# Episode 62: Untangling the Data

**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 CIDRAP News and I'm your host for these conversations. Welcome back, everyone, to another episode of the Osterholm Update podcast. It's been three weeks since I last hosted an episode of the podcast, and what a difference three weeks can make. Back in early July, the 7 day average of new daily covid-19 infections was around 12,000. Though it was clear at the time that the highly transmissible Delta variant posed a threat, especially to communities with a large proportion of unvaccinated people, the United States appeared to have put the worst days of the pandemic behind it. Now, the Delta variant has taken over and we're averaging around 63,000 new cases a day, the vaccination effort has slowed to a crawl, and vaccine resistance is hardening. And while hospitalizations remain low nationwide compared with previous surges, they are climbing with some parts of the country seeing substantial increases. The surge in new cases has led cities around the country to reimpose mask mandates, prompted new mask guidance from federal officials, and led many vaccinated individuals to question the feeling of safety they had just a few weeks ago. This week on the Osterholm update, as we resume our weekly episodes, we're going to focus on the changing U.S. situation, the response, and how this latest wave fits into the story of the pandemic. We'll also get an update on the worsening international situation, discuss breakthrough infections, ask whether FDA approval of vaccines could help with vaccine hesitancy, and address a covid query on booster shots. And we'll hear about another beautiful place from one of our listeners. But first, as always, we will begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:02:19] Thank you, Chris. And welcome back, we missed you last week. I want to thank Cory Anderson, who filled in for you. He did a great job, but there's only one Chris Dall. And I think all of our listeners know that. Let me begin, first of all, by saying that we are where I thought we would be four or five weeks ago, and I don't tell you that to say, oh, aren't I so smart. It's the fact that this should not have been unexpected. This should not have been a situation where somehow this week, I think so many people are feeling like they're being caught by surprise. And today I'll try to tell the story of why we could have known four or five or six weeks ago. We are going to be at a time like this, and I'm going to project for you or I think we're going to be in four or five weeks from now. And know that we shouldn't be surprised by additional issues that are going to come forward. They're going to be complicated, difficult. And now's the time for us to really take a step back, prepare ourselves both physically, meaning protect ourselves with vaccines, and emotionally, psychologically for what's coming. We're going to be talking about are my vaccines really protecting me or not? We're going to talk about what does this mean for our kids, are our kids going to be able to start school safely? What does this mean in terms of even more continued debate and in a sense, just really hard, hard, hard issues in our communities about things like masking? So I'll try today to to help focus on what I call kind of the story of covid here in late July 2021. Also, I want to just note a real sense of gratitude to so many of you who have sent us the most amazing emails, letters, tweets, etcetera, on the podcast, what it means to you, what issues you want to us to address that we haven't in really constructive comments and criticism about how we can improve things. And I wish we could answer all of them. I want you to read them all. We definitely read them all. But right now we are a bit overwhelmed with that. But please know how much we appreciate these. And again, as I do every week, it's almost like a one of those moments you have to do day after day after day. As I just want to remind all of us on this podcast when we talk about numbers again today, but we know they're not just numbers. They're our loved ones. I've heard from several of you this week who have lost loved ones in just recent days due to covid and how hard that was, because as much as you are involved with the college issue and your own personal life, as much as it's meant to you and you've been listening to the podcast, it didn't really hit you the way it has until one of your loved ones just recently died. And so I just want us all to take a moment and just remember that these are all our loved ones, our colleagues, our friends, not just numbers. And it's in that regard that today I have a somewhat, you might say, different kind of dedication. We are going to get through this pandemic. We will. This is not going to be the end of civilization. We will, in fact know a day when we can look back and say the pandemic's behind us. Doesn't mean that the virus is going to be gone, but the pandemics behind. Today's dedication really reflects this thinking about our future. And it's one that I want to make this a celebration as much as I want to make it a challenge. And that is to look to the future we need look no further than the new lives that will enter this earth today. On average, about 250 babies are born worldwide every minute. That's 15,000 young children born into this world just in the time that we'll be recording this podcast. That's 360,000 young children a day. I dedicate this podcast, all those children born today, that they may know a long, healthy and safe life, that they may know love, that when they have pain, there is someone there to help them. When they are distressed, there is someone there to support them. And that we can focus on living for the future and getting through this tough moment, but realizing this isn't the end of the world. What we need to do is focus on a world that we will all feel good about our children being born into living long, healthy lives and feeling the support that we want them to have. This podcast is dedicated to you children.

**Chris Dall:** [00:07:15] Mike, we've been starting our podcast over the last few months with a look at the international situation, mainly because the pandemic has been much worse in other parts of the world. I want us to start with the US situation this week, because, as you said, it feels like there's been a real sea change for a lot of people. But you noted that in our planning for this episode that your view of the situation in the US is really linked to what's occurring globally. How so?

**Michael Osterholm:** [00:07:41] Well, obviously, we are part of the global pandemic, and so anything that happens around the world of the virus that is somewhere today can be everywhere tomorrow, impacts on us. But I think if you look at the epidemiology, the trends, what's happening, it's like describing the seasons. It's like describing time. When you look at what's happened with this pandemic and its emergence in its earliest days, which now seems like a lifetime ago, we saw that initial hit of cases in China. We saw the spread around the world, but yet very localized, real problems. The Milano area of Italy, we saw in New York City, we saw in this country places like Chicago, Detroit, New Orleans. But basically we didn't see the kind of global, all at once, transmission occur. And if you actually look, it wasn't really until January of 2021, almost a year into the pandemic that we saw a big increase in global cases to kind of call it a global surge. So it didn't mean there weren't lots of cases occurring, some, I'm sure, which we didn't ever detect because of lack of surveillance around the world. But in January of 2021, we actually hit the first peak of cases, about 5 million reported per week. And then on February 15th, it was back down to 2.5 million cases, about half of what the peak was in January. And then we saw another surge around the world. On April 26th, the cases actually increased all the way to 5.7 million cases reported per week. Again, India was very key in that piece. And then the case numbers came back down on June 14th, back down to 2.5 million. Here we are now in July. And the most recent report for the show is for July 19th, the week thereof. And we averaged 3,888,000 cases reported per day. It's on its way back up again. So we can anticipate these cycles that go up and down, up and down. And since the world has had only limited access to vaccine, this cycling of surges and then low points and surges and low points have much more to do about the virus than us, meaning that this is not unexpected if you look at other previous influenza pandemics. Again, a totally different virus and maybe not applicable here, but surges occur. We never understood why. Why do cases suddenly show up, surge and then drop again? And of course, our first reaction is to ascribe human behavior, something we did to control that virus. That's kind of our our human ego that keeps doing that. When in fact, in many instances it isn't about that. Now, today, I'll tell you, we are doing things to really impact on the pandemic in some areas of the world with vaccine. But beyond that, we don't have great evidence that we've really bent the arc of these surges up and down. And that's true in the United States. So as we talk about things today and what's happening, I will refer back to that about what can we expect will suddenly occur without regard to what we're doing and why will things actually decrease again, oftentimes without regard to what we're doing? Well, let me just give you a sense of what's happening at an international level, and then we'll talk more about what's happening here at home. As of this week, a total of 132 countries have reported cases of the Delta variant, that's up eight since last week, I'm sure it's much higher than that. And it's a function of the capability of detecting the virus, sequencing it. And its impact is obviously very apparent based on the latest global activity. If one looks at the WHO covid dashboard, as I just talked about, we're now at 3.9 million cases reported last week, that's up from 3.5 million just the previous week. And again, that low number in June of 2.5 million. The increase appears to be fueled primarily by growing activity in the Americas, Europe and the western Pacific regions. This marks the fifth consecutive week of global case increases. Now, this is part of that search pattern I've talked about. I think we're on our way. Particular with Delta, into a whole new surge ,should not be unexpected. We've also seen a notable rise, by the way, in global deaths, with 69,200 reported last week. That's up from 57,000 the week prior. That too is the third straight week of increases in deaths. Every region of the world reported growth in their weekly death counts. And this is going to continue for some time. If we look at the issue in the US, South America, Europe and Russia, each are now reporting for the first time in a long time, very similar case rates per capita, the US increase going up, 48 percent increase in the past week is now at about 17 per 100,000 population per week. And if you look at South America, it has the incidence has decreased six percent in the past week, now at 18 per 100,000 individuals per week. If you look at Europe and Russia were at 18 cases per 100,000 per week. That's down two percent from the past week. So we see happening is almost this kind of whack a mole for virus activity around the world. Some places go up, some places come down. When the other ones come down, some places go back up again. And we're not really seeing any change in that pattern right now. And in part, we surely aren't seeing it because of vaccine protection, because, again, it's only a small part of the world has really had access to vaccine like we do here in the United States. We are following very closely activity in Latin America to see what will happen there, because now we're finally seeing Delta arrive there. It's expected to outcompete other variants, including P.1, remember that one, which was originally circulated in many parts of Latin America, such as Brazil, Argentina, Paraguay and Uruguay. And clearly, P.1 had caused to date some of the world's worst outbreaks in a given country. Now, each country mentioned above are current reporting downward trends and contributing to that number going down while are making it go up. But wait and see what Delta does there. And I think you're going to see, again, a resurgence of activity in Latin America. If we look at the countries with low vaccination rates, and then I'll look quickly at those with high vaccination rates and compare what's happening. This is going to be the challenge for the foreseeable future is most of the countries will fit into the category of low vaccination rates. In Africa after reaching a peak high for cases the first week of July, nearly 214,000 reported. The African region is now seeing its second consecutive week of case declines. Great news. This week we're reporting 184,000 cases as opposed to that 214,000 reported in the first week of July. The overall decline is driven mostly by less cases in South Africa, which appears to be on the tail end of its latest Delta surge. So Delta comes in, causes cases to go up quickly, rise, and then eventually within weeks comes back down. However, I do have to note that a weekly WHO report published on this past Tuesday mentioned that many other countries in Africa are now just starting to experience an increase in cases with seven countries at or near peak highs. Even with underreporting four African countries are now among the world's top 12 countries with the highest death rates over the past week. Namibia, Tunisia, Botswana and South Africa are all now in the top 12 countries, with number of deaths reported. For comparison, the US currently has a death rate that's eight times lower than for South Africa and nearly 19 times lower than Namibia. There is some good news from Africa, there is declining cases in countries such as South Africa, Tunisia and Uganda, all which experienced rapid case growth with Delta and now is coming back down. Let me move to Asia and the Middle East. This region is still being challenged, reporting an overall average of more than 200,000 cases each day. It's the highest average we've seen since India had its surge and then the big decrease. 10 countries in Asia and the Middle East are currently at or near peak highs for cases including Malaysia, Thailand, Vietnam and South Korea. I want to remind our listeners here that just a year ago I had an abundance of email just telling me I could get my act together here, because if we just put out a message, do what Malaysia, Vietnam and South Korea is doing, we would have this thing solved. And today we sit here looking at them and their major increase in cases and significant activity. Iran is now experiencing its fifth wave of the pandemic that's being attributed to Delta, and it's just reported a new record high average of daily cases. This goes to the issue of time and time again how many times I've heard people say we're going to hit herd immunity. I was told after the second or third wave that Iran hit herd immunity. And yet today here we are reporting the record high average for daily cases after a fifth surge. What that tells us is that these surges are critical. They do substantially increase case numbers, but they hardly hit the entire country. And that there's still, as I would say, a lot of human wood have left to burn for this coronavirus forest fire even after one, two or three surges, which means you have to expect more surges can occur in many places around the world. That's why I'm not surprised by what's happening in the US right now. Indonesia seems to be trending downward with daily cases, but the country still being devastated by its record setting Delta surge. The country reported a single record this week of nearly 2,100 deaths. Before this latest surge, Indonesia had never reported more than 400 covid deaths in a single day. On Sunday, The New York Times reported that more than 100 children in Indonesia have died each week for the past month. More than 150 children died during the week of July 12th, with half of the deaths occurring and kids younger than five years of age. A number of factors are being cited for the dramatic increase in deaths among this age group, including conditions such as malnutrition, low vaccination rates for other infectious diseases, and overwhelmed health care systems. Now, that's in the low vaccination countries. Let's move now to what it looks like with Delta in countries with high vaccination rates. If we take Israel again, a country with some of the highest immunization rates in the world, 64 percent of the entire population has one or more doses, 59 percent are fully vaccinated. Of those 60 and older, greater than 90 percent are fully vaccinated. Cases in Israel continue to grow with more than 2,100 cases reported just on Tuesday. This was the biggest single day total since last mid-March. It now pushes the daily average to 1,500 cases per day. There are 243 individuals who are hospitalized in Israel, this is up from 129 last week. 147 are in critical condition. That too is the highest tally since April. Deaths remain low in the country with the current seven day average of two. 35 total covid deaths over just the past month. And this is where context is really important. To help put these numbers in context, Israel had a peak of nearly 1,2000 individuals in critical condition in January, the same month that the country also reported a record high average of 65 deaths per day. So even with this surge, they only have 147 in critical care compared to what was 1,200 individuals in critical care in January, in the same month that the country also reported a record high average of 65 deaths compared to today, where we're basically at an average of about two per day. This example really gives us a glimpse into what vaccines can do, even when surges of cases occur, they substantially reduce the number of people who will be in critical condition or die. And I can't overemphasize how important that is. It'll become even more abundantly clear in just a moment. Let me cover two other countries that help inform us of that. Let me move to the Netherlands. There, if we look at the vaccination rate for the entire population, 68 percent have one or more doses. 48 percent are fully vaccinated. At this time last week and was mentioned in our last episode, the Netherlands reporting more than 10,000 daily cases, up from 600 cases just three weeks earlier. It appears, however, the peak of the latest Delta surge has occurred, with the average daily cases now very rapidly decreasing in down to 5,700. So that compares to just a week ago at 10,000 daily cases. But now hospitalizations are growing in the country with an average of 70 daily admissions, again reminding us all that hospitalizations and deaths are lagging indicators. However, if the downward trend in cases holds, hospitalization rates in the country should remain far below previous peaks. We averaged nearly 470 daily admissions last March and over 200 admissions per day for most of October through May of last this past year in this recent May. Now, just remember, that is compared to now 70 daily hospital admissions. So 470 daily admissions last March on average. 200 admissions during much of the period of October to May, and now we're at 70. So case numbers are way up, but severe cases and deaths are down. Finally, if one looks at the United Kingdom, which has taught us a lot and I so appreciate the work that they've been doing there in terms of providing us with the kind of information that I wish we had here in the United States. If we look at vaccination rates for the entire population, 70 percent have one or more doses, 56 percent are fully vaccinated. Adults, we look at that, 88 percent have one or more doses. 71 percent are fully vaccinated. And to their great credit, if we look at those 65 years of age and older, 95 percent are fully vaccinated. Cases in the UK appear to have peaked and are currently declining. The current average for daily cases is 33,000, down from 47,000 cases a day just one week ago. This decline in activity appears to be very real, interestingly enough, though, it's mirrored across all regions of the U.K. and supported by declining hospitalizations in Scotland, which we believe is a much more reliable indicator than case numbers. It remains unclear, however, if last week's reopenings will impact these declines. As I noted before, and as would be expected, hospitalizations and deaths continue to grow in the UK since they are lagging indicators. So case numbers coming down per day. But now hospitalizations and deaths are beginning to increase. Nearly 6,000 UK residents are currently hospitalized, recovered up from just 1,600 one month ago. Hospitalizations have risen by 25 percent in the past week. The UK has also reported an average around 70 deaths per day, which is up more than 40 percent in the past week. Again, these numbers are still far below the country's peak average of 1,250 deaths in before this particular surge. So it's really important to understand that there's actually a figure that I think really demonstrates it's a pyramid for which they have on one side of the picture the second wave, and the third wave on the other side of the picture. And the pyramid is on the left cases per 100,000 population. And on the right side of the pyramid, it's deaths per 10 million population. And the point I want to make is for both of these waves. If you look at the number of cases per 100,000 population from this last third wave versus the very severe second wave in December and January are almost identical. For those 50 years of age and older, there were 33 cases per 100,000 population with the second wave. And for the third wave there were 33.6 cases per 100,000 population, almost identical. And if you look at that pyramid by age with at the top of it, those one to five years of age, the numbers 4 per 100,000 rates are very similar. But if you look at the right side of the pyramid, which is the deaths per 10,000 population. For the second wave, what we saw was just take, for example, for 35 year olds to 40 year olds, it was 14.6 deaths per 10 million population, 20 deaths per 10 million population for those 40 to 45, 28.3 deaths for those 45 to 50. And for those 50 and older, it was 35.9 deaths. So we went from basically 14.6 deaths to 35.9 deaths for those older age groups. If you look on the third wave figure for the deaths, there is no right side to the pyramid, it's for 35, 40, 45 and 50 year olds, it's 1.6, 2.2, 2.2, and 2.1 deaths per 10 million population, respectively, far below what the deaths were on the other side. So the case numbers are the same, the deaths are much lower. And this is really a function, again, of being able to vaccinate people sufficiently not to stop the surge. But what it does is it greatly reduces the number of people severely ill. So I think the big question we have right now is what is going to happen? Will the UK declines that we see be a harbinger of things to come for around the world? I think it is. I think that this the rise and fall of Delta is really all about what this virus is going to do without much regard to what we're doing. What I mean by that is, is that if we vaccinate as hard as we can right now in this country, we're not going to have much impact on this surge. We surely could the next surge, because there are going to be more coming. There is going to be more. And what we have to understand is that this is the part of Mother Nature, the ebb and flow of cases that nobody wants to talk about. Why were we surprised we had a surge here? We shouldn't have been. This is the new epidemiology. So I think what's happening here in the United States can be reflected in part of what's happening around the world. If you look at India with its Delta surge, begun in March, peaked in late April, early to mid May, and fell rapidly through June, that wasn't ascribed to vaccine. That wasn't a major public health interventions. If you look at South Africa, we had a gradual rise of cases through May and then with Delta a sharp rise in June, peaked in early to mid July, and now a very steady descent in cases. And even look at Tunisia, they had a gradual rise for the first half of June, with steep rise lasting from mid-June to the peak in mid-July and now rapid decline. I think we're beginning to see the very same trend in countries in Indonesia, Russia and Bangladesh. So while there's still a lot of speculation here, what this is telling us is expect that probably in the next five or six weeks, the United States, we could very well see cases plunge after for the next three to five weeks going up a lot. And that's what we have to understand and anticipate. And this is what I think is really important for understanding what's happening on a global level and trying to apply that here. We're a highly vaccinated country relative to most of the world, and yet we're seeing the surge, we will continue to see surges. But what we can do is have a dramatic impact on the number of people who are severely ill, needing critical care, or who die.

**Chris Dall:** [00:28:34] So, Mike, as you just explained, one interesting trend that's developed this week is in the United Kingdom, where after several weeks of sharply rising case numbers driven by the Delta variant, all of a sudden there's been a steady and dramatic drop in new infections. And as you also noted, this trend, a rapid rise in cases followed by a quick drop off, is being observed in a few other countries hit hard by Delta. So does this tell us anything about how this Delta variant behaves, and how does this fit into the larger story of this pandemic?

**Michael Osterholm:** [00:29:09] Well, you know, we all have those wish lists that one day, if you could, you know, I'd I'd like to think I can talk to Albert Schweitzer, Albert Einstein or Ben Franklin, you know, Madame Curie, any number of people that I would love to have a conversation with, I wouldn't mind jamming for a night with the likes of Harry Chapin and people like that too. But one of the things for certain I want to do is I want to find out who is in charge of covid. I want to ask him what was going on with this activity in the world when covid-19 emerged. And we're trying to describe what's happening at the same time without really understanding necessarily what it is. And I see people with these fancy models and all kinds of complicated statistical analysis saying that they're projecting this, projecting this, I hear people continue to talk about seasonality, which hopefully this summer has just blown that out of the water. You know, we still don't understand what's going on there, but we can understand trends. People a long, long time before us understood so much about Mother Nature, what happened with seasons, what happened with certain events that occurred as a result of weather and so forth. They learned to survive, but they didn't understand gravity, they didn't understand the nuances of why the seasons change, but boy, they were really good at living it. I feel like that's where at with this virus. We basically don't understand why these surges occur up and down. Why do the variants do what they're doing now with Delta? So I'm going to describe to you as someone who might have thought back in the 1400s, is the world round or not? OK, with what lack of sophisticated understanding we had, but other than using the tools of that. So I think of me like that, OK. And that may give you a reason to discount anything I have to say. But I think if you look at the latest setting, we have over 92 percent of our cases are now confirmed to be Delta, they overtook Alpha or the B117 as the dominant variant nationally in early July. We're continuing to see cases and hospitalizations trend upwards across the country. The upticks are clearly more dramatic in certain areas. These areas have been typically dealing with Delta as the dominant variant weeks ahead of the other states in other regions in the country. Most of these areas, ironically and unfortunately, also have vaccination rates below the national average. I've already talked about vaccination rates in places like Israel and England. Let's just remind you here, for all ages in this country. 57 percent of the population has one or more doses. 49 percent are fully vaccinated. If we look at 18 and older, 69 percent have one or more doses. Only 60 percent are fully vaccinated. And if we look at those who are 65 and older, 90 percent have one or more dose, but 80 percent are fully vaccinated. Now, just remind you that 95 percent of those living in the UK who are 65 and older are fully vaccinated. So if we look at the trend data here and then bring this story to to some conclusion, but if we look at the seven day average for this week, daily cases at 63,250. Over the past two weeks, the daily average has risen by 145 percent. As a reminder, the seven day average for daily cases reported in last week's episode was only 38,000. Think of that. This week we're at 63,250. The average number of daily tests have finally started to turn the corner, they're increasing. Since last week's episode, the US is currently conducting about 626,000 tests per day, up slightly, but at least it's no longer dropping. This number is still near its lowest level in the pandemic, and not since last summer we haven't been close to this. For reference, we averaged one million or more tests from October 2020 to mid-May 2021. And a year ago, on July 27th, 2020, the number of average daily tests was 933,000. So I think that we're still missing lots of people out there that would be contributing to these numbers and we're going to pick them up, at least some of them in hospitalizations. Right now, 39,500 Americans are currently hospitalized, up from just 17,000 last month. We're now reporting an average of 290 deaths a day, again, far below our peak average of more than 3,300 daily deaths. But deaths are continuing to increase. If we look at trends from states over the past two weeks, once again, all 51 states, including the District of Columbia, reported an increase in cases. All but four states are reporting increases of at least 50 percent. 40 states, including the District, are reporting increases greater than 100 percent, and 12 have increases of greater than 200 percent. Hospitalizations are also trending upwards across the country, with 48 states reporting increases. That includes 23 states with increases of greater than 50 percent and six states with increases greater than 100 percent. In some states, the rise in hospitalizations over the past month have been dramatic. In Louisiana, 37 percent of the residents are fully vaccinated. We've all understood for some time the challenges there with vaccination. They recently reported a single day high for cases and the daily case average is at record high levels. In just the past month, the number of people admitted to hospitals for covid in Louisiana has grown from less than 300 to nearly 1,400. This is a far faster growth rate than the state's winter peak, which resulted in a peak of around 1,800 admissions. It will likely be only days before that number is far surpassed in Louisiana. In Florida, 49 percent of the residents are fully vaccinated, which matches the national average. There, the average daily cases are up tenfold in the past month. It's approaching record high levels. Hospitalization rates have risen from less than 2,000 to over 8,000. The number of current admissions is close to exceeding the state's winter peak of 8,400. This is still below that last summer's peak of 12,000 admissions. Finally in Arkansas, 36 percent of residents are fully vaccinated. The average daily cases are five times higher than they were one month ago. Nearly 1,000 people are in the hospital, up from 300 just last month. The question is, how will this play out over the course of what, as I suggested earlier, is four to six more weeks of surge activity? Well, as you know, the circumstances with the Delta variant continue to only be more complicated. On Tuesday, the CDC released data supporting the fact that those individuals who are fully vaccinated, who become infected with Delta actually have a much, much lower rate of severe illness, hospitalizations, and deaths, but may very well have the same infectivity, meaning their ability to transmit the virus as someone who is not vaccinated. Let me just say something right up front. While we are concerned about the sustained transmission of these individuals, we cannot for a moment forget how much this vaccine protects against severe disease. The CDC, as you know, has now reinstituted recommendations for masking in those locations that have high transmission and also have low rates of immunization. Well, if you look at just the CDC criteria for transmission, either high transmission or substantial transmission, the two characteristics that they use for describing a county or a parish in this country that should include masking as a recommendation, that amounts to over 2,043 counties or 64 percent of all the counties. If you take a map of the United States and overlay these counties as red color, whatever you want, you can see it overlays exactly where we see the under-vaccination counties existing, primarily the South. We'll talk more about this later. But I have a real concern as to how much of the masking recommendation will be considered in many of these areas. And the note is that this is just occurring. So where do we go from here? When we had the Alpha situation occur back in February, March, and we thought this was going to cause a national surge, as you know, I said that I thought it would. And then we only ended up having Minnesota and Michigan be the two states that were heavily impacted. We said, well, what happened? Why? Why did it not the impact the other states? As I pointed out before, Canada had its biggest peak in April. Exactly. We thought would happen here. And it didn't. What's different this time? Maybe what's going to happen are just these six or seven states in the South that we saw on fire last year at this time, maybe they're the ones that are going to just carry the brunt of this and that's it. I think we have to be very careful about assuming that to be the case. It still may be that that will be the primary thrust of the surge activity for the next five, six, seven weeks. But this time, unlike a year ago, and even unlike this past spring, we're seeing increases in all 50 states and the District of Columbia in cases. What we don't know is what the delay is in terms of rapid increases, given the presence of the virus. Remember the states that we're seeing, the big increase now are the same states that also had the first and earliest increase in Delta being present in those states. It's now unfolding all the states. So if it unfolds like it is and we look at what's happened in other countries, I would suggest the rest of the country is going to get hot soon. If not, then it could very well be that the states that are currently hot will be the ones that will stay hot, other ones will have increased activity, but it won't necessarily reach the levels it's reaching in these lower vaccination counties. And that's the unknown. But based on what we've seen in other countries, I would bet you that by September we will have seen a substantial drop in cases occur. And again, it won't because of vaccination, because that's not going to act fast enough. Now, don't misconstrue that statement to say don't get vaccinated. You want to prevent the next surge. You want to be covered in the next surge, so everybody get vaccinated. But at this point, we have to understand, as I've said before, are we driving this tiger? Or are we just riding it? And we're riding right now, we're riding, and so I think that's an important point. So I will be anxious to see, just as I'm sure you are, what's going to happen over the course of the next weeks. I just want to add one last context on masking. I know that I'm not in the mainstream on this issue. Every time I hear this term masking, it's like for me nails on the chalkboard because we are not giving our citizens the information they need and deserve. We've already pointed out on multiple occasions the limits that face cloth coverings and surgical masks play in reducing the actual transmission of this virus. The studies that have been done have been largely flawed in this regard. In the meantime, the use of N95 respirators or KN95 approved respirators could have a dramatic impact and even the availability of N95 or KN95 and now we have even KN95 respirators available for children. I wish we would talk about not masking but talking about what needs to be done. So I am very, very strong supporter of respiratory protection. Don't get me wrong, I'm not an antimasker at all, just the opposite. But I'm saying use the materials that will actually protect you. As I pointed out before, we know that if you use a face cloth covering, you may get five to 10 minutes additional protection in a room where the virus is present than if you wore nothing at all. That's not a real margin of safety. N95 respirators may give you well under 25 to 30 hours of protection. So I want to get us off of just masking and that's this whole focus, the last 24 hours or 36 hours about masking. Have you seen anybody mentioning about, by the way, don't wear it under your nose that chin diaper? Again, we continue to see up to 25 percent of people wearing a mask under their nose. As I've said so many times, it's like fixing three of the five screen doors in your submarine. So I hope we get this message out. We can right now greatly reduce transmission, if people are using N95s. They are abundantly available your hardware stores, online ordering sites, etc. They are available. So I hope we promote good respiratory protection, not just the concept of masking, and that could have a real important difference right now. So, Chris, to sum it up, the next six to eight weeks will be all challenging. But I think you're going to likely see after that, depending on whether we see these hotspots develop in locations outside the south. I think you're going to see case numbers drop precipitously. Those that are predicting a fall peak, fall surge, you know, I don't know. I have no idea. Let's wait and see where this surge takes us.

**Chris Dall:** [00:43:37] So, Mike, I just want to follow up on the CDC recommendations on masks, some people were happy about it, some people were upset about it, and some people were frustrated because it came just two months after the CDC said that vaccinating people no longer needed to wear masks in indoor places. So what do you make of of the CDC's decision on this?

**Michael Osterholm:** [00:44:04] First of all, I very much support them announcing the information and the cycle threshold data supporting that individuals who have been fully vaccinated, but our breakthrough cases can still be potentially highly infectious. So that that was an important piece of information to get out. The question is what to do about it? And masking has become such a divisive issue in our society, absolutely divisive. And I, first of all, find it somewhat difficult in that it is obvious and the CDC are right on the mark by recommending the counties that they did where masking should be reinstated as part of indoor activity contact. It also happens to be the areas that are most opposed to it. And we are actually creating only more division in our society. And I don't have an answer. I mean, it's easy to be an armchair critic here right now and say you should have done that. He shouldn't have done that. I mean, I think we have to empower everyone to say if you, in fact, are using N95 respirators and you're in those settings, you are adding a sufficient, really important piece of protection to your overall protection from your vaccine. For those who won't get vaccinated, they are likely not going to be masking either. All it will do is, you know, really, really make them more anti-public health. People are ready to move on with this pandemic. One of the things we have to do is major studies on the psychology of pandemic response, because it's only possible to have the public be part of public health activities and being part of the success of those outcomes if they are willing to do it. And we don't really understand that. So I found the recommendation on masking, that term that my nails on the chalkboard term, difficult because I saw, oh, boy, this is going to only make things worse. And I can tell you from my email the last day and a half it has. So I don't know what it will accomplish. I do think that it was important to get the information out. I think it is important to tell people right now if your mom and dad or brother and sister or aunt or uncle or colleague are at increased risk of having a serious outcome if they get infected, but they're vaccinated, they still want to take the precautions to protect themselves with using respiratory protection right now, particularly during the surge. And people may not want to hear that, but that, I think, is an important issue. When the surge is over, you may see the risk drop again in a way that you can say, well, now is not nearly as high a time risk to be there. I mean, think we were in May, people were all done and we weren't seeing the big cases. So I think for this time being, we have to give people some time limited issue, saying that this is a surge, it's going to come it's going to go, and during this time this is what you can do to add to your protection. And in this case, also, we keep hearing people angry at people that won't get vaccinated. I understand that, there's a part of me that is very much in that camp. But at the same time, I also understand that trying to get people vaccinated further in a sense, distancing them from us doesn't help. And maybe nothing would have helped. Maybe nothing would help, but I think right now we have to understand it's up to us to protect ourselves. And I would say you have to realize being around people who are fully vaccinated today doesn't mean that you're perfectly safe and you're going to have to make that decision on what level of risk you're willing to accept. Now, I wish I had a magic answer for you. I the number one e-mail I get, please tell me what to do. What's my risk? And I can't. You know, if you're going to go out to a restaurant tonight and eat in a crowded restaurant and you've been double vaccinated, fully vaccinated, you know, your risk of getting infected is is still much, much, much lower. But we're seeing this increase in number of breakthrough cases. And if you're someone who's likely to have severe illness, then I think you have to be very mindful of that. So I, I wish I had a better answer. I can't say CDC is right or wrong because I don't know what the right answer is. I just know this just doesn't feel good. And this is, I don't think where we want to be.

**Chris Dall:** [00:48:41] So on that issue of breakthrough infections, as has been the case throughout the pandemic, new research is coming out on a daily basis. And the information that's coming out on breakthrough cases, I think has been kind of confusing for a lot of people. So for those who are fully vaccinated, what are the most important things to know about breakthrough cases?

**Michael Osterholm:** [00:49:04] Well we'd all like to believe the ones were vaccinated, we're done. That was, I think, what a lot of people thought was going to happen. And with this virus, and particularly as we now see with the emergence of Delta, it's not quite that simple, but maybe at the outset say these are great vaccines we have. They're great, but they're not perfect and we can't make great into perfect just because we want it to be. So we have to deal with great. What does that mean? Well, first of all, let's just figure out what are we talking about, like breakthrough cases. The CDC defines a breakthrough case as "an infection detected by a PCR antigen testing more than 14 days after an individual receives their final dose of an FDA approved covid-19 vaccine." And as a reminder, we fully expected breakthrough cases since vaccines are not 100 percent effective. And remember, they were tested also before there were variants of concern and they were also tested for a more limited period of time knowing that we weren't sure what the time period would be for waning immunity if it was there. We had data on three to four to five months when they were approved for emergency-use authorization. At this point, CDC is opting to focus on routine reporting of breakthrough cases that results in hospitalizations and deaths. They have received a lot of criticism over this, and they're not tracking all breakthrough infections to understand what might be happening. Rochelle Walensky, the CDC director, has indicated that there are ongoing studies collecting data from 14,000 long term care facilities, health care workers, essential workers, 19 academic medical centers and 187 hospitals. I will say right now we need those data to understand what's going at so we can't just talk about we're collecting it. We need those data. This is where, as I've said before, Public Health England has done an amazing job of getting that kind of information out. We're also realizing the clinical trial updates will provide more data on breakthrough cases. As of July 19th, the CDC has received information on 5,914 breakthrough infections in individuals who were hospitalized or died. We know that there are substantially more than that. Nearly three fourths of these infections were in individuals 65 years of age and older. We knew that that would be the likely case. immunosenescence is very important here. Over one fourth of hospitalized breakthrough cases were asymptomatic or hospitalized for reasons unrelated to covid, let me repeat that one fourth of the hospitalized breakthrough cases were asymptomatic or hospitalized for a reason unrelated to covid. So they get tested routinely getting into the hospital and all, by the way, they happen to be asymptomatically infected. So they weren't being hospitalized because of covid. They got picked up as routine screening. At this point, there are many different opinions and thoughts are being shared about breakthrough cases. One is how important are they? Should we try to identify as many as we can or stick to focusing on those that cause severe disease and death? Some are arguing that the unification of asymptomatic breakthrough cases, the routine testing, doesn't mean a whole lot. They argue the focus should be symptomatic disease, especially that which results in severe disease or death. Other argue that breakthrough cases offer valuable information. There are many unanswered questions about why are they occurring in the elderly, immunocompromised immunosenescence? What does that tell us about how well the vaccines protect? What's the importance of the vaccine type? Does the incidence of breakthrough cases differ between vaccine types? And so we should know that. What is the importance of variants? Are certain variants more capable of causing breakthrough infections? What do breakthrough cases mean for transmission? And what I shared with you earlier in this podcast with this data now supporting that breakthrough cases likely are as infectious as those who are not yet vaccinated. That's a really critical new finding that actually helps explain some of the clusters of cases we've seen where there didn't appear to be anyone in that cluster who might have been the original source, when, in fact, it may very well have been an asymptomatically infected individual who was previously vaccinated. Finally, the question is, are we seeing waning immunity? And we're going to talk about that in a moment. But I think we really are. So how do we move forward? At this point we just need more data rather than less to try and get some of these questions answered. So I hope CDC continues to expand on the information they're collecting, working with state and local health departments. Please get the information out. Please get it out. When even more of the data becomes available, we have a lot of things to untangle. You know how applicable the data from Israel, which conducts a lot of routine testing, would pick up a lot more asymptomatic cases in the US would be because they're showing a substantial increase in the number of breakthroughs compared to us. You know, we're stuck making a number of assumptions from very limited and I think potentially outdated data to help guide policy. I say outdated because it has to really reflect on the current variant. For example, on the issue of breakthrough cases and their risk of transmitting disease. There's data from previously circulating variants like Alpha that show lower viral loads in fully vaccinated cases compared to those who are unvaccinated. There's also data again from non Delta variants suggesting that the duration of infection in fully vaccinated is shorter compared to vaccinated cases. Several recent studies in the U.S. and the U.K. and Israel have been conducted and indicate that secondary attack rates are lower when the index case is fully vaccinated. From these data points, we can conclude that fully vaccinated cases pose less of a risk of transmission compared to unvaccinated cases. But we don't know that yet, we need to understand the Delta variant and so in some ways, the entire record up to Delta has to be considered, has to be thought of, has to be included. But it shouldn't be the data that we necessarily use. We really need the data about Delta. You've heard recently a study that actually supports that Delta cases have 1,000 times the higher viral loads compared to previous variants. However, that also translates to data, meaning only two times higher risk of transmission. So I want to be really clear about that. A CDC Morbidity and Mortality Weekly report published last week found evidence suggesting that an asymptomatic, fully vaccinated individual who had cycled thresholds of 33 to 35, which means he likely wasn't very infectious, was likely the index case for an outbreak of Gamma or P.1, that infected 24 other people, including 15 of the 25 individuals who were fully vaccinated with the Pfizer vaccine. The good news is that although most of the cases of this outbreak raised dramatic and none were severely ill or hospitalized, but they still got infected. What are the implications? The individuals obviously infectious even at that lower level, so we've got a lot of work to do at this point to figure this out. So I think our key talking point around breakthroughs is, is that yet we know vaccination still reduces severe disease and death. It will reduce symptomatic disease. And what we need to do is really keep pushing them. I think the one challenge we're going to have is looking at is do breakthroughs occur more frequently with one vaccine or another? And if we look at the data for some of the states that have been collected, including Oklahoma, we see that, in fact, there is a trend for higher numbers of breakthrough cases with the J&J single dose. If you look at the Oklahoma data that's been made available, those who receive Johnson and Johnson vaccine had a rate of 127 breakthroughs per 100,000 fully vaccinated people with J&J. That compares to only 72 per 100,000 vaccinated people for Moderna and 100 for the Pfizer. If you look at Minnesota here, we see about 0.13 percent breakthrough for those that got Pfizer, about 0.8 percent for those that got Moderna, but 0.3 percent for those who got J&J. And finally, we see a similar situation occurring with data from Washington, D.C., where J&J had about 0.12 percent breakthroughs and Moderna and Pfizer had 0.04 and 0.05, respectively. So I think we're going to see that become another point of discussion in the very near future. And it's one that we surely must look at.

**Chris Dall:** [00:57:57] So, Mike, given that you and Cory just talked last week about corrected science during the pandemic, it's ironic that our most recent podcast episode was pulled from YouTube for violating their medical misinformation policy. Do you understand why Google, which owns YouTube, made this move?

**Michael Osterholm:** [00:58:14] Well, Chris, this is truly ironic that of all the podcasts that should be pulled, it's the one we did last week talking about corrected science and and misinformation. We do not know why the podcast got pulled. We were notified by Google, YouTube saying that because we had violated their policies on medical misinformation, that we, in fact, would have the podcast episode removed permanently and that should we do this again, we would not be allowed to use YouTube. It's one of those situations where there was no medical misinformation at all, in that podcast last week. I did talk about issues such as corrected science and using bleach and so forth. And I'm sure if I talk about it this time, that may some algorithm will pick up some set of words that will make it look like medical misinformation. We actually appealed this to YouTube and they sent us back in a statement without any human contact and said, we reviewed your content carefully and have confirmed it violates our medical misinformation policy. We've asked them specifically for what it did and they have not responded. So we are going to pursue this because this is exactly the thing we're talking about, is misinformation. This is actually just the opposite. Our episodes were meant to address misinformation, and I can only assume there was some electronic algorithm that picked up a series of words. And I'm sure if I use the B word again, that may get picked up again and somehow pull this one, which would represent a challenge for all of us. Our University of Minnesota legal counsel is working on this issue right now. We're obviously appealing through the Google process to get more information, but I think it is a threat. You know, if we can be shut down through YouTube for this type of thing, it really speaks to the challenge we have with misinformation, correction, misinformation addressing. And so somebody makes an outrageous claim, we can't repeat that claim to say we're addressing it, because then that then gets included as medical misinformation. And you can see the the problem with that. It's a circular argument. So we'll see what happens. We'll make sure you are kept up to speed. Fortunately, there are other venues to listen to our podcast on YouTube, but it really just goes to the heart of, ironically, the one episode I cover this whole issue of last week that this should be the issue, 61st episode, by the way, not including our special episodes. And this is the one that got pulled.

**Chris Dall:** [01:00:52] So now to our covid query segment, this is where we try to answer questions about the decisions that you, our listeners are trying to make, the situations you're trying to navigate, and the risks you're assessing on a daily basis in this post vaccination covid world. So our covid query this week is from Mrs. Stevens, and it relates to the issue of breakthrough cases that we discussed earlier. She wrote, "My parents, both age 65, were recently admitted into the covid unit ICU at our local hospital. They're both health care professionals. They were both fully vaccinated. I feel their vaccine was not protective against the Delta variant. Should there be a booster or even a new vaccine that protects against this variant specifically? I'm in fear that we are hyper focusing on vaccinating the unvaccinated and forgetting that those that have been vaccinated are running out of time where their vaccine is effective." So, Mike, what are your thoughts on booster shots?

**Michael Osterholm:** [01:01:42] Well, as you will continue to hear over the course of the next days, there's a tremendous amount of discussion on this. And in fact, just earlier this week, Pfizer announced that there was substantial additional protection provided for adults getting a third dose of vaccine. And I think that ultimately, as we're learning, particularly with this variant, that that may be necessary. First of all, I just want to offer my thoughts and prayers to Mrs. Stevens and her family and the situation that they've experienced. And also just to say that this is being played out in a lot of locations right now. So I think we will see booster doses included. I don't know that they have to be variant specific. That's a whole nother discussion whether or not that will be needed. But stay tuned. I think boosters are coming. Where I have a challenge with this, as someone who wants all my loved ones, family and friends, to be protected is meanwhile, the rest of the world isn't getting vaccine in any meaningful way. And that's a challenge. So here we are with the riches of high income countries, particularly the United States, getting potentially three doses when the rest of the world can't get a single dose. And so we've got to also wrestle with that. I will not be naive to think that somehow people would just willingly give up a third booster dose if they know that it's going to make a potential difference in what happens to their loved ones or they themselves. But it's one thing to consider when we talk about variant development, we've got to get the world vaccinated and we're just not doing it fast enough. We're not developing the capacity and the tools that we need to get vaccines into the world. So stay tuned. Boosters are coming. I'm quite convinced of that. And how soon? I don't know.

**Chris Dall:** [01:03:31] And Mike, just a quick follow up question on vaccines, a lot of people are wondering why the vaccines have not been approved by the FDA yet. Some people anecdotally say that's the reason why they don't want to get the vaccine because it's not approved. Do you have any sense when that's going to happen and if it will make a difference in vaccine hesitancy?

**Michael Osterholm:** [01:03:49] Well, I don't know when it's going to happen. I would use some very nondescript words that said, well, it's going to happen sometime. I do know it's going to happen. I have no doubt that these vaccines will be fully approved. You know, I am very sympathetic to this kind of situation we're in right now. Knowing a number of the FDA professionals who are involved with review of this vaccine and and understanding what they're trying to do, and also my colleagues who are incredibly frustrated, the vaccines are not yet approved. They both are right. They're both right. And when I say the FDA people are right, I know that they're working around the clock to review these data. This is not somebody who's just conveniently doing it five days a week from eight to five. And what they're saying, though, is, is that we can't do any less of a comprehensive review on these vaccines than we would if this wasn't covid and this wasn't a controversial vaccine. Because if we do and people come back in and say, oh, look at this shortcut, look at this shortcut, look at this shortcut they took, it will challenge the very integrity of the licensing process. Now, other ways that they can expedite doing what they're doing and not yet have any shortcuts, I think is is open. That's real. But I do want to say that we want to make certain that when these licensed vaccines are available, people can believe in the license. And so that's it. But I agree with many of my friends and colleagues just say, come on, we got to get this done, because this is potentially one of the at least minor game changers that could help us bring more people to getting vaccinated because they're waiting on that the single thing. And so I think everybody's right here, but nobody is going to be comfortable with that. And at the same time, I also feel the same way about the issue with the kids vaccines. We've got to get these vaccines out. We just have to. But we can't do it in any way that would suggest to the public that shortcuts were taken, that information that could have and should have been evaluated wasn't, questions that needed further answering weren't done because it would take more time. We've got to make sure that there is a complete faith in this vaccine approval process.

**Chris Dall:** [01:06:11] So, Mike, as we close out this episode of the podcast, we've been getting a lot of great, beautifully written emails from our listeners telling us about places that have served as a refuge and a place of solace for them during the pandemic. What's this week's beautiful place?

**Michael Osterholm:** [01:06:28] Let me just say that I want to add a context to this, because it happens to be a beautiful place for me, too. I've been here. The High Uintas Wilderness encompasses about 456,000 acres in Utah and stretches nearly 60 miles east to west. If you've not been there, it is a spectacular area with hundreds of glacier-formed lakes, and it reflects the blue skies and Utah's highest peaks and very clear cold water. And so from that perspective, I have been there multiple times and every time I found it to be a magical place. So when we got the beautiful place submission this week from Christian, it seemed as if almost a natural for me, at least of what to think about. So this is from Christian, who has shared with us their High Uintas Wilderness experience is a beautiful place. So here it is. "Greetings, Dr. Osterholm. My beautiful place I would like to share is the High Uintas Wilderness here in Utah. This has been my home range for the last 20 years for backpacking for my photography. It is magical. It is full of high adventure. And it provides a level of fulfillment you cannot find anywhere else in Utah. From the highest peak in the state to three mighty rivers, the Bear, the Provo and the Weber. And that all begin from the headwaters here in Uinta mountains. I think maybe before 2020, my appreciation was in the moment out there. But when the pandemic began, it was a refuge from the madness of the politics, division and pain that a life event like this pandemic comes with. Over the last two years, I've immersed myself in this mountain range to regain my focus and to be at one with nature as sort of a therapy, for the struggle the pandemic brought our family. Nothing more physically distanced than a solo backpacking trip. The high alpine lakes, the majestic peaks, the night sky all told, a tale that no matter what is going to be on with human kind, nature still operates under the laws of the universe. In a world full of madness and pain, it was great comfort to see that some things had not changed. This helped me gain perspective and return to our crazy covid world with a renewed sense of purpose and empathy and compassion that the wild things bring out in all of us. I feel fortunate to have had not only your podcast help me bob and weave through the mountain of misinformation, but I also had the Uinta Mountains to help my soul find peace and focus to be a better human being to my family, friends and the rest of the world. Some people like to spend time at five star hotels. I'll take a 50 billion star night sky over that every single time. I've had people through my photography say, my images over the years have brought them peace, comfort or just plain joy to be able to see the wild through my lens. I will continue this mission to capture the wild and the night sky in a way that take the viewers there. Maybe it will ultimately actually inspire them to go there. For one, to truly get to the heart of wilderness, you must give yourself to it. I have attached an image from this past year which sums up the sheer power and beauty of the wild out there. This was my first Milky Way panel this year. I hope seeing its majesty will bring comfort, Dr. Osterholm, as we move through this new wave. All the best to you, Michael." The photograph, that Christian included, was stunningly beautiful, moving, and I hope at the end of this podcast in a way that you can only imagine a night sky full of the Milky Way light, as beautiful as he shared. Thank you, Christian, for sharing this very beautiful place with us. I hope all the podcast listeners, while not being able to see the photograph, can imagine in their minds something as beautiful as you shared with us. This is a time to find beauty. However, wherever, whytever you can. The next days, weeks and months are going to continue to be challenging. But with beautiful places, we can find ourselves that peace and comfort that helped get us through that, that helped our families understand what's most important. So please continue to submit these to us. And I just leave us today on the final note of saying thank you for sticking with us. Thank you for being part of this podcast family. Thank you for your many, many, many notes. Again, I want to remind you, we read every one of them, and they mean a great deal to us. And to all of you out there that are now struggling with this next surge and what it means, please know you're not alone. I struggle. What do I do now? When do I feel safe? When I when I when can I be around my grandkids? Is this going to be a new kind of situation I have to, again, adjust to? I'm an old man gets harder to adjust. So I just want you all to know that we're in this together and we will continue to be here for you week after week. Thanks again, Chris, for being back with us. Your voice is one that is so appreciated and so be well, be safe, and be kind. Thank you.

**Chris Dall:** [01:12:01] Thanks for listening to this week's episode of the Osterholm update, if you're enjoying the podcast, please subscribe, rate and review and be sure to keep up with the latest covid-19 news by visiting our website, CIDRAP.umn.edu. This podcast is supported in part by you, our listeners. If you would like to donate, please go to CIDRAP.umn.edu/donate-now. The Osterholm update is produced by Maya Peters, Cory Anderson, and Angela Ulrich.