# Episode 68: Recalculating Risk

**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 forty five 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. In preparation for today's podcast, I decided to go through some of the scripts for episodes we recorded last September and what I was struck by was how many of the questions I asked in those podcasts remain with us, despite the widespread availability of highly effective vaccines. There was the concern about how cooler weather and the return of students to schools would impact the spread of the coronavirus, uncertainty about how bad the pandemic might be in the coming months and whether our hospitals would hold up, and the growing realization that the pandemic was impacting everyone's mental health. Today, a year later, the Delta variant has upended many of our hopes about what this fall would look like once we had a vaccine, and we're back to grappling with many of those same issues. So on this September 9th episode of the Osterholm update, after we get the latest on the trajectory of the pandemic in the U.S. and around the globe, we'll discuss whether the return of K-12 and college students could prolong the current wave of infections or make it worse. We'll also address some of the misinformation around vaccine side effects, answer a COVID query about packed college football games, and highlight another beautiful place from one of our listeners. But first, we'll begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:01:57] Thanks, Chris. And welcome to all of you, back to another episode of the podcast. We have a lot to cover this week, but I'm so glad that we have you with us and in particular, I welcome any new listeners to the podcast. As I've said on so many occasions in the past, we welcome your feedback, your direction on how we can make these podcasts more effective for you and the kinds of issues that we might be able to address that can help your community. I also want to say that this podcast, like many of the ones in recent days, will in many instances probably have more questions than answers. But at least I'll give you the most honest questions I think are there. As I've said in recent podcasts, I find myself waking up every morning trying to scrape four to five inches of mud off my crystal ball. And unfortunately, over the past few weeks, that mud has gotten crustier and crustier and harder and harder to chip through. I feel like in some cases I'm trying to chip off a half inch of ice on my windshield in the middle of a January blizzard here in Minnesota. But nonetheless, I will share with you what I think is the trend that you might expect to see in cases and some of the challenging issues we're going to have going forward. This is going to be a podcast, I will say right up front. It's not going to be easy. It's not easy because it's going to deal with our kids. I'm going to talk about our kids, and I'm terribly concerned that right now, our kids are, in a sense, a pawn in the debate between in-class learning and the safety of being in distant learning. And I know for many, this is an extremely emotional issue. It's one that has legitimacy in the sense that we all want our kids into in-class learning. As I will share with you today, I unfortunately believe that we are using our kids as the currency for making decisions about whether I'm committed to in-class learning or I'm not. And I can't say it any more firmly than that. I think this is going to be a huge challenge, and I just worry how we will be judged one day by what our recommendations were with regard to this virus, as opposed to what they could or should be. Let me begin, though, with a dedication that is actually very uplifting and one that brings a great smile to my face and my heart in terms of the organization that has happened around this particular group and what they've done to help all of us deal with the issue around vaccination. First of all, we all know that there's been an explosion in the social media that's really changed the landscape of so many things in our society. You know, people can connect with others at the click of a button. News or disinformation can be shared in real time. Pictures are posted for everyone to see what happened just moments ago. However, for all the good that social media has brought us, you know it's not without challenges which we are seeing playing out firsthand during this pandemic. It's not uncommon to see COVID-19 misinformation and disinformation shared on social media websites, and we know that it can spread with the speed of a wildfire. And to help control that intentional or unintentional spread of false information, social media companies have turned to algorithms and moderators to remove content. As we can attest to, this process isn't perfect. You may recall Episode 61 of our podcast, it was temporarily pulled from YouTube after being incorrectly flagged for misinformation. Fortunately, that issue was resolved and the episode is back up. However, as imperfect as social media is, especially during a pandemic, it can sometimes be a source of such uplifting news. A story in The Washington Post really caught my eye. It was published in late August and described a Facebook group that was formed by several mothers. The group, known as Vaccine Talk, is a place where people can go to have open, honest and respectful conversations about COVID vaccines. Members of the group of which there are now more than 70,000 are expected to abide by strict rules, including no bullying, no offering medical advice and providing citations for any claim that they make. The story opens with the testimony of an Arkansas man who was on the fence about the COVID vaccine before joining the group. And after looking through the various posts and weighing the evidence, he made the decision to get vaccinated. Here's a quote from the vaccine talk co-founder Kate Bilowitz, "It feels a lot like COVID is something that is completely out of control and there's nothing we can do. Like, it's this out of control wildfire and I'm just one person with a little hose. But when people reach out to us, it feels like we're making a little bit of difference." Kate, you are. All the people you have in this group that is working so hard to provide the scientifically sound and socially supportive information on vaccines. What a service you're doing. Thank you. And to all the others who are doing other kinds of group activities or reaching out. I want to thank you. So this podcast this week is dedicated to the group of Moms on Facebook, built around what is clearly an island of good faith vaccine debate in a sea of misinformation. I dedicate this to you. Thank you.

**Chris Dall:** [00:07:38] Mike, in its latest weekly snapshot of the pandemic, the World Health Organization reported that global cases and deaths appeared to be holding steady. But of course, we've seen this pattern play out before throughout this pandemic. What's your current take on the global situation?

**Michael Osterholm:** [00:07:55] Well, in fact, that is an accurate description of what's happening, but as you also pointed out, we've seen these moments in time come and go. And let me just give a context to what is still out there in terms of potential infections to occur. I've said this time and time again that this is a coronavirus forest fire that is just looking for human wood to burn. And unfortunately, there is a lot of human wood left around the world to burn. We are still seeing heightened levels of activity that have been brought about by the Delta variant. It's now been documented in over 174 countries. Last week, just under 4.5 million cases reported, up slightly from the week prior. According to the W.H.O.. Every region of the world, aside from the Americas, reported a decline in cases. That's important to note as I come back to what does that mean for the future? Most South American countries, including Brazil and Argentina, are still reporting decreases. However, those declines are being offset by activity in the U.S., which once again accounted for one in four of the world's cases reported last week. Global deaths last week approached 68,000. Now, when we look at what the potential for more surges around the world, let's look at what's happening with vaccination. Now clearly, protection is a combination of number of infections that have occurred to date in a given country, a given region, as well as the level of vaccination protection. We don't have any evidence yet that there's any country in this world that has obtained a very high level of protection from just the natural occurrence of disease. Look no further than countries like Iran, where we are seeing after the fifth surge still a very large number of susceptible people that are there. So vaccine becomes key. Well, we've officially vaccinated more than 5.5 billion doses of COVID vaccine as a world enough to fully vaccinate one third of the entire population. That seems to be a major step forward. And while this is great news, especially considering we didn't have vaccines available at this point last year, it also means that two thirds of the global population hasn't been fully vaccinated, with most living in low and middle income countries. In fact, according to Bloomberg's vaccine tracker, high income countries are vaccinating their populations at a rate 20 times faster than the lowest income countries. So here in the United States with this basically out of control transmission with one of the highest vaccination levels in the world and lots of vaccine. So what does this mean? Well, it's a very sad but unsurprising commentary, as we've previously discussed, the disparities in vaccine supplies and logistical challenges of transport and storage administration are faced even when vaccines are available, whether they be a high income country or a low income country. What this really is telling us, though, is is that there are still many, many, many people on the face of this Earth who are still susceptible to infection. And as I talk about some of the other highly vaccinated countries this will become even more increasingly clear. One of the primary regions that have been left without meaningful access to COVID vaccines is Africa, where just 3% of the residents are fully vaccinated. I'm going to repeat that, 3% of the residents are fully vaccinated. Despite the lack of vaccines, Africa is once again reporting a decline in cases and deaths following their record setting third wave. Even with the declines, activity in the region remains above levels recorded during the first wave, which occurred in July and August of last year. I am certain that there will be other very substantial and very painful surges of this virus in countries in Africa in the days ahead, as well in other countries around the world that are also low income countries or middle income countries which have had limited access to vaccine. I remind you that here we sit in the United States with large segments of our population vaccinated, ample access to vaccine and look what's happening. So why should we expect that we won't see major challenges in these other countries? And so just stay tuned to this podcast for the next 10,12 weeks, and I promise you that we will see resurgence of this virus in many parts of the world and we shouldn't be surprised by it. Now, in terms of if we look at the fight for containment, even as vaccines roll out and go forward around the world, we're not done seeing countries align other tools and strategies to try and control the virus. There are very few that have effectively shown how to control without vaccine. If you've been listening to this podcast over the past month or two, you'll know that we've been monitoring a few countries that have opted for zero COVID strategies which have been put to the test by Delta. Let's just take Australia. With more than half of the country's population under lockdown, Australia continues to report growing activity. Average daily cases in the country are now above 1,500 nearly three times higher than the previous peak. Although most of the activity is still occurring in the Sydney area located in the state of New South Wales, the state of Victoria is now also seeing case numbers climb. As I mentioned last week, officials in Australia have stated that they're moving on from a zero COVID strategy, calling it unsustainable. However, they're still working to vaccinate their population, which remains largely susceptible to the virus. As of this past Tuesday, just over 38% of Australia's adult populations were fully vaccinated. Officials in the country have previously stated that restrictions would be loosened when 70% of adults were fully vaccinated. A milestone is not expected until sometime in early to mid November. If the current pace of vaccination remains steady. So here's a country that is kind of throwing the towel in in terms of zero COVID approaches, and I understand why, it's been a real challenge. Meanwhile, the one I would call it almost country unto its own is China. While Australia has faced ongoing growth, China continues to report zero local cases of COVID after going through its own delta outbreak. Since the earliest days of the pandemic, China has turned to heavy handed tactics to halt transmission, including very strict lockdowns, unlike anything we've seen in this country. From a disease transmission standpoint, their strategy has been highly successful. But it comes at a major cost to society. With 64% of the Chinese residents fully vaccinated, many are still wondering what's the country's long term strategy? What will it be? Health officials in the country claim that they will stick to their current zero COVID approach for at least the next year, even as China prepares to host the Winter Olympics in Beijing in February. This will be interesting. Will they really be able to maintain a zero COVID country and when they still are short on the population vaccination numbers? I think it will be a challenge, but if any country can do it fortunately or unfortunately, China can. Now we look at New Zealand. This is the one experiment in a sense that I find very interesting in that I'm not sure where they're at. They may be able to look more like China without the kind of heavy handed lockdowns, or they may end up by going by the same way as Australia has. Finally, cases are now trending downward in New Zealand, which imposed a strict national lockdown several weeks ago following the detection of an initial delta cluster that blossomed into their largest outbreak since April of last year. On Saturday, the country reported its first COVID death in more than six months. However, it was announced this past Monday that the current lockdowns will be relaxed in all areas of the country outside of Auckland. Like Australia, the slow vaccine rollout in New Zealand has really been a challenge, with just 27% of the country's population fully vaccinated. While successful containment would surely buy them more time to vaccinate their population, failure to do so leaves the country highly vulnerable. Will they become another Australia, or will they be more like China in terms of the presence of virus? We don't know, but these serve as examples of what we are caught between in terms of complete control or very limited control. What is the delta path going forward? Of course, with a virus that is as infectious is Delta, vulnerability exists in every country that has pockets of their population without protection, either via natural infection or with vaccines. We know that. We're watching this play out firsthand in the US. What we're still trying to determine, however, is just what the path forward from Delta looks like. Let me give you some examples of Delta in countries with high vaccination rates. As regular listeners know, the two places with higher vaccination rates that we've been following most closely are Israel and the UK. Let me just remind people in the United Kingdom right now, four out of every five people or 80% of residents age 16 and older are fully vaccinated. In the U.S., we have 82% of our 65 years of age and older, fully vaccinated. That's it. Not the younger group. Despite the high vaccination rates, cases in the UK continue to grow, with an average of nearly 39,000 cases being reported each day. That's up from 33,800 reported at the time of our last episode. Hospitalizations are also trending upward, with about 7,900 U.K. residents currently admitted. Finally, an average of 135 deaths are being reported each day. If you adjust for population, that's equivalent to around 670 daily deaths in the U.S., which is surely lower than the 1,500 deaths that we're seeing. To put this in perspective, though, although activity in the UK is still trending upwards, their current level of hospitalization is five times lower than what they were during the winter peak, and deaths are nine times lower. Still, the virus is posing a real challenge. What is the surge in the United Kingdom looking like with regard to Delta? Let me remind you that on May 17th, the UK documented 1,978 cases. That was it that day. By July 17th, just two months later, that number had climbed rapidly to 54,180 cases, just one month from May 17th to July 17th. And then by July 26th, we saw this very rapid and precipitous drop in cases down to 24,600 from 54,180. People said, Ha. We're done. We've broken the back of Delta. Well, as I just reported, that didn't happen. Since July 26th, the numbers have just been going back up. And as I just reported you today, we are seeing 39,000 cases being reported each day. What we have to understand is that this delta surge that we're seeing in this country may not go away quickly if in fact, it follows the UK model. What that means is we will start to see drops in cases in states that have been impacted for six/seven weeks, but over time, how far will they drop back in terms of the actual number of cases compared to where they were in, say, May and June, when people were all convinced that the delta surge was done in the United States? So we have a real challenge yet try to understand what this means. If we look at one more country with high vaccination rates in Israel, the average daily cases have dropped for the first time since their delta surge began in June. It's great news. Hospitalizations and the number of seriously ill patients are also down. At the time of last week's episode, there were 720 patients deemed seriously ill. As of this Tuesday, that number was down to 677. And finally, average daily deaths in Israel has dropped from 27 last week to 23 this week. Since mid-July, Israel has been administering third doses of vaccine to its population, with more than 2.6 million residents now having that third dose. The vaccine is surely playing a role in limiting severe disease and death, with rates among the unvaccinated far surpassing the rates among the vaccinated. The third dose appears to further re-up protection against infection, although it's been less than two months since they were administered. We'll have to see how they hold up over time. In addition, we'll see how things progress overall in Israel, with schools reopening and the celebration of the Jewish New Year now underway. So the bottom line message from these two countries is that it may not be a clean, simple surge up and surge down, as we've seen in the past. There may be tails to this surge that, as I'll talk more about in a moment when we talk about the national picture, that could be very important. It's this uncertainty, this lack of clarity. Every day I get many letters, calls and emails asking me, Can we do this in late October? Well, what will it be like in November? And I have to say, we don't know. If we look at what's happened here in these highly vaccinated countries, it may be that the surge will last for some time. In last week's episode, we did mention Denmark after announcing that 80 percent of all residents age 12 and older were fully vaccinated. They opted to drop the remaining restrictions aside from certain border restrictions. Since that announcement in late August, cases in the country have been in decline. Again, it's early, but Denmark is yet another country worth following. Why did they see their numbers drop and they've opened up? Are they basically just waiting for the next surge to occur, or is there something else that we should be understanding that we're not? Finally, let me just briefly review what's happening in Portugal. They have fully vaccinated more than three quarters of their entire population. Cases there went throughout June and into July, coinciding with Delta becoming the dominant variant there. However, they've been slowly dropping since then and now sit at 1,600 cases per day, just under half the peak levels reported in July. Notably, cases in Portugal have yet to return to their pre delta baseline of three to four hundred cases a day throughout May. So here we now have a country that is more like the experience we're seeing in the U.K. or even Israel. So which model will happen? You know, we'll will we expect in the United States to see this big decrease into the fall based on these international models? We don't know. Let me just quickly summarize what we're seeing with Delta in some countries with lower vaccination rates. We're also tracking activity in countries that went through their delta surges without the benefits of vaccine. For example, we first learned what Delta was capable of after watching its emergence in India. They went from less than 12,000 cases a day in February, up to nearly 400,000 cases a day in May, and currently sit at about 40,000 cases a day again, up substantially from that baseline of 12,000 cases a day. What we don't really understand is what that means in terms of this higher baseline. The country's vaccine campaign is progressing, but just under 12% of the residents are fully vaccinated. Will India experience another major surge like they just saw in the days to months ahead? Surely possible. Similar situations with a very steep rise and steep fall in cases played out in countries such as Indonesia and Tunisia. Although case levels in both of these countries is approaching their pre delta baseline. In Russia and South Africa, ee saw the similar steep rise of Delta, but their descents have been slow going. In fact, although cases have been declining since mid-July in Russia, deaths have remained the same. So what are the key points here with this international picture? One, delta seems to take advantage of even the slightest gaps in protection at the population level. This is a bad virus. However, countries that have high rates of vaccination weaken deltas blow by preventing this severe disease and death that we're seeing play out over and over again in places lacking vaccines such as Botswana, India, Indonesia, Iran, South Africa, Russia, etc. Unfortunately, there doesn't seem to be one single cookie cutter type pattern that Delta surges follow. And this is making our future difficult to predict, particularly here in the United States.

**Chris Dall:** [00:25:18] So looking at the U.S., while the southern Sunbelt states still appear to be driving this current wave. Mike, you noted a few weeks ago that the next states to watch were the Sunbelt adjacent states like Kentucky, West Virginia and South Carolina. So what are we seeing in those states right now and what other areas of the country do you have your eye on going forward?

**Michael Osterholm:** [00:25:38] Well, Chris, let me just first to address that very important question talk a little bit about where we're at in terms of vaccine. I just got done referencing the situations in a place like the U.K. and Israel, where they're still seeing the challenges with Delta, even with these high levels of vaccination. The news that three out of every four American adults have now received at least one dose of vaccine coincides with some more somber milestones. For example, here in the United States, we've just surpassed 40 million confirmed infections, with four million of those reported over just the last month alone. We remind you 4 million over the course of the pandemic have just been in the last month. More than 650,000 Americans have officially died from COVID-19, although we strongly suspect that there are many additional individuals who in fact did die from COVID, but the cause of death was not listed as COVID on their death certificate. Meanwhile, around 12 million travelers passed through TSA checkpoints from August 31st to September 6th this past week, leading up to Labor Day and including the Labor Day weekend. That's more than double the number recorded during the same week last year, which was 5.2 million individuals. In addition to travel, Labor Day also brought about reporting delays, which can make it challenging to know where exactly we stand as a country. Despite these delays, it's pretty clear we're still neck deep in this delta surge. We're now reporting an average of 152,000 cases each day. Again, that's close to four times the levels we were reporting at the same time last year about 39,000 then. Just under 101,000 Americans are currently hospitalized for the virus, a number that fortunately hasn't risen over the past week but remains unsustainably high. More than 26,000 patients in the United States are currently in an ICU as a result of their COVID infection. Tragically, the deaths continue to climb, with about 1,500 Americans dying from COVID each day. Nearly 10,500 deaths have been reported in just the past week alone. That's more deaths than we reported in the entire month of June, which was 10,125 and the entire month of July 8,500. In fact, in August alone, we reported one and a half times the number of deaths than we did in June and July combined, August to 27,600 deaths, June and July combined 18,600. This stands is a sobering reminder of what Delta has done in this country in just the last two months time. While we're seeing decreased cases in a number of the hotspots we've been following, such as Arkansas, Florida, Louisiana and Mississippi. I just want to remind everyone that we're far from out of the woods. We have to look at what is happening in other states around the country and as we do, we see right now that that southeastern block of states Tennessee, South Carolina, Kentucky, West Virginia and North Carolina are all seeing increases of anywhere from 10 to 30 percent over the course of the past two weeks. If we look at cases in other parts of the country, particularly in the far northwest, in north central areas of the country, we see Colorado, Utah, Idaho, Wyoming, Montana, North Dakota all increasing, in some cases in substantial numbers. We are happy to report, however, Oregon and Washington seem to have hit their peak and are leveling off and hopefully about to decrease. What this all means is that I think that these other areas of the country, should they take off more like we saw in those southern states, then the surge could continue to grow. If they don't, if they begin to level off themselves, we may have hit the peak of the surge right now or at least within the next two weeks, and then we'll have to see what happens the other side. There are two other wild cards I'm going to throw into the deck, and these two will be major determinants of how this surge plays out. One is our schools. I'm going to talk about schools in a minute. But I think we are going to see a major increase in cases in kids over the course of the next six to 12 weeks. And with that, we will see spillover into adults who are not yet vaccinated or, in some cases, breakthroughs of individuals who are vaccinated. I really hope I'm wrong here. I pray to God I'm wrong, And I will be the first person to stand up and scream from the highest rafters of any building, I'm wrong, but I fear that our schools are going to become the flash forest fire for this virus for the upcoming weeks. The other area that I am watching carefully is what happens in New York City and Southern California. Right now, those two major population areas surely have pockets of unvaccinated people not previously infected that could cause large numbers of cases to occur in a short period of time. New York, as a state, has seen their case numbers rise 2% over the last 14 days. California has actually seen a 9% decrease. If these two areas don't blow up, that will have a big impact also on keeping the surge from going to an even higher level. Why it's not blowing up in New York and California, I have no idea. There's no one that can tell you, and if they do, be careful, they probably have a bridge to sell you to. And so I think that it's going to be kids, New York, and L.A. Those will determine where we go in terms of the this part of the pandemic. Now I just want to comment briefly on what's happening in our country because I think people had a hard time imagining this and there was a great deal of denial. You know, in the pandemic surge of last summer, I made statements about I had every reason to believe that ultimately this virus and that surge or subsequent surges would challenge the very bedrock of our health care system in this country. And you know, the kind of feedback I got there, he goes again, scary as hell. You know, not any data to support the point, but just relying on what we knew this virus has done in countries around the world. Well, as I've tried to do in the past several episodes, I've tried to give you some sense of what this delta surge is doing to the health care system and health care workers across this country now. Unfortunately, this is my worst nightmare that I had imagined. By far, the best illustration of its impact was provided at the end of Episode 66: Thank you, Dr. Jena. During my interviews with Dr. Jena, who works in an ICU and who described what life is like in these settings, if you haven't listened, I highly recommend doing so. Ever since that interview, there's been no shortage of challenges when it comes to the health care system in this country. For example, at least 10 states have reported record high hospital admissions during this latest surge. In Alabama, there are nearly 60 more ICU patients, 1,582. Then there are staffed ICU beds. More than half of the state's ICU patients have COVID. The ICU bed shortages are also being reported in states such as Hawaii and Oregon. The governor of Kentucky described the situation there as dire as he announced deployment of the National Guard to help the state's overwhelmed health care settings. In Mississippi, it was announced that four pregnant women died of COVID last week in a single hospital. Three of them had emergency C-sections to save babies, which were born prematurely. None of the women had been vaccinated. I'll comment more on this in a moment. On Tuesday, Idaho's State Health Department issued a release saying that crisis standards of care were being activated in the state's northern region. Let me just read to you from this release because I think this is one of those scenarios that people did not want to believe could happen. The release, "Crisis standards of care are guidelines that help health care providers and systems decide how to deliver the best care possible under the extraordinary circumstances of an overwhelming disaster or a public health emergency. The guidelines may be used when there are not enough health care resources to provide the usual standards of care to people who need it. The goal of crisis standards of care is to extend care to as many patients as possible and save as many lives as possible. We have reached an unprecedented, unwanted point in the history of our state. We have taken so many steps to avoid getting there, but yet again, we need to ask more Idahoans to choose to receive the COVID-19 vaccine." In short, Idaho had reached that crisis state, where now health care resources are being allocated to those who may have the greatest likelihood of surviving. And finally, in Texas, hospitals around Austin are out of staffed ICU beds for adults and for pediatric populations, as both have hit an all time high. Where do we go from here? It's going to be Southern California, New York, and kids in school. I'm convinced that that's what's going to either make or break the surge in terms of cases going up or cases coming down. I wish I had a better sense of where we're going.

**Chris Dall:** [00:35:46] So, Mike, you mentioned schools and we'll get to schools in just a minute, but obviously all discussions of the coronavirus at the moment are focused on the dominant Delta variant. Our audience, though, has probably been hearing reports of new emerging variants that the WHO and the CDC are keeping an eye on. Do we know much yet about any of these variants? Is there anything to be concerned about or do we need more time?

**Michael Osterholm:** [00:36:08] Let me remind everyone that the variants have been the wild card in this entire pandemic. And while it took us more than 10 months to recognize that into the pandemic, since that time, there's been no denying the fact that the variants have made all the difference. In fact, every morning after I wake up and before I actually get to my mud-covered crystal ball, I have this little song playing in my head from the fifth dimension in the 1960s and the dawning of the age of Aquarius. And instead, I keep hearing about the dawning of the age of the variants. And I think we have to understand that what they've done in terms of either more transmissibility, more severe illness or the potential to evade immune protection have really made our response much more complicated. And so it is really critical we follow the variants to see what is currently occurring in terms of the variants that are dominant in any one given area of the world. And also what new variants are that might emerge that may be worse than their predecessors? Well, I can tell you right now that if you look at what's happening in the United States, we've begun to improve upon our understanding of the variants because of additional testing. Right now, about 9% of all the viruses from patients in the United States are currently being sequenced. Other parts of the world are doing even a much better job than we are, but at least we're doing better. If you look at it, for example, we had 40,000 viral sequences in the first 11 months of the pandemic through November 2020. Now we're doing about 40,000 a week, which surely has improved and it varies. Some states, notably Wyoming, has the national lead with 20% of all their virus isolates being sequenced, whereas a state like Oklahoma only 0.3%. Now, 19 states are still under 2% sequencing. So we have some spotty coverage in this country, but we're generally getting better coverage. Right now, it is Delta Delta Delta. This is a virus which we know is much more infectious. The transmissibility has fundamentally changed the epidemiology of this infection, at least as it relates to young kids, in particular. The virus variant that has received a lot of attention recently, as one called Mu M-U. And right now, it makes up about 9% of the viruses in Florida. But on a whole, it is still just a very small, small part of the U.S. picture. It is what is called a variant of interest by the World Health Organization, with at this point not yet showing that it could become a dominant virus with even more severe consequences. It does have a certain mutation what we call E484K, which might blunt the vaccine and infection induced immunity. But at this point again, it has not taken off. It was originally found in South America and thought initially that this could be the competitor to Delta. But as we've seen, Mu and Delta take each other on head to head delta winds time and time again. So why we're watching for these other variants and we are surely mindful of, they could in fact again be a game changer as it relates to vaccine protection or that from natural immunity. It is a Delta Delta Delta world, and we just have to understand that that's what we're living with. And until I see something that would suggest to the contrary, I think Delta is going to be around for quite some time.

**Chris Dall:** [00:40:06] So now on schools, we've been discussing your concerns about schools in recent weeks, and at this point, most K-12 and college students across the country are fully back in school. Are we getting any indications yet of what we might see in the coming weeks?

**Michael Osterholm:** [00:40:23] We are getting an indication, and it is not pretty. Not at all. According to the latest report from the American Academy of Pediatrics and the Children's Hospital Association. There were nearly 252,000 cases in children aged zero to 17 during the week of August 27th to September 2nd. That's by far the highest number of weekly cases and kids we've reported to date, shattering the previous record set in mid-January by more than 40,000 cases. It also means that more than one in four U.S. cases that week was detected in kids. This is the challenge that I worry that far too many people in our educational system and parents do not understand. Let me just provide an update on the current number of deaths reported in the United States. According to the American Pediatrics this week, there have been 444 total COVID deaths in children since the start of the pandemic. If we look at that number for the last year, in particular from September 3rd, 2020 to September 2nd 2021 in that one year span, there were 341 deaths. A total of 66 of those annual deaths, almost 20% occurred in just the past three weeks. Think of that 20% of the deaths in the last year have occurred just in the last three weeks. This is indicative of what Delta is doing. This is why it is so urgent for us to address transmission in kids in schools and to understand that this is a different virus with regard to what happens to kids, and we can't rely on those old data. Last year's data looks very much like potentially a bad flu year. I can fully support. We should be doing for schools and children with that kind of a picture, as we do each year with flu. We're in a different setting. This is a different ball game. This is a different virus. Unfortunately, pre-Delta data tells us nothing about where we're at right now with children and the idea that we could actually have the kind of control measures put in place that have been recommended by the CDC is simply, I think, irresponsible in terms of understanding what a safe school is today. We can't make a safe school. Parents, do not for a moment minimize that. Administrators, please don't. In public health, please don't. We can make schools safer. We can definitely do that and we should and we must. But we got to stop telling people we can make them safe because we can't. Let's just look at the school issue in general. Even as we have recorded these record high levels in kids, as I've been saying for the last several weeks, we are hell bent on election and getting kids back in the classroom for in-person learning. Sometimes in a setting that almost seemed destined for failure with limited, if any, mitigation measures at all. Please don't tell me I don't get the fact that in-class learning is really important. In last week's podcast, I discussed this and shared with you the wise wisdom of what I think is one of the most gifted school superintendents in the country about the idea of trying to understand the impact that the loss of in-class learning has relative to this risk here. If you look at Burbio, a data company out of New York that is monitoring K through 12 schools, there have been at least 1,000 schools in 35 states that have already been closed in this earliest days of the school year for in-person learning because of COVID. Hundreds of students and staff in numerous states are being asked to stay home after either testing positive or being identified as a close contact of a case. Some examples. One in five school districts in Kentucky have already closed. At least 45 school districts in Texas have stopped in-person learning, impacting more than 40,000 students. More than half of Georgia's current outbreaks are in K through 12 schools. Fifteen employees of the Miami-Dade County Public School District have died of COVID in just the last ten days. What is our overall message right now as a country, we're still trying and largely failing to find ways to live with this virus. I think our kids in school are an example of that. How many more schools do we have to close before we understand we have to look at distance learning options? What do we need to do to actually get through this surge with kids and minimize what is clearly becoming a major public health challenge with younger kids and COVID? I think that it's fair to say that we are not doing much of what we could do in schools if we look at the fact, first of all, just vaccination right now. If you take 12 year olds to 17 year olds, the group that could be vaccinated as of last week, only 32% were fully vaccinated. Right there we are missing a amazing opportunity to reduce the risk of these kids getting infected. Next, we need to deal with ventilation over and over again, I keep coming back to that five to six air exchanges per room per hour. And yet we have many schools that hasn't even been addressed yet. We could do things like bringing in the HEPA filters that I talked about in previous podcasts where I laid out how they could help scrub out the virus. And we've got to stop the crowding. I think it's unconscionable that the CDC still has a three foot recommendation for students when this is an aerosol transmitted virus that we know is highly infectious. And to me, one day there will be someone who will go back and do a review of this pandemic. And I know these are strong words and these are my colleagues at the CDC. They will be held accountable for not lacking the willingness to go back in and admit they're wrong and to deal with this issue. These are my five grandkids I think about when I talk about this and it's wrong. One of the important issues we could do is reduce crowding in our classrooms. There shouldn't ever be more than one student within six feet of each other. That should be the density in a school. Don't tell me you can get three feet apart. Testing, you know, I know this is not going to be popular with many of my public health colleagues. You know, we're well beyond whether it be popular or not. This idea that we can test once a week and we're going to somehow make a difference, there are no data that supports that anywhere. I really believe, honestly, from my own experience and working in this, if you're not testing most days a week. You don't really have the potential to catch an early infection frequently enough, particularly when it takes one to two days to get test results back to actually stop transmission in a school. So testing, but do more of it and then masking quality masking, do not say I do not support masking, but just knowing the hierarchy of things you can do about schools is at the lowest level of protection, so I will take any protections. I've said before in my analogy, if I have an old 1960s car that only has a little twine seatbelt in it, I'll take it. But I would really love to ride in one of those 2021 vehicles that has a full harness, has a collapsible auto body, has airbags, has a computer on board to slow down the front impact coming, has shard glass so that basically people don't get cut. I love all those things in my vehicle. And it doesn't mean that it's perfectly safe in that vehicle, but it's much safer, but I know right now that in many locations and schools around the country, we're not doing this. We are hell bent on election of getting kids back into school because we made that commitment. That was OK a year ago. It's not OK with Delta. And let me just conclude this section by sharing with you an email from someone I received who I've actually had several communications with this person in the past. I'm not going to disclose their identity, but I think it it's a very poignant comment on where we're at in terms of this and what many parents are feeling right now. And I might add this as a parent with a tremendous amount of medical expertise. "Dr. Osterholm, thank you so very much for your last two podcasts addressing children in school. I thought I might just give you a quick boots on the ground view. Our teenage daughter is, of course, fully vaccinated. Our son is 11 years, eight months and two weeks old. But who's counting, so close to 12 years, but not yet quite there. Our public school district is well resourced, one that is unlike many others around the country. Despite that, we have no routine testing in schools and desks are at most three feet apart. While my kids were home last year remote learning, this year there is no virtual option. We had no viable alternative than to reluctantly send our kids back to in-person learning despite Delta and despite the fact that our son is still ineligible for the vaccine. Our kids are both wearing KN95s, meaning effective masking and understand they should physically distance whenever possible at lunch, PE in the halls, etc. To the school district's credit, doors and windows are open. HEPA filters are in use and all students must wear masks, although not necessarily effective ones both inside and outside, except when food or drink is going into their mouths. Unfortunately, after just five days of school, our younger son was placed into quarantine because of an exposure. This was the second exposure in the school in five days, and currently 40% of the sixth graders at our middle school are in quarantine. There is no remote teaching when the kids are at home, while quarantine is of critical importance for public health. Having no instruction for 40% of the sixth grade has been very disruptive, as you might expect. In any case, I write this only to reinforce what you have already said so well about safety in schools and to let you know what a mess it is right now. Even in districts that are well resourced. I feel for under-resourced school districts or even those where open doors and windows are not an option because of whether. We are in for some very tough months ahead in our schools. Be well and many, many thanks." I can't say it any better than that. We will over the course of the next few weeks understand is a surge going to really take off because of our kids? And I fear that of all the decisions we've made throughout this pandemic and its response to it, this will be the decision that our generation will be held up to for many, many years to come. So what is the alternative? We have to try to get back into school, we need to do all the things I just talked about. But most importantly, when an outbreak begins in a school, you got to get the kids out of there. So I'm not asking that we just don't go back to school, but we have to have rapid responses to when cases occur and make sure that we don't see a few small numbers of cases blow up into a large number of cases. And right now, that's what we're seeing in far too many schools in this country. And don't tell me that it's because they just didn't follow all the rules. A face cloth covering will not stop the transmission of this virus in a school setting, an effective mask will surely help. So this can't be used as a comment to not mask in schools, use quality masking. And I think at this point, we need to understand that we have to switch our plans out that we had for this school year because of Delta. That is going to be a critical, critical issue.

**Chris Dall:** [00:52:46] Mike, the return of students to schools is just one element of how this nation is is trying to return to normal. And that brings us to our COVID query this week, which is about college football games. Lonnie wrote, "I recently watched a college football game on TV. The stadium was filled to capacity with mostly unmasked fans. It looked like pre-COVID days, with a rowdy crowd having fun. But then I started wondering about the Delta variant and super spreader events. I'm wondering about your advice for fully vaccinated people like me who long for the days to take my family to an outdoor game again." Mike, Lonnie is not alone in this. I watched a few college football games over the weekend and had the same thoughts and concerns, and it should be noted that it's not just college football. NFL stadiums will also be filled with fans this Sunday. Some universities and NFL teams are requiring vaccination for attendance, but many aren't. So how should a fully vaccinated person assess the risk of going to the stadium and cheering on your team?

**Michael Osterholm:** [00:53:46] Well, we're in the middle of a grand experiment. I think it's fair to say that there have been large events for which many people did not get infected, but why transmission does occur in some of these groups. And we're now watching Sturgis play out. And I have no doubt that what happened in Sturges, whether it be Mead County in South Dakota or all these other areas of the country are going to see these increased number of cases come out of that. Now, some will say if only five or six percent or three percent get infected, so it wasn't a big deal. Well, that's not necessarily true when you look at how many cases is that given the total number of people were there. So, you know, I don't have good advice. I don't know what the risk is. I surely believe that if you are fully vaccinated and wear an N95 respirator and you're in outdoor air, you surely reduce your chances of becoming infected is a breakthrough infection. And that is is, you know, to me, a great news. But if you're at increased risk of having a serious illness, even as a breakthrough and we do have those. The question I have to ask myself is, do I want to be in that setting? And, you know, I personally don't want to. Now others are going to make decisions based on their risk tolerance and say, but I will. To better understand what the risk might be for these outdoor events, we can truly look at our immediate past experience, particularly with Delta, where we've seen outdoor events such as Provincetown, Massachusetts. The events that were held the large festival in Utrecht, Netherlands. We also have seen now the uptick in cases with Sturgis, although that may be much more indoor air where people are in bars, restaurants, gambling, casinos, etcetera. But we also have the Milwaukee Bucks NBA celebration, where there were at least 490 cases associated with that outdoor event. And then there's been other events music festivals in Washington, Michigan and Oregon. But the data that I come back to, which I think is really by far the most comprehensive data come from the Minnesota Department of Health, the Department of Health that I obviously am very, very fond of, and I'm very proud that they are our health department here in Minnesota, given the quality of their work. And they have documented in most more recently, 20 county fair outbreaks, which were likely all outdoor, four outdoor music festival outbreaks, two outdoor concerts, and 25 weddings, funerals or social gatherings that were reported by cases to be outdoor. There are several other outdoor outbreaks that occurred involving festivals or amusement parks, while there isn't an exact number of either cases or outbreaks. The department estimates at least 50 outbreaks have occurred in Minnesota, most more recently with Delta that were all outdoor related. So we know that when you're in large crowds and you're together, the chances of an outbreak increasing are there. So now it really boils down to what is your tolerance for risk? There is some risk of transmission in these events. Are you someone who has a risk factor for severe disease? Should you be a breakthrough case? Even though we know breakthrough cases are generally much milder and I think you're going to have to make that decision. Unfortunately, right now we're in a grand experiment. We're going to find out in the next month to two months as we see more delta activity around the country what it means in terms of these large crowds getting together, being close together, will we see more outbreaks like we've seen here?

**Chris Dall:** [00:57:34] It's been several months now since we last discussed VAERS, the vaccine adverse event reporting system and how the VAERS data can be misused or misinterpreted by opponents of vaccination. But that issue has come up again in recent weeks. So, Mike, what should people know about the VAERS data and how should they respond when people use these data to argue against the vaccines?

**Michael Osterholm:** [00:57:56] Well, this is a really critical issue right now because it is the source of a great deal of disinformation. Just in a recent rally here in Minnesota for medical freedom, about 2,000 people gathered near the state Capitol, in which one of the state senators, a chiropractor, claimed a federal database shows that there have been more than 200 deaths in Minnesota from the vaccine. Simply not true. And it came from the VAERS data where there have been that number of individuals who have died after getting the vaccine, but it had nothing to do with the vaccine. To help people understand what VAERS is and what it does and how to interpret it, let me just give a brief history. It was established in 1990 to try to detect potential safety problems in vaccines that are licensed in the United States. It was a proactive effort by public health to make sure we didn't miss safety signals. It's a database that contains information on unverified reports of an adverse event following immunization with vaccines licensed in the U.S., it serves as the national early warning system that is co-managed by the CDC and the FDA. A report to this does not mean that the vaccine caused a health problem, only that the health problem occurred after the vaccination. For example, if someone dies in a car accident on the day after the vaccination, this theoretically could report as a death following vaccination in the VAERS database. And just to give people a sense of this, I'm shared these numbers before, but just remember from an actuarial standpoint, meaning just life happens, death happens. If we look at a million U.S. residents from any different age group just based on the rates of anticipated events, this is what you might expect to see in a million individuals, 55 to 64 years of age, you'd expect to see 79 of those million people die from a heart attack in the next week. 46 in the population of 45 to 54. If you look at strokes, you'd expect 139 strokes in a population of people age 65 to 74 in a week. 74 strokes in a population of people age 55 to 64. So that these things just happen every day. Well, with VAERS, you don't get to decide should this be reported because it really didn't have anything to do with the vaccine or not. You report it. The purpose of VAERS is to cast a wide net to obtain information on any possible adverse event or death that occurs temporally related to the vaccine. VAERS cannot assess causality or prove a vaccine caused a problem. But it's very useful in identifying the potential safety concerns that should be investigated further. What are the kind of serious events they look for? They look for things like disability, hospitalization or extended hospital stay, life threatening illnesses, birth defects, death. All these things would be considered reasons why you have to report as a provider information about that individual if something happens within X number of days after vaccination and each vaccine has its number of days that you would expect to see, you would not expect to see an anaphylactic shock or an emergency shock like response to a vaccine. Ten days later, it's going to occur in the next 15 minutes. One of the really important uses of errors is to assess the safety of newly vaccine products such as we have with COVID-19. And so it's very important to note that anyone can submit a report of errors, including patients, parents, caregivers, health care providers, vaccine manufacturers, anyone and you can report your own event. It is important to note that health care providers are required to report, as well as our vaccine manufacturers, any events that come to their attention about a if something happening after vaccination. So when all this information comes forward, it is then reviewed by a team of people at CDC and the FDA to understand what is happening here. And it is clearly a very inclusive kind of system to pick up everything, as I just pointed out by ages. It's publicly available. The system can be searched by age, event category, gender, manufacturers, onset interval, etcetera, etcetera, etcetera. Remember who we are vaccinating first? We were vaccinating our oldest population because that was where the highest risk was for COVID related serious illness or deaths. So should it be a surprise to you that many of the deaths that occurred in 80 and 85 year old individuals after vaccination had nothing to do with the vaccine but again expected number of deaths? So you cannot, based on the number of reports alone, interpret this information. And this is where then you look at case after case after case to try to understand what might be in a relationship between the vaccine and the adverse outcome, or was it just temporally related? And today we have seen, as you know, thrombosis with thrombocytopenia syndrome, or TTS after the J&J vaccine, after 14.2 million doses, there have been 44 confirmed reports people who got the J&J vaccine and later developed TTS. To date, there have been two confirmed cases of thrombocytopenia syndrome following mRNA vaccines, Moderna have been reported to VAERS, that's what 346 million doses. Based on the available data, this is not an increased risk, and in fact, the risk of this occurring with the infection itself is much higher than anything associated with the vaccine. The same thing is true with Guillain-Barre syndrome, with myocarditis and pericarditis. And this, I think, is what is really an important issue to get out there. People are misusing and abusing VAERS data. So at this point, for anyone to use data to say that there have been 200 plus deaths in the state of Minnesota due to this vaccine is total disinformation, I can tell you with certainty, not one of those deaths after investigation was found having to do with the vaccine, and this is what is challenging for us. Now there is an additional program called the Vaccine Safety Datalink. This was created by the CDC Immunization Safety Office to conduct post-marketing evaluations of vaccine safety with a defined population, meaning these data contain a comparison group, so they're looking at people who get vaccinated one to 21 days after vaccination to a control group, people not vaccinated, but at the same ages, and also those vaccinated 22 to 42 days ago, and again, they are looking carefully at the safety overall of these vaccines. And I just want to leave you with the fact that you will continue to hear this disinformation. It'll be unfortunate. It'll make it very difficult because of course, it's going to be believable because they're saying the government is collecting it, but you will understand it's a totally inclusive attempt to gather information on anything that could happen to somebody after getting a vaccine and then try to sort it out. Is this a pattern? Is there evidence that this could be a challenge? Is there a biologic reason why this could be related to the vaccine? And if there is, we'll let you know. And the fact that we came forward with the thrombocytopenia, we've come forward with Guillain-Barre Syndrome, we've come forward with the myocarditis shows the system worked. In each of those assessments, it was shown that the risk of getting those same conditions with the disease was substantially higher than the risk of actually getting it from the vaccine. And so it's really important that people feel the confidence that they can in getting these vaccines.

**Chris Dall:** [01:06:06] Mike, staying with vaccines, we've addressed questions about vaccination in pregnant women on several episodes of the podcast, and you've gone over much of the safety data for our audience. But I'm not sure if anything you've said is as powerful as the email we received this week from one of our listeners. Can you share it with the audience?

**Michael Osterholm:** [01:06:25] Chris, as I've said many times in this podcast. We can never for a moment. Forget that these numbers I'm talking about are real people. They are our loved ones they're the people who matter to us, they're friends, colleagues, they're classmates, they are the children of good friends. And in each instance, if we ever forget that these are real people and not just numbers, then it's not a world I want to live in. And unfortunately, sometimes we have to almost be shaken a bit to realize how we connect names and numbers together. And, you know, I think we've tried in this podcast to do the best we can to help that Connection be a positive one, be one that motivates us to do more to make a difference in terms of reducing the transmission of this virus. I just wanted to share with you an email I got from Courtney this week. As I've said so many times also the emails, the text messages, the letters we get are so important to us. You have no idea how much you influence what I know, what I feel, what I think, and as the same is true for the entire team. Courtney sent me this email this week. Let me share it with you because it has a very, very important message, a very important message. She wrote, "Good evening. I just wanted to say that I so appreciate your podcast each week. They have given me a constant source for accurate information since this pandemic began. This past weekend, we buried my 38 year old sister after she fought a six week battle with COVID. She was on a ventilator and ECMO machine and was pregnant. Just one week before her passing, she gave birth to her twenty five and a half week old son via emergency C-section. She never got to meet her son, and he will never know his mother. She has two older sons, aged 15 and 17, who are now left without their mother. This has been an unbelievably difficult past two months for our family. She was unvaccinated because her OB-GYN wanted her to wait to get vaccinated until she was certain it was safe for pregnant women. By the time she gave her the go ahead to get the vaccine, it was too late. I've been a high school teacher for nine years and have four children of my own, ages 13, eight, five and two. Our 13 year old son has been fully vaccinated, but of course our other children are not eligible. It is incredibly painful to continue going to work and sending my kids to school, knowing our schools are doing nothing to contain the virus. No mask requirements, minimal quarantine of students and everyone crammed together in tiny rooms. Most of my classes have close to 30 students. I hear parents constantly harping about the statistics and the survival rates of children and adults being so high that any measures taken are unnecessary. I'm here to say that my beautiful sister Kristen was not a statistic. She was a person, a mother, a wife, a daughter, a sister and our loved one. When do we stop playing this off like, this is no big deal, and we start taking those seriously? When will our children be looked at as real people and not just numbers? I hope it is soon because I am not sure how much more this broken heart can take. Sincerely, Courtney." If there is any message here, please every OB-GYN, every family practice doc, every practitioner, please get your pregnant patients vaccinated ASAP. The American College of OB-GYN has come out strongly supporting this. The data are clear and compelling with the safety of the vaccine in pregnancy, and I'm aware of far too many of these situations where mothers have died while the baby was delivered growing up in a world that would never know its mother. So please, if nothing else this accomplishes this week, doctors out there who are not OB-GYNs, not family practice, talk to your colleagues. Make sure we are getting pregnant women vaccinated as soon as possible and to you, Courtney our deepest sympathy. I'm so sorry for what you have gone through. I just know that that new child is very fortunate to have an aunt like you, and I know that that by itself is no consolation. But it is a gift that is priceless. Thank you, Courtney.

**Chris Dall:** [01:11:22] So, Mike, amidst these dark times, people are still finding places of light in their lives, and they're sharing those with us in their beautiful place submissions. Where is this week's beautiful place?

**Michael Osterholm:** [01:11:37] Well, this beautiful place this week is something that will delight all of our listeners. And I'll explain that in a moment when you understand why. It also comes from an individual that comes from, as they would say, my neck of the woods, not only just Minnesota, but in northern Minnesota in terms of the beautiful boundary water canoe area. This is from Russ, "Dear, Dr. Osterholm and Chris. My name is Russ. I'm sure as many others, I go to sleep at night and throughout many days I am stirred to emotional disturbances regarding our world and how COVID has affected it. I'm a musician. When COVID begin to rear its ugly spikes around mid-March and many geographic locations started to hunker, close, isolate, et cetera in ways sadly suffer, some musicians took the opportunity to become creative, write and produce music. I am by far not being critical here, but I would go to my tiny recording space and make attempts to do the same. However, much to my disappointment, I found myself stifled by my mental disturbances of our COVID affected world. However, as time went on, I found myself being able to crawl out of that disturbance or might more accurately say cope better amidst it and started creating what I call my beautiful places. In other words, some songs that buffer my emotions. So with that, I send to you one of them. Please, please. In no way you feel obligated to play this anywhere, but feel free to do so. I'm simply feeling the urge to share it. Thank you, Dr. Osterholm and Chris. Russ." We have included a link to one of the songs that he shared with us. It is simply, stunningly beautiful. I do urge you to go listen to it, shut your eyes. Just listen to this melodic, beautiful music. And I promise you, if you've not had anything else good happen in your day that day, that will be a good moment. So thank you, Russ, for another beautiful moment, and please continue to send these beautiful moments to us so that we might share them.

**Chris Dall:** [01:13:55] And you can send those to us at osterholmupdate@umn.edu. Your closing thoughts today, Mike.

**Michael Osterholm:** [01:14:03] Well, first of all, thank you for spending time with us again today. I know that I was very frank about my concerns about the children. For those of you that are parents, grandparents, aunts and uncles, teachers, godparents, whatever. I didn't share that information with you to try to make you have a bad day, but I hope if anything, it empowered you to speak up and speak out about what are we doing to protect our children and all the things I laid out about what should be done at school right now to protect them. Demand your school district to share that with you, what they're doing. In addition, do not hesitate if there is an outbreak in a school to not have your children in school. I think it is a major public health mistake, an ethical issue of trying to keep kids in school when you're seeing transmission occur. To deny that you're going to need distance learning is to deny the fact that COVID is going to do what it's going to do with this Delta virus to our kids. So I hope that from that perspective, at least it's helpful a bit. Also, I just I wanted to give you a sense of kind of what are the take-home messages this week from what I want to share with you. And thanks to Roger who suggested that we try to provide a bit of a summary each week at the end of these podcasts, to give you a sense. We have to understand, number one, that our humanity and our institutions are dealing with this novel virus and that prior outbreaks, even a COVID a year ago particularly relates to kids, offer only modest, useful precedents. And we have to understand that that for this reason, we won't have all the answers. And that does not mean that there is misinformation or disinformation, it just means we have more to learn and that's why we need humble tolerance in how we understand what it is we're learning, but also not being afraid to take bold steps when it is protecting certain individuals, even if we overreact in, some might say. It's the important thing to do, because if we don't do it and we're wrong, the price to pay is too high. It's number two, a takeaway today is it's entirely expected that public health policies and guidance are rapidly changing in the face of what this virus is doing. Expect that. You're going to hear from the President later today about a plan that he is putting out to attempt to address COVID in the United States. We will cover that extensively next week. It's of course, not out yet, so I can't talk about it. But I think that it's really important you understand that if there is confusion or at least unclear direction. That's not because of misinformation or disinformation, necessarily. And that's what we have to understand about what we're trying to do going forward. And finally, just remember COVID-19 is transmitted via aerosols, these little particles that float out there do not try to deny gravity and do not try to defy aerosols, meaning that, you know, just because you don't want to fall off a roof, if you get to the edge of it and you do, gravity will take over. You can't deny it. We can't deny that these aerosol transmitted viruses pose real challenges in how we respond to protecting people and to say that you can be two foot or three to say that you can be two or three feet away from someone and not be at risk for exposure is to say I could stand immediately next to someone smoking and never smell a cigarette, just plain wrong. So I hope that this podcast today just reinforced some of those very values. I want to thank you again for being with us. I want to close today with a poem from Wendell Berry. Many of you may be very familiar with his work. He's an American novelist poet and received numerous awards for his work. I find the beauty in his simplicity is remarkable. And he's written one poem that I'll just share with you. It's all about hope, about the need for us to connect with others and about making plans for the future. But who are we if we don't make plans for the future? The title of this poem is, The Plan. "My old friend, the owner of a new boat, stops by to ask me to fish with him and I say I will. Both of us knowing that we may never get around to it, it may be years before we're both idle again on the same day, but we make a plan anyhow. In honor of friendship and the fine spring weather and the new boat and our sudden thought of the water shining underneath the morning fog. Go out and plan, make plans and do what we can to realize those plans, and we'll do it safely. And we'll do it with love and care." So have a plan, remember hope, and as I've said each week, please be kind. Right now, we need tolerance, probably like we've never had before. But at the same time, do not accept someone putting you or one of your loved ones at risk for this virus unnecessarily. So thank you for being with us. Thanks, Chris, for your work today, to the entire podcast crew, and I appreciate so much being with you. Thank you.

**Chris Dall:** [01:19:59] 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, and Angela Ulrich.