TWiV 1272 Clinical Update

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Guest: Daniel Griffin

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Vincent Racaniello: *This Week in Virology*, the podcast about viruses, the kind that make you sick.

[music]

VR: From *MicrobeTV*, this is *TWiV*, *This Week in Virology*, Episode 1272, recorded on November 20, 2025. I'm Vincent Racaniello, and you're listening to the podcast all about viruses. Joining me today from New York, Daniel Griffin.

Daniel Griffin: Hello, everyone.

VR: Look, Daniel has a bow tie, but not a pinstriped suit. Good job, Daniel. The bow tie is purple. I've seen it before, but I don't know what it is. If I could only zoom in, I would be able to see it.

DG: You would see the shepherd's crooks. You would see something right around the corner behind your really cool backlit wall.

VR: Right around the corner.

DG: You've got this big picture, this big thing on the wall.

VR: Oh, the shepherd's crook, the Ebola virus. Yes.

DG: This is a filovirus bow tie, which is going to be very appropriate because we're going to be talking about Marburg in a little bit.

VR: Daniel, as you walk around in your work during the day, does anyone notice your bow ties?

DG: They're famous. It's a topic of conversation. People want to know, and then the patient learns, and then it becomes, "Oh, what are you wearing in your bow tie today?" Then I point out the fact that there's the pocket square, and then there's the socks, which I won't show you right now.

VR: Do you ever tell the patient, "I'm wearing a bow tie. What's on my bow tie is in you"? That would probably be not good, right?

DG: No. Sometimes I'll do that because it seems appropriate if they've got maybe tuberculosis, it seems, I'll go ahead and so.

VR: Or COVID or RSV. Anything.

DG: Yes. This is actually earlier today, I was wearing a COVID bow tie, but then I switched to this bow tie.

VR: Nice. Very good.

DG: I had a coronavirus bow tie earlier today. All right, let's jump into it. Very appropriate. Actually, I have to say, I picked this quotation before it became as appropriate. “Human history becomes more and more a race between education and catastrophe.” That's H.G. Wells.

VR: That's great. I like that. Are we heading for catastrophe, Daniel? Is that what you're saying?

DG: I'm going to start off with the update to the CDC vaccine safety webpage. I don't know if you had seen this already, Vincent.

VR: First thing in the morning, I saw it. Oh my gosh, everybody's talking about it. I can't believe how dumb this administration is to put up a website like this.

DG: Our listeners, there's a CDC vaccine safety webpage. The head of the page is “autism and vaccines.” Then there's an asterisk. We follow that asterisk. The header, "*Vaccines do not cause autism,*" has been removed due to an agreement with the chair -

VR: Has not been removed.

DG: Has not been removed due to an agreement with the chair of the U.S. Senate Health, Education, Labor, and Pensions Committee that it would remain on the CDC website.

VR: Who is that chair? Is that the guy from Louisiana?

DG: Is it Cassidy?

VR: Cassidy?

DG: Is he the chair? I'll leave in a link. I don't know if I want to leave in a link, but I will. People can go. We read that, “pursuant to the Data Quality Act, DQA, which requires federal agencies to ensure the quality, objectivity, utility, and integrity of information they disseminate to the public, this webpage has been updated because the statement, vaccines do not cause autism, is not an evidence-based claim. Scientific studies have not ruled out the possibility that infant vaccines contribute to the development of autism. However, this statement has historically been disseminated by the CDC and other federal health agencies within HHS to prevent vaccine hesitancy.

I'm going to read a little more, and then we're going to chat a little. “HHS has launched a comprehensive assessment of the causes of autism, including investigations on plausible biological mechanisms and potential causal links. This webpage will be updated with this term again, Gold Standard Science, that results from the HHS comprehensive assessment of the causes of autism as required by the DQA, then following as required by the DQA, details the state of the evidence and studies and the lack thereof regarding vaccines and autism spectrum disorder, and outlines HHS future research directions to provide answers.” We can

read on, but I don't know if we really should. Vincent, thoughts?

VR: Well, as you know, Daniel, in these kinds of investigations where you look at kids who've gotten vaccines or not and see how autism tracks, it's been clearly shown that autism is not associated with vaccination. Millions and millions of kids have been studied. However, you can never say vaccines do not cause autism. That's a limitation of the observational study, right?

DG: Yes.

VR: You have to do a double-blind clinical trial to do that, and you can't. This is a play on words because they know you could never say vaccines do not cause autism. As Paul Offit said, you could never say that chicken nuggets do not cause autism because you can't do the proper experiment. All of the observational studies that have been done clearly show no link between vaccines and autism. This is disingenuousness at its height.

DG: It's very worrisome because we've now allowed, under this rhetoric of, oh, we're just trying to persuade to the Data Quality Act, we're doing this full disclosure transparency. It's not. Unfortunately, the CDC, really not in a good position right now. It's no longer a reliable source of scientific accurate information. It's become a place for Kennedy and his cronies to basically just post stuff.

VR: He has been saying this for years, that it's never been proven that vaccines do not cause autism, because you can't. You cannot prove that. All you can say is, in millions and millions of cases, do we see an association? We never do. That's the gold standard, and that's what's done for any other associative study. You do observational studies here all the time when they look back and see people who got this or that drug and look at the outcome, and it's the best you can do.

DG: We do. We discuss this all the time. I think your chicken nugget analogy is, actually, Paul Offit's, is really accurate if you actually track. We really didn't see that many cases of autism before McDonald's became popular, and the rise of chicken nuggets, and how many Big Macs had been consumed. There's a nice correlation there. There's a correlation with so many things, and there's no causality there.

VR: It is very, very clear, Daniel. Wouldn't you agree that vaccines do not cause autism?

DG: It's very clear. Huge studies, where they've looked at kids that get vaccinated, kids that didn't get vaccinated, we've actually shared on some previous *TWiV*s those studies. Millions of little kids. What do vaccines cause? They cause healthy adults.

VR: All this will do is put more doubt into people's minds about the safety of vaccines, and that's not good because we depend on people getting vaccinated to prevent infectious diseases.

DG: It's a sad day. Basically, there's a lack of ethics here. There's a lack of compassion. We basically have a lawyer giving out public health advice and bad public health advice.

VR: He's completely unqualified for this position, and he is driving healthcare in this country, as you would say, public health, into the ground.

DG: We already have dead kids. We already have, as we'll talk, thousands of cases of

measles. Canada lost its status. We're probably going to lose our status in January of having eliminated measles. Things are really headed in a dark direction. If this doesn't get you upset, just wait until, give me a couple of months. We'll be talking about one of our worst flu seasons ever because they've really undermined vaccines. We've seen a significant drop in flu vaccinations, in COVID vaccinations, and the rest.

All right, polio. Let's move on to something that maybe this'll - well, I don't know. This is not good news either. Polio. In Reuters, we have the headline, "Exclusive Wild Form of Polio Found in German Sewage Sample, Health Institute Says." Wild polio virus type 1, WPV1, has been detected in a sewage sample in Germany. It was first such detection in Europe since 2010. What do we make of this, Vincent?

VR: [chuckles] Germany has a great polio surveillance system. They're picking up what happened is that someone - Polio type 1, wild-type polio is circulating in Afghanistan and Pakistan. It is still endemic. It hasn't been controlled. Occasionally, it gets exported to other countries because it's a gut pathogen. Someone's infected. They don't know it. They go to another country, and they use the toilet, so the virus gets into the sewage system.

Now, I don't know how much poliovirus RNA they've found and how many people it would be commensurate with, but it could be that it's even circulating in Germany because they use inactivated polio vaccine and the intestine is still susceptible to infection. It could be that it is circulating. As long as you keep immunization rates high, it doesn't really matter. That's the outcome. If Germany let immunization rates drop, you could see outbreaks of polio type 1, but I doubt that they will.

DG: Then disease, meaning we'll start seeing little kids get paralyzed. All right. Also, vaccine-derived poliovirus detected in England. This is from the Global Polio Eradication Initiative, reported on November 18, just a couple of days before we're recording this, that vaccine-derived poliovirus type 2 has been detected in an environmental sewage sample collected in Yorkshire and the Humber in Northern England.

Why am I wearing my bow tie? Marburg. Ethiopia confirms first outbreak of Marburg virus disease. For our listeners, Marburg is a cousin, another filovirus similar to Ebola. Actually, we have that problem where our clinic is in Eastern Uganda, where in the caves you sometimes see Marburg virus. Ethiopia's Ministry of Health has confirmed an outbreak of this hemorrhagic fever, Marburg virus disease, in the South Ethiopia region, first of its kind in the country.

Basically, they did some lab testing on a cluster of suspected cases after some individuals developed a viral hemorrhagic fever. Really, a frightening disease. A total of nine cases, already six deaths, there's over 100 people exposed. We're going to follow that. I just checked. I haven't seen any updates more recent than what I just shared.

VR: I don't know why they say fruit bats. It is the Egyptian rousette bat. It's a type of fruit bat, I guess, that is the reservoir of the virus. Possibly, some of these individuals contacted such bat.

DG: It's not really far from South Ethiopia to some of these areas where we believe the bats have Marburg. In the place near where our clinic is in Eastern Uganda, the FIMRC clinic, there are actually these large caverns that are high salt content in the soils. They've been dug out by elephants over centuries. They're full of these massive pythons and all these

Marburg-infected bats that you can go and visit, Vincent.

[laughter]

VR: I can visit the caves. Is that what you're saying?

DG: You can visit the caves.

VR: Do they have bats of this kind in Ethiopia? Do we know?

DG: I don't know. I don't know, actually. It's a good question.

VR: I don't want to go in a bat-infested cave unless I'm wearing a BSL-3 suit.

DG: It's the pythons that worry me the most. All right, bird flu. Let's move on. Bird flu. Avian flu has decimated world's largest breeding colony of southern elephant seals. We have the article, “Highly Pathogenic Avian Influenza Viruses Associated with Major Southern Elephant Seal Decline in South Georgia.” It was published in the journal *Communications Biology*, where we read that in 2023, "Mass mortalities of southern elephant seals," they give us the Latin name there, "were observed in South America. The virus subsequently reached the sub-Antarctic, affecting multiple species."

Here they present in this article evidence of this virus's effect on the number of breeding female at the world's largest southern elephant seal population at South Georgia. Following the virus's arrival in 2023, they reported a 47% decline in the number of breeding females at the three largest breeding colony beaches in 2024 compared to 2022. They conclude by saying that the apparent loss of nearly half of the breeding female population has serious implications for recruitment and future stability of the population. 53,000 female elephant seals died.

VR: I didn't know where South Georgia was, but it's an island in the South Atlantic, and it's part of British overseas territory. How about that? 1,400 kilometers from the Falkland Islands, remember them?

DG: Oh, yes.

VR: Daniel, I'm going to channel a little bit of Dickson here.

DG: Channel away.

VR: Whenever Dickson heard the word decimated, he would say, "You know, Vincent, that means one in 10, don't you?"

DG: Deci, yes, but more than decimated.

VR: Because it was a punishment for Roman military people who disobeyed or something, I don't remember what. He said it's been changed now. We use it to say the population has been substantially destroyed, but not necessarily one in 10.

DG: Yes, one in 10, I don't think we would even think of as decimated. We'd say, yes, 10% reduction.

VR: It's the same with quarantine, which he would also tell me means 40 days, right?

DG: Yes.

VR: Which is not necessarily what we do anymore. We've changed the meaning of words.

DG: Yes, people should have stopped complaining like, you're only quarantining for, what, 14, not 40.

VR: Forty.

DG: [laughs] Modern people.

VR: Dixon was very ardent about that. It was good. I liked it.

DG: It's nice to remember the roots of things.

VR: English is a living language. It changes all the time.

DG: Yes, and some people are trying to kill this living language, aren't they?

VR: For some people, no seems to be yes.

DG: Correct. All right. I thought for this next one, we'll give a little bit of background because we've got some interesting stuff going on here. Let's see where I've got this in my thing. People have probably heard about this individual that was infected with the H5N1. First in U.S.-

VR: H5N5.

DG: -H5N5. Perfect. That was the distinction I wanted to raise. First U.S., human bird flu case in nine months confirmed with strain only seen in animals before. The patient, who's an older adult with underlying health conditions, developed symptoms including high fever, confusion, respiratory distress, was hospitalized in early November, according to Washington State Department of Health. It's not Washington State. It's the Washington State Department of Health, just in case people get confused there. Testing confirmed the patient has H5N5, a strain of bird flu that has previously been reported in animals.

Why are we making this big fuss? We're talking here about H5N5 as opposed to we've been talking a lot about H5N1 for a while. I thought there was a nice article to discuss. Where is this H5N5? How did it get here? What's going on? We'll even discuss probably a little bit about the different types of flu and how to understand the classification. We've done a little primer on that before. Last summer, July of 2024, there was a nice article in *Cell Reports*, "Multiple Transatlantic Incursions of Highly Pathogenic Avian Influenza Clade 2. 3, 4, 4BA, H5N5 Virus into North America and Spillover to Mammals."

I have to say, this is a great article. In 2023, a transatlantic incursion of the flu A H5N5 viruses into North America was detected, followed shortly thereafter by a mammalian detection. These H5N5 viruses were similar to contemporary viruses described in Eurasia. These investigators suggest transatlantic of the H5N5 viruses was most likely facilitated by pelagic seabirds. I don't know if our listeners - we need Dickson. Pelagic seabirds, he would wax and wane. I have to say, pelagic birds are really cool.

VR: Do you know what that means, Daniel?

DG: These are basically birds that spend most of their life in the marine environment and only occasionally come ashore to breed. This is -

VR: Except when your sailboat was in the middle of the ocean and they sit on your mast.

DG: They love to sit on the top of my mast and get the view. [chuckles] These are, thinking about the *Rime of the Ancient Mariner*, I don't know if anyone reads that anymore, but albatrosses, auks, skuas, petrels, skimmers, some terns, some gulls. We're going to learn about the black-legged kittiwakes. These birds are great. They spend the majority of lives, you ready for this, on the open ocean, far from land, and they only come ashore to breed.

VR: When they want to rest, they just sit on the water?

DG: They just sit on the water.

VR: That's very cool.

DG: Yes, very, very cool.

VR: Then they get eaten by some mammal, right?

DG: Yes. They can be actually - They themselves are going under, they're fishing, riding the waves, doing all kinds of stuff, but yes, they themselves can get eaten. Now, I'm going to leave a link into oceananimals.org so everyone can look at great pictures of the pelagic seabirds. Now, some of the Canadian H5N5 viruses from birds and mammals possess this PB2 E627K substitution. People are probably like, hey, that sounds familiar to some of those E2K substitution at amino acid site 627 that maybe people remember from SARS-CoV-2. Maybe. Probably one of the first times people started learning about all this other than maybe some of our HIV docs.

VR: It was also EEK, but it wasn't a polymerase. It was the spike, right, for COVID?

DG: Yes. Those were all spike mutations. This is an E2K. This is, yes, one of the EEK mutations or mutations leading to an amino acid substitution. Let's keep our language. This substitution seems to facilitate adaptation to mammals. We got our ferrets. Our ferrets inoculated with the H5N5 viruses showed rapid severe disease onset with some evidence of direct contact transmission. However, these viruses maintain receptor-binding traits of the avian flu viruses, were susceptible to Tamiflu, oseltamivir, to zanamivir, basically susceptible to our medicines.

They have a nice graphical abstract where you can see this area probably where the H5N5 moved. Then it ends up - is that Norway, I guess, we've got where it is? Then Norway comes across. I'm going to go to Norway. I'm trying to convince my wife that we should go stay in Alta, Norway, at this ice hotel. There's this recent TV show, *Pluribus*, where my wife has the same reaction to the star of the show about, "Oh my gosh, the beds are made of ice. Do you really expect me to sleep on a bed made of ice?" Anyway, goes to Norway, doesn't go to Alta, goes to Southern Norway. Then you end up in Eastern Canada.

Almost all the animals that were diagnosed were found dead. There might have been an issue there. A dead animal is easier to find and to sample, except apparently, there was a sick but not dead red fox pup near Halifax. He was sick, and he had neurological signs, disorientation, barely walking. The fox pup didn't even make it to the wildlife rehab before

he died. The H5N5 viruses were isolated from several raccoon brain samples. They have a really nice figure where American crow, the black-legged kittiwake, the common tern, the great black-backed gull, the herring gull, the northern fulmar, and then raccoon, red-tailed hawk, red fox, skunk.

Then you can see them tracing detections in Romania, Bulgaria. Detection in Russia, and then we're down in Norway, and then it's coming across to Eastern Canada. Prince Edward Island, Nova Scotia, New Brunswick. The story here is this H5N5 virus. Looks like it came across with the birds. A bird flu is now in the United States, and now we have this gentleman in Washington who was diagnosed.

VR: Probably got it from a bird, I would guess.

DG: Probably. The interesting thing, they comment about the fact that he had pre-existing illnesses, underlying health conditions. The thing we don't know is, is he the only one, and he only presented because this was a tipping point for him? What about someone who's young and healthy, they get exposed? Would they have got as sick as he got? Would they end up in the hospital? Would you even be aware that this had happened?

VR: This is the high-pathogenicity avian influenza virus, like H5N1?

DG: It is. Just a different neuraminidase.

VR: All right.

DG: All right, measles. Moving on to - oh wait, HPV. Don't forget HPV. Lately, we've been really excited about HPV vaccine, but I'm not sure everyone is as excited. We've talked about how this could not only prevent several cancers, but actually be part of successful treatment of cancers. It looks like we've got a lot of work ahead regarding education about this amazing vaccine. We have the article, “Regional Voices, Different Choices. Parents and Caregivers HPV Vaccine Attitudes in the Northeast and Southeast United States,” published in the journal *Vaccine*.

Online survey completed by 2,088 caregivers of children aged 9 to 17 in the Northeast and Southeast, Mid-Atlantic U.S. The Human Papilloma Virus Attitudes and Beliefs Scale. Did you know there was such a thing, the HABS assessed?

[chuckles]

VR: It just has to have BS.

DG: It sounds silly. The HABS scale assessed HPV vaccine attitudes, and also threw in the COVID-VAC scale. Over half, 55.7% of caregivers were vaccine-hesitant.

VR: That's crazy.

DG: It really is.

VR: This is a totally safe vaccine, and it's only because of RFK and his ilk spreading nonsense about it that people are hesitant.

DG: I think that's the challenge. He says, "Oh, the vaccine hesitancy, it's come from all these

mismanagement mistakes during the pandemic." It's not actually true. It's come from people like RFK undermining confidence, spreading misinformation, spreading lies. Really got a lot of work to keep educating people.

VR: This is preventing cancer. If you're not going to get the vaccine, you've got a chance of having really nasty cancers.

DG: Yes. Do we want kids to go on and have cancer? Do we want them, adults, to end up with cancer because they were not protected? Yes, this is horrible. This is a wonderful vaccine that prevents the majority of cervical cancers, the majority of head and neck cancers. This is an amazing vaccine to prevent cancer. What's wrong with that? I don't understand.

VR: No really appreciable side effects. The idea that this is killing people, which is what RFK Jr. is promulgating, is completely a lie. It's false.

DG: It puts money in his pocket. Follow the money and figure out why he's lying to you.

VR: You're the guy who prefers to have money than have people healthy. Yes. Here at Parasites Without Borders and *MicrobeTV*, we prefer health over money.

DG: [laughs] It's actually true, as silly and nerdy as that sounds, Vincent.

VR: We give away these programs for free.

DG: Yes, it's true.

VR: Not that anybody would pay for them, Daniel, right?

DG: No, I think they would.

[laughter]

VR: We have many donors who support our work, but we do it to inform people. This is just disgusting that he and other lawyers like him prefer people to get sick and them making money.

DG: Yes, it's the way capitalism works. Moving on to measles. United States, there are now more measles than in any other year since 2000. As of November 18, a total of 1,753 confirmed measles cases right here in the United States. Canada, another 46 new measles cases. They're up to 5,208. Thousands of cases down in Canada. We've got thousands of cases.

This is something that, unfortunately now people are going to be seeing. People are seeing. Remember cough, coryza, conjunctivitis, the three C's, and then four days of measles. Four days of fever, then the rash. Remember the three C's and the four D's. Interesting, as we've described, there are some situations where you have measles without a rash. Really scary there.

VR: Daniel, I just don't understand why RFK isn't saying anything about this outbreak. He's not sending vaccinators to these areas to vaccinate. His silence tells everything.

DG: His silence is what allowed this. Recently, and we'll probably cover this, the outbreak really started there in Texas, but there are connections to some of the ongoing spread.

VR: Daniel, if you were responsible for an outbreak in some way, you'd be mortified, wouldn't you?

DG: That's the crazy thing. Why is this happening? Is it a coincidence? Not really. Previously, when there would be an outbreak, we would step in. There would be honest education. There would be control put in place. We would not let this happen. Under RFK's leadership, this is being allowed to happen.

Influenza. Starting to see a little bit of activity. We've got some low, almost to moderate activity in Puerto Rico. We're starting to see some activity down there in Louisiana. It's a nearby state. Was that Mississippi right next to Louisiana there?

VR: That's right.

DG: Starting to see a little bit of activity. The trick is that we're about to go into our Thanksgiving holidays, where we cram all these people together, fly them all over the country. We'll see if that or the December holidays are going to be the trigger. The rest of the world is seeing a lot of early flu, and particularly something we're a little bit concerned about, a lot of H3N2. Couple of interesting papers for us to discuss this week.

The first is this article, “Emergence of Seasonal Influenza A(H3N2) Variants with Immune-escape Potential Warrants Enhanced Molecular and Epidemiological Surveillance for the 2025–2026 Season,” published in the *Journal of the Association of Medical Microbiology and Infectious Disease Canada*. Do you think this is going to happen, Vincent, the CDC is going to jump in with enhanced molecular and epidemiological surveillance?

VR: Our CDC? No.

DG: No.

VR: In fact, the story you just had about H5N5, there were a couple of quotes from CDC, and I'm like, "I don't believe anything they say anymore."

DG: It's unfortunate, yes.

VR: Which is too bad because there's still good people there, but the mouthpieces are corrupt.

DG: You worry about the ability of people there to do their job in good faith. We've seen so many people lose their job, just great, hardworking people. All right. This is open open-access paper, so folks can click on the link, they can take a look at this. Here we read. We start with a little bit of background. "All of the major antigenic changes in influenza A (H3N2) since 1968 have involved," oh, they're going to say, "mutations at just nine amino acid positions called cluster transition sites surrounding the receptor binding region of the hemagglutinin surface protein.” That should be “non-synonymous mutations in the nucleotide sequence that result in amino acid changes." What are we to do, Vincent?

VR: They go on to say substitutions, which is correct, amino acid substitution. Sometimes they get it right and sometimes they don't. I think a lot of people just don't care.

DG: Yes, they don't care.

VR: Because you know what? If you tell them, they push back. It's just crazy. They push back. "Amino acid change is not a mutation. It's an amino acid change." "Oh, no, no. That's the way I've always used it. That's the way I was taught." Well, that doesn't mean it's right. That's incredible. They push back.

DG: Yes. It's crazy. During the Northern Hemisphere 2024-2025 flu season, H3N2 variants emerged with multiple parallel substitutions affecting cluster transition sites, 135, 145, 158, 189. Here, they looked at over 24,000 flu A H3 sequences between September 2024 and August 2025 to assess the nature and frequency of amino acid changes - we're doing great - among emerging Northern Hemisphere, Southern Hemisphere H3N2 variants, subclade J, and updated 2025-2026 subclade J2 vaccine reference strains. They found that the H3N2 variants with a combination of cluster transition site changes emerged during the Northern Hemisphere 2024-2025 season. Influenza A further drifted, and the vaccine-mismatched variant now called subclade K arose during the 2025 season and is projected to predominate.

That's all. That's like word salad. I think our listeners are like, "What happened? What was he talking about?" I thought we'd just - a little reminder, a little primer, because this is in the news, and basically the question is, is the vaccine going to be as helpful this year as we had hoped? All right, so let's run through it. We'll do this -

VR: Can we just say at the outset, probably not?

DG: Yes, probably. I suspect the flu shot's not going to work as well.

VR: You'll still live, right?

DG: That's the big issue. Not getting the flu vaccine, what's the efficacy? Zero. Getting the flu vaccine, OK, maybe 50% reduction in getting it, medically attended, 50% reduction in severity. Getting the flu shot, still an excellent thing to do. The more people that get it, we as a society are better off. I think that they picked for the vaccine this year, this subclade J for our vaccine, and actually, it looks like it's subclade K that's emerged.

If you look at the UK and Japan, about 90% of the H3N2, which is predominating more than H1N1, 90% of samples are the H3N2, they're the subclade K. We've seen a drift away. Yes, we're predicting a bad flu season, less people getting vaccinated, and then less efficacy from the vaccine.

VR: I would say, and maybe you would agree, people should still get vaccinated because we don't know what's going to happen. We're predicting. Even if there's a mismatch, OK, we'll probably have more deaths in highly susceptible elderly people, but for others, it can still save your life, right?

DG: It's interesting. I'm going to read this as it's more important to get the vaccine this year. It's like they're calling for rain. They're saying, "We expect there to be a lot of flu this winter." Other winters, oh, it never was particularly bad, let's say, and so your chance of getting flu maybe wasn't as high as I'm going to say it is going to be, we're predicting it to be this winter. Sure, the flu shot might not work as well, but still, you're looking at a high risk of getting flu this winter.

The H3N2 is usually more severe. We're predicting a bad, a severe flu season. What is the best thing you can do? It's actually to get a flu shot. Get your flu shots. Now is the time to do it. Pretty soon it's going to be a little too late. Now is a great time. I know at the end we're going to say, whatever you're doing, pause and go to Parasites Without Borders and click Donate, but first pause, go to your CVS, your Rite Aid, wherever you get your flu shot, schedule your appointment, then go to Parasites Without Borders and donate.

All right, RSV, and we have actually an *MMWR*. I was shocked to see this come across, but the government's back open. "Nirsevimab Effectiveness Against Intensive Care Unit Admission for a Respiratory Syncytial Virus in Infants, 24 states, December 2024 through April 2025," so it's last winter. These are the results of a multicenter case control investigation. Nirsevimab was 80% effective at preventing RSV-associated ICU admission, 83% effective at preventing acute respiratory failure among infants admitted to an ICU with respiratory symptoms during their first RSV season.

VR: That's great effectiveness.

DG: These are great numbers, 80%, 83%. That's what we want to see.

VR: Remind us what nirsevimab, it's a monoclonal?

DG: We've got nirsevimab or Beyfortus is the monoclonal. The other choice is Enflonsia or clesrovimab, and these are monoclonal antibodies, and we've discussed, you get them before the child gets them before going into an RSV season. As we're seeing, they tend to last that season. They tend to be very effective. This is just passive monoclonal antibodies. Everyone likes these. Great way to protect the kids.

VR: The mother can get a vaccine, which would then protect the baby, right?

DG: If the mom gets a vaccine, let's say right at the beginning of that third trimester, makes antibodies and an immune response, you can then actually passively protect the infant. The other option is the baby is born, try to do it right up front in the first week or two, gets the monoclonal antibodies, and then protects the baby for that season.

VR: We don't have a vaccine for babies, right?

DG: This would be the passive, yes, the monoclonal for the babies. The moms, the older adults get the vaccine. This is a great lead-in. Why don't we just say everyone should run out and get the RSV vaccine? Why aren't we just recommending to everyone? Well, there was the concern for Guillain-Barré. There was this estimation, and we'll go to this. We'll say maybe two cases of Guillain-Barré for every million shots. What about RSV itself? What about if you don't get the shot? What if you get Guillain? What if you get RSV? What's the risk?

Here we have the article, "Estimating Risk of Guillain-Barré Syndrome in U.S. Medicare-Enrolled Older Adults Following Medically Attended Respiratory Syncytial Virus Disease: A Self-Controlled Case Series Analysis," published in *CID*. Guillain-Barré, just to remind people, this is this ascending paralysis. Here, they're going to look at adults age 65 and over with medically attended RSV disease. They're going to use those ICD codes. They're going to basically look at this risk period of one to 42 days post-RSV disease. Then they're going to compare this to a control period, basically outside of those zones. Pretty robust

numbers, right? They're looking at 452,471 eligible patients with RSV disease, and they actually find the adjusted IRR is actually 2.11, consistent across different analyses. It actually increases to 2.59 if they're looking at patients greater than 75 years, where it actually goes up to this fourfold adjusted incident rate ratios. They've got a nice figure that I pulled out of this. It hasn't been fully published yet, so it's got that stamp across it. You can look at this risk period. You can look at the number of events.

VR: Can you translate the risk ratio into a number we would understand?

DG: I would like to do that, actually, because that's, I think, ultimately what people want to know. It's like, OK, well, what is my risk per million compared to this two per one million with the shots?

VR: The shot, right? We don't have that data.

DG: Well, I think it's a fallibility on my part of doing that calculation. I'm sure someone can do it. Someone's out there listening going, "Dr. Griffith, it's such an easy calculation."

VR: An IRR of 2 means you're, what, twofold?

DG: You're twice as likely to end up with GBS during this period of time than a background. I guess you could look at this question, say, what is the incidence of GBS? Let's just look at it. Incidence of GBS. We look at that as a background. Look, AI is generating an answer for me. Incidence of Guillain-Barre per million. We'll see if that'll - Because I think that's really helpful because I think that's what people are trying to figure out. Here's a population. Here's a nice systemic review. Doing this nice regression model.

VR: I don't know. It seems to me that twice as likely is a lot more frequent than one in a million.

DG: It seems like it did. Just looking at background here. They're looking at 1,643 cases per 152 million person. They're doing person years here. It makes it little. Maybe people can email in. Let's give those mathematicians a job, right? Someone who's really good at math because maybe their mom took Tylenol. Can I say that? All right. Let's move into COVID. Actually, we're starting to see some activity here, actually. We're starting to see in some areas.

Really interesting. Actually, Utah and Nevada look like they've got very high wastewater activity levels. We're starting to get some issues, Long Island, Connecticut, and then if you look at the epidemic trend. I'm going to leave some links into this. You can see areas where it's likely growing. It looks like definitely growing in Pennsylvania, likely growing in the New York, New Jersey, Long Island area. I'm a little disappointed we don't have those multicolored lines. I just kept looking this afternoon to see if we would get those back.

VR: I know. Those are just so great, the wastewater.

DG: We'll follow, see what we find. All right. The more we learn about the mRNA COVID vaccines, it only gets better. This is interesting, vaccines that do things other than what they were designed for. We've got the article, “COVID-19 Vaccination is Associated with Reduced Complications in Pediatric Patients with Atopic Dermatitis,” published in the *Annals of Allergy, Asthma & Immunology*. They actually found, COVID-19 was associated with reduced

incidence of multiple infections.

You're going to reduce your risk of getting a middle ear infection by almost 40%. Pneumonia drops by 40%. Bronchitis drops by over 50%. Non-COVID viral infections, protecting you, dropping almost 50% there. Sinusitis, upper respiratory infections, impetigo, molluscum contagiosum, and then even skin infections, almost a 50% reduction. Then going with the other things we talked about, risk of allergic complications were also reduced. Asthma, relative risk, 0.69, about 30% reduction. Allergic rhinitis, imagine that, 44% reduction. Contact dermatitis, almost a 50% reduction. Even anaphylactic food reactions, a 30% reduction. Weird, right?

VR: Daniel, these mRNA vaccines are making America healthy again.

DG: It's crazy, right? If you didn't actually look at the science and you just followed your social media, you'd be missing all this.

VR: Just think, RFK Jr. says the COVID mRNA vaccines killed more people than they saved. That's just a lie.

DG: It's just a lie. Really, it's a lie. We were joking morbid gallows humor today about, no one died from COVID. Those million people, they were all faking it. They faked their deaths. No, this is horrible to lie. What makes it not funny is that people are dying, kids are getting sick. Yes, you're spreading lies for your own personal gain. That's just wrong. All right, this is a good one here. This is this article, "Risk Mitigation of Shared Room Ventilation and Filtration on SARS-CoV-2 Transmission: A Multicenter Test and Negative Study," published in *Infection Control & Hospital Epidemiology*.

We know admission to a shared hospital room is a risk factor for getting healthcare-associated SARS-CoV-2. You're in the room, someone else is there, they pull the curtain, somehow that's going to keep you safe.

VR: The curtain doesn't keep it out, Daniel?

DG: Well, multicenter test negative study of patients exposed to SARS-CoV-2 in shared rooms across five hospitals, independent variables tested where air changes per hour, ACH, presence of any room mechanical ventilation, these portable HEPA filters, I see them sometimes stick in there. They're going to look at another thing. They found out that if you've got 468 exposed patients, the secondary attack rate, you're in the room, person next to you got COVID, the secondary attack rate was 26.3.

Basically, about one in four people are going to get it if you're in the room with the same person. Now, the only thing that really seemed to help was these air changes per hour, but it was only about a 12% reduction. Basically, being in the room with that person, this is this whole issue, and I think it gets to it, is, do you have to be right there within six feet? Do they have to be breathing on you? Or is it if you pull that curtain in these poor ventilated areas, are you going to actually get COVID-19? It looks like you're going to get COVID-19.

It speaks to a lot of these facilities that are maybe not taking COVID-19 quite as seriously. Oh, you don't really need the N95. You don't really need the person to be in a private room. We can start putting these people right next to grandma. Yes, you do that, and one in four chance grandma's going to get SARS-CoV-2 and potentially all the horrible things that come

with that.

VR: Masking would be a good solution then, right?

DG: Yes, actually. Masking, better ventilation, not having to share your hospital room with someone who's got a contagious respiratory pathogen. All right. Remember, early viral phase, the role of early antivirals. The early inflammatory phase, right? A lot of people, you get through that first week, and then, in the words of Ian Lipkin, then I got COVID. Yes, the second week is when people feel really bad. It's the early inflammatory phase. Sometimes people get hypoxic. This is when we were seeing people coming into the hospital.

All right. The late phase. I'm just going to throw one study. There were a few that I looked at, but this one seemed like one worth sharing. The article, "Resistance Exercise Therapy After COVID-19 Infection: A Randomized Clinical Trial," published in *JAMA Network Open*. These results come from a two-arm multi-center randomized clinical trial including 233 adults with a hospital or community diagnosis of COVID-19 infection in the preceding 12 months. The intervention group comprised 117 individuals. Control group, 116.

Total of 224 individuals at baseline, 193 individuals at three months completed the incremental shuttle walk test. The intervention group received the personalized resistance exercise intervention for three months. The control group, treatment as usual. Primary outcome was the distance achieved in meters in the incremental shuttle walk test undertaken three months after randomization. Secondary outcome measures included health-related quality of life. They did a bunch of other things, grip strength.

The mean change in the shuttle walk test distance at three months compared with baseline was 83 meters in the intervention group, 47 in the control group. Almost twice as far. What is that? Thirty-six meters by three months compared with the control group. Greater improvements in the intervention group were also observed for health-related quality of life, utility scores, also patient health questionnaire category hand grip strength. Nice graphical abstract with someone lifting dumbbells there.

I don't know. Sometimes I feel like you need a statistician here, right?

VR: Well, Daniel, the error bars -

DG: They're huge.

VR: Gosh.

DG: They're huge. Then the mean is not very different here but exercise can't hurt, can it?

VR: Well, I think this is one of the nice things, right, is that here we're looking at resistance therapy, as so many other studies have looked at trying to get people to do aerobic stuff, the concerns that you're triggering more inflammation actually being harming people. Again, you want to be careful when you go down this road, making sure that you're not making people worse. Maybe there's something to be said for this exercise strength, resistance exercise therapy. Yes, the error bars are huge.

VR: They probably need more subjects to get those error bars shorter.

DG: You probably do. If you need more than hundreds of people, then you start to worry

how much of a difference are you really making. You really probably need to individualize this. All right, here we are. No one is safe until everyone is safe. I want everyone to pause the recording right here and first, go get your vaccines, time to get your COVID and your flu shot. If you're eligible, your RSV. If you're little kid's eligible, their nirsevimab, their Beyfortus, their clesrovimab.

Then go to parasiteswithoutborders.com and click Donate. Right now, we're in our *MicrobeTV* fundraiser, November, December, January, hoping to double your donations and send a check to *MicrobeTV* for a maximum donation of $20,000.

VR: That'd be great, folks. Donate, parasiteswithoutborders.com. Time for your questions for Daniel. You can send yours to daniel@microbe.tv. Mary writes, “Dear virus educators, I don't think I've missed a clinical update since the start of the pandemic. Thank you so much for the wonderful science education. I'm on day 13 of my first COVID infection. I've had all the jabs so far over the years, Moderna, Pfizer, Novavax. I started on the renal dose of Paxlovid on day I tested positive, day two of symptom onset.

My question is, why do I feel so sick? The Paxlovid was wonderful. I barely felt sick, but when I got to the end of the Pax, I started feeling really sick, including losing my senses of taste and smell the past three days. I understand that I'm in the cytokine storm phase. As a TWiV viewer, I wouldn't dare call it Paxlovid rebound, but I didn't think it would be this bad. Well, the vaccine's in the Paxlovid. I'm worried that I might have damage or Long COVID. Should I be worried? Thanks for all you do. Mary is in Washington. No need to say Washington state. And, PS, no, I did not die.”

DG: All right, Mary. You've been listening, and I like the way you're thinking it through. You're in an inflammatory phase. You're suffering from all that inflammation, the cytokines at this point. The vaccines, great job. The early Paxlovid, again, that was the right thing to do. We would have anticipated this being worse. Now, as you mentioned, you're on the renal dose of Paxlovid, so you have some degree of reduced renal function, so kidney disease. Yes, that does put you at risk of having more inflammation, worse outcome.

You're day 13. At this point, you're checking your oxygen levels, making sure they stay above 94 or above. No, at this point, I guess having gotten this email and us reading it, it's probably going to be a few days between the time you sent it in. I hope you're doing well. Yes, I'm optimistic that you've done all the right things.

VR: Stephen writes, “I was born in 1950, got mumps and chickenpox as a child, but as far as my mother and I know, I never got measles, although I know that people born before 1957 are presumed to be immune from measles exposure. I got the one-shot measles vaccine when it first came out. Probably '66. I'm now 60, 60 years later, I'm wondering whether I should get a measles vaccine. I think I remember your saying that the original one-shot vaccine doesn't give as long-lasting protection as the later two-shot.

I now live in Portland, Oregon, and checking the internet, there was an outbreak of 31 cases in Oregon in 2024, only one case so far in '25 in a person who had recently been abroad. Low levels detected in wastewater from a nearby county, so not much measles around me now. I've consulted with two nurse practitioners, and neither thinks I should bother getting it, but I'd be interested in Dr. Griffin's opinion.”

DG: It's an interesting scenario. You describe not necessarily remembering having measles.

The issue is that we assume that if you were born before a certain period of time, there was just so much measles that everyone was getting it, but it sounds like despite that, you went ahead and got a shot. The interesting things about the shots that we've talked about is when they first came out, there was some concern. There were a lot of different options out there. Not all of them ended up being the vaccines that moved forward because of issues with efficacy.

Then later, we talked about the fact that I start recommending a second shot because we were starting to see some more cases. Part of the second shot is if a person gets measles to reduce their chance of onward spread. In general, if we say born 1950, first off, in general, we wouldn't recommend it. We'd say even if you don't remember, it was just so prevalent prior to 1957. People born prior to 1957, you went and you got a shot, probably already did more than you need to. Yes, I'm not thinking that you would need to go ahead and get another shot.

VR: Michael writes, "I'm an infectious disease physician in an academically affiliated community hospital in Massachusetts and have some vestigial virology knowledge from a PhD decades ago. Many of the large hospital groups here are moving to treat all respiratory viruses the same as far as precautions, which entail using surgical masks rather than N95s for COVID patients. Thankfully, they're also moving away from the crazy gown requirement for COVID patients.

While I understand some of the rationale for this change in this era of high levels of immunity, would you agree that COVID is still different from flu as far as overall severity, particularly in immunocompromised hosts and the issues with post-infectious sequelae of COVID? Do you think there are significant differences in the transmissibility of SARS-CoV-2 and influenza virus, and would increasing immunity affect transmission rates?"

DG: All right. There's a lot of key features in your email here, Michael. First is you're an infectious disease physician. Second, as you mentioned, your PhD was decades ago. I'm assuming two things. One is during those years you've aged, so you're probably older, putting you at a certain amount of risk. The other is you're an infectious disease physician. You're like me where you actually pull up a chair, you sit down, and the acquiring the patient history and doing the exam is a bit of an event.

It's an afternoon where I say a lot of the doctors are sort of they're in and out. They're limiting their exposure by minimizing time. You're probably not minimizing time. Where were you born? Do you have any pets? Is anyone else sick? Where have you traveled? The amount of time and questions we ask. You say it's uncomfortable when you pee, but is it uncomfortable just because you have the wick thing on, or is it uncomfortable when you go to the bathroom and sit there? It's crazy how much time we spend.

Yes, if you're in that room more than the 15 minutes, the surgical mask is not going to provide you the same protection as the N95. The others we've talked about before, it's not just the acute issues with COVID. It's also the post-infectious sequelae. You get sick, 13 days later, you're not better. Thirty days, 90 days, you're still not better. Yes, there really is a lot going on. You are potentially putting yourself at risk just sitting there having that long-winded chat with just a surgical mask.

VR: You've said many times don't compare flu and COVID, right?

DG: Yes.

VR: Michelle writes, “I'm scheduled to get my COVID shot next week. I'm also seeing a physiatrist who I believe is going to recommend a cortisone injection for tendonitis. Is it OK to have both shots in the same week or better to space them out?”

DG: You're going to get your COVID shot, that's great. You probably want to wait before you get that cortisone injection because you don't want the cortisone to interfere with your ability to have a nice germinal center and a nice T-cell response to that COVID vaccination. Go ahead, get that COVID shot. If you haven't got a flu shot, get that, you can do it at the same time and then just delay that cortisone injection.

VR: How long?

DG: Three weeks.

VR: Could she get the cortisone first? How long would she wait after that before getting vaccinated?

DG: The problem is the cortisone is going to stay in the system for quite a while because it's going to be a depot type of long-acting. Go ahead, get your vaccines first, give it three weeks at least, and then go ahead. Because I know the tendonitis is painful.

VR: Sue writes, “I've been listening to clinical updates since the onset of COVID. Greatly appreciate all your hard work devoted to educating us all. My question is this, I'm a 68-year-old female in good health. For the first 18 months that COVID vaccines were available, I got them regularly with no more than ordinary aches, which quickly resolved. In the spring of '22, I went to my local Walgreens for a booster.

Although I normally got all my vaccines in my left arm, this time I got the injection in my right arm. This time the upper arm and shoulder reacted very differently, becoming sore and tended to the touch, which only got worse with time. I told the doctors that the shoulder had never been the same since that COVID booster, which I think they tended to ignore. Ultimately, the doctor told me I needed rotator cuff surgery, which was done in October '23, about a year and a half after that booster.

The doctor told me after surgery that he found the operative area had many sharp-edged crystals in it, which he had never seen in his long practice and which could have created the tears. On a later follow-up visit, he told me that he had recently seen another such case, only the second in his career. Here's my question. Is it possible or likely that my arm reacted to the booster in this way? I've not gotten another booster since then as recovery and rehab from the surgery was tough, and I'm reluctant to risk another reaction.

A doctor friend theorizes that the shot was injected into the wrong part of the shoulder, which caused the reaction. What do you think? Should I be concerned that the same reaction will happen again? I believe in vaccines, but I'm struggling what to do. Many thanks.”

DG: This is a tough one. What are the possibilities that happen here? One is the biggest concern is actually that vaccine was put in the wrong place. You say my upper right arm. Did the person actually put that vaccine into a tendon, actually? Did they actually cause a

disruption? Because you need to actually put it in the muscle, not into the joint, not into the tendon, not into the bursa. There is some training that goes into that. That's what I'm concerned about.

Then this is an overlap, could be either way, is that there have been some reports, and it's hard to know if it was a location that triggered it, but triggering a pseudo-gout, so a crystal arthropathy. Rather than your gout crystals, which could happen, but this is a pseudo-gout, another type of crystal formation which can happen. The way you're describing these sharp-edged crystals, it sounds descriptive that could that have happened. That's my biggest concern is that needle was put in the wrong spot.

The other is something we do see. A person might have cellulitis. They might have something else that triggers inflammation. It has been described where it's not necessarily administered in the wrong place, but there can be a post-vaccination or even an acute infection-induced pseudo-gout, as we call it. What are you going to do for the future? That's a big one. Let's see here. Go back to your left arm. Make sure they put it in the muscle. You might want to consider doing one of the less reactogenicity vaccines, such as Novavax, for the future going forward.

VR: That's *TWiV* weekly clinical update with Dr. Daniel Griffin. Thank you, Daniel.

DG: Thank you, and everyone, be safe. Thank you.

[01:03:39] [END OF AUDIO]