

Episode 69: A Whole New Ball Game

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. We're now more than two months into the Delta variant fueled wave of COVID-19 cases in the United States and the peak and decline that we've been waiting for remains elusive. The forest fire that began in the southern Sunbelt states is now moving on to unvaccinated populations in other parts of the country. And while hospitals and ICUs remain full across the south, health care facilities and other regions are now starting to buckle. Although deaths aren't as high as they were in the winter, the death toll from this latest surge eight months after vaccines were introduced is staggering. The current state of the pandemic in the U.S. and the toll this latest wave is taking on the unvaccinated across the country prompted President Joe Biden last week to announce new measures aimed at boosting vaccination and testing as the nation heads into the fall and winter. But will those measures help us get where we want to be? This week on the podcast, we'll discuss the President's plan following an update on the state of the pandemic here in the U.S. and abroad. We'll also continue our discussion on schools, explore the growing debate around booster shots and tell you about another beautiful place from one of our listeners. But first, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

Michael Osterholm: [00:01:56] Thank you, Chris, and welcome to all of you to another episode of the Osterholm update. As always, I want to just express my deepest appreciation and that of the team for your time with us. We know that you have lots of different places to get your information on COVID-19 and what it means. And so we're very honored and touched that you're with us. I just want to re-emphasize another point that we read every one of your letters and emails that come to us. We can't answer many of them just by the sheer numbers, but it's incredibly helpful to us in understanding what it is you're looking for, what it is that we could do a better job of

providing, what it is that you find that we're doing that is helpful to you on a week by week basis. So please keep the information coming to us. Let me just start out this podcast by stating the obvious. And that is, if you're more confused now about what's going on with COVID than at any time in the pandemic, welcome to the crowd. I will today try to drill through a number of issues that are challenging, whether regarding vaccines, whether it relates to the issue of what's happening with schools, where is the pandemic going? What must we be concerned about? In fact, what do mandates mean and what do they mean to me personally, professionally, to my family? And this is not to be unexpected. I actually want to share with you that I don't think that we're in a place that should not have been expected. I've taught over and over again about the sense of corrected science, where basically we learn, we implement, we do it, we learn more about what happened, we from that then implement what we've learned. And this is an iterative process that just continues on and on and on. And I think today, when we talk about this concept of boosters, you'll see that this is not really an unexpected place to be. And from that standpoint, that should give us comfort. It's not as if somehow we're, oh my god, I'm surprised what happened. You know, that's not the case. So hopefully this podcast today will actually be somewhat reassuring that the process is working as it should, and that while the virus is still consuming us day after day after day, it is one that it's not completely fooling us, making us think that we don't know what might be coming down the pike. I also want to just emphasize this week that this has been a tough week for some of us. I've had more people that I know get infected this past week and some of them in serious condition than I have had at any time in the pandemic. Of course, I talk about numbers all the time. And you've heard me say so many times that those numbers are real people. They're not just numbers, they're moms and dads and brothers and sisters and grandpa and grandmas and friends and colleagues. This week it hit home, and it's interesting because a number of these people were actually breakthrough cases, people who were doing everything they thought they could to protect themselves against this infection and I'll address breakthrough cases more. Again, not to be unexpected. And it is part of this iterative process, and I actually see a day when breakthrough cases will be minimized and I'll explain why. So for all those friends and family who have been impacted this past week with COVID, just know that we're learning more and more and that we will provide more answers. And I just wish all of you the very, very best. Now you know that I've been, you might say, on a mission here in terms of the issues around schools, I've been extremely concerned about the role the Delta is playing in our school systems right now and what that means to our

children. And so it's only fitting that this week I try to drill down even further about that in terms of our dedication. You know, I know from my years as a state epidemiologist here in Minnesota, 24 of them how important school nurses have been to the community wide health of children and the community in general. And this week, I just want to do a shout out and dedicate this podcast to the more than 96,000 full time school nurses in the United States who are really having a very uncertain school year. And these are individuals who literally do not start the day at a certain clock time and end at a certain clock time. Their days almost never end until they fall asleep, and they always tend to start when they wake up. And from that perspective, I just want to say thank you because I know right now you are in the middle of this delta situation. Whether you have cases occurring in your school, whether you have an outbreak, whether you're anticipating what's happening, whether you're caught between the angry parents who are for X or against X, it really is a challenge. And I just want you to know that we appreciate you. I know that you're grossly understaffed in this country in terms of what you're required to do or asked to do. I know there are schools that don't even have school nurses, and therefore teachers end up having to cover, in a sense, kind as paramedical professionals. The issues that are at hand in the schools and in the census includes you in this dedication. So thank you for what you do. It is never enough just to say thank you, given I know what's going on. But we also want you to understand that as parents and as professionals, we recognize the critical role you play. This podcast is dedicated to you.

Chris Dall: [00:07:45] Mike, you've recently been focusing on two groups of countries, those that have been following a zero COVID strategy and those with high vaccination rates in your assessment of the global situation. So what are the latest weekly data telling us about how these two approaches are faring against the Delta variant? And are there other global data points that have caught your eye?

Michael Osterholm: [00:08:05] Well, Chris, as you and the listeners of this podcast know, over the course of last winter into the spring, it became increasingly clear that this virus was far from done with us, even though my prediction last spring that some of the darkest days ahead of us was not well received among the community, we now know what in fact, this virus had the capability of doing well after last spring. And during that time, we've known that there were large portions of the population that remain susceptible. And we saw the emergence and the impact of these new variants. It's

exactly why around that time that I said, we were entering a whole new ball game. Remember, I went from innings to saying it's so many minutes in the first quarter and people will say, Wait a minute, that's not baseball. And I'd say, Yep, you're right, but it's a whole new ball game. The variants make all the difference and that although B117 or what we called alpha, which was the primary variant of concern at that time in the spring, didn't play out in the U.S. like it did in the UK and Europe. We once again have been placed in a game with a fresh set of rules brought about what I call the Delta variant impact. And we have to understand that it is fundamentally changing the game. Meanwhile, I have to say, despite the curveballs this virus has shown us since the beginning of this pandemic, we've all had one very similar constant question in our minds, how do we best go about living in a world with COVID-19? What do I do this week? What do I do next month? Can I go to this event? Can I see my grandchildren? What does it mean? Now, I think one thing that is very obvious is a path forward that has any chance of long term success and or sustainability must involve vaccination. For those who deny the benefit of vaccination, you have to understand that is the only way for long term success. These vaccines have already prevented so much pain and suffering. Without them, we'd be in much worse rates than we are right now. But as you know, simply having access to vaccines doesn't automatically guarantee any kind of smooth sailing with this virus. I mean, just if you need an example of that, just look here at the U.S.. So again, we're struck with asking ourselves, how best do we go moving forward and answering that question isn't as simple as we'd like it to be. In fact, if you ask one hundred people to answer it, you might get a hundred different responses. It's a blurry moving target that, much like the virus, is really subject to change. There's no one size fits all approach. As much as I would like to be able to give you one, there is no one size fits all approach. That being said, we're constantly looking for new strategies and potential solutions, things that we might want to avoid. And oftentimes those data points come in the form of other countries and their experiences, which can provide us with useful examples or lessons to draw upon. At the very least, they're an observation we can't ignore. If it's in that light, I want to frame the global discussion this week, not just lay out, this country is having this happen in those countries that happen. Make no mistake, the countries that have had long stretches of success containing the virus, including Australia, China, New Zealand, Singapore and Taiwan, have also been working to vaccinate as much of their population as they can. You know, I'm not sure any of these countries have had plans for a permanent zero COVID strategy or if that's even what might be economically sustainable, although I do have to acknowledge China

as a wild card here. We've already seen Australia and Singapore move away from that expectation of zero COVID. Our goal in covering the recent Delta outbreaks in Australia, China and New Zealand, it wasn't advocate for nor critique their strategy. Instead, we've been using them as examples of just how difficult it can be to slow or even stop the spread of Delta. For example, even with some areas of the country, including Sydney, in their 12th week of lockdowns, Australia is still reporting record high cases. Although I acknowledge the rate of growth has been slowing down in the last several weeks, around 43% of their adult population is fully vaccinated, which is a metric that is being tracked closely since the country still has plans for phased opening when the rates reach 70 or 80 percent. After successfully stamping out yet another outbreak, this time caused by the Delta variant, China only had a couple of weeks with no documented local transmission before detecting the virus once again. This past week, we've learned of a total of 102 local infections have occurred in three cities, each of which are located in the same province in southeastern China. They've all been identified since last Friday. It's being reported that this is the country's first school related outbreak, with elementary school students accounting for more than one third of the total cases as of Tuesday. Sound familiar? As expected, schools and public venues such as bars, restaurants and gyms have been closed in the affected cities. Residents are being instructed to avoid non-essential travel as mass testing is now underway. However, with nearly seven out of every 10 residents of mainland China now fully vaccinated, a growing number of people are left wondering what the country's long term strategy is. Finally, I want to quickly mention New Zealand, which has also pressed forward with their containment strategy in response to their own Delta outbreak. Cases there, which have been largely in the Auckland area, are continuing to decline. This is surely welcome news to Auckland residents, although they remain under lockdown until at least next week. An advisory panel in the country recently determined that a containment strategy is the best option at this moment, but also discussed prospects of relaxing certain measures when vaccination rates improve. Right now, only 30% of residents are fully vaccinated, but a vast majority are expected to be by the end of the year. Overall, it will be interesting to see how these countries go about moving forward as they continue to administer vaccines, all while playing, what I continue to call a whack-a-mole with delta experience. Let me just summarize the experience of these three countries Australia, China and New Zealand, don't really hold any kind of a model for us because we're so far past the idea of zero containment. But I think what they're going to do is give us a kind of microcosm picture of even in areas where efforts are

taken to control transmission as much as possible, where they have slivers of susceptible people, they will continue to see cases occur. These countries are not going to be out of it until they have virtually everyone vaccinated in their countries. And at some point they're going to have to come to grips with what does that mean about what they do, how they do it? What are the restrictions? Will lockdowns continue? Will they eventually just one day decide no, you know, we'll accept this many cases now? So I will put those aside right now, these countries and let's now move to countries that are more in the place we are, no zero COVID at all. Don't have any hopes for that, at least now. And yet these countries are striving to limit transmission that does provide us, I think, valuable lessons. Before I talk about the countries like that that might provide a more realistic model of where our path forward in the US could look like. Let me just take a step back and remind us of some sense of the overall global trends. Based on the latest WHO data, we're seeing an apparent decline in weekly cases, which fell from 4.5 million at the time of last week's podcast to just over 3.9 million now. Notably, every WHO region of which there are six total reported case declines. Weekly deaths were also down slightly, with just under 63,000 deaths reported last week. However, in a recent WHO press briefing, director general Tedros stated that more than 50,000 people have died from COVID each week since last October. That's 45 consecutive weeks, and it serves as a stark reminder of COVID's impact at the global level, even amid the ebbs and flows we've described. They make it very clear that as these numbers go up and down and up and down, we will see a global whack-a-mole approach. There will be other hot, hot, hot countries around the world in the near term ahead. And it's anticipating where they might occur. Why will they emerge? But there are lots of people out there who are still very susceptible. We all know, of course, that vaccines are going to be one of the keys we have at our disposal to help minimize the global impact. Well, the global vaccine programs are moving forward. We still have a lot of work to do. According to the latest estimates, just an average of 35 million doses of vaccine are being administered worldwide on a daily basis. And just over three in 10 people globally are now considered fully vaccinated against COVID. However, four out of every five doses administered up to this point have been middle and high income countries, leaving the low income countries particularly vulnerable. Now we're seeing news of lower overall supply forecast for COVAX in the near future due to challenges such as export bans, shipment delays, manufacturing limitations and slow going commitments from countries that previously pledged support. In June, COVAX estimated they would have access to 1.9 billion doses by the end of the year. Last

week, that estimate was lowered to 1.4 million. Unless some of the current obstacles are cleaned up, we're going to have challenges even getting our previous minimal estimates of vaccine to the world. Of course, any hiccups and challenges with COVAX only further delays improvement of vaccine inequity that we've been talking about since the beginning of the vaccine availability. If you need an example of that inequality, look no further than Africa, where just 3% of residents are fully vaccinated. As a whole, the African continent has had access to just a minuscule amount of the global vaccine supply. For context, a total of more than 1.2 billion people live in Africa. Repeat that 1.2 billion people live in Africa. That's more than 3.5 times the population of the U.S.. However, as of this past week, less than 150 million doses of vaccine have been delivered to Africa. Meanwhile, in the U.S., remember 3.5 times less population. We've had more than 450 million doses delivered, three times as much vaccine and yet we have one third of the population that they have. Despite the overall lack of access to vaccines, Africa is once again reporting a decline in weekly cases, although deaths in the region rose slightly. As it stands, the average daily cases and deaths are currently at around half the levels they reached during the height of Africa's most recent surge. A lot of the decline is being driven by downward trends in countries like South Africa, Morocco, Tunisia, Libya and Ethiopia. However, in their latest EPI report, the WHO noted that 18 of Africa's 49 countries reporting now growing cases over the past week. Remember, this is whack-a-mole. Africa will get hit again, it will get hit hard and we need to understand that this is what will continue to happen until the vast majority of the population of any continent, of any country of any region are fully vaccinated or have protection from natural infection. We can take a look at both Asia and the Middle East and see the same thing. There they continue to report declining cases and deaths. Cases in the region have dropped from about 250,000 a day in mid-August to about 200,000 now. During that same time period, they've seen deaths go from 5,000 a day to 3,000. All good news. A lot of this has been attributed to downward trends in India, Iran and Malaysia. However, the region is still home to some of the world's hottest spots. If you look at data over the past week, seven of the world's top 12 countries with the highest case rate and six of the world's top 12 countries with the highest death rates are in Asia in the Middle East. We look at Latin America. We're still seeing overall declines, a trend that started in late June and has kept up since. In that time, average daily cases have dropped from 150,000 to 50,000, close to the lowest activity they've experienced since the pandemic began. Daily deaths are also approaching some of their lowest levels in the region to date. A welcome reprieve from a region that has endured a lot of

suffering during the pandemic. Most of the declines are being driven by lower activity in places like Brazil and Argentina, even recent hotspots like Mexico, Cuba and Guatemala are showing early signs of decline. However, countries like Guyana, Surinam and Jamaica are still at or near their highest peaks in regards to cases. We're still monitoring Delta's presence in the region. Its prevalence is growing in countries like Brazil, but we have not yet see it lead to major surges there, which we did see play out in other countries like Mexico and Cuba. Meanwhile, Europe has reported slight declines over the past week, but overall daily cases in the region have plateaued at about 125,000 a day since mid-July. Although deaths in Europe have ticked upwards, the relationship with cases appear much weaker than it did during the previous waves of the pandemic. Otherwise, we're really still waiting to see what directions things go in places like the U.K. and Germany, which account for a decent part of the region's cases. In order to chart the delta path forward for the U.S., let me concentrate on several countries Denmark, Singapore, Portugal, United Kingdom and Israel. These are countries with sizable proportions of their population fully vaccinated. Take Denmark, 74% of its population is fully vaccinated. Delta took over as the dominant variant in late June. Around the same time, cases in the country rose from less than 200 per day to nearly 1,000 per day by mid-July. Daily cases remained at 900 a day from mid-July to late August. Although deaths remained very low, the seven day average ranged from zero to two. Since late August, cases in Denmark have declined and currently sit at 450 a day. This is a question with only 74% of the population fully vaccinated will, in fact they see a return, another surge? Right now, the Danes are counting on the fact they're not going to. They're opening up everything and assuming that they've now passed the risk period for Delta in their country. I think this is a at best an experiment that we'll have to wait and see. If we look at Singapore, 78% of its population is fully vaccinated. They've been dealing with Delta as the primary variant since June. Although they had clusters of cases, they didn't really see clear upticks until mid-July, which took them from 10 to 20 cases a day to more than 150 cases a day. By mid-August, cases had declined from the peak in July to 50 before spiking upwards once again. This spike is ongoing, with the current average sitting at about 550 cases a day. The good news is the deaths remain low, much as we've talked about in previous delta spike occurring in countries with high vaccination rates. But I think it points out again the challenge that we have with cases that occur even in highly vaccinated populations once Delta takes off. Portugal, which has 80% of its population fully vaccinated, are now seeing heightened activity in the Lisbon area, which had the country's highest prevalence of Delta at the

time it first appeared in June. It eventually made its way across the country from that late June time period into early July, coinciding with Delta's arrival, Portugal saw daily cases go from 500 in late May to more than 3,000 in mid-July. However, they've slowly tapered off since plateauing at about 2,300 throughout most of the August time period and dropping in September to 1,100 a day. Again, if you look at the deaths in the country, they've been very low. During the Delta Peak, they were seeing 15 per day. The current average is about eight per day. The previous peak last February, largely associated with Alpha, was at 291 deaths a day. I think all three of these countries are surely seeing the impact of vaccination. However, what that means for the future is still unclear in terms of the potential for even regional or even countrywide surges to occur. Let's just finish off with the last two countries here in the United Kingdom and Israel. Currently, 66% of the population in the United Kingdom is fully vaccinated. As you know, Delta became dominant there in June. We saw the UK go from 2,500 cases in late May to more than 50,000 cases in mid-July. That mid-July peak was followed by a sharp drop to 25,000 cases by early August, which then preceded an uptick to 38,000 cases in early September. And now they've come back down to 32,500. Let me just quickly trace this for you again. U.K. went from 2,500 cases in late May to more than 50,000 cases in mid-July. The mid-July peak then was followed by a sharp drop to 25,000 cases by early August. But then it preceded an uptick to 38,000 cases in early September, and now they're back down to 32,500. Far from the 2,500 cases in late May, that was their previous baseline. If you look at Israel, 61% of its population is fully vaccinated. Delta became dominant there in late June. Average cases grew from 10 to 20 a day in mid-June to more than 10,000 a day in early September, with recent dips and rises. Hospitalizations and deaths also grew, but have remained lower. There are 1,104 hospitalized patients today. 662 are considered seriously ill, down from 677 last week. So what is the main takeaway from all of this? I've just covered a lot of information about a lot of countries. Well, with the higher vaccination rates, it's clear and compelling, you can do more to blunt Delta's impact on severe disease and death. We're seeing that of these last five countries I just talked about, that is the one overriding factor that is so critical. However, even countries with much higher vaccination rates than the U.S. aren't quite seeing cases return to pre delta baselines at all. Our original interpretation of a rapid rise, followed by a rapid descent was far too simplistic. There is no cookie cutter model. This is why I've said to you time and time again every morning what I do is I get up. First thing I do is reach over to my four or five inch mud-crusted crystal ball and scrape away. So let me just conclude here by saying

that there are lessons to be learned from countries around the world, both in terms of delta activity and vaccination. And we'll talk more about that in a minute. But the bottom line is there is no clear pathway forward that doesn't involve a lot more cases.

Chris Dall: [00:28:42] So, Mike, as I noted in the introduction that delta peak and decline that we've been waiting for here in the United States has been stubbornly elusive. Are we following a different path than some of the countries that have seen big delta waves, followed by sharp declines?

Michael Osterholm: [00:28:58] You know, we've spent a lot of time trying to interpret what Delta does or doesn't do when it takes over in a in the various countries around the world. And I'm not sure we're even close to figuring it out. But let me just highlight some consistencies we've been seeing. Also, let me add a context to this. While a number of my colleagues have said with some certainty what this virus will do in terms of case numbers by season or by vaccination levels, et cetera, I really see very little data to support that their predictions or even their conclusions hold water. We've already seen what's happened this summer, where it was predicted by some to be a summer with few cases because of a high vaccination rates and the summer season, we turned that on its head. What will happen within to the fall and winter months? I'm not sure, but I will say that there will surely be more than enough human wood for this coronavirus forest fire to burn for some time to come. As we record this podcast today, there are at least 75 million Americans who could be vaccinated, who refused to get vaccinated. That is more than enough to keep future surges going. Let me just say at this point, it's clear that the Delta variant is going to continue to play a substantial role in driving up activity once it becomes dominant. We've seen that pattern play out over and over, whether it's in places like India, Indonesia, Iran, Russia, Botswana, South Africa, et cetera. The delta waves in those places, which largely lacked vaccines, have been devastating. At the same time, we're seeing Delta drive up activity even in countries with higher vaccination rates. Israel, the UK, countries I just mentioned, however, all of the cases and transmission in some of these countries have been significant. They're getting by with fewer hospitalizations and deaths. So although it's challenging to completely block Delta from gaining a foothold, vaccines can play a critical role in how smooth or bumpy that path is. I mean, here in the United States, we've clearly seen the sharp delta uptick with cases as we've climbed from an average of 13,000 cases in early July to more than 165,000 in early September. However, we've had widespread

access to a vaccine, and yet we haven't administered nearly enough to really get by this delta surge without steep upticks in hospitalizations and deaths. Let me just try to provide a comparison of what these two scenarios of high vaccine coverage, illnesses, hospitalizations and death looks like in two different countries the U.K. and the U.S.. If you look at the UK's latest numbers, this is of early this week. They are conducting just under 1.1 million tests a day in its population to detect COVID cases. Meanwhile, they're reporting an average of 33,000 cases each day. A total of 8,400 UK residents are currently hospitalized for COVID. And over the past week, an average of 138 residents have died on a daily basis. Now, if you adjusted those numbers to the U.S. population, you'll find that the current UK levels are equivalent to 5.4 million tests being conducted each day here. An average of 164,000 daily cases. A total of 41,850 hospitalizations and 690 daily deaths. Meanwhile, what are the actual U.S. numbers as of early this week? We are conducting just under 1.6 million tests on a daily basis. Remember, the adjusted number who was the UK would have been 5.4 million. We're doing 1.6 million. We're reporting in an average of 152,000 cases a day. Despite this major under testing, which suggests that the number of real cases has to be substantially higher. Right now, a total of 97,250 Americans are currently hospitalized. That compares with if it were in the U.K. 41,850 hospitalizations. We have more than twice as many people hospitalized per population. And remember, they only would have 690 daily deaths if those numbers were adjusted to the U.S., 690 daily deaths, we are now at 1,900 deaths each day. What's the difference? Vaccine vaccine vaccine, it's not the virus. We have many more people than they're seen in the UK who are not vaccinated. And as a result, we're seeing these increasing hospitalization rates as well as deaths. We could be more like England right now. It wouldn't mean we'd defeat the virus, but we could have a substantially improved outcome from a serious illness, hospitalization and death perspective. So if you look right now with 66% of the UK population fully vaccinated and 54% of the U.S. population fully vaccinated, and Delta continuing its foothold in each place, what differentiates our path? Our hospitalization rate is more than twice as high as theirs. Our death rate is nearly three times as high. It's about vaccine. Not only is this tragic from just a COVID standpoint, since many of those hospitalizations and deaths could be prevented. But we're also scrambling to alleviate the heavy burdens being placed on so many health care systems across the country. We're still seeing the impacts of these burdens well beyond just COVID. For example, earlier this month, a man from Alabama named Ray, who was three days away from celebrating his 74th birthday, was suffering from a cardiac event unrelated to COVID and went to his local

medical center. Doctors there quickly realized Ray needed ICU level care, which they weren't equipped to offer and begin calling around to find a facility that could treat him. They ended up contacting 43 hospitals in three different states before they were finally able to find him in an ICU bed. However, the bed was in Mississippi, not Alabama, almost 200 miles away. Ray was airlifted there but was unable to recover from his ailment ended up dying. His obituary included the following. "In honor of Ray, please get vaccinated if you are not, in an effort to free up resources for non-COVID related emergencies. He would not want any other family to go through what his did." Stories like this have become all too familiar in so many hotspots. Fortunately, activity seems to be letting up in states like Louisiana, Florida, Mississippi, Nevada, Arkansas and Missouri. Great news, but at the same time, we're now seeing activity continue to trend upwards or remain at high levels in many other parts of the country in the South. We still see Kentucky, South Carolina, West Virginia, Tennessee, even Texas in the Mountain West, Montana, Idaho and Wyoming in the Midwest, the Dakotas, Ohio, Indiana, even, to some degree, Minnesota. So right now, we're really more or less in a holding pattern. Until we can get more people vaccinated, this virus is going to keep being transmitted. It may very well come down to a new baseline, but which could be much higher than what it is. And I would just leave you with two wild cards of where we're going. First, as I said last week, we have seen a relative absence of cases in Southern California and in the Northeast, particularly in the New York City metropolitan area. We know we have large areas of under-vaccinated populations in both of those geographic regions, and why we've not seen cases take off is beyond me. We saw the same thing last summer. The Northeast and the southwest was largely spared when we saw that southern house on fire moment. With COVID now this year, we are seeing other areas of the country, but we haven't seen large major population centers in those two regions. If they light up at all in the next few weeks, that could fundamentally change what happens with this surge. If they don't, I know they will light up eventually. It's not done, but it will surely have an impact on this surge. The final piece I would just close with in terms of what this all means. It's all about the kids. Schools, schools, schools and schools. As I said last week, and I'll repeat again this week, our kids right now are in the crosshairs of this virus in our schools, which are not prepared to reduce, surely not stop transmission of this virus in those settings. And so that by itself could ignite community wide transmission when kids get infected and then bring it home to mom and dad, to brothers and sisters who are older, who could be vaccinated, who are not. And at this point, these are the wild cards. So hopefully, if schools don't take off, which I'm telling you,

they're going to, but I don't know about Southern California, the Northeast. But this this surge is is not done with by a long shot.

Chris Dall: [00:38:28] Well, that leads me into my next question, which is about schools. Weekly reported COVID-19 cases in children continue to rise as they have been since June, and this week children in the largest school district in the country, New York City, returned to the classroom. We probably won't have a sense of how the return to schools is influencing pediatric cases for a few more weeks. But what are we seeing so far, Mike?

Michael Osterholm: [00:38:51] Well, Chris, it's a challenging time to be a parent, to be a pediatrician or a family practitioner, to be someone who works in a pediatric intensive care unit. Last week was the single worst week for new pediatric cases in the U.S. since the pandemic began, with a quarter of a million new cases. Kids accounted for nearly 30% of all reported cases in the U.S., according to the American Academy of Pediatrics. For your reference, children under 18 make up 22% of the U.S. population. Now, this is not completely unexpected, since we would expect to see fewer cases in adults who are vaccinated. And of course, most of these kids cannot. Cases for children are now near the highest they've ever been. The group of children that recently saw a peak far higher than their winter peak are the group we would expect school age children who are now too young to be vaccinated, those five to 11 years of age. Two weeks ago in children aged five to 11, there were reported 271 cases per 100,000 population, 30% higher than their winter peak of 206 per 100,000 population. I realize abstract numbers, but you get a sense of the 30% higher. Children aged 12 to 15 also saw a peak in cases at 314 per 100,000 population, slightly higher than their winter peak of 313. Children aged 16 to 17 saw a weekly case rate of 327 per 100,000, far higher than the last few months, but still lower than their winter peak of 434 cases per 100,000. I am hopeful that this is in part, a sign of increasing vaccination in this group. The weekly case rate for children zero to four peaked two weeks ago at 152 weekly case per 100,000, surpassing the winter peak of 145 cases. So in short, what we're seeing here are daycare related, school related age kids who are too young to be vaccinated are surely seeing this major increase. And with regard to the older kids, because of some vaccination, there we're seeing, I think the benefits of that with somewhat reduced increased case numbers. Among 11 states reporting testing information for kids, children made up between 11.1 and 21.6 of the total cumulative state tests and between

4.9 and 17.8 of the children tested were positive. Let me repeat that it's not just a function of what percentage they made up of testing, given adults maybe tested less because of fewer cases. But what was important here was between 4.9% and 17.8% of the children tested were test positive in these 11 states. That's remarkable. New hospital admissions for children zero to 17 peaked in the U.S. last week, with a seven day average of 371 new admissions daily, or 0.5 per 100,000 population, much higher than the previous peak on January 10th, which had an average of 0.3 new admissions per 100,000 population, so 0.5 versus 0.3. Again, this is what is happening now versus what happened in the big surge last January. There have been 341 new admissions in children this week, 4.5 new admissions per 100,000 population, similar to what we saw on September 11th. There are surely a lot of regional variation right now in the data. Health and Human Services Region four, which includes Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee, has been hit the hardest, coming down from a peak two weeks ago, where they saw 1.1 new hospital admissions in children per 100,000 population and is currently seeing new admissions at about 0.95 per 100,000 population, a slight decrease. This is a figure which is a very sobering one. It's hard for me to even talk about it, and I think anyone on this podcast will understand that. In the past year, from September 10th, 2020 to September 9th 2021, there were 355 deaths in kids zero to seventeen, 355. However, 82 or 23% have occurred in just the last month. That's up from 20% last week. The number of deaths in kids have now reached a range that far exceeds anything we see with even a severe influenza season. We are really in uncharted territories here. We look at the schools. The surge in cases and children has already taken a toll on schools. This week, Burbio has reported just under 1,700 in person school closures, up from 1,400 last week across 386 school districts, up from 278 last week in 38 states, up from 35 states last week. And many of them are shifting to remote learning during the closure periods. In 55% of the disruption, schools have gone to virtual instruction. And 39% of the schools have closed entirely for the period. Just under 4% have delayed school starts, and just under 2% have moved to a hybrid format. Average school closure is about 8.1 days. The timing of closures in relation to the first day of school remains similar to last week, with the bulk of closures still occurring between three and four weeks after a district opens. This is the time it takes for the virus to enter, to start to be transmitted, and cause sufficient activity that the school would have to be closed. This is overwhelmingly impacting the southern region of the U.S., where the delta surge is hitting children the hardest. As I mentioned earlier, the HHS region four just saw its peak rate of COVID

hospitalizations in children just two weeks ago. And however, we can expect this as schools open in the northern states and we start to see the same potential transmission in schools there as we've seen in the South for the focus of primary activity to shift to more southern states. The school year is just beginning for many kids in the midst of the surge of pediatric cases. Well, we cannot say that the schools are causing the increase in pediatric cases. I believe they are certainly contributing to outbreaks and rise in numbers. Here are several examples that may help paint a picture of how this school year is playing out. If you look at the Mississippi K through 12 schools, they have detected more cases of COVID from the first month of school than they did for all the 2020 and 2021 academic year. In Galveston, Texas, local districts have case totals that have exceeded what they saw for the entire first semester a year ago. Several districts have been forced to shift to remote learning because of outbreaks. In Ohio, district Waverley City Schools was forced to shift to online learning after 39% of the district was absent due to COVID. Likewise, the South Carolina district was forced to shift a middle school to online learning because 50% of the students were quarantined. As I discussed last week, Tampa's Hillsborough County School District, where there is a 58% vaccination rate, saw an outbreak over 8,000 students being forced to quarantine. Atlanta's area's Griffin Spalding County School District made the decision to temporarily close all schools following the deaths of two bus drivers and a bus monitor. Michigan is currently reporting 71 new COVID outbreaks of schools. These are both K-12 and higher ed. Last week, they reported only 31 new outbreaks in schools, more than a two fold increase. I do want to emphasize a positive note. San Francisco has returned back to classes. They've had no outbreaks since in-person classes beginning Aug. 16. The district has updated their ventilation systems, has a mask mandate. All staff are required to be vaccinated or tested weekly. However, about 25% of the staff has yet reported their vaccination status. Now I believe that San Francisco can continue to do this, but I think they will be severely challenged if we see COVID-19 community wide cases increasing in that area. So what do I leave you with with regard to kids? I'm in the same place I was last week. Despite the fact that the CDC just put out a new tool kit for schools this past week for how to address the issue of COVID, there are still fundamental flaws in the approach. Number one is the fact that we still do not really handle this virus as if it's an aerosol. We still say to school administrators, if you need, you can keep kids as close as three feet apart if they have a face cloth covering on, neither recognizing the limitations of face coverings to protect you or the fact that as an aerosol three feet means nothing. And this is surely going to continue the transmission

issue. The second of all is that I hear people over and over again using masking as the central focus for prevention, and we know it's the other environmental related reduction methods that have the most impact ventilation, filtration, relaxing density levels, getting kids vaccinated for those 12 and older. Those are continuing to be the most important issues, and yet they're really not being addressed. I even want to just make a note that I have talked to a number of school administrators over the past week who have emphasized that they're putting their faith in the once a week testing programs. I defy anyone to provide me with a data that shows that testing once a week actually has a substantial impact on transmission. It was really an administrative decision made by someone once as an alternative, either not being vaccinated or as an attempt at some programmatic effort. But testing once a week does little. So I fear that we'll continue to see COVID-19 play out in our schools for the next five to six weeks. I hope that I can report to you a day when the case numbers have dropped precipitously, but I don't think that's going to happen any time soon. What I continue to urge you to do is based on the previous podcast. As parents, as concerned citizens, you must address your schools about ventilation. How much, is it five to six air exchanges an hour? What are you doing in terms of the density of students in a room? What are you doing to assure that those students that could be vaccinated are? What are you doing to make sure that all teachers, staff and support staff are vaccinated? And then you can talk about masking. And at that point, use quality masking, the N95, KN95 mask are what you must use to get maximum protection. So to summarize it, Chris, we're still in the soup in a big way in pediatric cases. I'm very concerned about that, and I fear that the worst is yet to come.

Chris Dall: [00:50:22] That brings me to the plan announced by President Biden last week to combat the latest wave of coronavirus infections, which was highlighted by the requirement that companies with 100 or more employees will have to mandate vaccination for their workers or conduct weekly testing for those who won't get vaccinated. Mike, the mandate has created a lot of controversy, but there are other elements of the plan. What do you think of the plan overall?

Michael Osterholm: [00:50:47] Well, it was clear that as a country, we were going nowhere fast with regard to changing the course of this pandemic because of the very, very low uptake of vaccine among those 75 million people that could be vaccinated. You know, Lewis Carroll once said, if you don't know where you're going in, the road will get you there. And I feel like that's where we were at. No one really had an idea of how do

we break through that logjam. Now, from that perspective, I think mandates are 100 percent the method of choice that we have. It's the only one we have left. And I realize the political issues here. I realize the challenges that will come to this. But I even look at organizations like the ACLU that support these mandates and say that in the interest of the community good, this should be the case. You know, we don't let people drive drunk on our highways just because they want to and can is because the danger to society, we don't let them speed one hundred miles an hour. I can go through a number of issues, including routine childhood immunizations in our schools, which have not been challenged like we're seeing now with COVID vaccines. Surely, we've always had some anti-vaccine population challenges, but nothing like now. What makes this different? And so the states really have not willingly taken this on in a way that would address the challenges we have. And that piece I just shared with you a moment ago about Ray. There have been consequences to many people in our society who could not get adequate medical care because the hospitals were overrun with COVID cases. And so I'm fully supportive of this based on the safety of the vaccines based on the impact that they will have. And I know that this is going to run counter to many people. Boy, let me tell you what my emails are like right now, but it's the right thing to do. And I do believe we're going to have challenges going forward as to how these programs will be implemented. Trying to get an OSHA rule that basically makes this happen is going to be a challenge. How this is implemented in states. What happens if people refuse? We've already had an individual, such as a gubernatorial candidate here in Minnesota, call for civil disobedience and don't put don't in fact agree to do these. Don't participate. Well, then it puts employers in the position that they fire people. What do they do or what accommodations they have to make if people refuse to get vaccinated who have no underlying health problems that would prevent them from safely being vaccinated? What would we do? So I strongly support these. I think that they should go forward. This is the safety of my kids and grandkids. You know, I can't I can't do more to protect them than to make sure that they're as bubbled as possible, which means that responsible adults and older kids are vaccinated. So I know that the next few weeks are going to be challenging. I look forward to a day when hopefully we get beyond those challenges when this becomes a standard of everyday life. And I do believe the disincentive program and the incentive programs are important. And what I mean by that is is that take things away from people. As I've mentioned before in this podcast, I will never forget when Minnesota was a national leader in the indoor air quality related public health issues and basically the state banned indoor smoking at restaurants and bars.

And at the time, it was seen as, Oh my God, they're going to go under. What people forgot is 70% of the population didn't smoke. They couldn't wait to go and be in a bar or restaurant where they didn't have to suck in all that smoke all night. I think you're going to see more and more incentive programs for bars, restaurants, travel, any number of things where you have to be vaccinated. And if you're not vaccinated, you can't go. You know that's your choice, then. But I think we need to do any number of things right now to get people vaccinated. It's not just about you. It's about the fact of what you're doing to spread a virus to many, many other people in our communities and your callous disregard for your own health, that's your choice. But it's not the choice for others. The second thing is, if you are in fact needing health care and you are rationing health care right now, you know it's going to be a challenge. We know that people who are unvaccinated typically do more poorly when having a serious case of COVID. Should you get the ECMO machine when there are two people who without regard to vaccination otherwise would have an equal chance of surviving, then vaccination shouldn't be an issue. But if in fact your lack of vaccination puts you in a less likely survival position, you may not get the machines that you may want or need at the time that you're clinically ill. So again, I can't say this enough. Congratulations to the administration for this. I do realize we have challenges yet trying to work out these areas of of mandate law, but I'm confident that will happen and I look forward to the results.

Chris Dall: [00:56:09] We'll move on now to the issue of vaccine boosters, which is getting a lot of attention this week ahead of Friday's meeting of the FDA's Vaccine Advisory Committee. We started the week with an article in The Lancet from two retiring FDA officials that argued against widespread boosting. Then yesterday, there were two new studies published one on the efficacy of mRNA vaccines after six months and the other on the efficacy of booster shots in Israel. Mike, where do you stand on the booster issue?

Michael Osterholm: [00:56:35] Well, as I've stated in previous podcasts, I don't like the term booster, I think we need to throw it out right now because it's not really what this is about. As I've stated before, and I just want to take a step back to reiterate this point because it's such a a foundational issue in this discussion. When we first devise these vaccine schedules, remember we knew we had this horrible pandemic coming down the pike and we need it to be able to vaccinate people as quickly as possible. And when the

vaccines were so successful after a dose at time one and then the second dose at a time three weeks or four weeks, which was a very accelerated scale. And so at that point, it was one where we just said, Wow, we're done now. I mean, 95% protection. We had this mental image that it was going to be over with and we'd move on. Well, that was naive. We should never have thought that. I don't mean naive in a way that suggests that anyone didn't do their job, but it was. We had an immediate pandemic before us. We were dealing with vaccines right now. But if you looked at the long game and said, now wait a minute, what are the two primary considerations about these vaccines that we must never forget? Well, one is safety, and we have clearly established the safety record for these vaccines in the hundreds of millions of doses. Remarkable. The other bucket was what is the best way to use the vaccine? How many doses? When are they spaced out? Dose spacing becomes important. And when we consider that, we have to ask ourselves, was our original approach the right way to go? We look at, for example, right now what happened in the United Kingdom and Canada, where because they were concerned about Alpha in February, March, coming in and wanting to get one dose of vaccine and as many people as possible, they postponed second doses until 10 weeks out. And we're now only looking at that to say, did that provide a more superior response than at three or four weeks? Well, now we're actually asking the same question as relates to this third dose. And why are we talking about this now? Because we finally have enough people who were vaccinated six or more months out now in that period where we can look at what is the likely immunity at that six or later month time period? And sure enough, what are we finding? We're finding a sense of waning immunity. Now, you can argue the Delta plays a role in that, and I think it does with regard to the infectiousness. But we shouldn't be surprised. We have a number of vaccines where we see this reduced protection in the prime series that six to eight months out. Let me remind people polio virus vaccine is given as a four dose primary series at two months, four months, six to 18 months and four to six years later, with a final dose administered on or after age four and at least six months after the previous dose. Hepatitis A vaccine in adults same way up to a year between the three dose series. We've known for some time that to get maximal response, you may need to have multiple doses, which we call the prime series, and it may need to be spread out over time. I think that the number of breakthroughs that we're seeing right now largely are milder in general. But we don't know that that's going to stay the same over time as waning immunity keeps dropping. And Chris, there was an additional study that was published on Tuesday from Health England, which actually supports the data that you

just cited from Israel, which was reported yesterday in the New England Journal of Medicine, showing exactly the same thing that actually in those individuals who are having breakthroughs, particularly older individuals, severity is increasing, hospitalizations increasing. And so I think that what you're going to see is what I call the front windshield rear windshield vision of a trip. Some people are looking backwards at the data that exist, and they're not wrong in what they see. But others are looking forward. And imagine you're driving across Colorado and everything is just been flat, flat, flat until out of the front windshield, you'll see the Rocky Mountains start to rise. But if you're looking backwards, only all you see is that flat, flat land, and neither are wrong when one describes these huge mountains, the other one describes this really flat plains. So I think what you're going to see is that over time, it will be recognized that there is a need for a three dose prime, not a booster dose, and there should be for everyone in the world and even the group that was involved with The Lancet study that in fact discussed the idea that booster doses might not be yet ready for prime time. They said in their Lancet paper if boosters, whether expressing original or variant antigens, are ultimately to be used, there will be a need to identify specific circumstances in which the direct and indirect benefits of doing so are unbalanced, clearly beneficial. Additional research could help define such circumstances. Furthermore, given the robust booster responses reported for some vaccines, adequate booster responses might be achievable at lower doses, potentially with reduced safety concerns. Given the data gaps, any wide deployment of booster should be accompanied by a plan to gather reliable data about how well they're working and how safe they are. Now, that didn't say don't do it. It was talking about what is the state of the art of the data. So I will just conclude here and say, I think the meeting the FDA will have on Friday, where the Israeli data and the data from the United Kingdom, we presented with some limited data from us again, another data challenge. And I think you'll see that long term we this will be a three dose vaccine and we shouldn't be surprised. And this is not taking vaccine from the rest of the world, but is completing a three dose series just as we would any other childhood immunization or any other adult immunization that we need to do so. And we'll just wait and see. But I suspect that's going to be what will happen. Now, it doesn't mean that the that third dose will be automatically recommended for everyone right away. It may be again, we already know it's for those who are immune compromised. It may be for older individuals, it may be for certain occupational groups. We're seeing so many breakthrough cases right now in health care workers. We need health care workers in the job badly. So I think that that

could also be a situation. So let's stay tuned and hopefully that this concept of booster dose goes by the wayside.

Chris Dall: [01:03:41] Mike, one of the most frequent questions we get from our listeners is when is this pandemic going to end? It's ultimately what everyone wants to know. I know you've thought a lot about this. So when you wipe all that mud off your crystal ball, what is it telling you?

Michael Osterholm: [01:04:01] Well, first of all, let me just be really clear that even crystal balls have a limits to how far out they can project, and this is clearly just in that category. And second of all, this is part of that humility situation of saying, OK, why would I know that or what does it look like? But let me speculate what I think will happen. It's very clear right now that this virus will continue to hunt people down who are not protected either through vaccination or natural infection. I think this idea of herd immunity hitting even 90, 95% just isn't really an acceptable way to look at this because I can see transmission occurring even in very limited pockets of some note, meaning that 90%, 95% of the population are protected. But if that one group is all together in some type of social or economic setting that you could still see big flare ups. So the question is going to be is when is the pandemic done in terms of the biology? And when is it done as it relates to the psychology? Two totally separate pieces. The biology, I think it will be done when we see most of the world vaccinated or having had natural infection and these large surges of cases not occurring. As I've already pointed out, as I mentioned earlier about the idea of a three dose prime versus booster. I do believe we will find over time increasingly good protection that will have some long term lasting effect. And so it's not even as I think we have to go back every six or 12 months. I don't know that, but I don't think that's the case. So I think that this over time will come into finding its own water mark. Where does it actually occur? Could it be a seasonal virus as we think of influenza? It's possible. Could it be one that, like we've seen through the earliest days of the pandemic, will just take off why and whenever it does, and we don't know why? You know, I've said this already in the podcast. Why are New York and L.A. looking so good right now when so many parts of the country are not? It's not that they are that much more vaccinated. It's not that they're not in high risk settings. We don't understand that. And so I think that that if I had to give my best crystal ball view, I think it'll be a few years yet before we really start to see vaccinations and previous infections sufficiently impact most of the world. Now I will reserve one judgment on that, and that

is the fact that is all about the variants. A variant could come out of nowhere, throw us a curve ball where it outcompetes delta and maybe has some aspects of defeating or at least reducing the protection from vaccinations or previous natural infection. Don't know that. But I think there's another part to this that says, Yeah, even if the surges don't occur anymore, when will we psychologically be done with the pandemic? And I think right now there are a lot of people in this country that already are even where we're at. And that's a huge challenge because responding to a pandemic has a lot to do about social conscience. It has a lot to do with community responsibility. It has a lot to do with our infrastructure systems of disease care or health care or of how we deal with social services. You know how our economy is set up. How do we deal with the rest of the world? Look what this pandemic has done to the supply chains of the world right now. The business community is finally really beginning to understand the implications of this pandemic. So I guess the question I will always have for myself is which pandemic am I talking about, the psychological pandemic or the biological pandemic? And then who am I talking to? Right now, I'm still in the middle of both. I'm not ready to say that from an emotional standpoint, I'm feeling good about where things are at. I get asked all the time and I'm comfortable going out in big public places indoors, et cetera. And I'm not. I'm just not. You know, and I'm somebody who's managed risk all my life, that will be a day for me when I know the psychological pandemic is over with and it'll be a day I think when the world finally comes to grips with the fact that we have successfully vaccinated the world in an adequate means to reduce transmission to that which will be at best, a seasonal situation.

Chris Dall: [01:08:51] So, Mike, as long as this pandemic continues, we are going to need all of us, those beautiful places that we can find to find comfort and solace. Where is this week's beautiful place?

Michael Osterholm: [01:09:06] Well, I want to thank Teri from Wisconsin, who was very kind in sending us a series of photographs which will be included in the website here. She talks about To Hummingbird Garden, a beautiful place to listen to podcasts. And she writes, "I'm sending some photos in appreciation for Dr. Osterholm's podcast. Before the pandemic, I was trying to attract hummingbirds to my yard. Once the pandemic hit, I spent more time researching on what native flowers to plant and how to attract them, and have had great success now. This summer, I would sit and listen to podcasts while watching the hummingbirds and photographing them. Finches,

chickadees and hummingbirds love the COVID-19 podcasts. Here are some photos. I placed a cup with water in one of the water baths that has a solar fountain in it. It attracts the birds to come and drink, especially the finches and chickadees. Teri." Well, Teri, thank you very, very much for your very kind and thoughtful words and for those pictures. They really were priceless. We had not thought of the CIDRAP Osterholm update mugs necessarily sitting in a water bath with these beautiful birds, but it seemed to just fit right in. So I urge everyone on the podcast here today to go take a look at Teri's beautiful photographs. Teri, thank you.

Chris Dall: [01:10:33] And to our listeners, please keep those beautiful place submissions coming. We love seeing the photos, hearing about the beautiful places that you've created for yourself. Mike, what is your closing this week?

Michael Osterholm: [01:10:46] Well, Chris, I tried to find a closing that would match up with the content of what I covered today in the podcast. And unfortunately, I wasn't able to find any kind of animal out there that had the head of an elephant, the legs of an ant, the wings of a butterfly and the tail of a tiger. You know, it's kind of one of those odd things. So I rather wanted to share a sense of with where we're at in this pandemic right now. What are some of the things that we can do just to make life better? You know, I've had this blessed situation over the course of the past few months to actually reestablish relationships with old friends that I hadn't before. This pandemic helped give me that sense of purpose and that importance that goes with those kinds of relationships that sometimes in a busy world, we just let go by the wayside and we never intend to have that happen, but we do. This week, I picked a song that was written by Craig Weisman and Steve McEwan and performed by American country music artist Tim McGraw. It was released in September 2005 as the fifth and final single from his album *Live Like You Were Dying*. It peaked at number six on the country music charts. Well, I don't hope any of us are dying right now, at least in the immediate term. But I think this song helps give that sense of why we all must today if we can reach out to old friends. So here it is, "My Old Friend." "My old friend, I recall the times we had hanging on my wall. I wouldn't trade them for gold because they laugh and they cry me somehow sanctify me. They're woven in the stories I've told and tell again. My old friend, I apologize for the years that have passed since the last time you and I dusted off those memories. But the running and the races, the people and the places, there's always somewhere else I had to be. Time gets slim, my old friend. Don't know why,

don't know why, don't know why, don't know why. My old friend this song is for you because a few simple verses was the least that I could do to tell the world that you were here. Cause the love and the laughter will live on long after all of the sadness and the tears. We meet again, my old friend. Goodbye. Goodbye. Goodbye. Goodbye, my old friend, my old friend. Goodbye. Goodbye." I hope these words cause all of you to pause a moment and think to yourself, who's that old friend that I should and could reach today? If nothing else, just to say hi. In a world of pandemic madness, what is it that might just bring a moment of peace, a moment of excitement, a moment of personal accomplishment? And if we did that today, there'd be a lot of people out there that would be truly grateful for you reaching out. So this is the assignment for this week. Go reach out, share that kindness that that memory. And if we do that, this is part of our pandemic of kindness, I've talked about so many times. I just want to thank all of you for being with us here this week again. A lot of hard stuff. We covered a lot. I also just want to share with you again, just to remind you, what are some takeaway messages from this week? One, we have a ways to go both globally and domestically before this pandemic is over. Both from a biological standpoint and from a psychological standpoint. The vaccines are here. They could make such a difference to end this pandemic sooner. We have to use them. We have to convince the world how to use them. Also another takeaway message is that schools are still going to continue to be a real risk challenge for our kids. We can't deny that fact. We all understand in class education is so important, but we have to balance that against the safety of these kids and data from a year ago do not in any way, shape or form give us the information we need about how to do that safely today, educate our kids in classrooms. And so I'll continue to hit on this as we go forward and keep emphasizing all the things that schools can do to reduce the risk of transmission. And finally, I think the third takeaway message is please understand, appreciate and accept corrected science. We are today in a situation with these vaccines, for example. Is it a booster? Is it a third prime? What does that mean? And know that the worst thing that could happen is we never changed that we never grew, that we never learned from what we're doing and how to make it better. That would be the worst public health sin of all. I take some comfort in that process. I have confidence in it that it may not seem pretty. It may seem like somehow we don't know what we're doing, but we do. We're learning and learning in the middle of a pandemic is not easy. But it is necessary, and it is making us better at what we do. So just hang in there with the vaccines. Trust me, they are safe. They are very effective and we're going to learn how to use them the very best we can. And that very well may

be that third prime dose is an important part of any vaccine regimen. And we just need to get all of those doses to the entire world. So let me just close by saying thank you again for being with us. I can't state it any more clearly than to say that we are so appreciative of the letters, the cards, the emails we get from you. And as I said, we read them all, and hopefully it's reflected in the kinds of things that we talk about on this podcast and thank you for your kindness. Your kindness has been immense. This is tough for all of us right now. It's very tough. Your kindness has meant all the difference for our team and how we do and what we do, and how even our families have to deal with what we do. So be kind, be good, be safe. Most of all, just remember how important it is to reach out right now to someone. Do it. Don't wait. Do it. Be kind. Thank you.

Chris Dall: [01:17:48] Thanks for listening to this week's episode of the Osterholm update. If you're enjoying the podcast, please subscribe rate and review, and be sure to keep up with the latest COVID-19 news by visiting our website [CIDRAP.umn.edu](https://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](https://cidrap.umn.edu/donate-now). The Osterholm update is produced by Maya Peters, Cory Anderson, and Angela Ulrich.