# Episode 57: Reading the Pitch

**Chris Dall:** [00:00:05] Hello and welcome to the Osterholm Update: covid-19, a weekly 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. This is the 57th episode of our podcast on the covid-19 pandemic and will be the last of our weekly episodes. But don't worry, we will still be here every other week to provide insight and analysis on the pandemic, to answer your questions, to share some pandemic acts of kindness and to continue calling balls and strikes. And we'll still be posting the podcast on Thursday mornings. This week on the podcast, we're going to focus on some of the big lingering questions that remain as cases continue to drop here in the United States and some glimmers of a global decline start to emerge. Among those questions are how much of a threat is posed by the B1617 variant that first emerged in India and is now taking hold in the United Kingdom. We'll also discuss the continuing controversy over the origins of the coronavirus, concerns about the upcoming Tokyo Olympics, and answer some listener questions about breakthrough infections and risk assessment in the wake of the CDC's new mask guidance. But first, as always, we'll begin with Dr. Osterholm's opening comments and dedication.

**Michael Osterholm:** [00:01:45] Well, thank you, Chris, and welcome to everyone again to another episode of our podcast, we are so pleased that you could join us. And as I say, week after week, and meant for sincerely from all of us at CIDRAP, we appreciate all of the feedback we get from you, the suggestions, the ideas. And as you know, over the course of the past several weeks, we've been looking carefully at the future of the podcast. We're committed to this podcast for ever as long as covid's around. But as you know, we, as Chris just noted, are going to be going to a once every two week format. To give some perspective to that, let me just say it's hard to believe that we've actually done 62 episodes since this podcast series started. This includes 57 regular episodes, 3 live updates, one holiday special and one special episode on masks and science on June 3rd of last year. We will continue to carefully look at the podcast information and how it is best serving you. If for some reason we find that there are challenges with the bi weekly or every two week podcast we'll surely go back and reconsider that. Or if there are current and urgent issues that come up, we will surely consider doing a podcast on short term notice to provide you with the kind of information that you have come to expect from us. Let me just say that in this process of hearing back from you, we learned two things. One is the fact that covid is still very much a real part of your lives. And it will continue to be and I'll talk about that today. Even if you're vaccinated, even if you feel as if somehow you've gotten this get out of jail card, which surely is a powerful one, covid will continue to be a part of our lives. And so we hope to continue to address those issues in a way that's helpful to you. The second thing we've learned, and it was really a follow up to a point that I made in the closing to a previous podcast in which I noted that there is so much more good in this world than there is bad. And that we must never lose sight of that in spite of the fact that we're surrounded by bad. And I think this podcast interaction between us at CIDRAP and you in the community has clearly demonstrated that I have seen so much good in the people who listen to this podcast, who respond back to this podcast, who share this podcast. So I just want to leave this opening on that sense of fullness that I have for all of you, for what you do in terms of taking this information and moving into the community. It's in that light that this week's dedication really is to many of us on this podcast. And I say many of us because I'm one of them. This is really dedicated to the people who continue to struggle, the people that aren't quite sure. Do I feel comfortable or not going into that public place, even though I've been vaccinated, even though, you know, I may not be required or may be required to wear a mask? What does that mean? How do I have this discussion about who gets vaccinated and who doesn't? This is for all those people who are out there wondering about how do I interact with family members who may have some form of immune deficiency, immune suppression, whether it be through drugs or otherwise. How do I share the world with my children, particularly those under age 12, with others in the community? What do I do? And so we know that there are many struggles that will continue to move forward. And this podcast is dedicated to you. Now, with that, I cannot help myself and everyone will have to indulge me. If nothing else, you just have to say, well, there he goes again, okay? But, you know, getting to this point in June every year is one of the highlights of my year. I love light. I'm happy to share with you that here in Minneapolis/St. Paul, the increase in light over the course of the last week has been 17 minutes 57 seconds. Think of that. That's pretty remarkable. We're now at 15 hours, 15 minutes and 40 seconds of light compared to where we were at the winter solstice of 9 hours and 4 minutes and 39 seconds. And we will continue to gain also slowly more light between now and of course next month. So thank you again for being with us today. I hope that the information we provide you is what is helpful to you as we all navigate this world of covid.

**Chris Dall:** [00:06:34] So, Mike, although global covid-19 cases have declined now for the past four weeks, the pandemic is still raging on in India, Southeast Asia and Latin America and the Caribbean, where the death toll from the pandemic passed one million last week. Do you think this is the last big wave of the pandemic or is it too early to tell at this point?

**Michael Osterholm:** [00:06:58] Well, after living through the B117 introduction here in the United States in January and February, and considering the implications of that relative to what had happened in Europe in just the preceding months and then realizing it didn't happen, like many of us thought would, my level of humility for predicting the future has taken on even a new measure of caution. That doesn't mean we shouldn't try to understand and predict what's happening, but we have to also appreciate that these variants are doing what they're going to do. And how they impact on the world I think is still a big question. We have to understand that today with 8 billion people on the face of the earth, we still have a lot of people who have not yet been infected with this virus for which they will be the cases of tomorrow, next week, next month, next year. And so that I don't believe for a moment that we have, in a sense, infected the whole world so that either people have developed immunity following infection or have died or have been vaccinated. There's a lot that are not in those three categories. So to talk about what the future might look like, I think we have to again, come in with a real dose of humility. I think that the pandemic will continue to rage around the world in countries that have not had access to vaccine. When you look at low and middle income countries right now, less than 1/2 of 1 percent of the population in those countries have had access to vaccine. These are still large forests just waiting to burn with this virus. And so from that perspective, consider what's happening right now as hardly the final act. If we do look at global numbers, I am happy to report that we're seeing the numbers continue to come down, even with the potential deficiencies in reporting. Last week, 4.14 million cases reported over the week. That's down more than 687,000 from the previous week. And it's mostly due to declining cases in Europe and Southeast Asia. More specifically, India is actually decreasing right now. Deaths are also down nearly 2,000 from the previous week. It last week was at 84,300 deaths. But we do see regions with increasing cases. South America had an 8 percent increase in cases over the past week, sub-Saharan Africa 19 percent, and East Asia and Oceania 5 percent. Let me just make a comment about sub-Saharan Africa. I think this one is, in fact, the next powder keg that's ready to blow. Much as we saw what happened in India, I think that we're going to see potentially some of the similar issues in Africa. Recently, I've seen data showing that while the continent's overall average age is much younger than the rest of the world, with many more people under age 29 than anywhere in the world, and these people typically experience a milder illness, we are seeing an increasing picture of severe illness in Africa and I think we're going to see more activity there. Closer to home with Latin America, we've now surpassed one million total covid deaths. As you mentioned, as of last week, this is 30 percent the global total. And despite less than 9 percent of the world's population is from this region. So 30 percent of the deaths, 9 percent of the population. If you look at the number of deaths in Latin America, about 90 percent have come from just five countries: Brazil, Mexico, Colombia, Argentina and Peru. If we actually look at incidence of new cases, 8 of the world's top 10 countries with the highest average new daily cases per capita are in Latin America. Uruguay is number 2, Argentina 3, Costa Rica 4, Paraguay 5, Trinidad and Tobago 6, Colombia 7, Chile 8 and Brazil 9. So right here, not far from home. And basically the Western Hemisphere, you can see the impact that this is having. Of note, after a record high peak in mid-April, Uruguay saw declines in cases and deaths, but now they're back on the rise again. The highest 7 day average for new daily deaths per capita in the world has occurred there at 1.6 daily deaths per 100,000 residents. And why this is occurring, we're not sure. P1, the variant that originally was discovered in Brazil is surely playing a key role there. Paraguay has the second highest 7 day average of new daily deaths per capita in the world and the numbers continue to climb. Argentina is battling its largest surge of cases and deaths to date, leading the country's president to order a national lockdown for the next week and a half. Of note, Argentina has the third highest per capita death rate in the world. I just want to reiterate something that I had emphasized before. Here we have India, Pakistan and Nepal, one of the clear real hot spots in the world, and then we have this area in Latin America, including Argentina, Paraguay and Uruguay. And note that they are both in very interesting geographical positions. Nepal, India and Pakistan are at 30 degrees north latitude from the equator and Paraguay, Uruguay and Argentina are at 30 degrees latitude south. Here we have these two groups of countries that are equal distance from the equator. And if there should be seasonality found in terms of occurrence, according to winter months, you would expect that we'd see just the opposite of what is happening right now. And so I'd be very cautious about interpreting how we look at the issue of seasonality. And I think these two countries really help demonstrate that. We're going to talk later about Japan and the Olympics, but just emphasize that right now, overall cases in Japan are starting to decline. But certain cities in the country are experiencing major challenges, which is now being attributed to B117 and something that again, is happening in Japan that just didn't happen here like we thought it might. Osaka, the nation's second largest city, is running out of hospital beds, ventilators and drugs. And this has really been a huge challenge for them given the fact that the Olympics are on their way. We've seen the director of the Kindai University Hospital in Osaka stating this week, "Simply put, this is a collapse of the medical system." That's what they're seeing there right now. Only 5.2 percent of the population has received at least one dose of vaccine. And less than 50 percent of health care workers there have had vaccine, which, of course, is a challenge going into this continued transmission and the Olympics. As you also may know, on Monday, the CDC issued a level 4 travel advisory for Japan, telling all US travelers to avoid all travel to that country. In terms of Africa, after a 5 week decline, cases are now starting to increase there, with several countries reporting substantial rises, including South Africa and Kenya. In Europe, nearly all the European countries are experiencing relatively low levels of covid activity. This is great news. Just one country in Europe made the list for the top ten countries with the highest new daily case rate per capita. Guess which one it is? Sweden, number 10. And this has really been a, again, another commentary on how countries handle the pandemic and are they doing the right thing? Let me just close out Europe with an update on the U.K. because it's been mentioned repeatedly with regard to the new variant first seen in India, the B1617.2. And right now, with 57 percent of the population having received at least one dose of vaccine and 34 percent fully vaccinated, cases and deaths in the UK have plummeted since the record peak in January. This is great news. The 7 day average daily cases now is about 2600. The average daily deaths is only 6. But despite this success, cases have crept up slightly throughout May, coinciding with the arrival and the establishment of the B1617.2 in various areas of the country, particularly in some areas of England, in some of the a lower socioeconomic status areas where crowding is part of the local picture. There has been an increase in cases due to 1617.2. And we'll have to see where this takes England. Right now, about 50 percent of the cases there are due to this new variant. And while the increase is not what I would call a surging kind of increase, it sure is one of real concern. And we're watching this one very closely. Let me just close out in our neighbor to the north. I consider our sister country, Canada. It has been interesting to watch the different provinces light up with cases over the course of the last four months. Of course, we've talked about the Ontario experience and what happened in the Toronto area, as well as all the area in Canada, right up to the Michigan border across the river from Detroit. We've talked about the challenges with P1 and the occurrence of outbreaks in British Columbia with the Whistler Ski Resort outbreak. And then what happened in Vancouver. Again, that number came down, but now we're seeing major increased activity in Manitoba. And in fact, right now they're airlifting patients out of Manitoba to the other Canadian provinces and the state of North Dakota because they're so overwhelmed with cases in Manitoba. And so why again the delay in case occurrence in Canada so it's stretching out over the months? I don't know. But they continue to see a substantial problem there. So in summary, when you ask what's going to happen on a global basis, I think we're going to keep seeing pictures like I just shared with you. Cases go up, cases come down. Where vaccination goes up, cases go down even more, but some cases continue to occur. But we have so many areas in the world where people have not had access to vaccine. The potential for more India-like surges to occur or more like we've seen in Latin America are surely going to happen. And I just keep reminding us over and over again, this is all about humanitarian response to these countries. Yes, it is. But it's also about a strategic response. It's about how do we protect the vaccines for the whole world, as we've got to stop variant development. The way we stop that is from having basically unfettered transmission occur in these low and middle income countries. This has to be the highest priority right now for governments around the world. And you've heard a lot of discussion over the course of the past several weeks about COVAX and how efficient it is or isn't and moving vaccines. What's it going to take to get more vaccine to people? Not just deliver the vaccines to the countries, but then how does it actually get used on the ground? We've had multiple reports of large numbers of doses actually going to waste because they couldn't get the appropriate refrigeration. They couldn't get people to take the vaccines once they were reconstituted as mRNA vaccines. And we've got just so much more to do. And the United States has to play a leadership role in this effort.

**Chris Dall:** [00:18:44] So let's dive a little further into that B1617.2 variant. This week, Public Health England put out a report on the variant, which, as you noted, originated in India, is now causing a growing number of infections in England. What are we learning of this variance in terms of its transmissibility and whether it causes more severe illness in people?

**Michael Osterholm:** [00:19:09] Well, at the risk of sounding as if I'm repeating myself over the course of recent podcasts, we have to have such respect for these variants. As we have talked about so many times, you know, they came upon us last November as a surprise. We learned quickly that the mutation changes in these viruses could result in more infectious viruses, could result in viruses that cause more severe disease and viruses that could evade some aspect of immune protection from either vaccination or from natural infection. And we continue to learn about what it means to live with these variants. Early on, there was a lot of discussion about the potential for these variants to evade the immune protection from vaccination or as a result of natural infection immunity. I think that has actually been somewhat of a more positive note recently, indicating, at least with the mRNA vaccines and even potentially the other vaccines, that there could be some reduction in overall prevention of infections that still does have a substantial impact on the frequency of severe disease, hospitalizations and deaths. And so I've not seen a variant yet that scares us completely about what it does in terms of immunity. But nonetheless, those other two buckets I talked about in terms of more transmissibility and more serious illness, I think are very real. Right now, work is going on to pin down the characteristics of this B1617.2 and fully understand what it means for the world moving forward. In India, where the variant was first identified, there's been really very little sequencing done to understand just what role B1617.2 is played in their surge, both in terms of the transmission and the severity of illness. There's more robust data available today from the UK, which has released several reports and updates related to B1617.2 over the past week. If you look at the latest UK data, it's very interesting in terms of transmission potential by looking at secondary attack rates, meaning who infected someone else and how many of those people did they infect. And this is all based on contact tracing. If one looks at B1617.2, it appears to have even a higher secondary attack rate than B117, the original variant of concern that we had with regard to transmission. In England, if you look at the B117, about 8.1 percent of the contacts of cases were infected. So in other words, I am a B117 case, on average I infect about 8.1 percent of the contacts around me. With B1617.2, that number is 12.5 percent of the contacts were infected using the very same kind of criteria. Now, this would suggest that the B1617.2 may maybe as much as 50 percent more infectious than B117. There's a caveat that I think is important and we're trying to understand this. These studies didn't really control for vaccination status. It could be that the context of B1617.2 cases were less likely to be vaccinated. We don't know that. But I think right now there's every reason to be concerned that, in fact, this virus is at the top of the heap right now in terms of transmission potential. If we look at the real world evidence of its impact in England right now, it's unclear at this time. There appear to be a number of confounding factors that need to be worked out. As I just talked about a moment ago, this variant is the dominant variant, all of England's local area is reporting high case rates. So clearly it's tied to that. What we don't understand is what are the socioeconomic issues that are also occurring among those getting infected. So we need more information there. If we look, for example, in London, it is likely the dominant variant there right now, but we haven't seen overall cases increasing nearly as much as we've seen in some of these rural areas. If we look at vaccine effectiveness, a comment I made just a moment ago and look at it with regard to symptomatic disease and B1617.2 with B117, you found vaccine effectiveness of 51 percent after one dose, 87 percent after two doses. So that's with B117. If you look at B1617.2, it's only 33.5 percent after 1 dose and 81 percent after 2 doses. So in the end 6 percent reduced. This is still unclear yet exactly looking at the distribution of vaccines and this variant, just what that means, but I think it does suggest that surely with the low effectiveness after one dose of vaccine, there's been concern raised about what the UK might see moving forward in their deferred second dose strategy. We now know that there are still many people waiting to get their second dose. This is something we've talked about before on this program, is many people we want to get vaccinated months ago and said go with one dose now, follow up with the second dose. The Brits really need to make sure that they follow up with that second dose now, given what appears to be this reduced transmission. So let me just summarize the variants issue and say stay tuned. This is a stay tuned moment. We're learning a lot about the variants every week. And there are some weeks when I'm quite convinced, after everything I've learned, that I do know less than I did the week before. I know you hear me say this often, but it's just the honest place to be. We still have lots of questions, lots of confusion. Could there be a variant that will emerge one day that will have a major impact on vaccine protection? It's possible. I hope not. But this is something we have to stay on top of. These variants or the curve ball. Every pitch could be different. And, you know, if you go to the plate as a baseball player and think that that pitcher is going to throw you only fastballs down the middle and that's all you ever prepare to hit, you know, when they throw that first curveball or screwball in there, you know, that can really upset your game. And so that's how I kind of feel with this virus. You know, I don't know which pitch is coming which week with these variants.

**Chris Dall:** [00:25:53] So let's circle back to Japan, which, as you noted, is among the countries that is currently battling a wave of covid-19 cases and has only vaccinated a fraction of its population, yet is still planning, at this point, to host the Olympic Games in July, despite widespread concern from the Japanese public. So, Mike, you co-authored a commentary addressing the safety of the Olympics and the International Olympic Committee's so-called playbooks that appeared in the New England Journal of Medicine this week. What can you tell our listeners about this article?

**Michael Osterholm:** [00:26:23] Let me just start by saying that I was very honored to be a part of the authorship list here on this article, which was published on Tuesday of this week by the New England Journal of Medicine entitled 'Protecting Olympic Participants from Covid-19: The Urgent Need for Risk Management Approach'. The lead author was Dr. Annie Sparrow, who is a world renowned expert in international health, someone who has just been a privilege to work with her. She also served as an adviser to Tedros, the director general of the WHO, has a renowned record in terms of her work on international health issues. Also, Lisa Brosseau from the CIDRAP was one of the co-authors, as well as Bob Harrison, who is with the Division of Occupational Environmental Medicine at the University of California, San Francisco. What we tried to lay out in this perspective was the fact that, as we know, in late July, approximately 11000 athletes and 4000 athletic support staff from more than 200 countries will gather for more than 2 weeks to compete at the Tokyo Olympics. To add some perspective to that, remember that the International Olympic Committee or the IOC postponed the Tokyo Olympics in March 202, a year ago, when Japan had 865 active cases of covid-19 against a global backdrop of 385,000 active cases. And everyone, I think, in planning for the Olympics assumed that it would be controlled in 2021, or that by this now vaccination would be widespread. Well, 14 months later, Japan is now in a state of emergency with 70,000 active cases and globally there are 19 million active cases occurring. We now have variants of concern which may be much more transmissible and we know more virulent than the original strain of sars-cov-2. And from a vaccine standpoint, less than 5 percent of Japan's population has been vaccinated, the lowest rate among all the Organization of Economic Cooperation and Development countries. We are fortunate that both the Pfizer and BioNTech have offered to donate vaccine for all Olympic athletes. But this offer doesn't ensure that all the athletes will receive the vaccine before the Olympics, since vaccine availability and authorization are lacking in more than 100 countries. Some athletes may not take it due to the fact that they don't want to somehow impact on their performance, and even though we have no data that would be the case or in fact, for ethical reasons, they may not want it because they believe that health care workers and vulnerable people should be authorized first. So we can't even say that vaccine is going to be the option that will, in effect, save the Olympics. The medical community in Japan has been expected to serve as the backbone for medical resources for the Olympics. And over the course of the past week, they have made it known that they are going to be really challenged to do that. Fewer than 50 percent of them are vaccinated, but more importantly, they don't have enough doctors and nurses in a number of locations in Japan right now just to take care of the patients they have with covid. They're in a very tough place. I already mentioned that in my introductory comments about Japan and part of the international perspective. But also very important has been the fact that our group spent many, many hours combing through word by word, what is called the IOC Playbooks. This is really their plan for reducing the transmission of virus at the Olympics. And, you know, it's a challenge when you read those. They were really written, first of all, what I would call pre-airborne transmission days. Meaning that there are a lot of things in here that are no longer really valid as a primary means for reducing transmission just because of the fact airborne transmission takes on very different aspects of activities to prevent transmission. It's not simply just being 6 feet apart. And we also find their efforts lacking in something such as simple as each country is supposed to supply their own face coverings and they're encouraged but not required. They don't get into any real aspect of respiratory protection from an environmental standpoint, such as ventilation, where they're asking 3 people to be housed in a single hotel room. So what we did is we really went through the Playbooks as listed and tried to identify all the areas that much more urgent work needs to be done that are based on scientifically rigorous risk assessment, and how they can reduce that risk even at this late date. We know that if something's not done in the next few weeks, it's not likely to be done before the Olympics. But even just being able to distinguish between high, medium and low risk environments and then adjusting accordingly. I think we'd all agree that sailing, archery, equestrian events outside could be considered low risk. On the other hand, if you look at sports that are held indoors and require very close contact, such as boxing and wrestling, are probably at high risk. We've already had wrestling related outbreaks here in Minnesota. And so the Playbooks really need to address the differences among venues, including non-competition spaces. How do people get from the Olympic Village to their venue? It's in buses. What plans have been made to limit the potential for transmission in those kinds of settings? How are people going to be evaluated on a day by day basis with testing and knowing that from the professional sports activities in the United States, comprehensive testing programs done on a daily basis, can really help in identifying cases early in such a way to limit their transmission. What's being done here? And so our hope is that the Olympics can happen. We actually were very careful in this paper not to say cancel them at this point. But because, in part, we understand that the Olympic spirit right now is so important to us. It's one of those few events that can connect all of us as opposed to driving us apart. I think all of us would love to rally around the torch and recognize the values of things that connect us over the value of the things that separate us. So we tried in a spirit of what can be done to have a much safer Olympics happen. But if this doesn't occur in the next several weeks, I think it'll be far too late. And I think it could be a potential disaster with a major super spreading event for the world. This is not an unprecedented request. Back during the Olympics in Brazil in 2016, the WHO actually convened an emergency committee to provide guidance ahead of the Olympics there on the Zika virus public health emergency. Why can't we do that now? And so I hope our paper will stimulate the kind of discussion and consideration I think that all of us need to be aware of and involved with in the sense that every country will be represented here. And this is what we need to do to understand we don't want to turn the Olympics into something that is going to be remembered as a potential disaster as opposed to something that, in fact, is a reason for celebration.

**Chris Dall:** [00:34:09] Turning back now to the US, the country has vaccinated more than half of its adult population, and cases hospitalizations and deaths nationwide continue to steadily decline. But there's an interesting article in The Washington Post this week suggesting that if you look at the unvaccinated population, the virus is continuing to spread, the adjusted covid death rate is similar to what it was two months ago, and the hospitalization rate is as high as it was three months ago. So, Mike, what did you make of this article and what was your takeaway from it?

**Michael Osterholm:** [00:34:42] One has to begin the discussion on vaccinations in the United States with a note of optimism and congratulatory comments about what we've done. It is remarkable that we've been able to administer over 287 million doses of vaccine since the beginning of the effort here in the United States. As you noted, we're now at 50 percent of the total population vaccinated with at least one dose, 39.5 percent with all doses. If we look at the population for those over age 12, which is now the new benchmark since children down to age 12 have been approved for vaccination, we look at 58.6 percent of that group has been vaccinated with one dose, 46 percent with two doses. If we look at everyone over age 18, that creeps up a little higher to 61.6 percent have had at least one dose, 50 percent have all doses. And of course, that very critical group in the age population of 65 years of age and older, now we're up to 85.3 percent have had one dose, 73.9 percent have had two doses. As much as these numbers are really a wonderful tribute to what's happened. We also have to be honest and keep our eye open as to what hasn't happened yet. And as I've shared with this audience in previous podcasts, we kind of live in a world where it's I'm vaccinated community, and an unvaccinated community. If we look at the 10 states that still are at the lowest vaccination levels, they still are lagging substantially below many of the other states. And they are lacking in a way that leaves them very vulnerable for ongoing surges of cases. And I got to believe that they're still going to happen, whether it's B117, whether it's the variant B1617.2, we're going to see these surges. For example, there are counties in the south where fewer than 20 percent of the population are fully vaccinated. And that means that we're going to continue to see surges there. But what The Washington Post study did, and I really congratulate them, I think that it was a very unique piece of work. I think a number of media venues like The Washington Post, New York Times, others, have really brought additional clarity to the epidemiology of what's happening in our country. And what they did is used a very novel approach by looking at how many people have been vaccinated in a given area, for which we have pretty good data, then subtracting that number from the total population, then concluding that that's the unvaccinated population. And they also then added in a margin of error there so that the people who were vaccinated weren't fully vaccinated yet at a certain time. And that's where they came up with these numbers to indicate that, in fact, we really live in two Americas. We really do see these two different populations, the fully vaccinated or partially vaccinated population, which does continue to increase each week, much slower now than it did a month and a half ago. And then that population, which is not vaccinated, for which we do see this increased occurrence of cases, that is actually if it were to be extrapolated to the entire US population, would mean we would see really high numbers. So it just reminds us that when people say, "Well, if enough people get vaccinated, you know, basically transmission will stop." And it feels like that to many people right now as the case numbers come down. But amongst those who are unvaccinated, this is still a real challenge. And I think it even speaks to the issue of this concept of herd immunity. I think it's going to take a level of vaccination that will never achieve herd immunity in our populations, but it sure can drive transmission down. So this is just a reminder, this particular effort in The Washington Post, I'd urge you to go review it, we'll provide a link to it on our website here for you. And I just think that it speaks to the fact of why you want to get vaccinated and not count on having everyone else around you get vaccinated and you not.

**Chris Dall:** [00:39:17] The debate over the origins of the coronavirus and whether it could have leaked from a laboratory in China continues to fester. This week, the Biden Administration issued a formal call for a transparent probe into the origins in a statement to the World Health Organization. Mike, given all the geopolitical challenges, and there are many, how do we get to the bottom of this issue?

**Michael Osterholm:** [00:39:41] I have from the very beginning tried to nuance this issue, and as so many things that require nuancing with covid, that's very, very difficult. As you've heard me say it's often like trying to thread the semi through the needle without scratching the paint. This is one of those. Let me just give you my, again, personal biases on these issues. I come from a world of biosecurity where I've raised concerns in the past, particularly around influenza virus work, about the potential for, one, either enhancing an organism to actually be transmitted more readily to cause more severe disease, this kind of gain of function, the term that's often used, or even one that's dangerous but worked on a laboratory where it might escape. As I've shared with you in the past, I served for 7 years on the National Science Advisory Board for Biosecurity here in the United States, which our entire emphasis was on this very kind of discussion about either the potential for enhancing organisms to do things that we'd rather not have them do in real life, but maybe want to understand what those changes might be so that we could anticipate what it would be like if that really happened in Mother Nature. Or, the potential for any dangerous agent to get out of a laboratory because of some laboratory accident. So I have a natural suspicion, you might say, about the potential risk of this kind of work. Now, having said that, I want to believe I will objectively evaluate whatever information comes forward to say, is that what happened with this particular virus? And the challenge I have right now is I'm less worried about weaponizing the virus as opposed to weaponizing the words to talk about what happened. And I think that Mother Nature surely could have done this on her own. You know, SARS and MERS were two examples of where Mother Nature did that with a coronavirus, with no one suggesting that there was a manmade element to that. But I'm also open to the fact that could there have been a lab accident, in particular, where it did escape out. But the challenge we have right now, it's become very personally driven. For what it's worth, there is not any daylight between the comments that Dr. Tony Fauci has said with regards to what he believes happened and what I believe. I think it's clear that this surely could have been a natural occurring event, but we haven't been able to rule out that it somehow was an accidental release out of that lab. And that's different than saying that's what it is. And right now, there are those that want to say this is exactly what happened. The Chinese intentionally did this, or it was unintentional but they covered it up and they're all in that camp. Or those who say there's no way that this could have been an intentional event, only Mother Nature could have done it. And so I just come back to the fact that it is important to try to understand this if we can. Only so we might better anticipate future pandemic emergences with coronaviruses. But I wish we could take the rhetoric down and I wish the Chinese would be much more transparent. Did in fact, we have cases occurring in parts of China well before the December recognition in the Wuhan fish market? Were there in fact ill employees working at the Wuhan Institute of Virology that did happen in that time period, immediately before the outbreak began? All these questions that we still need answered. And what I worry about is it's become such a divisive and politically charged issue that we may never find the truth now. And maybe we wouldn't anyway, even with the most open and comprehensive investigation. But at the same time, I think spending all this time trying to blame one country for whatever is not going to be helpful in getting us to the truth. I've said all along that there were problems with the early investigation, no question about it. But was it a national cover up? I don't think so. I don't think any more than might have happened here in the United States if, in fact, we had an emergent problem. The idea that the Chinese didn't have others come in from around the world to help out, I look at what would happen if it happened here in the United States? Would we have invited China and Russia to come in and be part of our investigation? I don't think so. It doesn't mean the Chinese are still not yet accountable for what did happen in those months before December 2019 in communities throughout China. Were there potential cases of a covid-19 like illness? What blood samples are available today to know and understand what happened? What do we really know about what went on inside the laboratory? So I think there's general agreement, whether it's WHO or whether it's our government, whether it's notable individuals like Tony Fauci, etc., that all say 'we just want to know'. And so we're going to need to get more information. And for the Chinese government to push back on trying to get that information is not going to help anyone. At the same time, to weaponize our words and to get into this very vicious battle about cover up and did the United States fund the work that ended up causing this? And, you know, are some people fully responsible for all these deaths? I don't think that's helpful either. So if I had to take a bet right now on it, I do think that the data still strongly supports the fact that it could have very easily been a real spillover from the natural animal reservoir of animals that that would potentially be infected with the coronavirus. I would also not rule out that it could have been in the laboratory in Wuhan and that there could have been an accident where someone got infected and took it out. I, for me, the the former is much more of a likelihood than the latter. And we'll just have to wait and see. And I just hope we can somewhat downgrade the rhetoric and upgrade the science.

**Chris Dall:** [00:46:27] And now to some listener e-mail questions. The first one is from Andrew, who wanted to know more about breakthrough infections. He wrote, "What does a breakthrough infection really mean? Does it mean the vaccine hasn't prevented infection or that it hasn't prevented illness? Isn't it an important distinction? It seems a breakthrough means the virus is somehow evading the protections of the vaccine. But what are the covid vaccines really supposed to do? Are they supposed to help the immune system completely shut down the virus before it can reproduce enough to cause a positive covid test? Or are the vaccines simply supposed to protect us from illness even if our vaccinated bodies can still carry the sars-cov-2 virus for a period? I'm thinking of the recent case of the Yankees outbreak. Most of the cases were asymptomatic. The media has been calling all of these breakthrough cases. But are they really breakthrough if they don't cause illness? Are the vaccine's working 100 percent as intended in these cases? And if they are working as intended, maybe we should stop calling them breakthroughs?"

**Michael Osterholm:** [00:47:25] Well, first of all, there's a lot to unpack here, and I appreciate the depth and the breadth of the question. But let me begin with just some clarity about what do we mean by breakthrough infections. Just as the word infections indicates, it's not at all necessarily describing clinical illness. It means that after being vaccinated and having an adequate period of time, i.e., more than two weeks after my last dose, I should have a level of protection that should keep me from becoming infected. We in public health would be very willing to take the outcome of just avoidance of illness, particularly a serious illness, hospitalizations and deaths. But that is a different thing than actually getting infected. So let's just be clear. When we talk about breakthrough infections, we're talking about people who are infected and they may even be asymptomatic. And surely that is the potential with what we're seeing nationally of individuals who are found to be positive on screening testing that's going on in workplaces or schools or places like that who are fully vaccinated. The case of the Yankees was just that, they were not ill and they were found to be positive, meaning that they did get re-infected but didn't have clinical signs and symptoms. So breakthroughs do relate to infections with further descriptions, of course, of who gets sick and who doesn't. Now, the challenge has been, what do we know about these breakthrough infections? Why are they occurring and what is their severity? What is the proportion of those individuals that have only asymptomatic reinfection or infection for the first time after having been vaccinated? And what does it mean in terms of serious illness, hospitalizations and deaths? I've talked about that in a previous podcast and tried to cover what we might expect to see, knowing that if you're vaccinating millions and millions of people, even if only a small percentage of those people are getting exposed, meaning vaccinate 100 people and only 8 to 10 percent get exposed over the next few months, that's then 8 to 10 out of that hundred. And of those, what percentage actually then go on and actually have a breakthrough? Which we know today is a very, very small percentage of that. So trying to understand breakthroughs, though, is important because of the potential of who some of the individuals are that are getting vaccinated. Number one, is if I'm immune compromised or immune suppressed, do I have a higher likelihood of having a breakthrough infection after vaccination? And we believe the answer is absolutely yes. This is a concern. I've raised it here on previous podcasts. We're going to continue to address this. You are some of the people that are in no man's land, and I feel very badly about that. We need to get you more information about what it means to actually have any number of immunosuppressive situations, whether it be from drug related therapies you're taking, or as a result of some impact that you've had on your immune system through other disease processes. So this is one area that we have a challenge, is understanding why breakthroughs occur and then describing what the seriousness of those breakthroughs are. So if I'm someone who's immune suppressed because of a certain drug, I'm vaccinated, I have a breakthrough, is it an infection only? Is it illness? Is it severe illness? Is it death? And so this is a very important part of what we're trying to describe here. And I think that it was, I think to some surprise, when the CDC announced this past week that, in fact, they had over 9245 breakthrough infections in fully vaccinated people reported to them. And when you look at that, you say, "Oh, my, that's a lot of people." Well, first of all, let's be clear, that actually is only the tip of the iceberg, because in Minnesota alone, we had 2249 breakthrough cases reported out of 2 million people who were vaccinated, grant you, that's less than 0.1 percent. But our 2249 compared to the 9245 reported to CDC, you can see there's got to be a lot more out there that are occurring. And why are ours not fully counted in the CDC numbers? It's because CDC recently decided that they would only address people who had severe illness or were hospitalized as breakthrough cases, making the point that this is all that we were attempting to do is make sure that we avoid serious illness. Now, I happen to disagree with that position. I think that that's not where we ought to be right now. We should be looking at every potential breakthrough, knowing that that's going to be a lot more work. But that's why we got more additional public health funding was to do that. And with many fewer cases out there, where are we right now using our public health teams to do follow up? We should be working to set up systems where, if I am found to have become infected and I have been previously vaccinated, we should investigate that case immediately. Even if this milder illness, we should do everything to get a hold of the viral material, the swab that was used, in this case with a PCR test, and to make sure that those viruses get sequenced. Right now, less than 5 percent of the breakthrough cases are being sequenced because right now there's a big delay that often occurs between becoming ill, getting tested, having the test results get to a state or local health department, having then the results recognize that this is a vaccinated person and then going back to the lab and getting the sample. To date, only about 5 percent of all the people who are breakthrough cases have actually had a viral sample obtained and sequenced. Which we should be looking at these to find out, even in mild people, are the variants having an impact here? Is it more likely to be occurring as a result of some underlying immune suppression that is occurring? And while I surely understand the importance of looking at the most severely ill individuals and in reporting on them, I think at the same time it really is inadequate to only look at those individuals and not the entirety of what's happening. So I think we're missing very, very important data right now that is taking place in our communities that could be really important to us in terms of understanding a new emerging variant situation.

**Chris Dall:** [00:54:23] The next question we received this week was in regard to comments you made during last week's episode. This one is from Robert who wrote, "I have a question about your comment that you do not want to be in a restaurant, movie, etc. with an unvaccinated person. I assume your concern for unvaccinated people is that they will become infected, which makes sense to me. However, are you also concerned that you might be exposed and get covid-19 even though you were vaccinated? Does your concern about being with an unvaccinated person also include being outdoors with sufficient distance from an unvaccinated person? If you could clear that up, I'd appreciate it. I have a good friend who refuses to get vaccinated and I'm concerned about meeting with them, even outdoors." So, Mike, this question really gets to the issue of personal risk assessment, doesn't it?

**Michael Osterholm:** [00:55:09] Thank you for raising that question. I think this is a very important issue, and I want to be really clear about it. What you're hearing from me, this is my personal voice as well as my professional head speaking. When I talk about my concern being in closed spaces with unvaccinated people, I'm actually talking about the risk of them transmitting the virus to me, even though I'm fully vaccinated. I've just got done sharing with you information on breakthroughs. They're very rare. They're very rare, but they occur. And this goes back to a point that I made last week also about the concept of immune passports, this general concept of knowing that someone has been vaccinated, which while the vaccination status may not be a perfect marker of absolute protection, it surely gives you a very, very high level of security that that person's not going to get infected and transmit the virus to you or someone else. So you know what? I don't want to go to a restaurant or sit at a bar or go to a theater and sit next to somebody I don't know who says I'm not going to get vaccinated. And they very well may be in the earliest stages of being infected and infectious, and they could infect me as a breakthrough case. Now, all of that is a relatively rare phenomena to occurm, grant you. But look at how many cases we continue to see transmit in our communities and we do have these breakthrough cases. So while, you know, I'd like to be concerned about this individual sitting next to me at a theater who's unvaccinated, you know, my real issue is don't expose me to this virus. I've done everything I can to minimize my likelihood of getting infected. And this is why I think immune passports, or some kind of a sense of this program, will actually take off, despite many in the political world saying, no, it won't happen on my watch. Just this past week, another state passed legislation signed into law by the governor prohibiting immune passport like situations from occurring. I think this is really misplaced. Just like as I said before, taking the Clean Indoor Air Act movement that occurred in the 1970s and 80s, getting smoking out of our bars and restaurants was not welcomed by those smokers. I understand that. But when you look at the private sector impact, it was just the opposite of what many people predicted. So many more people who didn't smoke, who are now willing to come out to restaurants and bars or go to locations where they would have otherwise spent a smoke filled night, are now willing to do it because of the fact that you can't smoke. I think there are many people, and I know them in my own personal life, who would actually pay more to go to a restaurant or a bar or fly in an airplane where everyone in that environment were basically guaranteed through some kind of a immune passport to show that they've been vaccinated. Now, that doesn't mean people who aren't vaccinated can't go to other bars and restaurants if they want, but they're well described then as 'will take any comers'. So let me be really clear. I care about the person who is not vaccinated. I want to do anything I can to get them vaccinated and work with them however possible. But in my public place, I don't want to breathe their air, OK? I don't want to breathe their air. And I hope that people take that point of view and say, you know what, I'm not here to shun you. I'm not here to somehow make you feel like you're, you know, less a member of our society. But I don't want to breathe your air. Get vaccinated, and it'll be a different situation. And so I know that sounds hard, but it's important. As far as the outdoor air, let me just come back to say that under most conditions, outdoor air is the kind of the solution to pollution is dilution approach, OK? The virus will dissipate readily in outdoor air. And so if someone is not vaccinated, and I'm standing back some distance, you know, six or more feet, not because of droplets just let the air move the virus and dilute it out, then you can have that conversation and you can go for the walks if you maintain those distances. Where my one concern about outdoor air has come in, I shared this very scenario with you last week about the outbreak that occurred at a concert we had here in Minnesota, an outdoor concert last July 4th, where people were packed like sardines into an open area where they were shoulder to shoulder dancing, singing with the band and spending three or more hours there, and there was an outbreak that occurred. Over 31 cases in the people who went to that concert. And so that is the rare exception where with outdoor air your standing close to each other, you're not moving from one location to another, and there was a super spreader in that crowd and you're all shoulder to shoulder nearby, then you can have transmission. Those situations are going to be rare. But with summer coming, they surely could happen.

**Chris Dall:** [01:00:17] Mike, can you share our latest pandemic act of kindness with the listeners?

**Michael Osterholm:** [01:00:23] This is another one of those wonderful family stories sent to us by Michelle. And she wrote, "For my act of kindness, I wanted to share a story about my family. My parents will be 86 in July, and they live independently in their own home over four hundred miles from me. Throughout this crisis, they have made a point to stay in contact their friends, especially those of whom live alone. Their donut shop group would get donuts and meet in the parking lot in a circle when they couldn't dine inside. They would invite friends to sit on their porch when their friends needed some human contact. My husband, two sons, aged 30 and 32, and daughter in law, aged 33, are all vaccinated, as are my parents. So we planned a weekend together at the house. I told mom to make a wish list of things they needed done. We spent the weekend preparing food, deep-cleaning their house, and cleaning up their yard and planting flowers. All the things on their wish wish was completed. They were so appreciative and the kids said, 'we need to do this every six months'. I feel so thankful to still have my parents. And it was such a joy to give them hugs and kisses. Michelle." You know, we picked this particular act of kindness as to remind all of us that there are those things yet we can still do with our families and our friends. But it just takes that creative imagination to think about let's do it. So to think about spending this kind of a family weekend doing what hadn't been done before is just to me, again, another one of the opportunities in the pandemic, not just one of the disadvantages. And so, Michelle, thank you for sharing this with us. It was a great example. I hope it motivates others in the podcast family here to think about how might I do something like this with one of my family members or friends? And to be able to experience this kind of a weekend where you're involving three generations and that it allows for not only good feelings, good times, but also some good things got done. So, Michelle, thank you very much.

**Chris Dall:** [01:02:37] And we would love to continue hearing about those pandemic acts of kindness, so if you want to share them with us or if you want to share memories of a loved one, friend, or colleague who died during the pandemic, please email us at OsterholmUpdate@umn.edu. Your closing thoughts today, Mike, on our last weekly episode of the podcast?

**Michael Osterholm:** [01:02:59] It's hard to believe we've gotten to this place where after this many podcasts, we are now talking about a new format or moving forward. Again, we're going to be here at just every two weeks instead of every week. We hope you'll stay with us and that the information we're providing you is still useful to you, even though it's going to be every two weeks. We've thought a lot about this and we appreciate this very unique relationship we have with you as a podcast family, and what we at CIDRAP hold true is the important contributions that we can make during this pandemic. And I think that today's words that I would leave you with really reflect that feeling of that we're still together. We're still in this, OK? We're not God. We may work a little differently, but we're not God. So I've actually gone back to the oldies but goodies again and picked out some words that I used in the January 21st episode An Imperfect Storm. The song lyrics I've chosen today are from a 1945 Rodgers and Hammerstein musical Carousel. It's been recorded by numerous artists over the years, including Frank Sinatra and Judy Garland, Elvis Presley and Gerry and the Pacemakers. It's also become well known in England as the anthem of the Liverpool Football Club and in the early days of the pandemic, became the anthem of support for medical staff, first responders and those in quarantine. And of course, I'm sure you all already are aware of what I'm talking about. The title of the song is 'You'll Never Walk Alone'. "When you walk through a storm, hold your head up high and don't be afraid of the dark. At the end of the storm, there's a golden sky and the sweet silver song of a lark. Walk on through the wind, walk on through the rain. Though your dreams be tossed and blowing, walk on, walk on with hope in your heart and you'll never walk alone. You'll never walk alone. Walk on, walk on with hope in your heart, and you'll never walk alone, you will never walk alone." I hope you feel that about our relationship, our podcast family and the team at CIDRAP. We're still here. You'll never walk alone. We will be with you every other week and we will continue to very much value and appreciate your input, your thoughts, your questions. I'm sorry that we can't do more to answer all of them or to respond to each of them. We'll also each week continue to remember, though, that all the numbers I talked about today are real people. They're someone's father, mother, grandfather, son, daughter, friend, cousin. They're people. And that's going to be important as we go forward that we just not get so lost into the numbers we forget in the first instance where each of these numbers come from. And last but not least, as we get into some of these very divisive issues around masks and what's happening in our communities and opening up and feeling unsure of ourselves, all we can do is rely on those most basic instincts that I think will serve us well. And those are kindness, patience, understanding. You all know that that's what gets us through. And so I leave you on this podcast with one last request: help get people vaccinated. Everybody has to go find their two people this week and get them vaccinated, OK? And always remember, kindness, patience and your safety are first and foremost. Be kind. Be patient. Be safe. Thank you very much for being with us today.

**Chris Dall:** [01:07:13] 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. The Osterholm Update is produced by Maya Peters, Cory Anderson and Angela Ulrich.