that people think, well, this outbreak will just kind of eventually diminish itself and be extinguished. I think the HIV lesson taught us no there is enough individuals who, as men having sex with men, will have anonymous partners, high risk partners, etc., and therefore they will sustain this sexual transmission of this virus. Now, I said sexual transmission. I do believe that's the case right now, that in fact, this particular virus is being transmitted from the sores, the little pustules that are present among those who have monkeypox and potentially even virus in the semen. This is important because, in fact, we need to now take a step back and say, well, we were initially going to do ring vaccination and contact tracing. Well, if you know about the risk factors for many of the individuals who have become infected with monkeypox, they've had multiple anonymous partners. How do you trace back someone you don't even know who they are? And so I think that what has happened in Canada and now is happening in the UK is where the recommendations are being made to vaccinate men who have sex with men who have certain high risk characteristics. A number of anonymous partners, a number of partners. Very similar to how we handle pre-exposure prophylaxis drug treatment, where we actually target people ahead of their possible risk. And I think that this is really a very important point is that we need to actually move away from contract tracing ring vaccination to one of concentrating on populations at risk, much as we are doing right now for HIV drug treatment. So I hope it's clear that I do not believe that all gay men are at risk for this virus infection. In fact, quite the opposite. It's really men who have had sex with men,

multiple anonymous partners who are in networks of individuals that are going to continue to see transmission. I hope that we move quickly to basically providing vaccine to that population, similar to how we handle the issue with pre-exposure HIV prophylaxis. Now, I want to cover one area that I think is very key, and that is the fact that we are still not dealing with the animal reservoir situation. Very little has been discussed about that. Remember, how did we get here with monkeypox in Africa today? Well, we've known that the monkeypox virus was present in rodents throughout parts of Africa for decades. But we were able to be protected largely from the ongoing smallpox vaccination programs that we did worldwide to, of course, eliminate smallpox, which in turn gave us cross protection against monkeypox. But it's been almost 40 years since these programs ended. Today, the vast majority of the population in Africa, particularly those under age 40, have no protection again against monkeypox. So we're going to continue to see the challenges of trying to control monkeypox in Central Africa with the current unvaccinated unprotected population. And I think we need to very seriously reconsider where monkeypox is endemic in the animal population. We should be supporting widespread vaccination with much safer vaccines than we had 40 years ago to protect the population against monkeypox and from this happening again. And if we don't, we're going to continue to just see situations like this arise. Finally, I've said it before. I'll say it one last time. I have major concern about the transmission of this virus in rodents from what might be domesticated rodents, everything from hamsters, gerbils, prairie dogs, you name it, jerboas. We have all kinds of animals that unfortunately all too often escape into the wild. And all it would take is literally one infected animal to begin a foci of transmission in an area outside of Africa. Remember, it wasn't until 1899 when the first Chinese ships brought over plague infected fleas and rats in the ships to start what has now become a very major plague situation in North America. The prairie dogs of the Dakotas, etc. is a function of that bacteria arriving in those animals and now starting this large national focus of infection in the wildlife. Same thing is going to happen with monkeypox, I'm convinced, in other areas of the world. All the more reason why we can't have infected people traveling around the world having potential exposure to the animal population. The way to stop that is to stop it and at ground zero. So I hope that this does not continue to grow like HIV did in its earliest days. We now have the safe and effective vaccines, which we didn't have back then, and hopefully we start to see large community based vaccination programs that will hopefully stop this. In the meantime, I think case numbers are just going to continue to climb for some time.

Chris Dall: [01:05:28] So we don't have a COVID query this week. But in our next episode, which will come out on Friday, July 8th, we are going to dip into our mailbag and try and answer as many listener questions about the COVID-19 pandemic as we can. But we do this week have a celebration of life from one of our listeners commemorating just one of the more than 1 million U.S. lives that we've lost during this pandemic. Mike, who is this week's celebration for?

Michael Osterholm: [01:05:55] Well, first of all, Chris, let me just say that this may be for me the most special part of the entire podcast production and delivery. Thank you. Thank you. Thank you to so many of the podcast family members who share with us the possibility of celebrations of life. I wish we could have all of them read on air. We can't, unfortunately, but they are so special. Today's one is one that has come to us from Dorothy, who wrote to us about Dr. Steven Coutre, a professor of hematology at the Stanford School of Medicine, and doctor with whom she had a special connection. According to a Stanford news release, Dr. Coutre, who died on November 9th, 2021 at the age of 62 from complications of chronic lymphocytic leukemia and COVID-19 was integral to the development of new therapies for blood disorders, including chronic lymphocytic leukemia, the disease he had and managed for many years. During the pandemic, he provided guidance to physicians and chronic lymphocytic leukemia patients about COVID-19's impact on their health and treatment. Dorothy specifically wrote to us, "Dr. Coutre's death adds to the staggering losses during this pandemic. His research helped to transform the once bleak outlook for CLL patients, and his expertise and clinical care were unparalleled. We deeply grieve Dr. Coutre's death as he saved my husband's life in 2010. His excellence had a profound effect, not just for my husband, for the entire family, with our eighth grade daughter and 10th grade son still at home. This tragic loss is deeply felt and ripples from his family to the Stanford community to the thousands of his patients, including patients throughout the world, benefiting from his research. We are forever grateful for your excellence, Dr. Coutre, and we deeply grieve your untimely death." Again, the vulnerable individuals at risk of serious COVID infections, hospitalizations and deaths we have experienced far too many of these, and this is an example of one of them. Dorothy, thank you for sharing this very beautiful celebration of life. I wish we'd all gotten to know Dr. Coutre. He obviously was a hero to so many, and unfortunately, COVID took him away from us far too quickly.

Chris Dall: [01:08:37] And just a reminder to our listeners that if you want to share a celebration of life for a loved one or friend, a neighbor or coworker who died during the pandemic, please email us at osterholmupdate@umn.edu and keep those beautiful places coming as well. Again, you can share those with us at osterholmupdate@umn.edu. Mike, what are your take home messages for today?

Michael Osterholm: [01:09:00] Well, Chris, I've got three messages that I hope resonate through the entirety of this pandemic. Number one, we live in a BA.4 and a BA.5 world. What will happen over the course of the upcoming weeks and even months will be all about what does BA.4 and BA.5 do in our communities and of course with us as the individuals getting infected with these viruses. It should be clear at this point that there is no evidence that seasonality, Southern Hemisphere versus Northern Hemisphere, hot versus cold areas, is playing much of a role at all in what's happening with BA.4 and BA.5. All I can tell you is we're not done with it yet. And while I don't see this emerging as the kind of severe Omicron, Delta-like surge, we could still see substantial illness in our communities, resulting in an increasing number of hospitalizations and deaths, and we need to be prepared for that. My second point, both vaccine and previous infection protection, is unclear as to what it provides us today. And what I mean by that is what is waning immunity? What happens over time? What happens that would allow breakthrough infections to occur, breakthrough deaths? Nobody wants to hear this. I don't want to hear it. I think of my own personal risk exposure. I'm now about four months out from my last booster. I don't have another booster coming. What does that mean? I think about that a lot. We all will be confronted with this over the course of the upcoming weeks, and we will learn more about just how much long term protection we have from our current vaccines and previous infection. And finally, the third point is really about monkeypox. I just want to say we're at a time where this thing could tip one way or the other in terms of what it means from a global public health crisis. I fear that if we do not actively engage those individuals at highest risk for becoming infected with organized vaccine campaigns. We will see what we saw with those first unfortunate 15 years of HIV AIDS, where we will see much more transmission in a limited number of the gay community. But it will happen, and it will be severe, and there'll be spillover. Limited, but there'll be spillover. Now is the time for an aggressive global response with vaccine and with identifying how we're going to address the natural reservoir spillover into humans in Africa, which by itself also should

result in an entire new consideration for the use of vaccines. So BA.4, BA.5, vaccine, previous infection, immunity and monkeypox. Wow, we've got a lot to address.

Chris Dall: [01:12:07] And do you have a closing song for us this week?

Michael Osterholm: [01:12:11] I do. And one that is hopefully reflective of what I would call a need that we have right now. And that need is to identify what it will feel like when this pandemic is really finally over. In a sense, you've heard me say throughout today's podcast, this is not like an earthquake, a hurricane, tornado, even a severe forest fire. We know there will be an end to it. This is more like a war. But I even envision in a war-like mindset that there will be a morning after. This song is about that. "The Morning After" is the song written by Al Kasha and Joel Hirschhorn for the 1972 film "The Poseidon Adventure," where it won the best original song at the 45th Academy Awards. Following the success of this song, it was actually rerecorded by another individual that then it became a number one hit in the US for two weeks in August of 1973. The song was originally performed by the character Noni, played by Carol Lynley in the movie, but then actually sung by a vocal double, Renee Armand. It appeared twice during the warm up rehearsal and then later during the New Year's Eve party early in the film, before the passengers must escape the sinking wreck. The title appears in the end credits as the song from "The Poseidon Adventure." As I noted, it was then in 1973 that Maureen McGovern actually rerecorded the song in which it became the single hit, the number one hit in the US for two weeks during August of 1973. Billboard ranked it overall as the number 28 song for 1973. To me, the song reflects the kind of hope that we all want, the kind of vision that we can set our sights to. It is all about the morning after. "There's got to be a morning after. If we can hold on through the night, we have a chance to find that sunshine. Let's keep on looking for the light. Oh. Can't you see the morning after? It's waiting right outside the storm. Why don't we cross the bridge together and find a place that's safe and warm? It's not too late. We should be giving. Only with love can we climb. It's not too late. Not while we're living. Let's put our hands out in time. There's got to be a morning after. We're moving closer to the shore. I know we'll be there by tomorrow and we'll escape the darkness. We won't be searching anymore. There's got to be a morning after. There has got to be a morning after." Thank you so much for spending another podcast moment with us again to all of our podcast family members, thank you so much for the cards, for the emails, for the letters. We appreciate them so much and we do read each and every one of them and share them

with our team. I want to thank the team who continues to provide me with the kind of information that I can share with you that is current, comprehensive and authoritative. I also just want to remind everyone that at this time, when it seems as if the whole world is falling apart one way or another, and as hard as it is to keep focusing on the fact that we must remember the critical importance of kindness, kindness right now. It's hard, but I hope we do. And we never forget those who have died like Steven today as our celebration of life. These are our grandpas and our grandmas, our sons and our daughters, our friends, our neighbors, our cousins, our aunts and uncles. And I hope we never, ever, ever find ourselves forgetting them. So thank you. I hope this has been helpful. Again, we'll be back to you in two weeks and we'll provide you with hopefully again, more updated information that will be helpful to you as you navigate this pandemic of COVID. Thank you. Be safe and be kind.

Chris Dall: [01:16:41] 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. This podcast is supported in part by you, our listeners. If you would like to donate, please go to CIDRAP.umn.edu/donate. The Osterholm Update is produced by Cory Anderson, Meredith Arpey, Elise Holmes, Sydney Redepenning, and Angela Ulrich.