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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. It's been six months since the COVID-19 pandemic began, and since those first reports of a novel pneumonia-like illness emerged from China in late December, the coronavirus has spread like wildfire, sickening more than nine million people around the world, and killing more than 473,000.
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In that time, we've learned much about how this virus spreads, how it causes illness, and who it affects most severely, but there's still so much about the novel coronavirus that remains a mystery. So for this episode of the Osterholm Update, Dr. Osterholm is going to flip the script a bit, and we'll focus on both on what he knows and what he doesn't know about the coronavirus, but first, Mike, who would you like to dedicate this episode of the podcast to?
DR. OSTERHOLM: Well, thank you very much Chris. It's so good to be with you again, and you know I've thought a lot about how have we gotten through those first six months, and what has made it possible for us to be where we're at today, even though we're still in the midst of this pandemic, a lot of good things have happened, and I think that we must never for a moment take for granted our essential workers in this country, or for that matter around the world. They have performed, you know, ways that many of us have no idea, that have made our lives as least tolerable through all of the situation,
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and so when you look at the groups that really fall into that category of essential workers, and this is from the Center for Economic and Policy Research, they really fall under the category of grocery, convenience, and drugstores, public transit, trucking, warehouse, and postal service, building cleaning services, health care, and its many different aspects, and childcare and social services. Those are some of the unsung heroes that have made it possible for us to get through this. There are 30 million U.S, workers in these six broad work categories. One half of the workforce today in this country are women, yet two-thirds of those in the essential worker categories are women. People of color, including Black, Hispanics, Asian-Americans, Pacific Islanders make up 41% of the essential workforce, yet they only make up 26% of our nation's population.
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Immigrants are over-represented in such things as building cleaning, 17.3%, and one-third of all the families in the essential work categories live in the low-income categories. These essential workers have been absolutely key to our ongoing efforts to survive day-to-day as a nation, and for that matter as much of the world. So today I really dedicate this podcast to them. Thank you, on behalf of many of us. Many who are grateful without even understanding how grateful we are for what you've done, and how you will continue to be there as we make our way through this terrible pandemic.

CHRIS DALL: Mike, in April, CIDRAP put out a document that laid out different scenarios for the coronavirus pandemic, some of which were consistent with past influenza pandemics, but you told me to press over the weekend that you have concluded that the influenza scenario doesn't apply anymore. Why not?
DR. OSTERHOLM: Well, we finally have enough information for me to feel comfortable moving from the second inning to a third or fourth inning of this game.
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It's a situation where over the course of the last three weeks, we've seen the epidemiology of this disease, particularly in the United States, but also in other parts of the world, giving us enough information to get a sense of what this scenario is likely to be over the course of the next few months, and the reason I concluded that it was not that third scenario of the three that we talked about, that was an influenza-like scenario, one where there is a wave of cases that then gives way to a trough, and that's what makes for a wave, is the fact that you see and big increase in cases without any human intervention, the case number is substantially decreasing, and then increasing again a second time, and what we're seeing right now in the United States in particular, but in other parts of the world, is just a hot burning forest fire of cases, where, as I said on Sunday at Meet the Press,
5:00
I feel like the whole human race is the wood that this fire is trying to find and burn, and we're not seeing any evidence of slowing down right now, anywhere suggestive of that this might be a wave phenomena, which would by now, if this were traditional influenza, be happening. What we are seeing is a combination of the two other scenarios that we laid out, one of the kind of a slow burn, and then one where almost the hills and valleys, kind of dimpled landscape, where some areas are impacted for a period of time and in other areas are not, but then they more or less switch off as time goes on. If we look at what's happened in the United States, in just the last month, that's been remarkable. Today we have twenty-six states with increasing cases. Among those 26 states, we are surely talking a lot about Georgia, Florida, Texas, and Arizona.
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There have been major challenges there with substantial increase in cases, and I'll talk more about that in a moment, because of those states many people have concluded "Aha, must be the warm weather. It has to be the warm weather," even to the extent that they think, "Well, maybe it is indoor air that's involved, but it's because of air conditioning not because of heating," but when you look at those 26 states even further, the states of Montana, Wyoming, Idaho, Oregon, Washington, Utah, Delaware, and even Northern California, where today it's only 63 degrees in San Francisco, have also seen major increases. Those eight state areas do not represent what I would call the air conditioning zone. So there's something more happening here than just the issue of air temperature and this whole concept of seasonality.
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You could surely conclude that based on this, that the reopening of the economy played a very key role in people being in much closer contact, in public settings, and enhanced transmission. However, if you look at the remaining states and the District of Columbia, there are nine that

actually have level case occurrence right now, and have had for the last two weeks, with no evidence of increase, and sixteen states are actually seeing a decrease in the number of cases. So there are a total of 25. Now, why is that? I don't know. I think that anybody who tells you they know, I would be very cautious about taking much more advice from them. It's possible that over the upcoming weeks, we'll see these 25 states and the District of Columbia, experience the same thing that the other 26 states are, and that there will be an increase in cases,
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but we don't know that, and so while we still are trying to understand where this is going in our country, I think the data from the 26 states and the District surely give us enough to say that, in fact, this is not going to go away. This is going to keep burning. Why is it not occurring like this in other locations around the world? Well to some degree it is. It's almost a game of whack-a-mole. We've seen New Zealand, which has accomplished a remarkable feat of at one point eradicating the virus off the island as best as they knew, over the course of the past two weeks, have seen nine new introductions of the virus into the New Zealand area, as a result of individuals flying in. Now, they were picked up by the quarantine services of the New Zealand government, which is much to their credit, but it just points out how this virus will continue to transmit around the world.
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We're seeing similar situations in Korea, in Japan, it's just a challenge, and look no further than China. The outbreak right now in Beijing, the other cases that are occurring. So nothing is stopping this virus in a way that means that there would be a second wave, but rather it's just whenever it can escape out of that leaky bucket, it's doing that. I now believe that we're just going to see the thing keep burning until we get from that five to seven percent of the population, with some kind of durable immunity, and we'll talk more about that later, what that might mean, to a point of getting to 60 or 70 percent to the population hopefully immune against this infection. Now as we have said many times here, remember that we can get there also with vaccine, if we get an effective vaccine, but we can't hope for that right now as being the answer. So what can we add to understanding the epidemiology of the disease at this point. First let me just remind us all how humble we must be.
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We don't necessarily understand it, but let me, for an example, share with you an observation. In early March the average age of cases in Florida was about 65 years. This past two weeks the average age of new cases is 36 years. Remarkable difference. Now, why is that that that's changing? We don't really know. It's clear that there is much more transmission right now in the general public. It's not just in one specific work group, such as migrant workers. It's across the board, because some have suggested more testing is occurring, that that might just be picking up more infections that were already there, and had been for a recent month it's just now we're finding them, but because the rate of positivity is going up substantially in Florida, that's not the case either. These are new infections, and we're really picking them up so it's not just more testing. So we don't understand that.
11:00
If you look at where we were on June 1 in this country, the seven day moving average, meaning if you take the last seven days an average them, which gives you a bit of a better estimate we

were seeing about 22,238 cases a day. On June 22nd we were up to 29,180. Almost 7,000 more cases reported per day. That is not just a function of testing. I hear that often, but let me remind people right now, that we are not the big testing country that some have suggested we are. If you look at testing per million population, we are now 26th in the world. To give you some idea, we have tested about 88,668 people per million. That's 88,000 per million. Denmark has tested 162,000 per million. UK has tested 122,000 per million, and even Russia has tested 120,000 per million.
12:00
Excess of what we've done, so please don't be misled into thinking that what we have here is really a fake outbreak as it's been inferred by some. This is really happening and we don't understand why. Now, one other observation that we should celebrate, I guess, it's still, seems odd to say that when you understand I'm about to say. On June 1st, we had an average 1,019 deaths reported per day. Today we will have about 627 deaths reported, that's a seven day average. That's almost a 40-some percent decrease. Now cases are continuing to increase, and deaths are going down. That's good news from the standpoint of deaths, but what's happening? Well again, we don't really know. It surely is different in some areas of the country, and depending on the population that is being impacted.
13:00
I think it probably can fall into three general buckets. One is just younger cases. We are seeing younger cases now which are doing better. Some still are seriously ill and dying with no underlying health issues noted, although those numbers are small there are more who are younger who do have some underlying health conditions, primarily people with obesity, but on a whole it's a younger group of cases. The lag time may play a role. We know deaths can, in fact, take sometimes several weeks to catch up with the reporting, but if you look at the trend since April, it has been a downward trend for literally each and every month, and so I'm not sure how much that plays. I think one really good news piece is we're getting better care. People in the ICU units are understanding, in ways they didn't in March, how to treat these patients whether it's mechanical ventilation,
14:00
the immune suppression issues around the type of conditions we worry about like acute respiratory distress syndrome, we're understanding better how to handle some of the vasculitis issues, in the stroke, and so forth, and so I think a lot of the credit goes to the ICU teams that are doing a much better job without that many really new armaments to work with. It's not like they have a whole new set of drugs. Remdesivir plays some role, we know that corticosteroids may play some role, but the bottom line is: this is good news. Now this could change tomorrow, If we see transmission from this younger age population now mixing back in with the older population, that exposure, we could surely see a large number of older individuals becoming infected, becoming seriously ill, and dying. That we have to understand. That's why distancing still remains very important. You know, I will say now, I'm sure there are some of you wondering, I did get together with my family over Father's Day.
15:00
It was one of the most joyous times of my life to see those kids and grandkids, and it was distancing, and it was hard for those young grandchildren to do, but I did, but thought to myself,

"I wonder how many family events took place on Father's Day, where the Father's Day gift that one of the children gave their father was a COVID infection," you know, I worry that we don't yet quite understand the vulnerability of the older population to serious disease, and somewhat of the casual nature we're seen right now in the younger population of this infection. So to sum this up, let me just say we still are in uncharted territories. We don't know exactly what's going to happen, but I am more convinced now than ever it will be an ongoing constant burn. You may recall on these podcasts months ago, I was quite strong in my comments about saying that I saw no reason why we should suspect there would be a seasonality,
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and that we would see cases decrease in the summer, and that was despite the fact that there were those experts out there saying, "oh no, no, this is going to go away. It'll come back in the fall with influenza, but it'll be gone for the summer." Well, I think we're in summer right now, and you know what's happening, but where do we go from here? Just remember: viral gravity will keep this virus moving. We can't lock down. We can't shut down. We can't bring the economy to a halt, because we will also kill society, but we still have that absolute need to control the transmission of this virus, so that we don't have thousands and thousands of additional people dying from it, and so inning three and four, for those who thought that I couldn't count beyond two, who actually would email me kindly asking me when was I going to go from inning two to inning three. As is, hopefully a good scientist, I waited until I had the data, and made an assessment, and now we're on to inning three.
17:00
CHRIS DALL: Since the early days of the pandemic in the United States, one of the patterns that has emerged is the higher rates of infection, hospitalization, and death among people of color. This was initially linked to underlying health conditions, but there's been an increasing focus especially in recent weeks, on the disparities that racial and ethnic minorities face in living conditions, working conditions, and access to healthcare. As you look at this issue, what questions are coming up for you?
DR. OSTERHOLM:
Every day, more and more questions, and also, more of a sense of pain for what some communities are experiencing right now. You know, I've said this before on this podcast, I'm an old white man. You know, I still am at risk for having a serious outcome, and like many people listening to this podcast I know that you think about it, wonder if today is the day.
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On the other hand, I also know that I have access to incredible health care. I know I don't have any underlying health conditions that would put me at greater risk for having a severe outcome, but there are those who don't have that choice, and I think to myself, "Wow, if this is something that I'm experiencing now, imagine what it must be like for them." If we look at risk factors as we know them today for severe disease or fatal outcome, older age is clearly, and male, that I get, cardiovascular disease, underlying hypertension, diabetes, obesity, COPD, and now we know HIV infection, and it's likely that certain hematologic cancers may also predispose you to more serious disease, but the one thing that is overriding that is been across populations is also the role that race and ethnicity plays as a risk factor.
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It is part of a summer of awakening about the risk of life, happiness, healthiness, and risk, and ethnicity, and I think that it's really important we do whatever we can to better understand this, to try to address it. Now let me just try to oppose, a kind of a summary here, you might say, UNCOVER which is the Usher Network for COVID-19 Evidence Reviews, which is part of the University of Edinburgh and the Usher Institute, which is really a very thoughtful data-driven review of what's happened in the world have just reviewed this very issue of race and ethnicity as risk factors, and they have clearly demonstrated that across the board communities of color have a much higher use of ICU and when they become ill,
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because of the nature of the severity of their illness, they were not able, in a sense, to attribute it to one thing, but looked at a series of issues including living conditions. Generally speaking these individuals often live in overcrowded, in multi-generational households.
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They are employed in essential work areas, the very thing I talked about at the beginning of this podcast, which puts them at higher risk and maybe higher dose, one of the things that I've talked about before in this podcast, and I believe definitely deserves much, much more attention, is the protection of healthcare workers. Now over 700 healthcare workers in this country have died as a result of COVID infections. While it's not clear exactly how many of those were occupationally acquired, at least some estimates suggest it's over two-thirds. Dose appears to be a potentially very important part of that, with so much of the virus in these units. Well, also, if you're basically employed in essential work areas, we know that you may be exposed to more, by the very nature of the work that you do, and so that's been an issue. It's clear that comorbidity conditions do have a problem. You're more likely and to develop severe obesity, diabetes, or hypertension as a member of the communities of color, and part of that is the disparities just in healthcare, low socioeconomic status, and living in close urban clusters where you don't have the opportunity to eat or exercise the way that others might, and so I think that this issue of race/ethnicity, we have to put a much greater concentration on it. I find myself quite disturbed that when you look at this today, literally only about 45% of all the case records the CDC has, has any race/ethnicity data noted.
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We should not be missing that. This is a huge important issue so that we better understand what we can do, and you know, I would just say that clearly there are members of our community who are weathering the same storm that we're all weathering, but they're definitely not in the same boat with us, and we now have to make this a priority, and I will throughout the course of this podcast, in the future, spend more time concentrating on this. I think I haven't done a good job really laying out the fact that the case fatality rates for our communities of color are 1.4 to 2 times higher than they are for comparable members of the white community, and so this is my commitment to you, that I will try to do a better job of covering this topic. I will try to understand what we know and what we don't know, what we can do about it, and we have to make this a much higher priority. It's not fair for anybody in our society, to have to experience a severe illness or die from this virus,
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but it's also even worse when it's so disproportionately carried by one part of the population, and we need to do better.
CHRIS DALL: Mike, over the past week two studies came out that looked at antibody production and people infected with SARS-CoV-2. One was conducted in China and the other in Italy and there was some concern about what these studies revealed about immunity and how long it lasts. Did these studies add more mystery to the issue of immunity?
DR. OSTERHOLM: Well immunity clearly is the word of the week, if not the word of the year. We all want immunity against this virus, and as I discussed earlier, the idea that we are trying to achieve herd immunity, the 60% or 70%, with no pain, with no illness, with no death. The only way to get that obviously is a safe and effective vaccine, which were a long ways from yet the other way to get it, of course, is through experiencing the infection, and hopefully having a mild case,
24:00
and developing a type of durable immunity long term. Well where are we at on that? We've known for some time from the coronavirus work that was done with MERS and SARS, that immunity may actually be something that can be achieved for a short period of time but the long term is fleeting. We know that the immunity response is a very complicated one. There are different kinds of antibodies that are involved. The T cells in our body are involved, and how they interact is not completely clear. So you really have two things happening. One: what is the quality of the immune response I have today? Will it protect me and/or how long will it last and protect me? And that is the challenge. So, these two studies really were an attempt to look at, at least some initial data, on people who might have had milder illness or who were asymptomatically infected.
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The first study from China which was published in Nature of Medicine looked at 37 asymptomatic individuals who were PCR positive, and so they knew that they were infected, but remember they were asymptomatic. When they looked at virus specific IgG levels, the type of antibody that is long-term protection, they were significantly lower in the asymptomatic group. Right up close to the time that they likely are infected than a comparable symptomatic group in their acute phase. So what this means is that if you were sick you made better levels of antibody that would expect to be protective. 40% of the asymptomatic individuals actually became IgG negative in the convalescent phase. So from this standpoint, it's an issue of the sensitivity of the test. There still could have been IgG antibodies there, specifically to SARS-CoV-2, but they weren't detectable, which is not something we'd like. We'd like to have them detectable.
26:00
Even 12.9% of the symptomatic group in their convalescent phase lost detectable IgG antibodies. So what we saw here really, was that the asymptomatic infect individual also had lower levels of 18 different pro and anti-inflammatory cytokines, chemicals that are very key to the response that we see with regard to infection. Some of these cytokines are very important in helping to enhance and direct the immune response to killing the virus. They also of course can be part of what we call the cytokine storm, which is a bad thing, but what these data really give us is pause to think about, are we going to be watching a situation where we won't have detectable protection over a period of time, and we surely have viral infections like that, where

we may get short-term protection, just as we have ones where we get very long-term protection. A second study was published in Eurosurveillance,
27:00
which was actually from a group in the Lombardy region of Italy, and they were in the Lodi Red Zone, which was ten municipalities that were really in the hot, hot zone during the large outbreak there in March and April, and they recruited 390 blood donors from this area, and they were all recruited after February 20th, when the virus would have been circulating, and they found that overall, 91 of the 390, or 23%, ran antibody positive, and could be reproducibly shown to be antibody positive. An additional 17 had evidence of viral RNA, i.e. the tests showing that they had been infected for 4.3 additional percent. Overall they then had, because of this, 108 of 390 were positive, and when they followed up with this group, they saw the very same things that we were talking about with the Chinese study, that they too actually had this loss of antibody presence over time.
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Another important observation was the majority of the neutralizing antibody positive blood donors appeared to have lower antibody titers then did the actual patients who had this. Not different than what we saw in China, and they suggested in this observation, that based on it, that it might be very well that the severity of symptoms may be a key determinant for mounting these neutralizing antibody levels, and in that regard, they suggest may be treatment with plasma hyperimmune globulin, which we've been all been talking about, may help, but also raising the question about just how long such antibodies might last in people who have milder illness, and I think the underlying challenge we have here is we don't have what we call a correlate of protection.
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That is a measure that says, it's like inches or pounds or it's, you know, a gallon, you know what it is, and in this case what we'd love to have is a marker, an antibody level, something that we can measure to say, "yep, this is a correlate of protection. If you have a lot of this you're protected. If you don't, you're susceptible." We don't have that yet, and we don't know, for example, anything about the T-cell responses here, again that cellular immunity, which may play very important role in this, but I think these are all, in a sense, kind of warning shots that we have to be very, very careful in making assumptions that they will have durable immunity, or that it will protect us from not only illness, but from infection. We may not get a vaccine like that. We may ultimately get a vaccine one day that reduces the severity of illness.
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That by itself would be great, it would mean that we'd sure have a lot less fewer hospitalized people, or people who die, but we have a lot more to go here, and I think that this is just a reminder why we have the challenge as we do with the vaccines we have, and let me say last but not least, none of these studies reported actually including people have underlying health problems. We know from the influenza world that vaccines response can be heavily dictated by underlying health issues. One example of persons with obesity, respond not nearly as well as people who are not to an influenza vaccine. So we have a lot more to go here, we need a lot more information on neutralizing antibodies, we need a lot more information how the

t-cells work, and this is going to be an area that I can't emphasize enough how high priority it is that we get this kind of information, and the people who are doing the research on vaccines understand that.
31:00
This is not a revelation at all. It just is also a reminder to the public that this is not going to be easy. It's just not going to be easy, but at least this work is now beginning.
CHRIS DALL: So, Mike, can some of these questions be answered in the various clinical trials that are going on for the potential vaccine candidates.
DR. OSTERHOLM: Well they can be answered to the extent that we can look at what happens in terms of the immune response to the vaccines, but we won't really understand the actual effectiveness of these vaccines until we go through time and people get exposed to the virus, and then at that point we'll see how well they work. The other thing we won't know is their durability of protection. We may have a vaccine that for the first year, works quite well, the second year works so-so, and by the third year what protection was provided is gone. That's not that dissimilar to what we see with things like influenza. So that's gonna take time. Now, we don't have time right now,
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so we're gonna obviously move forward making assumptions that if we even get short-term immunity, it's worth it to move this vaccine and to get it into people. This is where, when we talk about the course of normal vaccine research often taking a decade or more, that's the kind of studies we would do, and say by the end of year four or five, what was the level of protection that was there, and we're not gonna have that here. That's not a safety concern. It just means we may find that, you know, we're gonna have to vaccinate people, you know, every year, every several years, even if we do get a successful vaccine.
CHRIS DALL: There have also been some recent studies on masks and respiratory protection against the coronavirus, that have gotten a lot of media coverage. Have either of those studies changed your thinking on this topic? And what are the big questions that need to be answered on the issue of respiratory protection?
DR. OSTERHOLM: Well, anyone who has been following this podcast knows that I have had a real interest in mask respiratory protection, and what we can do to keep people from becoming infected,
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or spreading the virus to others, and in a previous podcast I tried to go through and lay out, as succinctly as I could, how we got to the point today of routine and now mandatory requirements for wearing cloth face coverings. You know, I will say right now just for anyone listening I think that they should wear such cloth face coverings right now, in light of where we're at, but at the same time please understand the real method of protection is still going to be distance, distance, and distance, but I think just to add on to the point that I raised earlier about the lack of science around this issue, were these two papers that were published. The first one published in the Proceedings of the National Academy of Science, a quite distinguished journal, and the second one published in The Lancet. The most recent one published in
34:00

Proceedings of the National Academy of Science, the title was "Identifying airborne transmission as the dominant route for the spread of COVID-19," and this paper made some very bold statements about that their work had demonstrated that it was airborne transmission which they didn't even use that term correctly. They concluded that wearing face masks in public corresponds to the most effective means to prevent inner human transmission. There were so many problems with this paper, and included by the way a Nobel Prize laureate on it who was way out of their league in terms of what they were trying to look at and describe. As a result of the incredible poor quality of this paper, a somewhat unprecedented event took place where 45 distinguished scientists from 26 different institutions around the world wrote a letter to the Editorial Board of the Proceedings of the National Academy of Science about this paper, and I quote,
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"Given the scope and severity of the issues we present in the papers outside and immediate public impact, we ask the editors of the Proceedings the National Academy of Science retract this paper immediately, and reassess the contributed submission editorial process by which it was published." This letter was a very careful and thoughtful review of the challenges. Now this is not a refute of the issue of wearing masks or face coverings. It was an issue that what they did and how they concluded was just simply plain wrong, and I very strongly support the message of these 45 scientists, and say that this paper contributes nothing, nothing to the overall issue of airborne transmission in how to protect oneself. Now the problem with it was, it was all over the media out there, in which is saying that we now have definite proof that wearing masks, without any definition what a mask is, it now protects you against this infection,
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and the challenge we have with things like that is we're giving the public this information in a way that doesn't help them protect themselves, and may put them at greater risk, because now they have a reliance on something that they don't understand. I mean, if I had to ask the average citizen, "what's a mask?" they couldn't tell us what it was in terms of a surgical mask, versus an N95, or a cloth face covering, and so this is the kind of problem. The second paper which was published in Lancet was entitled "Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 in COVID-19: a systematic review and meta-analysis." What this paper attempted to do, was pull together all the relevant literature that addressed physical distancing, face masks, and eye protection, and then to evaluate what did they say in terms of the potential for prevention of SARS-CoV-2 transmission.
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Now the problem with this paper, and there is, again, problems here, is it was picked up by the media as absolute proof, and stated as such, that masks protect you against SARS-CoV-2, but we've had from the very beginning is the challenge of the confusing definitions we use. Where N95 respirators with the tight face fit and the impermeable material for the virus to come through when you breathe, versus a surgical mask which has the loose open sides, and a cloth face fitting. This has been lumped as "masks." They are not. That would be like trying to compare a tricycle, a Maserati, and a large semi truck, and saying they've all got wheels, just not the same. So from this perspective this study didn't help us, because they did not do anything to really

define what they meant by mask. More importantly, out of the 172 observational studies from 16 countries and 6 continents that they looked at,
38:00
they then parsed the information out, and what most people had no idea what happened here, was really only two studies out of that 172 observational studies even begin to address the issue of non healthcare use of surgical masks, or some other face masks which they define, and even to the extent that if you look at the one study that was a one done looking at SARS patients back in the 2003 SARS outbreak, where they compared exposures of 94 unlinked probable SARS patients with 281 community based controls match for age and gender. They concluded the use of masks was protective in the community settings, but they failed to detail what type of mask were used, or any other aspect of this area. I mean the data were so poorly described,
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it's virtually impossible to to define what it means here. The authors themselves said, "we sought details on the type of mass used, but were unable to evaluate the protective efficacy for different mask types." Well, that surely doesn't give us a lot of definitive information. Then we go to the second study. That was a study looking at the probable secondary infections in households of SARS patients in Hong Kong in 2004, and in this particular paper again, it was a review of face mask use without defining it clearly at all, of looking at SARS patients and when they used and when they didn't, and when household members may have used them. Here's what they said, "individual household members who had visited the index patient, when neither the index patient nor the visitor had worn a mask, were more likely to have contracted SARS when compared to those who had not visited the index patient,"
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and at that point, it's virtually impossible to understand the impact that routine use would have had, and without knowing what kind of mask that we had on here. So this study, even though it was touted as having 172 different papers included, this was a sole sum total the data on the community. Again, it doesn't confirm or it doesn't deny the potential impact of cloth face coverings, it's just how soft the data are that we're using, and yet they get portrayed to the public, often if some definitive piece of information. Now you ask me about any other new developments, and I'm happy to report that, you know, we're trying to put our money where our mouth is and we have actually convened a group of 20 international experts in the areas of industrial hygiene, respiratory protection, clinical medicine, virology,
41:00
animal model studies, etc, and we're actually, we've launched a study called "Infectious dose: how does it inform our decisions about exposures and controls for preventing transmission of SARS-CoV-2?" We're actually trying to come up with the infectious dose for SARS-CoV-2, and then measure what that dose means in terms of exposure. Meaning how much virus is in the air you're breathing? And how long are you in that environment to breathe that virus? This is not a game of tag. This is not, "Oh, I bumped into you, now you're it," it requires time, and it requires a certain dose, meaning that you have to have had a certain amount of virus in the air, and so we are working right now with this group. We are coming up with models and incorporate the

infectious dose to illustrate the role the concentration time and airflow play in infection transmission.
42:00
We're looking at the issue of distance contact time, the number of contacts in terms of limiting transmission. We're also looking at the issue of ventilation, indoor air, and the use of respirator or surgical masks and cloth face fittings, and hopefully from this, we can give the public much more clarity on what the risks are or are not, so that people can make their own judgments. I keep coming back to the fact that it's distance, distance, and distance, but, with that, what can we do to reduce the risk? We are working as quickly as we can to come up with the answers to these questions, and to try to provide that information to the public in a usable way, so you can make your own decisions about what exposures you believe put you at risk that you're not willing to accept or that, and you know, I can go do this and feel pretty good about that kind of risk.
43:00
One last thing I would just say, we've been doing a informal study looking at specific TV news shows, and looking at public footage of people wearing cloth face coverings, whatever kind of masks they might have on, and looking to see how they're wearing them, and it is quite amazing to see that up to 25 percent of individuals wearing something to protect themselves or to protect others are wearing to blow their nose. That is like trying to fix three of the five screen doors in your submarine. What are you doing? So, we need to do a much better job of educating the public. If you're gonna wear one of these cloth face fittings or a surgical mask, please at least use it right, so that you have the best chance of minimizing your risk of transmitting to others, or for that matter of someone transmitting the virus to you.
44:00
CHRIS DALL: So Mike, this focus on the unanswered questions and what we know and what we don't know about the coronavirus raises an issue about the public perception of scientists and health officials. I think there are a lot of people out there who are frustrated that scientists don't have more answers about the coronavirus, or they get confused when the study comes to one conclusion, then another study comes out a week later comes to a completely different conclusion. Are the public expectations of scientists and science fair? And what should the public expect from scientists?
DR. OSTERHOLM: I think the public's expectations are fair. I think we just need to do a better job of helping them understand what they can expect. You know, I have been critical of some of my colleagues, and I'm sure they've probably been critical of me, but I've seen some of them provide quote-unquote "expert advice, expert opinions," with a sense of definite clarity that I can understand where they get it from.
45:00
You know, I can list the people who I heard multiple times say just three months ago that this virus was likely not to be around this summer. It would go away. Be seasonal. I can go through a
laundry list people who said, you know, through the month of February that we're at low risk, don't worry about it. Then one day we're on a war footing, and so the public listens to that, and when they do they have an expectation then that that's what will happen because it said

with certainty. As we've talked many times on this podcast, we have to relay uncertainty when that's what we have. You know, I've tried very hard to share with you what I know and what I don't know, and as you've learned today, I have a lot that I don't know. I think that's what the public wants. That's what the public needs is just to understand what we know and don't know. They don't hold us accountable to know everything.
46:00
Frankly, we've learned a lot in six months, but not nearly enough, and so we need to keep learning. So I will urge that the public, you know, continue to expect the quote-unquote "experts" to provide them with good information, but don't hesitate to challenge them when they give you something with certainty and state that without any evidence why they've said it. Today I said with some certainty to you that I did not believe that the influenza pandemic scenario model was going to be the one we're gonna see moving forward, but I gave you the data why. You might disagree with that, and you might even be right, but at least you know why and how I came to that conclusion, and I think that's what we need today in our scientific community. You know, Peter Sandman and Jody Lanard did that Viewpoint piece for us some weeks ago,
47:00
on crisis communication, and that is lesson one, two, three, and four, practically, is just tell the truth. Convey the uncertainty, and what you're gonna do to try to end that uncertainty. What you're going to find out. So I realize today, that the media wants people to get on with clarity, and with some definition of yes or no, and we just can't do it, nor shall we ever be forced to do it. I surely won't.
CHRIS DALL: So, for our last question, Mike, we're gonna dig into our I guess virtual email bag, and I think the question we have today is timely, given that many people across the country are heading back into offices and factories, and it involves the safety of the air that circulates around these buildings. Rahel writes, "I had a question about building safety and ventilation. We talked a lot about masks, but what about ventilation? Should elevator doors remain open when elevators are idle to improve air circulation? What about offices with windows?
48:00
Should they have fans blowing air from outside?"
DR. OSTERHOLM: Well, thank you Rahel for that very good question. You'll have a book on its way to you this next week for helping us with the podcast today. This is an important question, a critical question, as I think we've seen with the protests, the relative lack of increased cases occurring, despite the crowds, the close nature of their involvement, etc, it points out the importance of air, in this case outdoor air, and how it likely dissipated the risk by dissipating the virus. When we're indoors that's a very different situation, and that indoors can occur either because of the need for heat, or indoors because of the need for cold. So as much as we think of the heating season and flu, even the air conditioning season can cause us to be in an indoor area where air is being recirculated.
49:00
So this is a very important question. I think it's the source of where much of the transmission for SARS-CoV-2 is actually occurring. I'm very happy to report that there is a really, very thoughtful, comprehensive paper just recently published called "How can airborne transmission of COVID-19 indoors be minimized?" And it's put together by a group of 35 leading experts led by

Lidia Morawska, who, Lidia from Australia, is one of the members of our expert group that I just talked about a few minutes ago, a brilliant, brilliant researcher, and then this group that she brought together here, a number of other ones who are on our our expert advisory group, are also co-authors. We will put this paper on our website. It is open access, It's published in the journal Environment International, and I think it will answer many of the questions that you raised today. You'll want to share this paper with the building manager, or those who are responsible for the HVAC system in the area that you are working or otherwise spending time in.
50:00
I think it will go a long ways to helping reduce the risk of COVID-19 indoors, and I welcome all of you to take a look at it and share it very, very widely. I think it could be a very important piece for the HVAC community to be aware of.
CHRIS DALL: What's the message you'd like to leave our listeners with today, Mike.
DR. OSTERHOLM: Well, first of all, I want to say again thank you so much for spending time with us. As I say each week, and I mean it sincerely, I know you have many other places you can go to get your information, and spending time with Chris and me is a real special treat. I also want to thank the many of you who are sending me emails that
literally melt my heart as much as they inform my brain. I try to write back as many as I can, but today I'm finding myself a bit overwhelmed, but I try to read them all,
51:00
so I just want to thank you so much. Today I want to share a song with you, the lyrics that came in from Kathy Johnson. Thank you Kathy, who suggested this song. It's a song that means a great deal to me. It was written and recorded at a time in my life as a younger boy, that it meant a lot just by the nature of what the words were all about. It was written by Bob Scott and Bobbie Russell, recorded on June 1st, 1964 by The Hollies. It's, "He ain't heavy. He's my brother. The road is long with many a winding turn that leads us to who knows where, who knows when, but I'm strong, strong enough to carry him. He ain't heavy. He's my brother. So on we go. His welfare is of my concern. No burden is he to bear. We'll get there, for I know, he would not encumber me.
52:00
He ain't heavy. He's my brother. If I'm laden it all. I'm laden with sadness. That everyone's heart isn't filled with the gladness of love for one another. It's a long, long road from which there is no return, or on the way to there, why not share, and the load doesn't weigh me down at all. He ain't heavy. He's my brother. He's my brother. He ain't heavy. He's my brother." Thank you Kathy, for sharing that. I think if there was ever a time that we all could reflect on that and what's going on in the world and this SARS-CoV-2 virus that's after us, this is the song. I also just want to challenge all of you again before we leave, your acts of kindness are counting up, they're mounting up, but keep them coming, you can never run out of it. You know, it's kind of like that concept of love, isn't that funny. It's the one thing you give away, and the more you give away the more you have, and kindness is the same way.
53:00
The more you give, the more you have. So thank you again for joining, and we look forward to talking to you next week. Have a good week. Bye.

CHRIS DALL: Thank you Dr. Osterholm, and thanks for listening to the Osterholm Update: COVID-19, a weekly podcast from the Center for Infectious Disease Research and Policy. We'll be back next week with another episode. Until then, you can keep up with the latest COVID-19 news by visiting our website cidrap.umn.edu.