# Episode 71: Boosting the Vaccination Effort

**Chris Dall:** [00:00:00] This month, CIDRAP is commemorating its 20th anniversary. Since we first opened our doors, our team has created what is now a globally renowned center tackling the world's toughest challenges in infectious disease and public policy. In celebration of this milestone anniversary, a generous CIDRAP supporter has offered a transformational matching gift to support our efforts and ensure we're able to continue our important work into the future. For a limited time, your gift will be matched to 50%, helping to build a solid endowment to support CIDRAP's work. Please visit CIDRAP.umn.edu/donate. 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. If your head is spinning from all the recent news about COVID-19 booster shots, you're not alone. Between the pronouncements of the Biden administration, the deliberations of the FDA and CDC advisory boards, and the final recommendations from those two agencies figuring out who exactly is eligible for booster shots, who isn't and why they're needed requires an advanced degree. And even then, it's still confusing. This week on the podcast, we're going to try to clarify some of the confusion around the booster shots recommendations after we review the state of the pandemic around the globe and here in the United States. We'll also answer a listener question about booster shots and continue our look at how the Delta variant is affecting children in schools. And we'll hear about the latest beautiful play submission from one of our listeners. But first, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:02:14] Thank you, Chris, and welcome to all of you, back to another weekly episode of our podcast. On behalf of the entire podcast team, I want to thank you for your continued listening and support of our efforts. As I've said many times on this podcast, we very much appreciate the feedback we get from you. And as you know, we read every letter, card, note that comes into us. And while we can't respond to all of them, we take that information to heart and try to provide you with what you're asking for and what you need. This week, let me just say that we're on a journey and we're far from being to our final place of where we want to be at. But at the same time, we're making progress. And what I'm going to try to do today is maybe give you a rest stop view of the world meaning where we've been, where we're at and what's ahead of us yet. And so that it may give you some sense of at least what that journey looks like. There is good news, there is troubling news, there's confusing news and we'll try to wade through all of that today with you. One last thing to note in the podcast today is I will try to be very clear about what we know and what we don't know and share with you the difference in those two in terms of what are the data that support what we know and what are the questions we have left of what we don't know. So if any of you are coming here today for all the answers, this is not the podcast you want to be on. If you're here to understand what we know and don't know. I'll try to do my best to make that an outcome that you, when done listening to this will at least have a sense of what the journey looks like at this point. In terms of the dedication today, you know, after thinking about where we're at with the pandemic and vaccination, I just want to take a step back and acknowledge that there are people who every day are getting their first dose of vaccine. Unfortunately, the number is small relative to where we've been. And, you know, 650,000 to 800,000 people a day is surely better than zero. But it's not the millions of people we need left to vaccinate those 70 million Americans not yet vaccinated that could be. So today the dedication is to all of those who finally have chosen to get vaccinated, whatever it was that brought you there, more information, the unfortunate reality of losing a loved one or a loved one who was very critically ill because they weren't vaccinated. Whatever the reason is, thank you for being among the vaccinated today and helping to protect all of us against this ongoing transmission of this virus.

**Chris Dall:** [00:05:05] Mike, the World Health Organization, in its update this week, reported another 10% decline in COVID-19 cases and deaths globally, continuing a trend we've seen over recent weeks, but stubborn hotspots remain. What's your assessment of the current global situation?

**Michael Osterholm:** [00:05:25] Well, Chris, this is all about that journey I just talked about. What we're seeing play out at the global level fits that ebb and flow pattern of this pandemic that we've talked about many, many times. Of course, it's a pattern that's not just apparent at the global level, either. It's also emerged on a smaller scale, with notable rises and falls occurring regionally, nationally and even locally. And while it's enticing to ascribe explanations to these hills and valleys, whether they be mitigation measures or seasonality, I don't think we've fully cracked the code, which is why I continue to stress the importance of humility. Anyone who comes forward with certainty about why these cases suddenly increase, why we see surges lasting several weeks up to five to six weeks in a given area, we don't really understand that. And I wish there would be more challenge of people who put forward these statements as to what their data are to support that conclusion, because oftentimes it gets in the way of good public policy where people have made these declarations what will happen only to have them not happen like that. But unfortunately, decisions were then made assuming that they would happen. Fortunately, as you alluded to in your question, we're in an ebb phase right now. Cases have declined for the third consecutive week globally, with 3.4 million reported most recently, our lowest level since early July. Confirmed deaths are also down, with 56,000 reported, marking the fifth straight week of declines. However, in some sense of context, although these declines are always welcome, I just want to remind everyone that this virus has been responsible for at least 50,000 deaths every week since last October. That's nearly a year ago, and while I know that it's not very satisfying to be left without clear and simple answers or explanations, I think a brief overview of what's happening regionally will help add some context to my stance that we're still riding this tiger rather than driving it. Something I've been saying from the beginning of the pandemic. Let's take a look at Africa. For more than a month, Africa has reported significant overall declines in both cases and deaths following their record setting third wave that rose quickly and plateaued for several weeks. And although a number of countries in the region have reported recent upticks, including four that are entering their fourth wave per the latest WHO report, many others are reporting less and less activity. This includes South Africa, a country that has now exited their third wave. Yet as a whole, just 4% of Africa's population is fully vaccinated. So why the decline? Limited testing, gaps in reporting? Could that be it? It's possible that it could be playing somewhat of a role, but deaths which are much harder to miss, are tracking closely with the cases. How about restrictions? Surely some African countries have implemented restrictions, however, using South Africa as an example, where nightly curfews, limited nighttime hours for bars and restaurants, and rules prohibiting indoor gatherings of more than 50 people surely it is not enough to reverse that delta wave. A similar trend is playing out in Asia and the Middle East, where overall regional declines appear to be driven by falling cases and deaths in countries like India, Iran and Vietnam, none of which have fully vaccinated more than 20% of their population. I think we all can agree a country with only 20% of their population vaccinated does not have a strong vaccine wall set up to protect you from this virus. If we look at places with even higher vaccination rates, they too are not immune to case surges. We've talked a lot about Israel, where more than six in 10 residents are now fully vaccinated, although activity there now appears to be declining. They've been challenged by Delta since late June. Even Singapore, which has fully vaccinated 80% of its entire population, is currently reporting record high cases, prompting them to reintroduce some restrictions and to acknowledge that a zero COVID policy is not likely to work. Now, I don't bring this up to discount the effectiveness and benefits of vaccines. If you want evidence of how much pain and suffering they've prevented, simply look at cases and deaths following Delta's emergence in places lacking access to vaccine like South Africa, India and Iran, and look at those compared to countries with higher vaccination rates, including Israel and the UK. The former has paid a much higher price than the latter when it comes to deaths and serious illnesses. Vaccines definitely get the credit for that difference. Even right now in Europe, we're seeing all time high cases and deaths in Russia and surging activity in Romania, both of which have fully vaccinated less than 30% of their populations. Meanwhile, other European countries with higher vaccination rates, including Denmark, Spain and Portugal, each of which have fully vaccinated at least three out of every four residents, reported rising cases as Delta became their dominant variant, but have so far managed to limit hospitalizations and deaths. Instead, I bring it up to emphasize that the virus can and will take full advantage of any gaps in protection at the population level. But exactly where and when the surges and declines happen doesn't always seem to comply with human logic or reason. And I can tell you anyone who has the answer as to why this is occurring also, be careful they probably have a bridge to sell you. In the meantime, we need to make use of this current ebb and flow to do whatever we can to get more of the world vaccinated and to limit the damage of future surges, which should not be unexpected. This, unfortunately, is likely to occur for months and maybe even years ahead, at least until we can get the world vaccinated.

**Chris Dall:** [00:11:29] So here in the United States, we appear to finally be seeing signs of a long waited decline in new daily cases. But the decline is much slower than what we've seen following Delta waves in other countries. Mike, how do you see things playing out over the coming weeks?

**Michael Osterholm:** [00:11:46] As you know, I've been referencing my mud covered crystal ball quite a bit over the last couple of months, using it to illustrate just how difficult it is to predict our path forward. That uncertainty might be best understood by taking a step back and remembering where this delta surge has taken us. Not a long time in history, but it seems like forever since it started. Just a few months ago, we were reporting an average of less than 15,000 cases a day as a country. Soon after, hospitalizations dropped below 17,000 and we were reporting less than 300 deaths a day. Let me repeat that, 15,000 cases a day as a country, hospitalizations dropped below 17,000 and we were reporting less than 300 deaths a day. Our lowest level since the start of the pandemic in this country. Vaccines had been rolling out. It was summertime and frankly, we were ready to move past COVID. People did not want to hear anything to the contrary. However, as you all know, in just a matter of weeks starting in early July, we saw cases take off. Of course, this was later followed by surging hospitalizations and deaths. And before you knew it, we found ourselves in the summer delta surge that has brought about levels of activity that we thought we had moved far past. I only bring that up as an example of just how quickly things can change with this virus. It has a funny way of making a couple of weeks feel like a decade, which can really complicate predictions. Now, with the long winded disclaimer out of the way, it's clear that we're currently experiencing real declines in activity. Average daily cases have dropped from 170,000 to 114,000, and hospitalizations have fallen from 102,000 to less than 79,000, the lowest they've been in six weeks. Unfortunately, as the slowest lagging indicator, average daily deaths remain high, currently sitting at more than 2,000 deaths per day. Still, these overall declines in cases and hospitalizations are much welcomed as they come amid reports of exhausted health care workers and acute staff shortages. As we mentioned in previous episodes, these challenges have led to the rationing of care in multiple states and the deployment of more than 13,000 National Guard personnel to help that support. However, as much as I wish I could say that these declines will only continue, I don't think we've reached that point. Note, as of today, the single highest incidence of COVID infections in the world is the state of Alaska. At 176 cases per 100,000 population, the next highest level we see as a country is Bermuda at 115 per 100,000. 176 cases per 100,000 versus 115 cases per 100,000. What's happening in Alaska right now is just simply tragic. If there is any good news in this assessment, I have, though it comes in the form of at least temporary relief from previous hotspots Florida, Georgia, Missouri, Louisiana, South Carolina, etc. But at the same time, activity seems to be creeping north as I like to think it would kind of like viral lava. And I don't think we can discount the possibility of new hotspots emerging in the Midwest or even parts of the Northeast. This could pause national declines as we see increases occurring in Montana, North Dakota, Wisconsin, Michigan, we still have to be concerned about how high those particular states will go. Some states, like Iowa and Minnesota, while still having increased rates of new infections, it appears that might be leveling off. If we look to the far northeast at Maine, which has seen an 18% increase in cases over the last 14 days, Pennsylvania 10% increase, New Hampshire 14% increase, Vermont 35% increase. We have to ask ourselves what will happen in those areas? Will this in fact end up basically peaking also in the next few days to weeks and seeing the continued diminishing surge occur? Well, we don't know. If we look at the Northeast, we're not sure what will happen there. Will this, in fact, in the next few days to week level off and also show that the same kind of declining cases? On the other hand, we just learned this week that the Harvard Business School has sent all their students to distant learning because of ongoing outbreaks occurring at the school there. And yet, this is in Boston one of the more highly vaccinated cities in the country. In addition, as I've stated before, if we see upticks in L.A. or New York City, we could just as easily find ourselves back to where we were. At this point, there's no evidence of that happening, but I must tell you that given the rates of vaccination and I'll comment on more of that in a minute, we surely could see major surges in both of those metropolitan areas where with the population density being what it is could really, truly raise the number of national cases in short order. Overall, there's still a lot of human wood left for this coronavirus forest fire to burn. That fact, combined with Delta, schools, and upcoming holidays, has me skeptical that we won't be seeing new hotspots emerge in this country over the next several weeks and months. So where do I see us going? I think we will continue to see surges. They may not be nearly as high as the ones we've just had, but they will occur. They surely will have the same geographic pattern that we've seen in the past, where it's not the entire country, it's one region. This recent surge surely has been unusual in that it started in the southern Sunbelt states and then moved its way northeastward. The surge in the northwest started in the far northwest in Oregon and Washington and seemed to move eastward. I don't know what that means. We had not seen that same pattern before. And so just trying to be a student of what this virus is doing, this is riding the tiger, not driving it. I am convinced that we will see additional challenges. Now as I'll talk about in a moment with vaccination, though, that is our ticket out. All of this will change with vaccination. I think as many of us attempt to come to grips with, where we're at in this pandemic, vaccination is our answer out and I'll comment more on that in a moment. As we look at, well, how well can we expect our vaccines to work going forward? And I think very well, and that could be the one deciding factor to change not only the national update, but the global update also.

**Chris Dall:** [00:18:23] So I want to turn now to the vaccine booster discussion, per the FDA and the CDC, a booster dose is now recommended for people 65 and over who were fully vaccinated with the Pfizer vaccine at least six months ago. It's also recommended for those 18 through 64 who have conditions that put them at risk for severe COVID-19 and are also six months from being vaccinated, as well as those whose institutional or occupational exposure puts them at risk, such as health care workers. So Mike, after all the back and forth in this issue, did the FDA and the CDC get this right? And are you concerned that this entire process and the communication around it has left the public confused?

**Michael Osterholm:** [00:19:05] First of all, the public is very confused, and we have to do much more to change that. Second, I think that the process did get it right. And I know that that will not be something that many of my colleagues will agree with, but let me share with you the context for that. When you look at where we're at today in this pandemic, we really have two kinds of public health response. I understand those two different aspects of public health in a very personal way because I live with those at the Minnesota Department of Health as a state epidemiologist. One is an approach where public health action is required with tremendously incomplete information. I can't tell you how many times I led major foodborne disease outbreak investigations, where we had enough data to implicate a product as causing the outbreak, but it was far from definitive. And we had to take steps to move to get that product off the market, knowing full well that if we were wrong, that would be our last rodeo. You know, nobody would ever trust us again. On the other hand, if we didn't move quickly, people would get sick tomorrow and the next day because of our inaction in some of those people would die. And so we ended up kind of the John Snow approach to public health, where we had to pull a pump handle in the middle of the night when most of the people didn't believe it was really the source of their illness or the fact of the matter is, is that just wait and get more data. But unfortunately, there were consequences to that, namely human illness and death. And so on one hand, that this process really was about that, where incomplete information went to two advisory groups, which usually deal with the other kind of public health information where while there may be questions, there's a much, much more robust and well thought through and research body of data that supports a number of different points that make it easier to say yes or no. And what happened is these two processes came into conflict, and they're both important ways in which public health has to act. So this is not a criticism of either one. But I believe that time will show that this is a three dose prime vaccine. I know there are some of you out there who are my friends who will disagree strongly with me on this, but I think it is. And I think that there were two elements about what happened with these vaccines over the course of recent months. One was Delta, of course. The second one is the fact of just the time period from when someone was vaccinated and the potential for waning immunity. As I've said before on this podcast, there are two different kinds of buckets, one for safety and one for how best to use this vaccine. We've answered the safety bucket. That's not a question. The issue is how best to use these vaccines in terms of dose and dose spacing. And then what does it do in terms of the human immune response? And I think one day it will be shown that this is going to be a three dose prime vaccine. And, you know, maybe it'll be an annual booster. I hope not. But maybe the data will show that too. And so I think the challenge we had was we don't really have compelling data showing for many, many people that in fact, over time, this waning immunity would result in not just mild illness, but potentially an increase in severe illness. And some would say, well, let's wait and get that first. And I'm saying, well, you know, that means other people are going to get sick and some people will die. And if we basically are in a position of doing something now, why would we let that happen? And the appropriate response is well you don't know that's going to happen. I don't. I don't, nor does anybody. We have data from Israel which supports basically that might be the case. So I think the right answer is right now that number one, we do want to prevent severe illness. But you know, I categorically reject the sense that we've always said that this was a vaccine just to prevent severe illness, hospitalizations and deaths. You know, I don't I don't know where anybody wrote that down and said that a year ago, you know, we wanted to prevent all infections. And when we got those first data on the mRNA vaccines, that's what people believe this vaccine would do. That was the accepted position. And so I think that it's still a very important measure to vaccinate people even against milder breakthrough illnesses. If, for example, it's resulting in major shortage of health care workers because they are now out with this infection. People who are essential workers, I think it is fair to keep them out. Now the flip side of that is, of course, but then we don't have a vaccine for the rest of the world. Well, I understand that, and I do believe that this a critical issue, I've been the strongest supporter of global vaccine access. Our country continues to lead the way we've donated more vaccines to low and middle income countries than every other country in the world combined. You know, I think it's we're a little hard on ourselves that way. And I believe that one day that this vaccine will be a three prime vaccine for the entire world. I may be wrong. I think it's going to be the case. So what we have to do, though, is do a better job of telling that story. And the story that's out there right now is the White House decided they wanted booster doses. They determined when it was going to happen, and then they basically made it such that FDA and CDC had to agree. Now that's not what happened. That's not what happened. The VRBPAC, the FDA committee, ACIP, the CDC committee, did have a chance to review this. Yes, it's true that Rochelle Walensky overrode the ACIP recommendations, which are their advisory to try to bring the CDC recommendations in line with the FDA recommendations. And people can disagree with those. I think over time it'll be borne out that this was the right thing to do. What we must continue to focus on number one, is getting people vaccinated for the first time. We still only have 64.4% of the people in this country who could be vaccinated having one dose and only 55.8% who are fully vaccinated. Those are numbers that are really a tragedy. How is it that we as a country who made these vaccines, did the clinical trials, had enough vaccine for every person? But we're now 48th on the list of countries for vaccination per population. That's a challenge. That's what we've got to deal with next. That's where we have to go. But second of all, I do believe that the booster doses, as they're now called, will have a substantial impact. And I think if you want to bring back America right now, for the vast majority of people who can get these vaccines, this will be the answer. Now, just briefly looking at this, you know, I'm not going to go through all the different categories of people who can get the vaccine. They've been widely published, but right now there are at least 55 million Americans who over the age of 65 are eligible for the vaccine. An additional approximately 41 million adults aged 18 to 64 have an underlying health condition that puts them at an increased risk of developing severe COVID-19. The CDC says that those above the age of 50 in this group should get a booster, and those that are over 18 can get a booster. This gives us a total of about 97 million Americans who can or should get a booster because of their own medical conditions. Then we see the recommendation for all Americans living in long term care facilities to get a booster dose. However, most of those living in long term care facilities are over the age 65 and therefore already previously counted. The CDC also allows those ages 18 to 64 to get boosters if they are at an increased risk for exposure and transmission because of their occupational institutional setting. While CDC didn't further specify which groups these do and don't include, most would tell you that it includes health care workers, frontline workers, etc. and even potentially educators. The bottom line if I add all of this up and put this together, there is somewhere in the neighborhood of about 119 million Americans that meet the criteria for a booster, which if you look at the adult population, that's a big chunk. That is 36% of Americans meeting the occupation or medical guidelines to be able to receive a booster. Now if we look at those who have received Pfizer, which basically is 57% of all the doses received. That means there are about 38 million Americans who will need boosting doses based on the current recommendations put out by the CDC. I think it won't be long before we all see boosting recommendations from Moderna and for J&J, which virtually makes everyone eligible then for a boosting dose and at older ages or underlying health conditions and maybe one day, even to the extent that most everyone who gets this vaccine will have a three dose prime regimen. Let me just say one last point, though, about vaccine recommendations globally. I think this is an important concept because it I think many people think that we're out of step, that what we're doing here is something that's unique to the United States. In fact, that's not the case. Israel now offers boosters to anyone over the age of 12 that was fully vaccinated at least five months prior. The Czech Republic is offering boosters to anyone who received their second dose at least eight months ago. The U.K. is offering boosters to anyone who received their second dose at least six months prior and is over the age of 50, lives and works in care homes, aged 16 and over with a health condition that puts them at high risk of getting seriously ill from COVID 19, caregivers age 16 and older, people aged 16 and older who live with someone who is more likely to get infections, such as someone who has HIV. And finally, people who are pregnant and in one of the eligible groups above. Italy is offering third doses to individuals that are over the age of 80, immunocompromised, living in nursing homes, or frontline health care workers. South Korea has decided once they fully vaccinated 70% of their population, they will have a similar policy, giving boosters to high risk or immunocompromised individuals, as well as those over six months out from their second dose. China's policy is also similar, offering boosters for immune compromised and high risk individuals and anyone traveling to foreign regions experiencing a surge in cases. Canada is recommending a three dose primary sequence for immune compromised individuals. Australia is not recommending boosters at this time, but they're offering replacement doses for anyone who received their second dose 14 days or fewer after the first dose. So you can see we're not totally out of line here, and I think you're going to see more and more countries coming to the same position. So yes, we do have to get vaccines to the low and middle income countries, and we need to make an effort to do both. I think that one day the low and middle income countries will also see a three dose regimen and time will tell. So I go back to my original comment and just say that at this point, it's clear to me that the decision of what to do really fell into those two different buckets of public health response. Urgent, immediate, incomplete information, but public health action could save lives. The second, having a much more extensive body of data that's been well researched, almost more on a casual time sequence and one where we would have many more answers. I think right now, the public health response that we must have is the first one. That's what we demand. And I think that actually was what happened.

**Chris Dall:** [00:30:54] That brings us to this week's COVID query. This comes from Karen, who wrote, "If you're in the group that can get a booster, do you get a booster now or wait for a new formulation that could potentially be much more effective against new variants? Would getting a booster necessarily preclude getting a reformulated vaccine?"

**Michael Osterholm:** [00:31:13] Thank you, Karen, for that very thoughtful question, one that many people are asking. In short, the good news is that the data supports that using the vaccines that were developed with the previous strains of the virus still are highly effective with the delta strain, for example, if you have sufficient immune response. And so at this point, with the third dose, I think that the evidence would tell you that we won't need to have a strain specific vaccine available. Now that may change over time as we learn more, but at this point, I feel confident that with third doses, we will see very good protection with the vaccine. The question will be how long does that last? Will it be an extended period of time? Will it be one that after the end of the year, we may need a booster and will a new variant should it emerge that can escape immune protection and actually overtake Delta? If that happens, then we are going to be back to the drawing board. But for right now, I think we're in good shape to use what we have. It will work and go for that.

**Chris Dall:** [00:32:25] Mike, the latest update from the American Academy of Pediatrics shows nearly 207,000 child COVID-19 cases were reported from September 16th through the 23rd, the fifth straight week of over 200,000 child cases. That number, however, is lower than it's been in recent weeks. Does that tell us anything about how in-person learning is going?

**Michael Osterholm:** [00:32:47] Well, let me take this opportunity, since it's probably one of the most emotionally difficult, and from a public health response standpoint, complicated and difficult issues is to deal with illness in our kids. As I've said many times on this podcast, we must never forget that these numbers are real people. They're our moms and our dads, our grandpa and our grandmas, our brothers and our sisters, and unfortunately in some cases, our kids. And there's nothing to me that's more gut wrenching than to try to deal with a serious illness in children and particularly the deaths. So I just want it to be outset here. Just remind everyone that if there is any vulnerable group that we must never forget, it's our kids. Yes, I agree grandpa and grandma are also very important, and we don't want to miss that other end of the spectrum of life. But right now, our kids deserve everything we can do to protect them from this virus. As you noted, Chris, this was the fifth straight week with more than 200,000 pediatric cases reported. In the last four weeks alone, there have been almost one million new pediatric cases. As of this past week, there now been 5.73 million children in the U.S. who have tested positive for COVID. If you look at the overall rate, this is about 7,607 cases per 100,000 children in the population. There has been an 8% increase in cases in kids over the past two weeks, according to the American Academy of Pediatrics. Kids accounting now for 26.7% of all reported cases in the U.S., compared to the 16% of the total cumulative cases since the pandemic began. Now, this is not totally unexpected because with increased vaccination in adults, we should see proportionally more cases associated with kids who can't be vaccinated. If we look at the states reporting testing information from kids, we now see that between five and 18% of the children testing are now positive. This is an exceedingly high number, indicating that we're not doing enough testing in kids. That number should be lower, indicating that in fact, we are catching more of the real infections. These numbers are nearly identical to the numbers reported in last week's podcast. According to the Academy of Pediatrics, among the 24 states and New York City reporting case hospitalization there's been 733 new hospitalizations in the past week. After hitting a peak on September 3rd, of 0.51 hospitalization per 100,000 population. The number of hospitalizations has decreased to 0.35 per 100,000 population. This is still much higher than the winter peak reported in January. It's notable that the case numbers are coming down. I think this is a real effect of seeing the surge that we saw in the southern Sunbelt states, the Southeast and to some degree, in the northwest beginning to level off, as I talked about earlier in the national data. However, we have to understand that in the past year, there have been 389 deaths in kids zero to 17. 73 of these occurred in just the last month. This is 18% over all of the deaths. This is down somewhat from the week before, which is an indication that overall activity is reducing. Now, the challenge we have with this issue, though, however, is what's happening in the schools. What are we going to see going forward? And with the school year well underway, many districts across the country are now struggling to keep schools open. And despite what I call a false narrative that school reopenings have gone better than expected in this fall, the numbers in many parts of the country, especially ones with low adult vaccination rates and little to no mitigation efforts, suggest otherwise. This past week, in an article in Reuters, one of the individuals who talks a lot about this in the media said, and I quote, "it's going better than expected." Well, I just categorically disagree with that point. This is a person I've disagreed with on a number of other issues in the past. This is the same person who suggested at one time you could just wear your mask and get in a less than highly infectious dose of of virus and having an asymptomatic infection and then be protected. I just don't agree with that. Now, it is true that only about 2% of the U.S. schools have closed temporarily because of COVID-19 outbreaks, and this is according to the research firm Burbio, which I've talked about in the past. But let me before I cover more in the U.S., let me just take a quick tour around the world because I think it sets the tone for what's happening here. In Singapore, cases among children have been on the rise for all of September, and in Japan, Tokyo schools are now alternating students in class because of COVID. In Norway, cases spiked to a daily record of 1,785 after the first two weeks of school before falling 60 percent as of last week. Britain has seen an increase in cases in schools that opened early on, but it's not spread beyond the wider population at this point, which is good news. Scotland schools reopened in mid-August and positive test results spiked to record numbers by the end of the month. I think what this is all pointing to is that schools, yes, are an important place for transmission to occur and for us to continue to not acknowledge that, I think is a real challenge. If we look here in the United States, we have seen a number of states with in which there have been severe challenges. In Kentucky, for example 45 of the state's 171 school districts have closed down at least once since the academic year began in August. In Kentucky, the state school districts are already struggling with staff shortages before COVID-19 cases and quarantines actually took place. We are seeing states like Iowa, where now one quarter of all the schools are reporting COVID related outbreaks, so we just have to acknowledge that this is occurring and that again, all the points that I made in previous podcast are still holding true. Most of the administrative responses we see to COVID in schools is about how to keep kids in school without regard to whether they're infected, infectious or even moderately ill. For example, all new quarantine requirements, if you're next to someone who is a case and you have a face cloth covering on and you're only three feet away, but you're there for more than 15 minutes, in the past, that inadequate recommendation was that it should be quarantined. Today, we've seen many schools even eliminate that. That, to me, just flies in the face of good public health. I have received literally hundreds of emails from teachers, school nurses etc around the country who are saying we have virus transmission in our schools. It is out of control. Nothing is being done. Nothing's being sent home. We don't have masking in place, etc.. I don't think it's possible at this point to have impact much of what goes on in schools. The system's in place. We set the schools up to have this problem in many parts of the country. And part of that was all about the fact that we believed we could run schools safe. Now is this virus widespread in schools all over the country? No. But where we see the surge activity, we see it spill over into the school and the evidence is clearly there that the transmission is occurring in the school, not just reflecting community transmission. So I'll just leave it at this. I know that one of the major challenges we will have in evaluating how we respond to this pandemic will be what do we do with schools? And I think this will be one of our sadder moments in terms of how we've dealt with this issue. I can't say more. I've laid out every thought I have in previous podcasts, et cetera, about what can be done. And we're seeing, in most instances, very little of that happening. All of you have written me some of the most heart tugging emails about what's happening in your schools. I'm sorry. I'm sorry. I think we've let you down. I think public health will one day again have to reconsider what it did and how it did it, and I'm unfortunately certain that that will not be our finest hour.

**Chris Dall:** [00:41:36] Continuing with schools, Mike, there were three studies published by the CDC last Friday on the impact of mask mandates on school outbreaks and pediatric COVID-19 cases. What did you make of those studies?

**Michael Osterholm:** [00:41:51] Let me just start out by repeating something I've said so many times, but it bears repeating many more times. We at CIDRAP, me personally, are very strongly supportive for effective respiratory protection for everyone with regard to COVID, including students. And I fear that what's happened is we now have a mindset where we're only trying to report the good news that masking works without ever defining what masking is, without really critiquing the studies that show that. And this is just poor science, and I know I will have my comments taken out of context on this podcast, you'll go read it somewhere that Osterholm's against masks. And it will be used at some school board meeting because I know had a lot of them. But I keep coming back to one central focus. What are the data? Now, I've talked all about the hierarchy of controls, you know, from ventilation, etcetera, etcetera, etcetera, where masking as the term mask has come to mean virtually anything from putting a piece of cloth over your face to using N95 respirators. What we must come to some agreement on is that just more studies that are not well done but have a punch line conclusion masks work that end up getting great headlines in newspapers. Basically stories written by reporters who didn't understand the limitations of the study presented or by the authors for that matter of those studies who didn't put out these limitations of the study for consideration. We've got to stop that because we need a body of science. Next week, we're going to be publishing on the CIDRAP site, a major commentary on masking and what does it take to constitute a good study on masking that gives us reliable information about how well it works, what it can do to protect us, etc. But in the meantime, these reports just keep coming out. And I think one of the challenges we have as they come out from organizations like CDC, which to me should do a much better job than they're doing right now on these issues. So let me just take a look at the studies you just mentioned, Chris. The first one was in Morbidity and Mortality Weekly Report entitled "Association between K-12 School Mask Policies and school associated COVID 19 outbreaks, Maricopa and Pima County, Arizona, July to August of 2021." At least it was done during a time of Delta, which is important. This study looked at public schools in Arizona and compared whether or not there was a school associated outbreak among schools that did and did not have mask mandates in place at the beginning of the school year. They did adjust in the study for demographic factors and the seven day case rate in the school zip code. The authors found that the schools without mask requirements were 3.5 times more likely to have COVID-19 outbreaks compared to schools that started with the year with mask requirements. The second study, also in the MMWR, "Pediatric COVID-19 cases in counties with and without school mask requirements in the United States, July 1st to September 4th 2021," again done during a period of Delta. So that is helpful in the sense of understanding the actual potential protection. In this paper, CDC assessed differences between county level pediatric COVID-19 case rates in schools with and without school mask requirements. The authors found that the counties without school mask requirements experienced larger increases in pediatric COVID-19 case rates after the start of the school year, compared with counties that had school mask requirements. The authors acknowledge the limitations of the study. I quote "the findings in this report are subject to at least four limitations. First, this was an ecological study, and causation cannot be inferred. Second, pediatric COVID-19 case counts and rates included all cases in children and adolescents less than 18 years later, later analyses will focus on cases in school aged children and adolescents. Third, county level teacher vaccination rate in school testing data were not controlled for in the analyses. Later analyses will control for these covariates. Finally, because of the small sample size of the county selected this analysis, the findings may not be generalizable." These MMWR papers have some major limitations that we need to consider. First, the studies were ecological in nature, meaning that one of the drawbacks of this type of study design is we don't know information about individuals in the study. For example, we don't know if people who wore a mask were people also are less likely to be infected, meaning they were in communities where a lot of other things were going on. If your school had a mask mandate, might they not have also been working on ventilation? May they have not also been working on on teacher and and older school aged children vaccination rates. Similarly, we don't know if the people who didn't wear masks were the people who are more likely to get sick or transmit to others. Were these the same school districts where people basically took the risk with COVID because they didn't believe it to be a problem to begin with, this type of impact can be substantial in studies like this. Remember that an association between two factors, a mask mandate and low COVID-19 cases does not equal causation. In observational studies like this, we always worry about a thing called confounding factors or factors associated with both exposure in this case, masks and the outcome, in this case COVID-19. Let me give you an example of what confounding is. Early studies looking at the risk of lung cancer found that both smoking and drinking were associated with lung cancer. But when you actually controlled for people who smoke and drink, people smoke but didn't drink, people who drank but didn't smoke, and people who did neither. It was just a matter of people who smoked more, drank more. But drinking had nothing to do with the actual risk with lung cancer, but it got carried along in the analysis. Also, it's kind of like the issue of describing an event and coming up with a conclusion because it seems logical. For example, I think we all agree our nose smells, our feet run. But now, on the other hand, if your nose is running, your feet smell. You can then conclude you're built upside down. Well, it makes sense, right? Do you know how many studies we see come out like that that take that same logic or that they don't deal with confounding? And so these studies really were at risk of that. And so, you know, as much as they've provided information about the role mask may play to control for factors that we know are associated with both masking and COVID-19, we still have a demand for much better data. And what I worry about is the CDC putting out studies like this give people ammunition to say, Oh, look at masking works without defining what masking was. Was it a piece of cloth over your face? Was it a surgical mask? Was it an N95 respirator? What was it? And we don't have any of that information. We need fewer of these studies, many fewer of these studies. We need better studies to be done. And so I congratulate the authors of these studies for what they were trying to do. The necessary limitations are really a challenge. The same thing is true with the study out of Bangladesh that recently has gotten a lot of attention and was just covered in the New York Times. This study compared surgical and cloth masks in a cluster randomized trial conducted in Bangladesh from December 2020 to January 2021 before, of course, Delta. The study included over 340,000 adults in 600 communities. The study has not yet been peer reviewed, but it sure has gotten a lot of attention out there. I could go through all the number of challenges with this study, and it surely is a challenge study in terms of how they looked at outcomes, looking at what we call seroprevalence, blood samples were drawn, and while the numbers appear big, in fact, less than 3% of those people who may have had a potential COVID like infection were never tested and looked for for antibodies without ever having done it at the beginning of the study. Now, for many of you, this may be way in the weeds, but I'm telling you, as an epidemiologist, this is not a study that I would accept for a publication like this. It has very limited observation. And finally, the authors basically make this conclusion about the impact of their masking when in fact, if you look at the seroprevalence, the people who are antibody positive suggesting they'd had COVID didn't say when, that was in fact, if you look at the rate in control communities versus those communities that were using masks, there was a what we call basically there was what we call an adjusted prevalence ratio of 0.9, meaning there was about a 10% reduction in the overall incidence of COVID with these masks, a number that surely is soft. But more importantly, the confidence interval of this estimate included one which meant there was no difference. And the same finding was true with regard to the relative reduction in risk in terms of being greatest in communities randomized to surgical masks compared to cloth mask or no mask. Again, the adjusted prevalence ratio was 0.89, with a confidence interval that included one which in epidemiologic terms means there was no difference. This was a very, very weak result in a study that was severely challenged and yet look at all the play it's gotten and because it had supposedly big numbers, if you didn't know it, you'd say, wow, this is really important. Well, we'll be commenting more about this in our commentary next week. So let me just conclude by saying we want good studies that help us demonstrate how the respiratory protection can help protect us. So I'm all for it. You already know what I think about face cloth coverings, you know, with aerosols, the challenges with how surgical masks can protect you. So this is not an anti-mask comment, but we got to stop publishing these things that are basically feel good efforts, but not science sound efforts to give us more definition about protection. It seems like if you get more and more of these published, somehow the number just builds up, so it must be right. You know, I learned a long time ago as a kid back in Iowa, right is right, if nobody's right and wrong is wrong, if everybody's wrong. And we don't have the kind of data that people want and need to show at this point, how effective masking is in our environments.

**Chris Dall:** [00:52:54] Mike, we continue to get a lot of great submissions for our Beautiful Place segment on the podcast. Where is this week's beautiful place?

**Michael Osterholm:** [00:53:04] First of all, I want to thank Steph, who sent us this wonderful email, as well as six very beautiful pictures. And Steph wrote in her email "Last month amidst the tightening grasp of the Delta variant, I planned another distance visit with a friend to meet halfway between California and Colorado. We were lucky to find a campsite in one of the least visited national parks, the Great Basin in Nevada. We marveled at the groves of 3,000 to 5,000 year-old bristlecone pine trees. Seeing the twisted, gnarled, stunning beauty and stamina of these trees still living, adapting and thriving after all these years absolutely instilled a deeper perspective about navigating the strange and challenging pandemic times. On the way home, I camped in Capitol Reef National Park and appreciated the stunning beauty of the Utah landscape, a result of centuries of erosion and shifting changes in climate. My hope is that you all will find as much inspiration in the beauty I tried to capture in the photos attached and hope that despite all the trauma and loss that is quite painful for so many of us as we endure this pandemic, that there will also be some slivers of beauty that emerge from each of us at some point. Steph." Please, I urge you to go to the website and look at these pictures. They are stunningly beautiful and thank you, Steph. The eye that you had for this beauty is absolutely a gift to all of us. And so we thank you, and I know that I surely found the beautiful place in your pictures and your story to go with it. Thank you so very, very much.

**Chris Dall:** [00:54:48] Mike, your take home messages and closing thoughts today.

**Michael Osterholm:** [00:54:54] Well, first of all, let me just summarize my three take-home messages. First of all, we're still on a journey with this global pandemic virus. We're not done. We're not close to being done yet. Don't be confused that the decreasing number of cases now in the United States means we're done. The unvaccinated will remain our challenge, just as it does around the world. Now, if you're vaccinated and as I've described earlier, I think fully vaccinated, I think you have a very different perspective on this from your own personal vantage point. But just know, as a world, we still have challenges. The second point being is vaccines are the answer. While things may seem confusing right now, I think time will bring clarity about the protection of these vaccines, and the public policies will match up with the science in a way that isn't confusing. Give it time. This is corrected science. We're learning as we go. We then adjust. We adapt, we incorporate. Then we learn some more and then we on we go. We learn, we adapt, we incorporate. That's what's happening with these vaccines right now. This is not a challenge to whether or not they can work. They will. It's just a matter of how we're learning how to make them work the best. And finally, the last point is schools will remain a challenge for us. I'm convinced the kids are ultimately going to be a focus of much review when this pandemic is over is how we did to protect them. And I continue to unfortunately conclude that we've done a very poor job of what we could do, particularly in our schools. For my closing comments today. Let me just share with you a special gift we received from Amira. Amira is a physical therapist in the home health care setting. What Amira shared with us was a very beautiful song with lyrics for the time. It turns out that America's best friend is a Tulsa based singer songwriter named Casii Stephan. Casii clearly captured the moment of where we're at today in this pandemic in her song, she recorded this song from her bedroom and collaborated with producer virtually and then put the song together. Their friend, Bobby, was so touched by it, he wanted to create a video, and he did. This song, which I will read the lyrics to you in a moment, must be viewed through the YouTube site, where Casii brings her voice, her emotion and her lyric talent to the table. As Amira so clearly stated in her note to me, this song speaks to all of us as much as it does any of us. So here it is, "These Hard Days." "These hard days when the good days seem only in the rearview and there's pressure mounting to smiles as if skies are still blue. Oh, these hard days, these hard days where anthills feel like burdens that we can't escape, and our head is filled with fears that we won't ever escape. Oh, these hard days. Can you lift your head because it's not over yet? Can you raise your voice because they're still breath inside these lungs? Yeah, though these days may be long and hard, they're still our days. These hard days when your bones are weighed down by every thought you've had and emotions keep you paralyzed inside your bed. Oh, these hard days and these hard days when fighting for your life is like breathing in the smoke. You think that you'll survive, but you're unsure of the scars left behind. Oh, these hard days. But can you lift your hands because help is on the way? And it's OK to scream at silence because you'll never be the same. Yeah, though these days may be long and hard. They're still our days. So here, here we stand one foot in front of another, working to love each other. And here, here we breathe. Ready to forgive. Ready to believe that we can lift our heads because it's not over yet. We can lift our voices because they're still breath inside these lungs. Yeah. Though these days may be long and hard, they're still our days. Can you lift your hands because help is on the way? It's OK to scream at silence because you'll never be the same. Yeah. Though these days may be long and hard, they're still our days." And let me just conclude by, I think, the lyric that, "yeah, those these days may be long and hard. They're still our days." We must never forget that these are our days. We're still here. We're still in the fight. This is so important. So I just thank you, Casii, for a remarkable piece of work. Such an artist, so talented and gifted. Amira, thank you for sharing this with us. It's inspirational, and I leave all of you today with the sense that we're on this journey, we're making progress, we've got rough days ahead, yet it's not over. Don't plan on it being over because you'll only be disappointed. But at the same time, know we're making progress. It's about vaccine, vaccine, vaccine. Get people vaccinated here and around the world. And one day this podcast won't be necessary. We won't be talking about COVID every day. It'll become a historic perspective, and that's what we're looking for. So I leave you today thankful that I had this opportunity to be with you. The entire podcast team appreciates it. I want to thank the team, the remarkable efforts that they put forward each week to do this podcast. Thank you to them. And keep those cards and letters coming. We read them. We hear you. We try to understand them. We try to incorporate what you're telling us into how we can be more effective in your world. And thank you. Thank you for being kind. Some of you have been so amazingly kind to us and be kind, be safe and thank you.

**Chris Dall:** [01:01:17] Thanks for listening to this week's episode of the Osterholm update. If you're enjoying the podcast, please subscribe, rate, and review, and be sure to keep up with the latest COVID-19 news by visiting our website CIDRAP.umn.edu. This podcast is supported in part by you, our listeners. If you would like to donate, please go to CIDRAP.umn.edu/donate-now. The Osterholm update is produced by Maya Peters, Cory Anderson, Angela Ulrich, Meredith Arpey, and Sydney Redepenning.