# Episode 91: The Decline of Omicron

**Marnie Peterson:** [00:00:00] Hi there. I'm Dr. Marnie Peterson, an expert in antimicrobial resistance and host of Stewardship Spotlight, another podcast produced by the team at CIDRAP. The Stewardship Spotlight podcast features discussions with world renowned experts on topics related to antimicrobial resistance and stewardship of antibiotics. Over the next few weeks, we're releasing three new episodes featuring fascinating discussions with experts on how patient care can be improved through the use of advanced diagnostic tools. Be sure to subscribe to Stewardship Spotlight, which is linked in the episode notes, so you don't miss any of these important conversations.

**Chris Dall:** [00:00:46] 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. Every once in a while, I like to go back through my old scripts for this podcast just to remind myself what the pandemic mood was like six months, nine months or even a year ago. So this week I went back and looked at my introduction for the February 19th, 2021 episode. Here's what I wrote quote "as cases continue, their steady decline in the United States and more people get vaccinated, you can feel the complacency starting to set in. Americans are ready to be done with this pandemic. Will the threat of variant viruses and the possibility of another wave of infections be enough to prevent the U.S. from becoming too complacent?" End quote. Well, it seems the more things change in this pandemic, the more they stay the same. Once again, Americans are ready to be done with this pandemic, even as we continue to see roughly 150,000 new COVID-19 cases a day and the threat of new variants remains. And it's not just Americans, either. Around the world, many seem to be done with this virus. But is it done with us? That's what we'll discuss on this February 17th episode of the podcast as we assess the trajectory of the pandemic here in the United States and around the world. We'll also look at the latest data on booster efficacy, discuss the decision to delay the application for authorization of COVID-19 vaccines in children under five, examine the lack of demand for COVID antivirals and answer a query about future variants, and we'll share the latest beautiful place submission 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 back to all of you to another episode of our podcast. We welcome you back with the hope that one day we can talk about something different than COVID. But right now, as Chris just laid out for you in his introduction, the world is still very much about COVID. Let me start out by saying that today's podcast will really try to serve in part as a one with which is all about a transition to where we're going in the days ahead, but also laying out some really major fundamental questions about what those days ahead will look like. What must we be prepared for? What can we accept? What in our lives can we now assume with some sense of normalcy that this is a good way to live life? So stay with us, and I promise you that we will try to answer some of these tough questions going forward and what they mean. But I have to start, as I do every week with a sense of hope and optimism. That is something that is easy for me to find this time of year. All in that wonderful sunlight here in Minneapolis, St. Paul. I'm happy to report to you today that we have 10 hours and 33 minutes and 24 seconds of sunlight. We have gained 20 minutes and 21 seconds just since last week's episode. That's a lot. But it's even going to get better because as we get closer to March 21st and the spring equinox, we will actually find ourselves advancing almost three minutes plus a day in sunlight such that by June 21st, we will actually be at 15 hours and 36 minutes of sunlight here, as opposed to just the ten hours and 33 minutes we have today. So things are looking up. For you in the southern hemisphere, you know you've had your great summer. Sorry, it's going to get a little darker. But but there's hope every year. There's hope. So let me move to the dedication. This is something that we've thought a lot about and actually only in the last day that came upon this dedication. And that is after talking to a number of parents who have children under five years of age who were so hoping last week that their child could begin getting vaccinated. And of course, with the delayed decision by the FDA, and we'll talk more about that today, as we did last week, they're disappointed. And so I understand that. I know for those parents that want their children vaccinated every day is a challenge. And if any of you have been following the national news, you know that Vivek Murthy, the surgeon general of the United States, announced that one of his children under age five has become infected with COVID over the past several days. And while she's doing well, it's still nonetheless, as Dr. Murthy laid out a real challenge as a parent, you hope that those sniffles don't become anything more than that. You hope that that mild fever, that malaise doesn't turn into something more serious. So as a grandfather of children, including one who is under age five, who now has actually become a case. And while we still would like to get the vaccine there, had to go through that same thing. So this really is dedicated to you. The parents of children under age five who really want their children more than anything to be vaccinated. And last, let me just tell you, I hope you're noticing on a personal level a little improvement in my voice. I've gone through more and more forced silence over the past week to try to rest my vocal cords. So I'm doing well. For those that worried, I'm on recovery. I'm going to not try to talk nearly as much. For those who think that's welcomed, OK. But anyway, so with that welcome again, I'm so glad you're with us. And let's get into it.

**Chris Dall:** [00:06:44] Mike, for our international update this week, you wanted to zero in on a few countries that you think give us a sense of where this pandemic is going and how the Omicron wave will play out over the coming weeks. So which countries are those and what are you seeing in those countries?

**Michael Osterholm:** [00:07:00] Let me first just address where we're at on an international level in just a broad overview. Again, I want to reiterate that we know that case numbers, as they are reported, are selling complete as to what's actually happening, and that even includes deaths. But if you look at what's happened in the past week, we are now at 16,291,000 cases reported for the week, which is a lot, but it's down 19% from the previous week. We're at 74,857 reported deaths, which is up about 4.3% but appears to be leveling off. These numbers compare to the 23,368,000 cases reported on January 4th. In other words, a decrease of almost seven million cases reported for the week. And if you look back on November 1st, just before the Omicron surge, we were only at 3,166,000 cases, so it gives you some idea of where we're at. Globally, things are improving, but they're still much, much hotter than they've been at any time through the pandemic. All the regions in the world are seeing case numbers decrease, except for the western Pacific region, which has really been a house on fire for the last several weeks. They've actually seen almost a 20% increase in cases. So that gives you a sense globally. But as you pointed out, Chris, let me focus in in a few countries to try to look at what we might know about what's happening here in the U.S. and what that means for the rest of the world. If we look at the following countries of Denmark, the Netherlands, Norway, Sweden, the U.K., as well as what we're seeing in South Africa and China, Hong Kong, South Korea and Singapore, we get a sense of a pattern that's beginning to develop that isn't necessarily predicted by of how many cases of infection are actually detected. And I'll try to explain more about that as we go through it. But first of all, if we look at these countries, we'll explore case rates, death rates and the vaccination rates, and they're all intricately linked. Just as a reference, let's remind everyone. In the U.S. case incidence this week is about 46 cases per 100,000. Let me come back to that 46 cases per 100,000. So as I talk about countries, the absolute numbers often don't mean as much because they are in different population sizes. So let me emphasize the incidence rate 46 per 100,000. in the U.S., the average daily deaths are at about 0.72 per 100,000. So we can see cases at 46 new cases per 100,000 in the U.S., 0.72 deaths per 100,000. And I also want to remind you, as we talk about immunization levels, only 64% of our population is considered fully vaccinated, according to the CDC definition of two doses for those with mRNA and those with one dose plus one additional dose for those who received the J&J vaccine. Now, you know, I do not think this is the appropriate definition for fully vaccinated. I think it really is a minimum of three doses, which we'll talk about today. And if you look at that, only 27% of our population that could be vaccinated have all three doses, 27%. But now let me take a look at these other countries. Let me first look at the countries of Denmark, Norway, Sweden, the Netherlands, and the U.K., all of our European colleagues. All of these countries have very high case rates, have high COVID vaccination rates, and because they're observing a decoupling of COVID cases and COVID deaths, we've seen that they have lifted many of the restrictions in the past few weeks. For example, Denmark's case rate is still higher than what we've been seeing anywhere else in the world, with 781 new cases per 100,000. Remember, we're at 46 cases. They are at 781. Just two weeks after becoming the first European Union country to lift all of the COVID restrictions, Denmark is starting to see a decline in cases. The country's death rate has remained low considering the number of daily cases at about 0.5 per 100,000 population. Remember, ours is at 0.72. This is likely in part due to the country's high vaccination rate, with 81% of their population fully vaccinated with two doses and 61% are boosted. Remember our population having the three doses or what they call boosted is only at 27%. Also of importance as Omicron took off in Denmark, only 7% of senior citizens had received their second dose over two months ago, compared to the U.S., at about 30%. So they were more recent vaccinees, which means that they surely had more protection for the same number of doses. The Netherlands has the second highest daily case rate in the world after Denmark of 665 new cases per 100,000. Our reference point again 46 versus their 665. The Netherlands is also lifting all their restrictions, despite a 71% increase in cases in the last two weeks. The past few days have seen a decline in cases, however, but it's not clear if they've reached their Omicron peak yet. A death rate of only 0.07 per 100,000 population surely can be explained by the fact that 71% of the population are fully vaccinated. We don't have data on their actual boosted population numbers. Norway has also had a high case rate 10th in the world, with 370 new cases per 100,000 population. Ours again at 46. Norway lifted some, but not all of the restrictions two weeks ago and has seen a 1% reduction in cases in the last 14 days. Like Denmark and the Netherlands, Norway has also a low death rate relative to their case rate at 0.12 per 100,000 population, with three quarters of their population fully vaccinated. Again, not clear how many have had third doses. In Sweden, cases are already declining prior to lifting their restrictions last week and have decreased 62% in just the last 14 days. Sweden is currently seeing 150 new daily cases per 100,000 population and 0.45 daily deaths per 100,000 population, with 73% of the population fully vaccinated. In the UK, where COVID restrictions such as face masks and COVID-19 passports were eased at the end of January following the Omicron peak of 182,400 average daily cases on January 6th, cases are now down 28% from just a week ago. Over the past week, they've reported a daily average of 46,000 cases. Again compared with their peak number of 182,000 cases on January 6th. Their hospital admissions are down 14% in the last week, with a daily average of 1,100 hospital admissions last week. COVID related deaths are also declining in the UK, with 1,400 reported last week, which was about 10% lower than the week prior. Last week, there were 1,243 deaths that occurred over 28 days of a positive COVID test, and this was also lower than the previous seven days. Over the past week, England, Wales, Scotland and Northern Ireland have all seen death rates below 0.3 per 100,000. Again, let me remind you that ours here in the United States is that 0.72 per 100,000. They are at about half of ours. England and Wales have the highest rates 0.28 and 0.23 per 100,000. Scotland and Northern Ireland both had a rate of about 0.21 per 100,000. 73% of the population in the UK is fully vaccinated, which surely contributes to the lower death rate that we're seeing. We'll keep a close eye on what happens in these countries, but for now, these countries all have vaccination rates over 70% and are now seeing much lower death rates, despite their very high case numbers and the easing of restrictions. Next, let's turn to a country that has lower vaccination rates and case rates and a leveling off of cases following the Omicron peak. Of course, I'm talking about South Africa. It's reported a case rate of 4 per 100,000 population. Again, let's compare this to Denmark at 781 per 100,000 population. South Africa hit their peak average daily cases of nearly 23,500 on December 17th and has fallen to about only 10% of that peak. Cases declined rapidly following the peak, but began leveling off at the end of January. Since then, the seven day average of cases has hovered around 2,500 to 3,200 cases per day. Surely much below that of their 23,500 earlier in December. Despite the decline in cases, deaths in South Africa are still up about 50% over the past two weeks, with 881 deaths reported Tuesday. But the death rate remains relatively low, at about 0.3 per 100,000. About half of that that we see in the United States. It's unclear exactly what is happening in South Africa with the leveling off of cases, it appears they may have reached a holding pattern. But it's uncertain how long they will remain here versus what we hope will be further declines in transmission or deaths. Remember, only 30% of the South African population is fully vaccinated, but they now have administered 75,000 doses of vaccine per day over the past week. Now let me move west. Let's take a look at Hong Kong. Remember, they have a population of 7,500,000. In contrast, the other regions we looked at today, they are reporting a record number of cases and there are reports that hospital capacity is overwhelmed in the city. Just recall, it was just weeks ago that we kept hearing from people saying we got to do it like they do it in Hong Kong, they have the system to respond. They can hold back COVID. I've heard that over and over again. Well, on Tuesday, over 4,000 new cases were reported in Hong Kong and 21 new deaths were reported in the past week, including a three year old. Remember, they had just gone five months with no deaths whatsoever. Keep in mind that Hong Kong has had a total of 25,000 cases and only 221 deaths throughout the entire pandemic, and 75% of their population is fully vaccinated. A statistical model from the University of Hong Kong estimates that 950 more people could die by June if no further restrictions are put in place during this Omicron surge. It's also notable that as of yesterday, over 12,000 people reported to be positive that were waiting to either be hospitalized or put into isolation hospitals in terms of their infection. I had the opportunity to talk to individuals from Hong Kong in the past week, and they will tell you without any question the situation there with Omicron is more challenging than any time in the entire COVID pandemic. The Hong Kong government already has tight restrictions on social gatherings, and while they have ruled out a city wide lockdown in response to the surge, it is now implementing additional restrictions. It's also questionable how long they will be allowed not to have a lockdown in light of the Chinese national government having indicated their displeasure with how the situation is unfolding in Hong Kong. Now, public social gatherings are limited to just two people. And Thursday marked the beginning of a two week shutdown of their hair salons and places of worship. The government is also implementing a new vaccine requirement for shopping, dining and using public facilities beginning on February 24th. Following the announcement of the new vaccine requirements, vaccination rates in the 70 to 79 year old population increased 1.2%, the highest single day increase in any age group. The elderly population is of particular concern in Hong Kong, as less than half of this group are vaccinated. Throughout the pandemic, Hong Kong has hospitalized anyone who tested positive for COVID-19. However, with the Omicron cases surging, just as I indicated, they are now suggesting anyone a with mild case may stay home so they can prioritize the elderly, children, and anyone with a serious case. They have instead sent some asymptomatic or mildly symptomatic individuals to government quarantine centers where close contacts used to be required to go. Close contacts are now allowed to quarantine at home. In short, as we follow what's happening in Hong Kong over the next several weeks, I think we're going to see even they with a system that was supposedly so airtight in controlling COVID cases is surely being challenged. Let me also add that two other countries that we're following closely, including South Korea and Singapore, are both seeing also all time high in case numbers. And again, both of these countries have been touted as having model programs for containing COVID. And yet, you see with Omicron the challenges they have, and they too have holes in their vaccination levels throughout the population. And let me just conclude by saying that China has reported less than 100 new cases per day. Over the past week outside of Hong Kong, China has reported less than 100 new cases per day. On Tuesday of this week, 80 new cases were reported, with half of those cases being imported. The 40 local cases were reported across four provinces and two high risk areas. I am convinced, as we're seeing with Hong Kong, that the case numbers are currently being underreported in China. And I can only assume that in part, that's intentional with the situation with the Olympics and with the Communist Party wanting to come into the March elections without any evidence of challenge from Omicron. I feel certain this is going to continue to be a challenging situation where a zero COVID policy will simply not work with Omicron. So let me conclude the international piece by saying I am convinced that vaccines, vaccines, vaccines make a big determination not necessarily about case numbers, but surely about severe illness, hospitalizations and deaths. How many times do we have to learn that lesson? Why are the vaccines important? They're important for that reason, if nothing else. And I think that the data from today, whether you look at Europe, whether you look at Asia, anywhere else in the world, the real challenge we have is continue to get people vaccinated and as we are going to talk about it in a minute. How often is still a question?

**Chris Dall:** [00:21:47] So here in the U.S., the descent from the Omicron peak continues with the seven day average of new COVID-19 cases now under 150,000. Given how transmissible Omicron is and the continuing challenges we have with getting people vaccinated in this country, whether it's with two doses or three doses, how much lower do you think we can go?

**Michael Osterholm:** [00:22:09] Well, Chris, this is that crystal ball moment where I'm working feverishly to chip off all that hardened mud on my crystal ball. But let me just give you some background to take a look at what we might be considering. First of all, according to the CDC variant tracker, Omicron now makes up 100% of all U.S. cases, so we're not seeing any residual activity from Delta or any other variant. As you may recall from our previous podcast, BA.1 still accounts for the vast majority of cases, but as we also noted, the BA.2 is growing. Two weeks ago, BA.2 made up 1.6% of the cases, that has now more than doubled up to 4% in just the past week. Still a very low number, however. Despite Omicron taking over and BA.2 growing at least somewhat in proportion of cases, the U.S. is experiencing a sharp decrease in cases. As of Tuesday, the average number of cases have decreased to 140,424 per day. This is simply a dramatic reduction from two weeks ago. Average daily cases are down by over 66% during that time. The fact that we're talking about this number is low, however, it is a reminder that we're dealing with the phenomena of what I call shifting baselines. Keep in mind that this number of daily cases we're celebrating as an indicator of declining activity is similar to some of the previous peaks. For example, the peak of about 164,000 average daily cases in the fall of 2021. All 50 states have seen a decrease in cases over the past 14 days. The seven states with the highest number of cases per 100,000, have 60% or less of their population fully vaccinated. Kentucky and Alaska have the highest daily average case rate, with 123 and 100 cases per 100,000, respectively. They are followed by West Virginia and Idaho, with 98 and 93 cases per 100,000. Mississippi, West Virginia and Arkansas, which all have just over half of their population vaccinated, have the highest daily average deaths 1.8, 1.2 and 1.1 per 100,000, respectively. Nationally, the lagging indicators of hospitalizations, patients in ICUs, and deaths all have decreased over the past 14 days as well. But remember, the U.S. is still average nearly 90,000 hospitalizations, 17,000 patients in ICUs, and 2,400 daily COVID deaths higher than the peak in April of 2020 of 2,200 deaths per day and September 2021, with 2,100 deaths per day. And again, I come back and remind everyone that only 64% of Americans are fully vaccinated with a two dose definition fully vaccinated, and because only 42.9% of those have actually received that third dose, that means overall, only about 27% of Americans right now really have the adequate protection from vaccination that they should have. And unfortunately, the rate of new vaccine doses being administered daily is also decreasing, with the majority of doses administered recently being those third doses. Good news, but we are still far, far short of what we need to do. So let me just put this into perspective, shifting baselines. How many times have I talked about that in podcasts? Here we are celebrating what appears to be a real victory, and yet we are experiencing peaks in cases at this moment that exceed that of previous peaks when the house was on fire. It kind of reminds me of those Minnesota winter days that after having five consecutive days of 20 below weather, it gets to 25 degrees Fahrenheit. And all of a sudden we are outside practically in short sleeves because it's so much warmer. But if that same 25 degree day occurred in June, we would be freezing. And that's what we're experiencing right now. Now it's on that backdrop that we're actually seeing all these changes being made with regard to mandates, restrictions. And I will tell you that what is changing America's view of this disease are two things. One is we're tired, we are so tired. We have moved on. The virus has not completely moved on yet. Yes, that peak has been hit. We have come down substantially, but even on the back side of the peak, look what we're experiencing, but we're tired. We're done. The second thing is we have no criteria upon which to base. What should we be doing at this level of disease in our communities? I anticipate very shortly the CDC will be coming out with some guidance in that regard. But here we are two plus years into the pandemic and we don't have that. So how are decisions getting made right now? The governors are reading the tea leaves. They see what's happening in terms of the general public's perception of COVID, what they want to do, and how they want to move on. So people are making these really grand statements about why we're relaxing, releasing or changing mandates, which I'm not saying they shouldn't but know that it never was based on some objective criteria. It was just, we're done. We're tired and it's acceptable enough now. Well, what does this mean going forward? And we'll talk more about this in a moment as we talk about what the future scenarios might look like. We need more guidance so everybody knows what the rules of the game are. Why are we doing what we do to restrict movement, require certain mandates? Why do we do that? And at what level is much they be triggered? At what levels can they be relaxed? And so I think today we are at that point where it's begging for that kind of leadership to be able to say to the public, here are the numbers just like you're looking at temperature, OK? You know, you still may think 25 degrees is really, really warm after a week of minus 25 degrees, but it's still really, really cold if you're considering what you might want to be doing for a July afternoon picnic. So to me, I think this is going to be a very important period over the next few weeks of understanding, how do we measure, how do we respond? How do we think about COVID in our everyday lives? And we need leadership on that. We need direction. We need the public to better understand what it is, why we do it, and how we're doing it. So stay tuned. I suspect next week case numbers will continue to decrease, and I think that'll be great news. But in the meantime, we still have many, many people in this country who are dying every day from COVID. And we can't forget those people. They are our mothers and our fathers, our brothers and our sisters our grandparent our grandmas. And unfortunately, they are even sometimes our kids. And so, you know, we're not done.

**Chris Dall:** [00:29:14] Mike, you mentioned this earlier, and we've talked about it a lot in recent weeks, how effective the vaccines have been against severe disease, severe outcomes. Well, last week the CDC released new data in Morbidity and Mortality Weekly Reports on waning efficacy of the booster shots. So what do you make of that data and how should that data impact the conversation about a possible fourth shot?

**Michael Osterholm:** [00:29:39] Well, let me begin, Chris, by noting a personal bias that I have. I like to think I'm driven by data. To me, it you know data next to love has always been the ultimate Four-Letter word. Ok. Two separate hats. But they're really important. And when we look at data, that should be what drives public policy. But sometimes as an epidemiologist, you have to anticipate what's coming on incomplete data. And you may recall from this podcast, as early as last summer, I was urging that we look at the idea that we've got to stop talking about a two dose vaccine with the mRNA vaccines or even a one dose with the adenovirus platform, the J&J vaccine, and that we have to start thinking about a three dose vaccine as the primary series. Skip that term booster. I don't like it. I think it's misleading and it really is, I think, doing us a disservice by having people think, Well, that's kind of a luxury dose. It's not. So eventually more data came forward and it was clear and compelling to I think reasonable people that those who are 65 years of age and older, those who are immunosuppressed, this third dose is very important. But as we've continued to follow over time what doses mean and x number of days out from that dose, so two doses at one month, three months, six months post that second dose or three doses, one month, three months, six months out from that dose, what is happening? What is the level of protection? And I think this is a critical question as we look to the future of how do we use these vaccines? What will they do to protect us? Well, the CDC published in their MMWR are a very detailed study looking at waning two dose and three dose effectiveness of the mRNA vaccines against COVID-19 associated emergency department and urgent care encounters, as well as hospitalizations. And they looked at it for adults among both periods when Delta was the predominant virus and also when Omicron was, they used what we call a test negative case control study design, using data from eight vision network sites, sites that had been set up from the CDC and funded by them to look at things like vaccine effectiveness. This was really a very important study, and I have to say I give them great credit to the CDC and to the vision network participants. The network analyzed 241,000 emergency department or urgent care encounters and 93,408 hospitalizations across 10 states between August 26th, 2021 and January 22nd, 2022. Vaccine efficacy after both dose two and dose three doses were evaluated, and I must say that this was a very well done study. There are surely limitations to any of these kinds of studies, but this was really an elegant piece of work, and I think their conclusions are really, very, very important. In short, what they found and I'm going to skip over a lot of the methods and so forth. Just please take my word that this was really a well-done study. During the Omicron predominant period, the vaccine effectiveness against COVID-19 associated ED/UC encounters the emergency department urgent care encounters was lower overall compared with that during the Delta predominant period and waned after the second dose from 69% protection within two months of vaccination to 37% protection at five months after vaccination. So let me just say this again. Vaccine protection against ED or UC encounters went from 69% during the Delta predominant period within two months of vaccination to 37% at five months after vaccination. Protection increased however, after the third dose, with vaccine efficacy of 87% among those vaccinated within the past two months. However, VE did decline even after three doses to 66% against those vaccinated four to five months earlier, and it was only 31% of those vaccinated greater than five months out. Although that latter estimate was as, by their own acknowledgment, somewhat imprecise because of the few data they had available on people vaccinated for five or more months with three doses. However, the decreasing trend of vaccine effectiveness with increasing time since vaccination was very, very significant. Now, if we look at a second category among recipients of three doses during the Delta predominant period vaccine effectiveness against COVID-19 associated hospitalizations. So this is a more severe spectrum now. Against hospitalizations it declined from 96% within two months of vaccination to 76% of those who were vaccinated greater than four months earlier. Although the latter estimate again is a bit imprecise because of the few data that were available for those who were four months out. So clearly, we even saw that waning immunity of going from 96% within two months of vaccination to 76% of those greater than four months out. This, again, was for three doses during the Delta predominant period. Now let's move to Omicron because this was in fact the challenge people said with immune evasion was in fact the vaccines less effective. Well during the period of Omicron predominance vaccine effectiveness against COVID-19 associated hospitalizations was lower overall and waned with time since vaccination. Vaccine effectiveness after a second dose declined from 71% within two months of vaccination to 54% among those vaccinated greater than five months earlier. Among the recipients of three doses and again in an Omicron predominant time period, vaccine effectiveness against COVID-19 associated hospitalizations declined from 91% among those vaccinated in the past two months to 78% among those vaccinated greater than four months earlier. So what we're seeing here is clearly even increased vaccine effectiveness drops over time and particularly with Omicron. So if we look here in this study, clearly the estimates of vaccine efficacy against laboratory confirmed COVID-19 were lower during the Omicron predominant, then the Delta predominant period after accounting for both number of vaccine doses received and time since vaccination. However, during both periods, vaccine effectiveness after receipt of a third dose was always higher than vaccine effectiveness following the second dose. However, I have to unfortunately acknowledge vaccine effectiveness waned with increasing time since vaccination. Just remember that during the Omicron predominant period, the mRNA vaccination was highly effective against both COVID associated ED/UC encounters a vaccine efficacy of 87% and COVID hospitalizations vaccine effectiveness 91% within two months after a third dose. But as effectiveness waned, it declined to 66% for prevention of ED/UC encounters. So it went from 87% to 66% just over that several month period. And the protection dropped to 78% for hospitalizations by the fourth month after receipt of the third dose. So what is this telling us? It's telling us two things. One is these third doses are important. Please understand you may not prevent an Omicron related infection right now with your third dose. But the chances you have of avoiding a very severe illness, a hospitalization and even a death is absolutely one of the benefits of being vaccinated with that third dose. So I can't urge you any more strongly than that to get vaccinated with that third dose. Now, in this study, the authors laid out the limitations of this study. I think they're very fair, but I think these results really do tell us something important about the need for that third dose. I will also add that we are working here at CIDRAP on putting together a document summarizing the impact of third doses across all adult ages from 20 all the way to the end of life. And I can tell you that the data are surely confirming that this benefit of the third dose against severe illness, hospitalizations and deaths extends all the way down to the 20 year olds. Some recent data that we've been working with the L.A. County Health Department, who have done just a remarkable job their work there. It really is a real gift to work with a group like them, clearly shows in L.A. County the benefit of the third dose at all ages in terms of preventing hospitalization, serious illness and deaths. So please, if I can implore you all, if you have a grandma or grandpa, father, a mother, a brother, a sister, a son or a daughter, a friend, somebody who might not be your friend, but you still don't want anything bad to happen to them. Please help them get that third dose. It's important. One other piece that these data tell us is we have got to confront the issue of waning immunity. I don't know what it means yet, I don't, and anybody that tells you they do. You've heard me say this before. Be careful they have a bridge to sell you. I think at this point, it's fair to say that we cannot keep boosting our way out of COVID in an indefinite time period. It won't happen. When we talk about annual immunizations for influenza, remember, this is a very limited number of people in the world that have access to vaccine every year. We can't get the individuals in the United States, the 64% of people who have had two doses of vaccine to get a third dose. Look at only 40% of those who have had two doses have agreed to get the third dose. Can you imagine I'm telling you they got to get dose four or dose five? This is something we in public health must address. We must look at this very carefully, and I am convinced that we will not have an ongoing program a one more, one more, one more, one more dose. Surely we're going to be talking about additional doses in the future, but it can't be at three or four months. And we also have to understand why is this waning immunity occurring? You know, I'm willing to take a vaccine that may, you know, not protect me from getting infected, but if you can keep me out of the hospital, keep me from dying, man, that's gold. So just stay tuned. This is one of those areas where we have to have great humility. We don't know and don't understand yet what it means. We're a long ways from that early days of mRNA vaccine success, where public health was touting the fact that these two vaccines likely prevented infection and gave us the sense that it was lifelong like a measles shot. Now some will deny that and say, We never said that well, I can go back and we have confirmed over and over again people did say that. You know, I'm not sitting here blaming anybody. I'm not saying they're wrong, but we have to understand the current reality. And the current reality is we don't understand waning immunity and what it means for our vaccines. But for now, I'm telling you get the third dose and let's move on with fully vaccinated, just three doses. Last but not least, I just want to emphasize to all of our friends, people who we think a lot about who are immune compromised, whether moderately or severely. Please get that fourth dose, get that fourth dose you can and you must. And I hope that you get it as soon as possible if you haven't. And so for all those who are immune compromised, now's the time if you haven't already to get that fourth dose.

**Chris Dall:** [00:41:58] So sticking with vaccines. Last Friday, Pfizer and BioNTech announced that they were going to delay the application for emergency use authorization of their COVID-19 vaccine in children under five. As you noted earlier Mike, my many parents were understandably upset about this. Many felt like they'd had the rug pulled out from under them. But was this the right decision in your mind?

**Michael Osterholm:** [00:42:21] You may recall that last week I covered this topic at some length Chris, and tried to lay out the pro and con of FDA moving forward with an emergency authorization for two doses or waiting until the third dose data came in. And they obviously made the decision to go with the third dose data as really critical to any kind of approval process. So as you just indicated, last Friday, the FDA put out a press release about the postponement of the advisory committee meeting that was scheduled for this week. As you know, the goal of that meeting was originally to discuss the authorization of Pfizer's vaccine for kids six months to four years of age. As we discussed last week, initially the FDA requested the two dose information from Pfizer because of the rapid increase in hospitalization rates among young children during the Omicron surge. The dosage of the vaccine for these younger kids is about a third of what is given to children five to 11 years of age, three micrograms compared to 10 micrograms and only a tenth of the dose that we give to adults. Recall that when we deal with the authorization or licensure of vaccines, we're looking at two separate buckets both safety and efficacy. Well, the data submitted to the FDA regarding two doses of vaccine showed that the vaccine was quite safe in all age groups studied. There are no concerns about the safety of the vaccine in children, and this is an important point. I want this really clear, so there's no confusion. Nothing has been postponed in the approval process because of a safety signal. The challenge is related to the vaccine's efficacy. It showed that it was likely effective in children six to 24 months of age, but did not show efficacy for the two to four year olds, which seemed somewhat curious. The FDA delay was due to the fact that there was just a low number of COVID cases in the trial. COVID cases are needed to be able to assess how effective the vaccine is among trial participants, so it wasn't even somehow the study was flawed. You don't want to have more cases in kids, but on the other hand, you've got to have cases in kids to be able to study the vaccine effectiveness. So the faster the cases occur, the faster we can measure the effectiveness of the vaccine. And we do believe that that will happen over the course of the next four to five weeks. In the end, the FDA determined it was best to wait and evaluate the efficacy of the vaccine based on that third dose data. Pfizer believes that a third dose may provide better protection, which would be consistent with what we've seen in other age groups as well. According to Pfizer, the data on the third dose will be available likely in early April and would hopefully be available soon afterwards and allow for a rapid evaluation and consideration for emergency use authorization. As I noted last week, I was concerned that if we appear to be short-cutting the review process of anticipating the three doses is going to get approved, so why not get kids on the path now with two doses, but then telling them this is really isn't the vaccine schedule we want you to have, we're just getting you ready for the one that will be approved. I think that would have backfired. And so actually, I want to see young kids vaccinated. I had a personal interest in this. But at the same time, I also want to see a situation where no one can say there was a shortcut taken that somehow something unconventional, very unusual, if not troubling, occurred in the review process. So I support the FDA on this. But as I said in my opening dedication, I really feel for parents, grandparents, cousins, aunts, neighbors of kids under age five who are not yet able to get the vaccine. Hopefully, that will end soon when we get this additional data.

**Chris Dall:** [00:46:11] We haven't spent too much time on the COVID-19 antiviral medications molnupiravir and Paxlovid. But last week, CIDRAP News reporter Mary Van Beusekom wrote a story about the slow uptake of these medications in Minnesota, and we've seen similar reporting from other parts of the country. The initial concern when Omicron hit was that there would not be enough of these drugs to go around. So Mike, does the lack of demand for these drugs, which could be important tools for keeping people out of the hospital, need to be addressed?

**Michael Osterholm:** [00:46:41] There are currently four major COVID therapeutics available for non-hospitalized patients. The monoclonal antibody treatment sotrovimab, an intravenous antiviral treatment remdesivir, and the two oral antiviral treatments you mentioned Chris, Paxlovid and molnupiravir. Prior to Omicron becoming dominant, there were three monoclonal antibody treatments available, all effective in reducing the risk of hospitalizations and death. Once Omicron became dominant, the FDA has halted the use of two of the three antibody treatments as they were not effective against the variant, leaving sotrovimab as the only effective monoclonal antibody treatment for Omicron. With only one monoclonal antibody treatment remaining available, it was thought that these new oral antivirals would be in high demand. Despite this, the usage of these new oral antivirals packs Paxlovid and molnupiravir have been fairly low. For example, MHealth Fairview, which is in the Minneapolis-St. Paul area, received 2,100 courses of molnupiravir on February 1st and five days later had only used 5% of the supply despite high case numbers and hospitalizations. They also receive 420 courses of Paxlovid and over two thirds of those doses were still available one week later. The higher usage of Paxlovid compared to molnupiravir is not surprising. Paxlovid has a much higher efficacy rate in preventing hospitalizations and deaths than molnupiravir 88%, compared to just 30%. But the low usage of both is still very concerning. There are actually several factors that may explain the low uptake of these new treatments, including barriers in accessing accurate and efficient testing and primary care, as well as a lack of awareness about who is eligible, the importance of the treatment, and where to find it. Let's start by looking at the lack of access and availability of highly sensitive tests. Patients need to have a positive test in order to get a prescription for antivirals, and antivirals need to be started within the first five days of the infection. So a lack of early detection could prevent people from accessing treatment. In many parts of the country, tests have been difficult to find, or it has been taking many days to get test results back due to testing backlogs from the large number of samples. Especially in rural areas, rapid antigen tests are the only form of testing readily available. As we've discussed before, these rapid antigen tests are not highly sensitive tests, meaning that there could be a lot of false negatives, especially in the first few days of infection. Even in places where the more sensitive PCR tests are available, it may take three to four days to get results, which often does not give patients enough time to contact their provider to get a prescription. The second factor that may be contributing to the low uptake of these treatments is the systematic barriers in the health care system, especially for nonwhite Americans. When we look at prescribing practices for monoclonal antibodies as an example, a report published last month in the CDC's Morbidity Mortality Weekly Report found that black, Asian and other races of Americans and Hispanic Americans were less likely to be prescribed monoclonal antibody treatment than white and non-Hispanic Americans. The systemic barriers that could explain this disparity in monoclonal antibody treatment may also prevent these populations from having equal access to antivirals. Oral antiviral treatments require prescription just like monoclonal antibodies and not having insurance or and having a primary care provider can make it harder to obtain a prescription. Biases in prescribing practices. Transportation challenges. Language barriers. All of these may play a role. People in rural areas may face similar barriers to accessing these treatments as they do with accessing testing. It is possible that counties that do not have any COVID testing sites also do not have a primary pharmacy that has received shipments of Paxlovid or molnupiravir. A third factor that may be contributing to the low uptake of antivirals is that many people and their providers are simply not aware that they qualify for these treatments. Take Minnesota, for example. Patients qualify for these treatments based on their M-MASS score, which is an assessment of patient risk factors. Points are assigned based on different preexisting conditions: being over the age of 65, having chronic kidney disease, diabetes or a body mass index over 35 at any age, being immunocompromised at any age and having cardiovascular disease, chronic respiratory disease or hypertension all over the age of 55. An M-MASS score of four or greater is needed to qualify for Paxlovid, which is 88% effective. Or sotrovimab, which is 85% effective and an M-MASS score of one to three, is needed to qualify for molnupiravir, which is 30% effective. This means that anyone with one or more of the risk factors qualifies for antiviral treatments, but lots of patients are unaware and may not look into treatment options at all. A young and otherwise healthy diabetic, for example, may not consider themselves to be at high risk, so they may have no idea they're eligible for antiviral treatment. A fourth factor that is likely contributing to low uptake is patient hesitancy. These treatments are approved under emergency use authorization, just like the COVID vaccines were. Patients who are skeptical of vaccines because of the EUA and may have the same concerns about the antiviral treatments, patients seem to be especially hesitant with molnupiravir due to the lower efficacy rates. Patients that qualify for molnupiravir but not Paxlovid may not feel a 30% efficacy is enough to warrant taking the drug, not realizing that 30% is far better than nothing at all. There are also many patients who qualify for Paxlovid based on their risk factors, but are unable to take it due to medication interactions, severe kidney disease or cirrhosis that may opt to not take any antiviral at all, rather than take one with a lower efficacy. Finally, the last factor that could be contributing to low uptake antivirals is confusion about where to find the medications. Despite there being plenty of medication available relative to demand, patients are having a hard time finding pharmacies that have received shipments. Some patients are reporting having called over 20 pharmacies before finding one that had the antiviral they were prescribed in stock. Patients may simply give up and try to find these treatments. Some states have made dashboards similar to those created for finding vaccines to help patients with the process, but many of those dashboards lack complete information on all pharmacies carrying the medications. The bottom line is that these treatments are being vastly underutilized. Paxlovid is highly effective in reducing hospitalizations and deaths, and even though molnupiravir may have a lower efficacy rate, it is still far better than no treatment at all.

**Chris Dall:** [00:53:51] So that brings us to our COVID query segment. This week we have a question about coronavirus variants from Yvonne, who writes, "I have noticed that each successive variant has been more infectious than the previous one. Presumably, this gives the new variant the competitive advantage over its predecessor that allows it to spread. Should we assume that each future variant will be ever more contagious?" And Mike, this gets to the is the virus done with us question?

**Michael Osterholm:** [00:54:20] Thank you, Yvonne, for that very thoughtful question. And it is one definitely worth pondering. Let me begin by just caveating what I'm about to say and saying, this is crystal ball material here, OK? I don't know what the right answer is. I'm not sure that anyone could even begin to tell you what that answer is. But let me just give you a deja vu moment. And that is for me personally, I feel like I am set back, just as Chris indicated, some of his previous opening comments were to a year ago. When we were coming off that huge peak of cases in January, vaccines were flowing and everybody thought the pandemic was over. And no one wanted to hear me say that maybe the darkest days of the pandemic are still yet ahead of us. And I surely didn't say that to make people feel bad. But when I saw the variants, I saw a situation where I could only anticipate after alpha, beta and gamma what else was coming? Well, we're in the same spot. There will be new variants after Omicron, what we don't know is what they mean. And let me just set the stage for this discussion by just briefly sharing with you a paper that was just published yesterday in STAT by Don Burke, former dean of the School of Public Health at the University of Pittsburgh, a noted infectious disease epidemiologist, a dear friend and one of the most brilliant minds I know in the area of infectious diseases. And the title of this piece is "Coronaviruses are Clever: Evolutionary Scenarios for the Future of SARS-CoV-2" and what Don laid out in here were really for different possible scenarios. Each taken directly from the known evolutionary playbook of coronaviruses, as he described it. The first one was a slide towards endemicity. And what that means is this is going to just become part of the normal, everyday life and not a great crisis every time we see cases. And he actually referenced how humans currently coexist with four known endemic coronaviruses, their scientific designation sound almost like technical code, as he said, 229E, OC43, NL63, and HKU1. And almost everyone in the face of the Earth has been infected with all or some of these viruses during childhood. They tend to be mild, causing, you know, mild illness, upper respiratory disease, et cetera. Could in fact, this virus morph into that over time? It's surely possible. And it's even possible that maybe these four common cold coronaviruses started out as a novel epidemic virus itself. We don't know. But that's one possibility. So there right away, we're looking more at it may even be more transmissible, but it's not that significant from a public health perspective. So that's scenario one. Scenario two: what he laid out as altered disease and symptoms. And when this situation for which there's precedents, SARS-CoV-2 evolves to infect new cell types in the human body, changing from predominantly infecting and affecting the respiratory system to infecting and affecting other body organs. And this has occurred before where in fact, if you look at animal coronaviruses, they actually can infect different cell lines in your body and may be able to switch the ability of the virus to grow in cells of another organ system. A good example as Don laid out was one among swine. A major shift occurred in 1984 when the transmissible gastroenteritis virus mutated to become porcine respiratory virus, a very significant and serious illness now in pigs. And so we know that SARS-CoV-2 has been found in a number of other body organs in the intestine, the kidneys, central nervous system. And is it possible that a new variant could actually cause a whole new illness picture because it has a tropism or an ability to go to other organs? That's surely a possibility that has happened in animals with coronaviruses, don't know. The third scenario is emergence of a new recombinant coronavirus. You know, in this case, as Don described, viruses like influenza, HIV and coronaviruses routinely swap genetic material between strains. So it's very possible the genetic material of a human SARS-CoV-2, where it could be combined with the genetic material of other existing animal coronaviruses could in fact give us a whole new virus. And with the number of animal species we're now seeing, even infected with SARS-CoV-2, you've heard me talk time and time again about how I've been blown away by the data in white tailed deer, creating this hybrid that spawns a new pandemic surely is a possibility. Where in fact, the current protection we have from our current vaccines and innate immunity acquired from previous infection would not necessarily protect us. And as I pointed out, there's already evidence that SARS-CoV-2 strains are recombining with other SARS-CoV-2 strains. And so this is one that we don't know, particularly given the large number of humans that are infected and now what we're seeing in a large number of animal species. So this is one we'll have to consider. The fourth area, which is one that is frankly also not good news, is what he calls the exploitation of antibodies. And in this scenario, SARS-CoV-2 evolves to not only evade the human's host immune system, but to actively exploit it. And in this case, what happens is if you look at the coronaviruses like feline infectious peritonitis virus, what they've done is they've taken this immune evasion to a whole new level. And in this case, when you have a little bit of antibody, it actually combines with the virus as you're being infected. And it's that antibody that actually has a receptor site in some cells, which you get an uptake and it actually enhances the infection process, causing even more severe disease. This is something that we see with dengue virus, which is not a coronavirus, but the principle is the same. We call this antibody dependent enhancement of the virus growth. So having a little bit of protection is actually almost deadly as opposed to having none at all or a lot. And as Don has pointed out, as with other coronaviruses that infect humans, such as SARS-CoV-1, the original cause of the 2003 epidemic of SARS and MERS CoV-2, which is called MERS, has shown in laboratory studies to be able to exploit bound antibodies as a way to attach to cells and begin to replicate in them. So I know none of these are sounding good. None of these are sounding pretty. The first one, I guess we'd all accept and take. But you can see how complicated it is, we don't know. And so, as I have said, time and time and time again, we can hope for the best. That's the guardrail on the left side, but as I've said, so many times, hope is not a strategy we can hope we're done. This is it. I'm the far right side, the guardrail there is one of these scenarios that Don has just painted. And I think we have to consider it, and we have to at least be prepared, what does that mean? What plans do we have if it's scenario one, two, three or four? So thank you, Don Burke, for what I think was an incredibly thoughtful, comprehensive and right on the mark piece. I'd urge you all to go read it. It's in STAT. In the meantime, I don't know what's going to happen, but I know this virus isn't done with us yet. Nobody wants to hear that. Nobody wants to hear it. Everybody wants to go back to a new normal that, in their minds, is going to be like the old normal. And maybe that will happen with the example one. But we have to be prepared, for example, two, three and four, and that means our governments, that means our public health systems need to plan now because I just got done talking about drug availability, what are the testing systems in place today to make certain somebody can get tested in eight hours and have a result back so that they can get drugs early? What is the system in place for getting the drugs there? What are we doing to find ways to enhance vaccination, particularly among those who have already received two doses? These are the plans we need. So, Yvonne, I'm sorry, I haven't directly answered the question is it going to get more infectious or not? I don't know. I just know that these viruses are not done with us, and it's our job to stay on top of them and hopefully make life as livable, enjoyable, as comfortable and as safe as we possibly can.

**Chris Dall:** [01:03:23] So on a lighter note, Mike, where is our latest beautiful place submission from?

**Michael Osterholm:** [01:03:30] Well, actually, this is a very unusual, beautiful place situation because it actually comes from Paul, who is a resident here in Minnesota. But he's a native Kiwi, comes from New Zealand. And as anyone who's listening to this podcast knows, understands that two of my most favorite countries in the whole world are New Zealand and Australia, so I have a major love and affinity for that. And in fact, sitting in my home is a painting that was given to me by the owner of the Occidental Bar in Auckland when I spent one of the most wonderful days of my life in that bar. And I will be back again and again, so this is all about that. So Paul writes and says, "My beautiful place. I grew up in the north of the north island of New Zealand and have lived in the UK before moving to the U.S.. Now living in the Midwest and being so far from the ocean it is and probably always will be unusual for me. For nearly 30 years, I spent several weeks at a time and numerous weekends away at our family's remote beach house. It was built by my grandfather in 1950, right on the edge of Ohawini Bay in Whangaruru Harbor. There is vehicle access, but no road to the bay. Vehicles drive along the beach when the tide is low enough and the beach isn't too soft. Constructed of native timbers and with primitive but adequate amenities, the beach house or the badge, as we Northlanders call it, was a magical place. Days were spent exploring the rock pools and coastline, swimming and paddling in the ocean, water skiing, fishing, gathering shellfish, enjoying time with extended family and friends. In the late afternoon, you might spot a game fishing boat motoring into the bay with his catch of the day to be weighed, and all the holidaymakers would gather at the weigh in station to admire the Marlin, the Mako or the Hammerhead Sharks. Evenings were often spent spotting satellites in the night sky, and maybe you'd see a blue eyed penguin scurrying from the beach to seek refuge under the batch for the night and wake up with their late night squawking. We had electricity for lighting and cooking, but thankfully no telephone or television. In front of the batch is a small, rocky point. And in one of the rock stands a very determined and incredibly resilient Pohutukawa tree. A New Zealand native, and known fondly as the Kiwi Christmas tree because they bloom in the summer with the beautiful large red flowers. This little tree has been on the rock for as long as anyone can remember. Never gotten bigger, never been destroyed by a storm. It have stood strong for a long time. During the pandemic, I've been fortunate enough to work from home a lot of the time, and our kids have attended school online. In my cold Minnesota basement office, many times I've looked at those photos and wished I could click my heels and our family would be whisked away to the warm New Zealand summer. I look forward to the time, hopefully soon when our kids can fill their lungs with sea breeze and feel the Pacific sand between their toes. Ohawini is my beautiful place. Paul." Paul, thank you so much for painting a very visual place in our minds with your words, but also for sharing with us the pictures that you'd have and there posted on our website here with the podcast. This is a beautiful place. I could only imagine what it was like for you and what a beautiful place for me. I found myself. I think my blood pressure dropped substantially just looking at those pictures and reading your very, very thoughtful words. Thank you for this beautiful place.

**Chris Dall:** [01:07:16] So, Mike, what are your take home messages and closing thoughts for today?

**Michael Osterholm:** [01:07:21] Well, Chris, again, three take-home messages. We're still trying to understand the backside of this blizzard. What's it going to look like? What's going to happen over time? Will we see a tail that eventually comes down to a very, very low level of cases? Will we see a tail that still has its ups and down days and still is causing some significant morbidity and mortality in our communities? I'm not suggesting we're going to put any kind of mandates back on or we're going to do things like that. But but don't forget that our whole concept of baseline has changed fundamentally from the earliest days of this pandemic. When what we're seeing now on an average day might have been considered a house on fire back then. And you know, we're adapting as a human species to this virus psychologically. What does it mean? But we can't discount yet the fact that it still has challenges. We still have to think about if you're one of those individuals at high risk for serious illness, how do you live your life? You know, what do we need to do to keep the level of infection as low as possible in our communities without causing the community this great psychological stress of what those actions do? So we're still trying to understand the back of the blizzard. The second thing is the drugs, drugs and drugs. We have to understand that these are really valuable tools and we're not using them well. For all the reasons I just laid out, I don't know why any one person would not want access to one of these drugs if they were at increased risk of serious illness, hospitalizations or death. Is it because they don't know? Is because they don't want it? Is because it's too tough? And so we really have to explore this. And as a public health and medical care community, as our government oversight organizations, we need to do much more to get these drugs into people early so we can help them stay out of the hospitals, get seriously ill and die. And then finally, vaccines, vaccines, vaccines, these are remarkable tools, but they're not perfect, and we're going to keep learning more and more about them. And the data I shared on waning immunity today. I wish I didn't have that data to share with you. I wish it didn't exist. I wish it was not because we hadn't studied it. It just didn't happen. But waning immunity is going to be important. But right now, don't let the great become the enemy of good. These vaccines are still keeping people out of hospitals. They're keeping people from getting seriously ill and dying. And we've got to get as many people to that three dose level. And all I can say is, again, CDC, please change your definition of what fully vaccinated means. It's three doses. To stay with two doses denies the science, and I think that's going to be an important issue. So those are my three main takeaways, and hopefully our discussion has been helpful to all of you.

**Chris Dall:** [01:10:15] And you're closing for today.

**Michael Osterholm:** [01:10:18] First of all, thank you to all of you for sticking with us through this podcast. Again, I can never tell you in words how much your feedback, your input, your thoughts mean to us, to the entire podcast team. And I'm so lucky to work with this team. They're remarkable. They work long and hard hours to help me put this together. And so thank you, Chris, to you and the entire team. To me, I'm at a place where, you know, I just want to see if we can. How do we not only reduce the risk of this virus causing harm to us, but how do we enhance that potential thing called kindness in our communities? And what can we do to get through what is right now becoming politically a more and more difficult moment? So I know I'm naive and I don't even care if you think that's true or not, but I'm going to go back to a song that I shared with you on Episode 12, June 17th of 2020. Can you believe that? I mean, we're coming on almost two years. And it was one that at the time probably was more prescient for me than I even realized in the sense of talking about how important this would become. This is a song entitled "Try a Little Kindness." It was a song written by Curt Sapaugh and Bobby Austin. It was first recorded by the American country music singer, the late Glen Campbell. It was actually recorded in March and April of 1969 and released in October of 1969. It peaked at number two for one week on the country charts. It also was a crossover and it hit number 23 on the Billboard Hot 100. So here it is. "Try a Little Kindness." Glen Campbell. "If you see your brother standing by the road with a heavy load from the seeds he sowed, and if you see your sister falling, by the way, just stop and say you're going the wrong way. You've got to try a little kindness. Yes show a little kindness. Yes, shine your light for everyone to see. And if you'll try a little kindness and you'll overlook the blindness of the narrow minded people on the narrow minded streets. Don't walk around the town and out, lend a helping hand instead of doubt. And the kindness that you show every day will help someone along their way. You've got to try a little kindness. You've got to try a little kindness." I hope all of you can feel these words, not just hear them and feel them. Today, do something you would not otherwise do. Find some way to be kind to someone, even if somebody in your own family. Just make that an effort, and then maybe when you do one, it'll make you feel good enough, you want to do two. So among all this confusion, all this challenge with Omicron, all this challenge with the science and public health mandates and everything. Maybe we all could just take a moment, find that island of kindness and go celebrate it. So thank you very much for being with us again. We so appreciate it. As I pointed out, please keep sending your input. We listen to it. We love it. We love your beautiful places and it means the world to us and we'll stay with you on this one. We're not done yet. So I've heard from some of you out there worried that these podcasts are going to end. They're not ending today. Ok? I promise. And my voice is getting better. I hope you think that's the case. My poor kids have been getting all kinds of emails and comments also about what's wrong with their dad. So anyway, I'm fine. Thank you so much. Remember these cases, they are our families, they're our friends, they're our colleagues. We've got to do what we can to make them not happen. And the way we do that is right now, get those vaccines in people's arms, get those drugs into people who may very well be at risk for serious illness once they become infected. Thank you. Thank you. Thank you. Be kind. Be safe. Thank you.

**Chris Dall:** [01:14:48] 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-now. The Osterholm update is produced by Maya Peters, Cory Anderson, Angela Ulrich, Meredith Arpey, and Sydney Redepenning.