# Episode 72: A Surge in Optimism

**Chris Dall:** [00:00:06] 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. Nearly three months after the summer surge of the Delta variant began and plunged the country back into some of the worst days it's seen during the pandemic, the United States is finally starting to get some good news. Over the past month, new infections have dropped by more than 34% and hospitalizations are dropping as well. The country is still reporting nearly 2,000 deaths a day, but that number is also starting to fall. This is not where we thought we would be back in late May, when millions of vaccine doses a day were going into arms across the country and the coronavirus appeared to be on its way out. And we're not out of the woods yet, but we'll take it. On this October 7th episode of the podcast, we're going to discuss the decline in U.S. cases and where we're headed after we review the global situation. We'll also continue our look at how the Delta variant is affecting children in schools, discuss the recent news on an oral antiviral medication for COVID-19 and answer a listener question about flu shots and timing with COVID-19 boosters. Dr. Osterholm will also share how his own personal outlook has changed since he's received his booster dose. But first, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:01:54] Thank you, Chris, and welcome back, everyone, to this week's edition of the podcast. I know that you have many choices for your information on COVID-19 and the fact that you're still looking for information and you're still with us is is great news. So thank you very much. If you're new to the podcast welcome, I promise you you'll get my unvarnished view of the world on this issue, and hopefully it will provide some insight. Let me begin by just acknowledging that we're in a journey this summer with this virus here in the United States and, for that matter, around the world, and that I don't find it surprising where we're at. I still have questions and wonder why certain things happen or don't happen. But overall, this virus is doing what this virus does, and we as humans unfortunately are doing what we do. And that has been a very potent mix over the course of the last 10 to 12 weeks here in the United States. And today we'll talk a bit about where I see us going from here, and we shouldn't be surprised by seeing future surges and why they're happening and what we can do about them. But to start the podcast today, I want to make a dedication that is, in a sense, a addendum to previous dedications that I've made with regard to our health care workers. We have throughout the duration of this podcast celebrated the incredible efforts that so many in the health care teams across a wide breadth of professions in the health care industry have provided so that we could do whatever we can to save as many lives as possible from COVID and to make those who recover as whole as possible in terms of the sequelae of related to their illness. But something's happened this summer. That is very different. It is very different. I see it with my colleagues in public health and I see it in the hearts and souls of our health care workers. This past week, Elizabeth Chuck wrote a piece for NBC News entitled "From Heroes to Villains Why This COVID Surge is different for Health Care Workers," and we'll include a link to this article on the podcast website so you can go look at it. And Elizabeth does a remarkable job of telling the story of how today patients and their families treat the health care workers who are doing everything they can to save their lives. And frankly, it is beyond belief what health care workers have been subjected to by angry and disrespectful patients and their families. Now, clearly, not all patients are like that, nor their families. Many are grateful. Many appreciate what is being done for them. But just as we have seen with the hostility at school board meetings, just as we've seen at the hostility related to the response to certain mandates for vaccination. We are now seeing health care workers who they themselves are being subjective to nothing short of vile and tragic responses by the patients and their families. Early on in the pandemic, the emotions that were expressed often by family and patients with sympathy, empathy, remorse and guilt. Now that's all dried up. As Elizabeth Chuck says in her article, "what now is left is anger, hostility and mistrust." And so it's bad enough having to work these long, long hours under the most difficult of conditions. But now to take what is literally abuse is beyond anything I can imagine. It speaks to the very, very least of us as humans. So this week I dedicate this podcast to all those health care workers who are struggling to be good health care workers. They're struggling to be humans, subjected to the kind of response that they're getting from far too many families and patients. I can't begin to admit that I understand what that must be like. But let me just say that on behalf of many, many very grateful individuals for what you do every day, thank you. And all I can say is we need you and you've been there. And that is one of the greatest gifts anyone could give to our society. Thank you.

**Chris Dall:** [00:06:41] Mike, looking at the overall and global situation, the downward trend in cases appears to be continuing, according to the latest World Health Organization updates. But the Delta variant is still driving surges in different parts of the world like Eastern Europe and Southeast Asia, and the persistence of the Delta variant has forced the pandemic shining star New Zealand to give up on zero COVID. So globally, have we fully entered the living with COVID phase of this pandemic?

**Michael Osterholm:** [00:07:13] Well, Chris, I don't mean to sound like a broken record, but what we're seeing take place on the global scale right now is really just the latest piece of that larger pattern of ups and downs that this pandemic is adhered to since its very emergence. We're not in new territory. And whether you prefer metaphors, as I've used in the past, you know, involving we're, you know, riding this tiger, we're not driving it or Whack-A-Mole, you know, kinds of approaches to responding to it. This pattern continues to support my stance that we're largely at the whims of this virus, with the exception of when we can have an impact with vaccination. And I think this is such an important point to make is that in fact, what this virus is doing is what is done from the very beginning. There aren't big surprises. You know, you mentioned in your opening that many people were surprised that we're at where we're at this summer relative to what people thought we were going to be at in May and June. I don't find that a surprise. And as you know on this podcast, I've been saying that we were going to see darker days ahead and I know people don't want to hear this, but we're going to continue to see darker days ahead. This surge will basically continue to drop in case numbers, but it's not the last surge we're going to have in this country. And the future surges may not be nearly as large as this one. But regionally, locally, they could be really bad. So let me just continue to emphasize this fact that whether it's at the international level or the national level, we're not done. If we look at the current latest numbers from W.H.O., though let's put into perspective where we are. We saw weekly cases climb from 2.5 million in mid-June to around 4.5 million throughout most of August. Now, in the month since the August plateau, we've been falling with 3.1 million reported cases this past week. Again, from a high of 4.5 million throughout most of August. Now we're down to 3.1 million. Weekly deaths have also maintained their consistent descent since August, when they approach nearly 70,000 deaths a week, with just over 54,000 reported more recently. Although the latest overall global trends are encouraging, as you alluded to in your question they're not uniform. A number of outliers exist, and some countries are facing their biggest surges to date. For example, Eastern Europe, which is home to several countries with notable upticks, including Bulgaria, Estonia, Latvia, Romania and Slovenia, although nearly three out of every four adults living in the EU have been fully vaccinated. The rates in many eastern European countries have lagged behind. This is particularly true for the countries I just mentioned. For example, only one in three adults in Romania are fully vaccinated. Bulgaria fares even worse, with less than one in four adults fully vaccinated. Unsurprisingly, they both also happen to rank among the world's top countries, with the highest average death rates over the past week. In fact, 10 of the 12 countries with the world's highest current death rates are in or near Eastern Europe. Apart from Lithuania, which has fully vaccinated 58% of its population, and Serbia, which has fully vaccinated 42% of its population, none of the countries have fully vaccinated more than 35% of their population. And it's important to note, according to multiple officials, the region's low vaccination rates have little to do with lack of access or supply. Instead, it's being attributed largely to widespread hesitancy and mistrust. Sound familiar? A CNN article published last Friday highlighted the gap in vaccination rates that distinguish most of Eastern and western Europe and offered some interesting insight. According to the article, the EU's top 15 countries with the highest vaccination rates are all part of what used to be the Western bloc when the Iron Curtain split the region. On the other hand, the 10 countries that ranked the lowest are all former communist countries. Regardless of what's happening in Eastern Europe right now is just another reminder of what this virus can do when there are gaps in protection in the population level. As I've said many times, you cannot outrun the game clock with this virus. If you do not have protection from either vaccination or from immunity acquired through natural infection, then in fact you will eventually know the COVID related outcome. And as I've said before, with plenty of human wood left to burn, we're going to see future upticks. The question is when will they occur and how bad will they be? When will Africa see its next surge? Just last week, a wave of news stories focused on the fact that more than two thirds of the countries in Africa have yet to fully vaccinate at least 10 percent of their population by the end of September, which was the goal set by the W.H.O.. In fact, nearly half of the countries in Africa had fully vaccinated less than 2% of their population at this point. Let me repeat that nearly half of the countries in Africa have fully vaccinated less than 2% of their population up to this point. Still, despite these challenges, the region once again reported an overall decline in weekly cases and deaths, which have fallen steadily since July. What is driving this decline? I'm not sure, but I can tell you that again, this is up to the virus. The virus is doing this. It's not for mitigation. It's not for vaccination. And at some point this virus will come roaring back in Africa. Fully expect that we will see it light up again. Let me summarize a recent quote for you from a dear friend and colleague, Sir Jeremy Farrar, who directs the Wellcome Trust. In a story from Science. He summed it up well. He said the following, "Going into a pandemic is hard enough. Coming out of it is even harder. We don't just go from a no vaccine state in horror to a status quo. There's a transition phase." Well, I'm convinced we're now at that point where we're seeing this play out with decision makers and leaders constructing plans and putting them into action on attempt to live with COVID. Remember, even with the patchwork approach between countries. Vaccines are the common denominator. Without vaccines, the path forward is guaranteed to be extremely bumpy and painful. With vaccines, it becomes more sustainable. So with vaccines as a prerequisite for any chance at a long term responsible success, I think many countries in the world, including the U.S., still have a lot of work to do. Otherwise, living with COVID will routinely involve surges that challenge health care systems and ultimately result in many deaths. On the other hand, I do want to acknowledge that there are places that have been remarkably successful with their vaccination campaigns. This includes places like Chile, Ireland, Denmark, Spain, Singapore and Portugal, which have each fully vaccinated at least 75% of their entire population. Some of them, like Denmark, have lifted all restrictions and are venturing ahead. But it's worth noting that the country is also fully vaccinated 97% of individuals aged 60 and up who have clearly been at a heightened risk for serious outcomes. Meanwhile, in Portugal, 98% of individuals eligible for vaccines, meaning anyone 12 years of age and older are fully vaccinated. Both of these countries are hoping that such high levels of uptake will defang the virus and minimize any future threat it might pose to their health care systems. Although they're early in their journey, things have been going well so far. We do recognize we still have the challenge of breakthrough infections trying to understand what they mean. How does future vaccinations beyond the initial series play in terms of assuring this type of ongoing protection? These are questions that need answering, and we'll talk more about that in a moment. At the same time, talking about Denmark, Singapore's latest experience serves as an example that even higher vaccination rates don't ensure a completely smooth path forward. Cases and deaths in the city state, which has fully vaccinated 83% of its entire population, have been on the rise, although more than 98% of the cases there are reportedly asymptomatic or mild. The surge has prompted officials there to re-implement restrictions, including remote learning for primary school students. Overall, I'm expecting that many attempts to live with COVID will be touch and go for the near future. A lot of it will depend on vaccination rates, health care capacity and the level of infection and death that's deemed tolerable. Ultimately, higher vaccination rates will help minimize the morbidity and mortality and provide us the path forward. Even countries like Australia and New Zealand, which you just mentioned Chris, which are no longer shooting for zero COVID, are still relying on fairly heavy restrictions to buy time for more vaccines to be administered. So in conclusion, we must keep working to get people vaccinated. The world will know a COVID situation for many, many more months to come.

**Chris Dall:** [00:17:01] As I noted in the introduction here in the United States, we are finally getting some good COVID news, though the situation in some parts of the country, places like Alaska, remains pretty bad, but this gets at the issue that you were just discussing. The U.S. vaccination rate has not risen dramatically. School is back in session. Most mitigation efforts rely on personal choice. I could go on. Why are we now seeing this decline in cases and and how long do you think this can last?

**Michael Osterholm:** [00:17:34] Well, I wish I had that answer for you, but I don't. As you know, I've been talking about this two month cycle of where roughly from the beginning of a surge to the peak of a surge, to it coming back to some relative baseline compared to what it was before the surge is about a two month visit, a hell of a visit from a virus. But that's what it is. And so if you follow by a map on a weekly, biweekly basis where the cases have greatly increased over time, you'll see the cycle and how it emerges in one state, one region, then you'll see it another state, another region. And I'll talk about it in a moment. But while everyone is now beginning to celebrate this, in a sense, the reduction in case numbers, if you're in certain parts of the United States, that's not what's happening. The path that I just described is not one you'd necessarily expect. This virus doesn't abide by human logic. This virus doesn't act according to what some statistical model predicted it would. It doesn't even care who the experts are and what they're saying about what it's going to do. It just does what it does. And it's another lesson in humility that those virus is offered up. With the latest lessons involving more declines, I'll gladly take that. But let's try to understand if we can at least observing what it's doing, even if we can't understand it. Barring any sudden change, we're on pace to dip back below an average of 100,000 cases a day. Of course, that's still a level that would have been jaw dropping just several months ago, when the average was almost 10 times lower. But it's down from 170,000 cases a day we were reporting in early September. Hospitalizations have dropped below 70,000 per day, their lowest level since early August. However, while daily deaths have also been slowly trending downwards, we're still losing an average of 1,800 Americans to COVID each day. And in the time since our last episode, Delta has pushed the total U.S. death toll past 700,000 deaths. Most tragic is how preventable so many of these deaths are. 100,000 Americans have died from COVID just since mid-June. At this point, the vaccines were fully available in the U.S. for months, and in fact, over 400,000 deaths have occurred since vaccines first became available. And by our best guesstimate, at least half of all these deaths, if not more, could have been prevented have vaccine been used by these individuals. If we look at those who have died from COVID since mid-June, almost 40,000 of them were younger than 65 years. Let me repeat that 40,000 of those who have died since mid-June were younger than 65 years. In fact, the Delta surge brought about the highest ever number of per capita deaths in the following age groups 45 to 54, 35 to 44, 25 to 34 and even under 25 years of age. In other words, in every age group, 54 years of age and younger, this virus has caused more deaths than at any time in the pandemic. Now, if we look at what's happening, we see this ongoing flow of what I have called before viral lava. From those original cases that showed up in the Ozarks, to the spread through the southern Sunbelt states, to the southeastern part of the country and into the mid-Atlantic and then upwards towards the northeast. We haven't seen the virus sweep further than the mid-Atlantic states. The Northeast has largely been spared, with the exception of those northern border states, Vermont, New Hampshire and Maine. They have seen sizable increases just in the past two weeks, Maine has had a 24% increase, New Hampshire an 18% increase in cases. While the virus was emerging on the eastern side of the United States, we also saw a similar situation in the northwest, with early cases showing up in Oregon and Washington, particularly the eastern parts of the state, and causing a very similar kind of surge activity that was being seen in the East Coast area. Following the initial surges of activity in Oregon and Washington, we then saw the virus literally start to impact on in states adjacent to those into Idaho, Montana, Wyoming. Utah, Northern California, northern Nevada, and we went through a similar two month cycle in those locations. Now they too are largely showing substantial increases in those areas. But what's happened? We're now seeing it show up in the Upper Midwest. Cases in North Dakota are up 23% in the last two weeks, Michigan up 23%, Minnesota up 16%. This is now another hot spot in the country and emerging. So from where I sit today here in Minneapolis-St. Paul, I don't see this pandemic going away. In fact, just the opposite. So what can I say generally is happening? Well, first of all, rural parts of the country are getting hit particularly hard, and they have throughout this past summer surge. A recent analysis from Kaiser Health found that COVID death rates in rural parts of the country are more than two times higher than their urban counterparts, an outcome that is being attributed to differences in vaccination rates and less access to specialized care in many rural areas. For example, many of these rural counties don't have hospitals with ICU beds, and during the height of the pandemic surge, could not be transferred to metropolitan area hospital systems because of a lack of beds. So while I welcome these overall declines, I also think about how much pain and suffering came from the preceding surge. And I remember that we're not in the clear, for example, crisis standards of care have now been implemented in Alaska and under consideration in North Dakota, with some doctors now being forced to decide who gets care based on the likelihood of survival. Other states, including my own here in Minnesota, are still reporting substantial increases in cases. Again, I can't always figure out when and why these rises and falls happen. But based on what we've seen internationally and where we currently stand with vaccination rates in this country, we will clearly see more surges. Remember that there are 65 million Americans, 12 years of age and older who could be vaccinated right now and are not. They will continue to serve as a critical source of cases for future surges. And also, remember that there have been some areas that have not hit with this surge that will in the future. Listeners in New York and Southern California don't want to hear this, but if you look at the rates of vaccinations in those areas, there's nothing special about them. They have millions of people who are fully susceptible to those virus. And don't be surprised when a future surge involves either one of those or both of those. It's going to happen. The sense in New York City today is we're done with the virus we're over. And they've done a lot to try to make that happen, but they still have millions of people who are vulnerable to this virus. So all I can say is that right now we are in a better place than we were five weeks ago. And if we can continue to get people vaccinated, which is a real challenge, we'll even be better prepared for the future, but right now, please don't be lulled into a false sense of security that this pandemic is over. Now we're going to talk more in a moment about how to live with this virus.

**Chris Dall:** [00:25:52] We now have more than a month of the school year under our belts. Two months in some parts of the country. So Mike, what does the pediatric case update look like and how is this affecting schools?

**Michael Osterholm:** [00:26:04] Well, Chris, as of September 30th, almost 5.9 million children in the U.S. have tested positive for COVID-19 since the onset of the pandemic. Notably, 173,000 reported just this past week. This was the first time in six weeks we have seen fewer than 200,000 pediatric cases, so that's good news. However, to put this into perspective, in the past four weeks alone, there have been over 850,000 new pediatric cases. This is an overall cumulative rate of about 7.8 cases per 100,000 children in the U.S. population. That is in short about one out of every 10 kids have now been test positive. Also of note, this is a 7% increase in the cumulative number of cases and kids just over the past two weeks. In other words, 7% of the total pediatric cases that we have seen in the U.S. have just happened in the past two weeks. According to the American Academy of Pediatrics, kids now account for about 27% of all reported cases in the U.S. as of last week, compared to 16.2% of the total cumulative cases since the pandemic began. This is not surprising in that more adults have been vaccinated, most kids can't be. Among the states reporting testing information for kids, they now make up between 11.5 and 22.1% of the total cumulative state tests and between 5.1% and 18.1% of the children were test positive. This is an incredibly high number, suggesting that the number of actual infections in kids is much higher than we're even picking up with testing, meaning some kids are not getting tested. These numbers are unfortunately nearly identical to the numbers reported in the podcast the past two weeks, indicating that in fact, ongoing widespread transmission is still occurring. According to the American Academy of Pediatrics, among the 24 states in the New York City area reporting child hospitalizations, there have been 615 new hospitalizations in the past week. Now it's good news that this compared to 733 hospitalizations the previous week and 645 hospitalizations a week before that. So there is some sense the case numbers may be coming down. There have been 22 child deaths in the past week, the highest number of deaths in the past six weeks. This is a tragedy. And the increasing number of deaths in the past week are reflective of what we call lagging indicators, you've heard me talk about that. Deaths often occur days to weeks after the onset of the case this is why we continue to see the deaths increase. In the past year, October 1st, 2020 to September 30th 2021. There were 408 deaths in kids zero to 17. However, notable 76 or 18.6% have occurred in just the last month. Closer to home in Minnesota, cases have been on the rise, with pediatric cases growing especially quickly. In the past seven days, there there's been an average of 50.4 new COVID cases per 100,000 population for zero to nine year olds and 70.7 new COVID cases per 100,000 population for 10 to 19 year olds, higher than the state average for all cases of 47 per 100,000. These cases have begun increasing quite rapidly. Test positivity rate in Minnesota is up almost a full percentage point this week, at 6.6%. But we believe that number is actually substantially higher for kids. Our surge here now in Minnesota is unfortunately substantially impacting our kids. Let's talk about schools. The number of school closures has slowed, as many districts across the country have been changing policies regarding quarantine guidelines and mandates, as well as the fact in those states so dramatically impacted by the surges of six to eight weeks ago are seeing case numbers drop. This week, Burbio has reported over just 2,238 in-person school closures, up from just 2,200 last week across 561 districts. That's up from 549 last week. This involves 45 states, up from 43 last week, with many of them shifting to remote learning during the closure periods. What's happening here is, in fact, those states I just mentioned where we're seeing decrease in cases, yes, in fact, things are improving. But in many locations, people have come to understand, Wait a minute, I will have to close down if I in fact have so many kids in quarantine because the kids are tested in the school and then the contacts are identified and now needing quarantine. What's challenging with this is that many districts, rather than responding from a public health risk model saying, So what should I be doing? Should I be sending kids home who have been potentially exposed and put into quarantine? They're saying in large part, if you're well, if you're not feeling sick, stay in school. We know that schools have changed their policies in many instances to make it harder for someone to be excluded based on a quarantine recommendation. What I mean by that is we have clear and compelling evidence from schools that said, look at if you have a contact with a known case, meaning someone that is actually positive for the virus, it was such that you would have to be quarantined if you had an extended exposure time next to that individual. Today, the school districts are unfortunately all too often saying, Well, if you're not sick, if you're feeling well, come on back. And we are not really understanding just how much of this ongoing transmission is occurring, just because of the fact that we now are telling kids, you don't have to count as a quarantined individual if in fact you're not feeling bad. That is a huge challenge, and that is only going to continue to spread cases, it will surely keep your number in quarantine down. It may allow you to keep your doors open, but you are not acting in the best interest of these kids. Let me just give you an update on some of the states that are experiencing challenges right now with COVID-19 in their schools. Michigan reported 95 new school outbreaks this past Monday. This comes one week after Michigan changed its definition of a school outbreak to three plus cases, rather than its former definition of two plus cases, meaning that under the old definition, there likely would have been many more outbreaks reported. Alabama has decided that they will not publicly be reporting on school outbreaks anymore. The schools and public health officials will not be investigating cases. One way to make it go away. The state is still running their school COVID-19 dashboard, which reported a total of 3,802 cases in K through 12 schools last week. These cases are not being investigated. Last year, the Alabama Department of Public Health told schools they had to keep track of seating charts and notify parents as students were exposed to COVID-19 positive individuals. But this year, schools in Alabama are told they did not have to do that. School nurses are still required to report COVID-19 cases that they know of, but they are not required to report which schools the cases are coming from. Now, if you wanted to get rid of a problem administratively, this was a perfect answer. That, unfortunately again, should be unacceptable for the health and safety of our kids. In the last 28 days, 232 schools here in my home state of Minnesota have reported five or more cases in students or staff that were infectious in the building in a two week period. Since August, there have been a total of 275 outbreaks, with an average of 12 cases per outbreak. School cases in Minnesota are increasing with there now being a total of 2,388 reported student cases and 408 reported staff cases. This is double the number of cases that Minnesota schools were seeing last fall. Part of this may be due to more students opting for in-person learning this year compared to last year. It is clearly also a result of schools not following the best practices for reopening, as outlined by the Minnesota Department of Health. These guidelines include universal masking and regular testing, keeping sick children at home and contact tracing when a case is detected. Many schools are not doing these things, and many parents do not want to get their children tested because they do not want to have to keep them at home if they test positive. Schools where fewer guidelines are in place are often in areas with lower vaccination rates, so the children that are already less protected by their community are also suffering from a lack of COVID mitigation strategies in their schools. One more example of a state and what's happening with their schools. North Carolina has 263 active clusters in schools or child care centers. North Carolina defines an active cluster of five or more cases occurring within a two week period in the last 28 days. There are 28 clusters that have been declared over for a total of 291 clusters in the school year. Remember that North Carolina was one of the states that we've talked about with regard to masking, and that they published an op ed piece in the New York Times touting how masking had in fact greatly reduced the risk of transmission in their state. These case numbers raise questions about just how well their actual programs for reducing the transmission in a school setting are working, including the issues around masking. One last note to close on and this is, I think, a very favorable positive note for kids. California is the first state that require all eligible students to be vaccinated once the vaccine is fully approved. The mandate, which adds COVID-19 to the state standard list of vaccination requirements, which includes 10 vaccines such as MMR, will apply to both public and private schools. Several California districts have previously announced their own preemptive vaccine requirements, pending full FDA approval of vaccines for kids. Unsurprisingly, the statewide announcement from Gov. Gavin Newsom has been met with opposition from both political opponents and parents. This is not surprising, as the governor has had pushback following many other decisions throughout the pandemic. In this case, I salute the state of California for taking this on and trying to protect our students. So let me just summarize what is happening with kids and COVID-19 in this country. Clearly, we are seeing schools play a major role in transmission and amplifying on the case numbers. And of course, this is all tied to the Delta variant, which is acting very differently in kids than we saw in the variants of a year ago. Second of all is the fact that the cases are rising and falling in schools within the transmission that's occurring there by itself, but it's also reflective of what's happening with the surge in the community. So as we've seen, the southern states, for example, have substantial drops in new cases. The pediatric cases in and of themselves will drop off. It's not somehow that the schools by themselves are going to keep perpetuating cases for months and months after the rest of the community sees a drop. So just know that the time for really protecting our school kids in schools is when surges are occurring in the community because we have that additional transmission that occurs there. So if you're trying to understand what the risk is for my child in a school today, just know that where there's a surge, the risk for your child is substantial. Where the surge is over or hasn't occurred, the risk will be much lower, won't be zero, but it'll be much lower. And so we really need to focus right now on highlighting the prevention efforts that are necessary during surges in communities around our schools. And you may be able to actually reduce some of those efforts once the surge is over. But right now, what we're seeing happen in many schools is that they just basically don't respond to the surge in any different way than they did before the surge occurred. And you can see what's happening. And this, I think again, is a failure from the national leadership and public health to help explain this. What do we do once we see major surges in our communities? And, you know, don't tell us that basically just masking and, you know, being three feet apart is going to make the difference. Yes, high quality masking is very important, but we also need to then understand how do you work within the context of quarantine, testing? How do you make sure that ventilation is at its best? And I think that that has really been a challenge.

**Chris Dall:** [00:39:33] Mike, we've talked a lot about vaccines in recent episodes of the podcast, but Merck last week announced that its oral antiviral medication molnupiravir, when taken within five days of infection, reduced the risk of hospitalization or death by 50% in adults with mild to moderate COVID-19. Granted, this is more science by press release. But if the data back this up and the FDA were to issue an authorization for this drug, what kind of impact could it have?

**Michael Osterholm:** [00:40:05] Well, this announcement this past week is very important. Molnupiravir is, in fact the first of a number of small molecule drugs that will be coming down the pike that can surely reduce morbidity and even potentially mortality. At this point, as you alluded to, this has largely been a press release event. But there's reason to believe that this drug can be effective and helpful. The information about the study that was released indicated that the drug had to be taken within five days of the onset of infection among those who had not been vaccinated and those who had some reason to suspect an increased risk for hospitalization based on other co-morbidities. What they found was that in fact, the drug reduced the risk of hospitalization by 50% in adults with mild to moderate COVID-19, and the number of deaths reported were zero in the treatment arm and eight in the placebo group. Surely supporting that there may be a reduced mortality benefit also. We don't know much more about this study other than that. In short, this is good news. This is good news. Now what's the relevance, though, of this drug and its treatment with regard to protecting people from getting infected at all? And what I'm worried about is that we're going to see people who are already unwilling to get vaccinated, only digging in deeper now and saying, Well, even if I don't get vaccinated, I can get this drug. It'll save me. I'll be fine. And I think this is a very, very dangerous message to send forth. No one in the pharmaceutical world or in public health is sharing that kind of a message, but I can see how many people would interpret it, particularly because it was studied in people who were not vaccinated. We'll have to also see if there are other potential complications with using this drug. It does have the ability potentially for mutagen activity, which means that could it be used safely in pregnant women? The initial studies support that it can in looking at animals, there's more work going on, but at this point, I'm sure this drug will not be approved, potentially for pregnant women or women of childbearing age if they're not using birth control. We'll also find out if this particular drug has a increased occurrence of drug resistance associated with it. This class of drugs very well may have that happen, and we'll have to look at that. But again, let me just say it's a it's a positive development. I look forward to more small molecule drugs coming forward. What will this mean for low and middle income countries? Is this a drug or part of a whole drug picture that looks like PEPFAR, the program we have for HIV aids that has been so highly successful in low and middle income countries? We don't have any evidence of that yet. In summary, this is a very positive development. It's not a game changer. It doesn't mean everything changes overnight. In fact, any tool today that can reduce the burden of serious illness and deaths is very welcomed. So we look forward to getting more information on this drug, as well as other ones coming down the pike and how they might be used.

**Chris Dall:** [00:43:28] That brings us to this week's COVID query. And this one comes from Polly, who wrote, "Could you comment on the benefits or drawbacks to getting the flu shot this year? And as to the timing with COVID-19 boosters or the primary series, do you recommend them together? If not, which would you recommend first?"

**Michael Osterholm:** [00:43:48] Well, I have good news across the board on this one. Number one, it is time to get your flu shot. Get it, now. This is the time of the year to get it. Number two is it can be given at the same time as your COVID-19 primary series or booster shot. So there's no problem getting them both on the same visit. Let me just comment briefly on the issue of whether we need to prepare for this what some have called the twindemic meaning that we would see potentially a major flu winter season on top of a cold season. And I just have to come back to a very simple point based on true humility and understanding what we do know and don't know and say. No one can tell you that we're going to have a bad flu year. We could. We could have another very mild flu year. This is one of those issues where I talk about the virus being in control of what we don't really know and understand. I've mentioned in previous podcasts the challenges we've had with understanding why last year we didn't see influenza, why we didn't see respiratory syncytial virus occurring in our communities during the winter months, as we would normally see. What we know from a previous influenza pandemic in 2009, that basically all the other respiratory viruses we'd typically see, including the other strain of influenza A and the two influenza B strains which cocirculate each year, as well as these other respiratory pathogens, just didn't show up in 2009 after H1N1 emerged in that winter of 2009 and 2010. What was the interference there? It wasn't because of mitigation. We didn't do anything different. We didn't mask. We didn't distance. We didn't do anything. If we look at this year and we look at the RSV issue in the summer, as we've talked about before on this podcast, what was happening there, I don't know what was happening. Why did it suddenly show up in the middle of the summer and not winter? Well, people have said, well, it's because we suddenly stop masking and distancing that doesn't hold water because there are other countries around the world that also saw summertime RSV activity that weren't masking. They didn't stop because they never started. They weren't being distanced. They weren't basically holding kids out of school. We don't know why this happens. I wish I did. There is an answer. I know Mother Nature has the answers. She just hasn't shared it with us yet. So to summarize what's going to happen this flu year, we have to be prepared as if it could be a bad year. And for health care workers listening to this, you don't want to hear that, I know. You're already stretched beyond max, but we have to be prepared to say what happens if we do see increased occurrences of influenza as well as COVID-19. In short, you've already had a very painful experience with that kind of twindemic this summer with RSV and COVID-19. So we'll see what happens. But don't be surprised if we don't see a challenge with influenza this winter. We just went through the winter season of the southern hemisphere, i.e. our summer, and we saw almost no influenza throughout the world in the southern hemisphere. Could that happen again here? It could. We just don't know.

**Chris Dall:** [00:47:13] Mike, you recently received your booster dose of the Pfizer COVID-19 vaccine. Like many of our listeners, you've been living your life very carefully for the past 18 months. But you noted in our pre-podcast meeting that receiving the booster has changed your outlook. How so?

**Michael Osterholm:** [00:47:32] Well, Chris, I think every one of us who are listening to this podcast right now realize we've been on a journey with this virus. In a sense, it's been a very delicate and sometimes very painful dance between what we do in our everyday lives, how we feel about the safety of our environments, where we're at, how it relates to our loved ones, our colleagues. And there is that biologic aspect to what this virus does. But there's also that psychological aspect, and I think we're at a point right now where people feel like they've been fooled once. There was a sense in this country for many that last May and June we were done, enough people had been vaccinated. There had been an administrative decision that we had to reach 70% of the U.S. vaccinated, like somehow that was the magic threshold. As you know, some people continue to persist on this idea that herd immunity would occur at that level, something that as you know, I've dismissed for a long, long time. And there was a really major reaction among so many when in fact July came about and we started to see this major delta surge. And some of the darkest days of the entire pandemic have occurred since then. Well, that affects all of us, whether we've actually been infected with the virus or whether we haven't been. Then as we saw breakthrough cases starting to happen, increasing in numbers, reports more and more of people who were sick, people who were seriously ill, who had had their two doses of the mRNA vaccines or their single dose of the J&J vaccine. And we were really in this very unsettled place of wait a minute. Is it safe or not for me? Is a breakthrough infection dangerous or not? And while I'm human, I'm just like everybody else, even though what I know, maybe in some cases is a bit more than others might know about this virus. I too, am living this experience of what do I feel? So one of the issues that, for me, became clear and compelling was the issue of what is the long term immunity with these vaccines and what might be the consequences if that immunity is limited by time? Now, I've always all along said that, in fact, there was never a question in my mind about these vaccines from a standpoint of safety. I think the safety question has been asked and answered. We know the safety issues around these vaccines and we don't have to vaccinate another 100 million people or wait another 10 months to find out that answer. We have it. We can move forward. But the second bucket, the bucket about how do these vaccines work over time? And remember, as I've before emphasized on this podcast, remember first and foremost, a year ago today we were talking about the fact that if these vaccines were even 50% effective the FDA would approve them, and it would be a major tool in fighting this pandemic. Well, then we were overwhelmed with joy. You might say when we found out with the mRNA vaccines, at least that in fact, we were getting 90 to 95% protection against infection at three to five weeks following the second dose. But remember, the dosing that we used was always about getting results as quickly as possible, dose one on day, one dose two on week three or week four. Very close in time, something that many immunologists said, Well, that's not going to give you the maximum response, but if you get a response, that's all the better. You get it approved and get these vaccines out. We're in a crisis. And so we got into that mode of thinking these vaccines are going to be almost perfect, which we should never have done. We should have been looking at. Well, we've got to look at the next three months, the next six months, the next 12 months. But we were in a mindset. We were done. I mean, even to the extent that the current administration. And I don't think it was a wise move. I've said that publicly well before the Fourth of July, calling this Independence Day from COVID. It gave people that sense. So I understand why people were jerked in a way of saying, Wait a minute, it's not done. And now we're seeing all these breakthroughs. You know, I think on a national level, the issue of breakthroughs has been at best a challenge because of how complete the national data set is that the CDC has. So I don't really even rely on that. I look to my own home state here where I think we have probably some of the best data in the country on breakthroughs. And right now, 3.2 million residents have been fully vaccinated. As of this past Monday, a total of 32,796 breakthrough infections were identified across the state. A very small, small percentage of the total number of residents who were vaccinated. Of those infections, 1,690 were hospitalized, which was 5% of the infections. And 185 died. If we look at that, the Minnesota Department of Health does note that the hospitalization numbers include patients admitted for any reason within 14 days of a positive test. So it could include people who are screened before admission for non-COVID related reasons. So you can't say all those hospitalizations were just for COVID. On the other hand, the 185 deaths were in people who had both a positive test and evidence of COVID related death. Now, most of those were older individuals. But the question was over time, as we get further out from that second dose, together with the increased infectiousness of Delta, would this waning immunity be in a sense, like a cliff high, high protection, you drop off, you drop 10, 20, 30 percent and then it levels off again, and you don't have to worry about ongoing ever decreasing protection. I don't think so. I think this is very much like a ski slope where the protection, once it starts going down, it goes down, it goes down and goes down. Now I will be the first to say that we are wanting more data for what does it look like six to 10 to 12 months out from vaccination to understand what that waning immunity might look like. And we don't have those data yet, because people have only been vaccinated within the last 10 to 11 months at most and most of them within the last six to seven months. And so we're watching this as time goes on. And today, what we do is have enough data to show, yes, there is an ever increasing number of people who are breakthrough infections, and we have data that some of them are infectious and do transmit the virus to others. Generally speaking, these are milder illnesses, but not exclusively. And the question is, is this only a function of people who are 65 years of age and old or older people? And or is this possibly increasing in terms of numbers in younger people who also are suffering breakthroughs that may be serious? In a paper this week and in the New England Journal of Medicine, we see a study that was just released from Cutter that actually showed, in fact, that the effectiveness against any severe critical or fatal cases of COVID 19 and two dose recipients of Pfizer stayed really in the 90% level right through the first, second, third and fourth months. But then it started to drop. Ever so slightly, not significantly different until we got to month seven or greater, which most of them were at seven to eight months. And the point estimate dropped down to 55% protection. Now, this is very similar to what we saw with the Israeli data. And the question is, is this going to happen over time? Will we see a bigger and bigger drop? Now, I have to say, I don't know. Nor does anyone know yet, exactly. But I liken what we have here to an experience I've had many times in my public health career. When I was an epidemiologist at Minnesota, we had many serious outbreaks, particularly of food borne disease, where a given product was on the market, and in fact it was in this case contaminated with E. coli O157:H7 and young kids were eating this particular food item and an increased number of kids developing severe illness, including hemolytic uremic syndrome, HUS. We had to often act on incomplete information. We had enough epidemiologic data to implicate a product. We didn't have isolate of the bacteria from the product yet. We didn't nail down how it got contaminated. But we went forward publicly stating that this was the situation. This was the product. If you had it in your home, you had to get rid of it. If you hadn't in your homes, don't buy it. And more importantly, we've got to get it off the market with the company. Now, that was a really always uncomfortable place to be because we never had enough data beyond saying the preponderance of evidence supports this, knowing full well that if we were wrong, that would be our last rodeo. No one would ever listen to us again. But if we were right, we might save not only serious illnesses, but people from dying. So take that kind of public health decision making. Take the second kind, which is what we traditionally do when we get vaccines approved at the FDA and we get recommendations from the ACIP how to use them. Fortunately, the dockets that come together, the information packets are really comprehensive in nature. Companies have spent years putting this together, asking and answering many of the questions that I wish we had asked and answered now. But if we waited for that data to be accumulated, we wouldn't be using the vaccines. And millions of people would potentially become infected, and even very many millions of people might die. So we have this challenge of where people want more information. They want it and they deserve it. So the question is, do we have enough data here to support that this is an emerging problem and that all along, we probably should have been using a three dose mindset for this vaccine because we clearly have the immunologic data showing that you get a major boost with that third dose a major boost. And or should we wait until we see the case numbers, you know, increasing each month, we get out with more serious illness? I'm absolutely convinced based on the number of breakthrough infections that's going to happen. I'm also well aware, particularly in the medical area and some of the essential work areas of the state. We are seeing major challenges to keeping people in their jobs, particularly in the health care setting, because of breakthrough infections. Health care workers are now at their sixth and seventh month following their early vaccination, and we're having problems keeping health care workers on the job. That has health implications in and of itself. So I very strongly support the use of this booster third dose, which is not popular among my colleagues, I get it. I know it. I, first of all, categorically disagree that putting that vaccine into that into this third dose means that somehow we're not trying to get people vaccinated the first time. Those 65 million Americans that are over age 12 are not yet vaccinated. No, we are doing that. It's not, you can do one or the other. You can do both. That's just a false argument, and I've seen it put forward by a number of my colleagues. The second thing is on a global basis, I do understand that issue. And I do want more than anything to get the vaccine to low and middle income countries. We do have to acknowledge that getting the Pfizer vaccine to low and middle income countries is more challenging because of the cold chain issues that this particular vaccine requires. But the point is we need to get those vaccines there. Here's a country that's put more vaccine throughout the world than all the other countries combined. So for us to be able to use a third dose here for what I believe will ultimately be a three dose vaccine, I am convinced of that. It may actually even be a booster occurring more than the three initial doses. I hope not, but we'll have to wait and see more corrected science. So I think the point of this is is that I feel that the recommendations that the CDC came up with and they are as follows, I think everyone knows them. But this is for the Pfizer vaccine only, who would basically be eligible for this booster, people 65 years and older and residents in long term care settings should receive a booster shot at least six months after their initial Pfizer series. People aged 50 to 64 years with underlying medical conditions should receive a booster shot of Pfizer at least six months after their primary series. People aged 18 to 49 with underlying medical conditions may receive a booster shot. It's up to you and your doctor, at that six month period after your initial series. And finally, people 18 to sixty four who are at increased risk of COVID exposure and transmission because of occupational or institutional settings, and they may receive a booster shot also. Again, this is the health care workers many of our frontline workers who are now seeing an increased number of breakthroughs. So. What will this mean for all the other vaccines? Well, we're going to have answers soon. The FDA on October 14th is going to have a meeting regarding the Moderna booster request. On October 15th the next day, the FDA is meeting on the J&J vaccine booster request and as well reviewing the preliminary NIH studies looking at heterologous boosting or meaning being able to mix and match vaccines. On October 20th and 21st, the CDC's regular fall meeting with ACIP is going to occur. Part of October 20th will be used to discuss the boosters of Moderna or J&J is given an emergency use authorization or if heterologous results could lead to a new recommendation. Finally, on October 26th, the FDA is meeting on the Pfizer request for children five to 11 years of age, and it's likely if that is approved as an emergency use authorization, that CDC's ACIP would have a meeting shortly thereafter. So hold on this next month is going to really bring these vaccines all into accordance with each other. The recommendations, I think, will be very similar. So where am I in all of this? I have to tell you, as I saw more and more activity around the breakthroughs, it gave me pause to be in public places again. It made me wonder, should I really be next to my grandkids holding and hugging them? Because in fact, they're sitting in school settings right now where we have widespread transmission of COVID in the state. It may be doubt, you know myself, how protected am I really right now? I've had too many colleagues and friends with breakthroughs, and some of them were pretty darn sick. I know people who have died from breakthroughs who are not over 65 years of age. Now, please don't misinterpret these vaccines don't work, they are still working. Remember, still, 98% of the people who are in our hospitals and our intensive care units are the unvaccinated. So I don't want to confuse people. But are we losing some of the horsepower on these vaccines in a significant way? And I think we are. And that shouldn't be seen as a failure, it should be seen as well, you know what we needed to think about this all along is a three dose vaccine. So I believe one day for the world, that's what this will be like, and we hopefully with that, we'll get more protection, but even there, I'm willing to say corrected science. We're going to have to keep watching this. We're going to have to keep learning over the course of the next six to 12 months. What kind of protection do we have and potentially act again. So I leave people with the sense that when I got my booster, which I was eligible for, it gave me a new sense of relief. I felt like I had a protection. Last weekend following a sufficient period of time since my booster, I found myself hugging my grandkids in a very different way than I had in recent weeks. I found myself more confident just being out in public places. And I think that's what it's going to take for a lot of people to feel like they can move forward in their lives right now. So, you know, for what all this booster is about preventing severe illness, which I believe should be the number one, number two, and number three priority, this booster is also providing many, many people with a new lifeline to the new normal. And to admiss that or not acknowledge that says we are not using these vaccines like we can and should. You know, I keep hearing people say, Well, you know, these vaccines were meant just to prevent severe illness and hospitalization. Show me where that was written early on. Early on, that was not true at all. Now, now that we're in this place, people are saying, well, it's just meant for severe illness and hospitalizations. You know, we had set up the expectation in the minds of the American public last winter that these vaccines were incredible and that they were going to do an amazing job of not only keeping us out of hospitals, but keeping us from getting sick. And I think now we have that chance to maybe see that again. Time will tell, but I, for one, feel much better in my life right now with my booster knowing that it still doesn't mean I'm bulletproof. But it also means I have a newfound freedom, and I urge everyone out there who is potentially eligible for a booster dose under the criteria I just said and again knowing that the Moderna and J&J vaccines will be coming forward shortly with new recommendations. I think that we will have a, in a sense, a new opening of our society with these vaccines. Now we still have to work really hard in trying to get people to get their first dose. But don't confuse these two issues. They're not one or the other. They're both. And we need to get vaccine to low and middle income countries. Don't confuse this third dose, which likely will be standard as somehow we're not getting vaccine to those countries. So I hope this is a helpful explanation of how I've come to where I'm at, and I suspect that there are many of you who have been in that same course as I am. And I hope that this is helpful.

**Chris Dall:** [01:06:36] So, Mike, I understand you want to wrap the beautiful play segment with your closing thoughts today, but first, let's start with your take home messages for this episode.

**Michael Osterholm:** [01:06:48] The first take home message I want to lead with is what I just addressed. I am more optimistic now that I've been even to the earliest days of the vaccine availability that we can turn the tide of this pandemic around with our vaccines. If and when we use them based on what best science we have, and I think the science today does support that we need this third dose. So to me, I'm leaving hopefully all of you today with the hope that boy, can you feel much safer? Not 100%. I'm not going to give a safety label to say it's absolute, but I think with these third doses or second doses for J&J, we will have a level of protection well beyond that, which we had with those first two doses. So the first thing I want to leave you with as a take home messages is there's hope. And we can do this. The second one is, yes, cases are coming down. They are, but we're not done with this virus in this country. We still have 65 million Americans, 12 years of age and older who could be vaccinated, who are not. They represent a huge reservoir of human wood for this coronavirus forest fire to burn. We will see more surges. The New York City metropolitan area, the Southern California areas have largely been spared with this most recent surge, that will not continue. I can't say when it's going to happen, but I see people in a sense of complacency in those areas saying, We're done. They're not. Finally, let me just say that, and let me just say that on a global level, we are going to continue to see severe challenges with ongoing surges of sizable proportion, sizable. So again, don't take away these lower numbers right now as we're done, we're out of the woods. This would be a redo of what we did in this country in May, June and early July. And so we have to keep the high priority efforts in place to get people vaccinated, to get as many vaccines as we can to these low and middle income countries, while at the same time using the vaccine as wisely as possible in our country and other high income countries around the world. So those are my take-home messages. Hope good news two, this pandemic is not over with yet in the United States or around the world and three, in particularly in the world we've got a lot of work yet to do.

**Chris Dall:** [01:09:38] And you're closing today, Mike.

**Michael Osterholm:** [01:09:40] Well, thank you. As I've said in so many other podcasts, I do want to leave all the listeners with a stark reminder that I talked about a lot of numbers today. I talked about cases and in the pediatric population, I talked about health care workers. And, you know, none of these are numbers. Really, none of these are nameless faces. These are our loved ones, our mother and our fathers, our grandpa and our grandmas, our sons and daughters, particularly in the pediatric world, our sons and our daughters. And I just want to remind everyone which I know really doesn't need to be done. But it is almost, you might say, a critical ritual for me just to remember that all of these people are not numbers. And so today, I hope all of us remember that and take that home with us. Today, I'm going to share what I think is a beautiful place from my perspective. It's a place in my mind, you might say, which some people would say is probably dangerous. But for me, it's a beautiful place as relates to a singer songwriter that I think has a very, very powerful message for us today. I have been a real fan of country music legend Garth Brooks for a long time. If you know anything about his history, how he was raised and so forth, and how he has turned out to be the man that he is. He's gone on would sell more records than any single recording artist in the United States history. He also is a huge advocate for the COVID vaccines and has been cognizant of COVID from the very beginning. He did start up his tour this past summer and very quickly realized that there was a challenge because of the emerging pandemic. And actually, he ended up canceling his tour in mid-August following the uptick in cases, saying the following. "In July, I sincerely thought the pandemic was falling behind us. Now watching this new wave, I realize we are still in the fight and I must do my part. So it is with heavy heart, we announce the decision to cancel all shows, but with a hopeful heart, we will reschedule and start over when this wave seems to be behind us. The joy I have seen in everyone's face as live music returns has been much more than worth our constant diligence to maintain safety protocols, not only for the fans but for our band, the crew, and hardworking staff in these stadiums. The dedication to safety for the people who fill these seats has been a miracle to watch and a blessing to receive. I am truly grateful." He is an amazing man that way, and I must also note as many here on this podcast know, I am very, very big fan of James Taylor having used his music on multiple occasions to close one of these sessions, and Garth Brooks actually is a major fan of James Taylor. In fact, he once wrote about, "my older brother Mike brought a James Taylor record into our house, and our house finally agreed on one music," said Brooks. "I owe James my life because, you know, our house was not an easy house to grow up in. If you had an argument, you ended up in the backyard, but if you came home and heard James Taylor on the stereo, it was going to be a good, peaceful and wonderful night. I've tried to explain that to James how much I appreciate it, but he'll never know the godsend he was to our family." So the song I've chosen today was written by Tony Arata and Wayne Tester. It was on Brooks's Fresh Horses album in March of 1996. This was the fourth single from that album. It reached number 19 on Billboard's Hot Country singles. The title of the song is "The Change." If you listen to the lyrics, you get a sense of what this means about what we're trying to do for each other today and for ourselves, "The Change." "One hand reaches out and pulls a lost soul from harm, while a thousand more go unspoken for. And they say, What good have you done by saving just this one? It's like whispering a prayer in the fury of a storm. And I hear them saying, you'll never change things, and no matter what you do, is still the same thing. But it's not the world that I'm changing. I do this so this world will know that it will not change me. The heart still believes that love and mercy still exist, while all the hatred rage and so many say that love is all but pointless and madness such as this. It's like trying to stop a fire with the moisture from a kiss, and I hear them saying You'll never change things. No matter what you do, it's still the same thing. But it's not the world I am changing. I do this. So this world will know that it will not change me as long long as one heart still holds on, then hope is never really gone. And I hear them saying you'll never change things, and no matter what you do, is still the same thing. But it's not the world that I am changing. I do this. So this world we know never changes me. What I do is so this world, we know that it will not change me." Thank you for these very beautiful words reminding us that while it may be like trying to stop a fire with the moisture from a kiss. We must never forget that we will not let the world change us. And that's what's important right now. Part of the dedication I just made to the health care workers, the public health workers of our country and what they're going through. Please know that it's so important not to let this world change you. I close today with the sense of excitement. I do believe that the boosters have the potential to fundamentally change how many of us feel about being in those public places, being with our kids, hugging our grandkids. I also want to emphasize that while this pandemic is not over with yet and it won't be for some time, we do have the way to make it a better world with this pandemic. Get vaccinated, please. Finally, I just want to remind all of us how important it is to reach out, continue to spread this pandemic. A kindness we talk about often find one person this week to be kind to you would not normally have even considered. Just do it. I promise you, it'll make you feel so good and know that it will make that other person feel good. Thank you again for being with us. Thank you, Chris. Thank you. Podcast team. And just remember to be kind. Thank you.

**Chris Dall:** [01:16:47] 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.