TWiV 1304 Clinical Update

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

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From *MicrobeTV*, this is *TWiV*, *This Week in Virology*, Episode 1304, recorded on March 12, 2026. 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: This week, we have a bow tie because we're not in Venezuela.

DG: [laughs] I am back in New York, and I've got my *H. pylori* bow tie on.

VR: This is a good question. How do you get *H. pylori*? Do we just have it in us, and it goes awry?

DG: No. It's actually oral, so it ends up in your mouth. It's something you see all throughout the world. You acquire it. You can reacquire it. If you get it, certain people might end up with ulcers. It was actually during my training. I'm in medical school, and this is when it becomes apparent that ulcers are not because you're Type A and you work too much. It's actually the majority of ulcers are coming from a bacterial infection. There was still a surgeon who was teaching the class, and he's like, "I will not mention *H. pylori*." We're all like, "Why are you still teaching the class?"

That was the last year he taught the class because it used to be. The Mayo Clinic was doing all these surgeries for ulcers. They treat the bacterial infection, and you don't take too many of those non-steroidal anti-inflammatory drugs; 90% of ulcers are gone.

VR: How do you acquire it?

DG: Maybe someone in your family has *H. pylori*, and then you might get it from them.

VR: Outside of your family, if you lick a subway pole, you could get it?

DG: I don't think there's a lot of *H. pylori* on the subway poles, but you could get it from food. You could get it from another person. We talk about this fecal-oral, which is the idea that there's a certain amount of feces in everything that we eat.

VR: People have bad hand hygiene. I guess you do poop it out, right?

DG: Yes, you do. It comes out in the poo.

VR: Then it's contaminating your hands because people generally don't have good hand hygiene. It's just like polio.

DG: Ulcers are an infectious disease. *H. pylori* is a contagious pathogen.

VR: Yes, so polio, norovirus, rotaviruses, all these fecal-orally transmitted viruses, and to it, we add this bacterium. Good to know.

DG: All right. Let's start off with our quote. We've got a lot to cover. I really like this one. “The end never justifies the means because it never ends.”

VR: What is “it?”

DG: "It," the world, the thing that never ends, because there's this idea that, "It's OK. I shouldn't have done that, but in the end, it's all going to be OK." There's no end. It just keeps going on.

VR: Martha Gellhorn, wasn't she the wife of Ernest Hemingway?

DG: I think she divorced him. I think she retired. [laughs]

VR: He had a couple of wives.

DG: He had several. I remember the story. I used to go visit his house down in Key West, and it was a saltwater pool which one of his wives had built. There was a penny that was glued, affixed to the edge. Apparently, he came back from one of his trips, and this beautiful saltwater pool had been built. Hemingway put that as his last penny because she had spent all the rest of his monies.

VR: Nice.

DG: All right. Yes, we're actually starting off with global polio. There's now a level 2 practice enhanced precautions alert from the CDC. There's this nice map. I guess you can call it nice map where you can see all these areas where polio is being detected. Right on the CDC website, what can travelers do to prevent polio?

VR: Get the polio vaccine.

DG: Yes, exactly.

VR: The thing that bothers me, Daniel, is that there's polio circulating in many countries, but they're either not looking. Like in the U.S. we have polio virus circulating in the U.S., but they don't look.

DG: That was what came to mind when I saw this. They've got a list of 30 countries here, and a lot of them, most of them, sub-Saharan Africa. You can even see some other areas. Just east of Iran, people look at maps. Afghanistan, Pakistan, you can see south of Saudi Arabia there. You can see countries in Europe. You've got Germany, Poland, the UK. This is really the tip of the iceberg. This is the only places where people are looking. The circulation is much higher. I'm glad -

VR: What do you do? If you live here in the U.S. and the virus is circulating, what does it

matter if you go somewhere else where the virus is circulating? Right?

DG: That's a little bit odd, right? What do travelers, what does anyone do to prevent polio? You get the polio vaccine. What's really crazy to me, I don't think this is political, but when people say things like, "Oh, the polio is like the common cold, it's not a big deal." That's not true. It's not true.

VR: It's not true at all.

DG: It is horrible.

VR: When kids get paralyzed, it's very bad. This is not a good thing. Since the virus is circulating, we have to remain immunized. There's no two ways about it. We use an activated vaccine in the U.S. The virus is going to continue to circulate, and people need to be vaccinated. If you weren't immunized as a child, you should certainly be vaccinated, even if you're not traveling. You're staying here in the U.S. I had both vaccines. I had the IPV in the '50s and then the OPV in the '60s. Then I worked with polio for 40 years, so I'm probably the most immune person in the world. [laughter] Maybe next to Amy Rosenfeld.

DG: Does this speak to your care in the lab? I also did the IPV. Then it used to be when you would travel, and particularly some of the places I would travel to, you'd end up getting - interesting, you'd get oral polio back when it was still licensed, that old, I guess. Now, maybe if you're going to do it, it'd be IPV. All right. I'm going to keep reminding people that polio, it's out there. The virus is out there. Whether it's wild or vaccine-derived, that virus can paralyze you.

VR: What if people want to travel to the U.S.? Should they get a measles vaccine, Daniel?

DG: Yes, they should. Even if they're not going to travel to the U.S., they should get a couple doses.

VR: It's in many countries, right?

DG: Yes, it is.

VR: Has any country eliminated measles? I think probably that's the case.

DG: There are countries that still have measles elimination status.

VR: Let's see. Let's look it up. Eight countries have recently lost elimination, including the UK, Spain, and others. Five countries have been eliminated measles. Bhutan, DPR Korea, Maldives, Sri Lanka, and Timor-Leste. All the big countries have not eliminated. I mean, big in terms of population and landmass. It's inexcusable. It is a vaccine-preventable disease. The vaccine is harmless. What is the problem?

DG: It's incredibly safe. Unfortunately, there's a lot of people, say, who get wealthy by distributing this misinformation. It's inexcusable. All right. This article had me a little bit concerned. The article, “RFK Jr. Has Unreviewable Authority to Reshape Vaccine Policy, a DOJ Lawyer Tells Judge.” This is published in Reuters. This is this idea. A lawyer for the Trump administration told a judge that Health and Human Services Secretary Robert F. Kennedy Jr. has such broad authority over vaccine policy that he can even scrap recommendations for measles shots in favor of people deliberately exposing themselves to

the virus. This is their argument.

VR: That's absurd, Daniel.

DG: He offered this. U.S. Department of Justice lawyer Isaac Belfer offered that hypothetical as he urged U.S. Department Judge Brian Murphy in Boston to rule that Kennedy, a longtime vaccine skeptic, and other health officials have such unfettered authority that their vaccine decisions are not subject to court review. James Oh, an attorney for the AAPs, that's American Academy of Pediatrics, urged the judge to review the advisory committee to prevent the advisory committee from holding its next meeting on March 18-19, saying that it is now unlawfully constituted in violation of the Federal Advisory Committee's Act's mandates for balance after Kennedy last year removed all 17 independent experts who sat on it and restocked it largely with people who share his outlook on vaccines.

This is, Oh said, absent an injunction, the panel will move forward with a meeting that, according to a Federal Register notice, will focus on injuries and risk posed by COVID vaccines rather than how to address the pressing issues arising from measles outbreaks in parts of the country. We'll talk a bit about how bad things are with the measles. U.S. District Judge Brian Murphy indicated he planned to rule before that meeting takes place, calling it a hard deadline.

VR: COVID vaccine injuries and risks, they're going to spend a whole meeting? This is ridiculous, Daniel. It's ridiculous.

DG: It is ridiculous. I think independent of this, there's already been mumblings that they're not going to go down this road because there's pressure from the Republican Party that the road they're headed down - so RFK Jr.'s war on vaccines, it's not popular. It is not popular. He's going to go down his Mike Tyson focus on ultra-processed foods. I think he's being forced to stay his hand on vaccines. Which has me quite worried because this just means get us past the midterms, and then he can go crazy again.

VR: Yes, of course. Don't buy it. Don't buy it. Don't buy it.

DG: I think this is very telling, is people are paying attention, or at least some people are paying attention. Headline, “Stark Divide: Americans More Confident in Career Scientists at U.S. Health Agencies Than Leaders.” The Annenberg Public Policy Center conducted a survey and found that among a nationally representative sample of 1,650 U.S. adults, confidence in federal health and environmental agencies on specific topics is lower than in major professional health and science associations in those areas. They list a number of points.

The career scientists versus the health agency leaders, two-thirds of Americans have confidence in career scientists. Only 43% have confidence in the leadership. RFK Jr. and Dr. Oz, when you look at confidence there, adults are confident when it comes to RFK Jr., only 38%. Dr. Oz, only 42%, that they're providing trustworthy information on public health.

VR: What is with these 38%? Where are they living? In what world?

DG: That's why I say most people are paying attention, because I think it's tough when you give someone this role, this mantle, then people think, "If they're in this role, they must have - The office carries a certain -"

VR: It's a lack of critical thinking.

DG: Yes. Anyway, I think this whole idea that when they came in and said, "Oh, we're going to restore trust in the CDC, the FDA, and the NIH, we're actually seeing that year over year, public trust is just dropping. It's down to like maybe 60% to 62% in 2026. Here, I think, and this is what I want to sort of - hopefully, people can echo this, they can talk to people about this, who do Americans trust? The majority of Americans trust their primary health provider; 86% are confident that their doctor, nurse, or other primary health provider is providing trustworthy information.

This is the highest of all measured things out there. They've got a nice figure where you can really see that. I think the onus is on the primary care docs. I know it's tough. I know we got an e-mail from Mike Schmidt this week about what's happening in some parts of the country. If the pediatricians, if the family doctors, if the internists, if the primary care doctors are willing to have these conversations, they are the most trusted voice out there.

VR: We've heard so many stories, Daniel, of doctors who screw up with COVID. "Let's wait and see." "No, you don't need Paxlovid," right?

DG: "It's not a big deal. You don't need to worry about vaccines." That's tough because if the primary care providers are not getting the right information, then they can't be providing the right information to the public.

VR: I think they listen to RFK Jr.

DG: I think they've got to listen to *TWiV* because we'll tell you the science, we'll tell you the truth, and then you can share that with your patients. Guess who's resigning again? [laughs] Dr. Vinay Prasad.

VR: What do you mean resigning again? How many times can you resign? Oh, you mean this is one that happened a week ago, right?

DG: Yes, so he's resigning again, but he resigned before. Then somehow they brought him back, and now he's resigning again. We'll see what happens there. All right. Let's discuss some articles, some literature here. The first article I wanted to discuss is, “Characteristics and Outcomes of Patients With Hematologic Malignancies Hospitalized With Respiratory Viral Infections,” published in *Open Forum Infectious Diseases*. I always try to pick articles that I think have teaching points. Take away from this.

These results come from a multicenter retrospective cohort study of hospitalized patients with hematological malignancy, or HCTs. That's a transplant at two comprehensive cancer centers between January 2019 and June 2023. They included all patients with acute viral respiratory infection. They compared clinical presentations, care processes, outcomes. They are going to give us a primary composite outcome of hospital death or discharge. They're going to look at 385 hospitalizations, 346 unique patients. A couple of things I'm going to say.

The primary outcome of death or discharge to hospice occurred in 14% of the encounters and did not differ significantly among different pathogens. We're talking about SARS-CoV-2, RSV, rhinoenterovirus, flu. Now, in their discussion, one of the things that I think is really important is this whole idea that people say, like, "Oh, I had such and such, but fortunately,

it wasn't COVID, and I could tell because -" Here, they found that among these patients, acute viral respiratory infections display similar initial physiology. Basically, what we're seeing here is you can't tell initially.

That's why you need a test. I like to bring up this article to highlight one of the things I'm hoping people have learned. What have we learned during the last few years? A person, a patient, not even a trained clinician can differentiate between different pathogens by how they initially present. A viral illness presents as a viral illness, and it takes a test to tell the difference.

VR: Yes, you start with a flu-like illness because interferon is doing that, and all viruses are doing that, for sure.

DG If you don't do the test, you don't know what might make a difference. You do the test, you find out it's COVID. OK, you might jump in with an antiviral. You find out it's flu.

VR: Maybe the doctor puts their ear up to your head, they can figure out what's going on. [laughter] Like when Johnny Carson used to put the envelope to his head.

DG: He would put like a turban or something on. I remember that.

VR: Yes, he would put a turban, then he would get an envelope, and he'd put it to his head, and he could read what's on it. The doctor could just put their ear next to the patient's head, and they'll know it's influenza. I can tell.

DG: I can just tell. "Oh, your throat doesn't seem that sore. It's not COVID because COVID we've been seeing -" No. A viral illness presents as a viral illness. It takes a test to tell the difference, to tell what it is. Then that test then tells us how we might be helpful. Is it Tamiflu? Is it Paxlovid? What might be? All right.

VR: This study was done in these specific patients, right?

DG: Yes, it was done in specific patients, but I think it just reinforces this.

VR: Do you think it's the same in the healthy population without malignancies, for example?

DG: Yes, that's what we saw. There was a study that was being done, actually, here locally at one of the Northwell facilities, where they do this extensive respiratory pathogen panel. They were trying to somehow, maybe there's certain symptoms that tell it's one virus versus the other. In an individual level, you can't tell. Viral illnesses present as viral illnesses. This is whether you're in the immunocompromised or the immunocompetent. It starts off, maybe runny nose. Maybe this time it's a sore throat.

Maybe this time it's a cough. Now, once you get several days in, you start to see some of the discrimination. We talked about measles, a viral illness that has certain hallmarks early on. If you're really careful and look in the mouth for the Koplik spots, five days later, they get the measles rash. OK, then you start to get some hints. Right up front, first 48 hours, the most important time to make a difference or prevent it from spreading to others. Really hard to tell the difference. All right, so this is going to be controversial here. The article -

VR: No, this is a good article. No controversy.

DG: [laughs] No controversy if you care about truth. Controversy if you have an agenda. How about that? The article, "Dynamics of Natural Selection Preceding Human Viral Epidemics and Pandemics," was published in *Cell*. Here's the question. Can these viruses out there in the world, in all those animals around us, jump directly into us, or do they need selection in a lab or prolonged evolution in an intermediate host? We've got some wonderful - I think it's like 15 figures, a lot of figures in this.

As per CIDRAP, contrary to prevailing belief, an evolutionary analysis finds no evidence that most viruses with epidemic or pandemic potential that jump from animals to people were shaped by selection in a lab or prolonged evolution in an intermediate host. Challenging claims that SARS-CoV-2, the virus that causes COVID-19, was engineered in a lab.

VR: Amen. Amen.

DG: To the article. [laughs] It's a *Cell* article, so this is going to be a little bit of a challenge, but OK. Maybe you guys will do a deep dive. Using a phylogenetic framework to characterize natural selection, this group investigated the hypothesis that zoonotic viruses, so viruses jumping from the zoo animals, require adaptation prior to zoonoses, prior to ending up in us, to sustain that human-to-human transmission. They looked at the emergence of Ebola, Marburg. They say mpox virus. Fortunately, it's still named monkeypox virus, but the disease mpox. Influenza A virus, SARS-CoV-2.

They found no evidence of a change in selection intensity immediately prior to outbreaks in humans compared with typical selection within reservoir hosts. They found a change in selection on SARS-CoV-1, I guess, in an intermediate host. They concluded that extensive pre-zoonotic adaptation is not necessary for human-to-human transmission of zoonotic viruses. Now, in contrast, the reemergence of H1N1 influenza A virus in 1977 was preceded by a shift in selection intensity consistent with the hypothesis of passage in a lab setting.

What do you think about that? This is this idea that the 1977 influenza story, that may have actually been sparked by a lab strain, possibly in the context of a failed vaccine trial.

VR: Yes. This happened when I was a graduate student. Peter Palese worked on this virus, my advisor, and he concluded this is too similar to the 1957 version. The pandemic of 1957, this virus was circulating, and then it was replaced by H2N2. Then it reappears in 1977, but it didn't change enough to be able to be circulating. The idea arose that it was just frozen, and some kind of a vaccine trial led to its accidental release. This study is nice because you can tell signatures of cell culture adaptation in this and some other viruses that they looked at.

It's clear it was in a freezer somewhere for many years, but no one, of course, is going to admit it. It probably happened in either Russia or China, but nobody has ever owned up to it.

DG: All right. It's nice to have the comparison. Like, here you have it, actually, this is a situation where it looks like there was a lab leak, 1977, which one?

VR: You're doing a vaccine trial. I don't know if it's a lab leak because you're putting it in people, right?

DG: Yes, that's true. It was, yes.

VR: What it is that maybe they had tried to attenuate it, and it wasn't sufficiently attenuated or reverted. It started to spread in the population. It was a poorly designed trial if that's the case. This is not a lab leak in the sense that you're working on some virus, and suddenly it gets out, and you don't want it to get out, right?

DG: Yes, you're putting it out there. It just wasn't - You can almost think of this as like the version 2 of the oral polio type 2 virus, right?

VR: Yes. They make that it's a circulating vaccine-derived influenza virus, right?

DG: Yes. Clearly, really, yes.

VR: We will do this tomorrow on *TWiV*, by the way.

DG: Oh, OK. Awesome. All right. Measles. I saw this headline, "U.S. CDC Deploys Staff to Curb South Carolina Measles Outbreak." How long are they going to wait? U.S. CDC staff will arrive in South Carolina to help the state contain the largest measles outbreak in the country in decades, state officials said in a briefing. The first CDC on-the-ground assist comes some five months after the South Carolina outbreak began.

VR: This is ridiculous. The old CDC would have been there on day one and vaccinating people. Are they going to vaccinate people here, or are they just going to help?

DG: It's going to be interesting to see. I am very curious. There seems to be this, I'm going to keep calling it the midterm shift, but this idea, like, this is not popular, what's going on. We are not happy with thousands of measles of cases.

VR: The acting director of CDC is Bhattacharya, who has said measles vaccine prevents measles. Maybe this is a consequence of that.

DG: Yes. Which is a change, right? We're finally here, and we're finally seeing the CDC out there helping with this outbreak. We're seeing this messaging, you should get vaccinated.

VR: I'd like them to put RFK Jr. on the stand now and ask him what the hell is going on. He's the one who said, "No vaccines," and now suddenly this, what's going on? See if he can explain it. You know what he'll say? "I never said that."

DG: [laughs] We're approaching about 1,000 confirmed down there in South Carolina, but where things are really hot are actually out there in Utah, where we're over 400 confirmed cases so far. Really a lot of activity. If we look at the Hopkins measles tracker, always a little bit behind the times, but 1,305 already. Compare that to the CDC, about the same, 1,281 confirmed measles cases. You can see the areas where we have hotspots. If you look at the Hopkins tracker, a bit going on in Florida, a lot going on in Utah. I've got cases in New Mexico, stuff going on in Florida.

VR: What's this dot near Long Island, Daniel?

DG: I don't know. Actually, there's a little bit of activity.

VR: There was a case in New York City, right?

DG: Yes. All right. It's crazy. Last year, it was 2,200. We're almost halfway to what we were

at last year. We're more than halfway where we were all of last year. All right. Influenza, we're still high. We're still on this plateau with influenza. If you look at our multicolored map, or you look at all the different states, you can see, really, we have a lot of activity going on, a lot of parts of the country still. We're getting a little bit better, I'll say, in the New York area. We're seeing that most of the areas are declining. There's only a few areas, like Florida, where it seems to be growing.

We're seeing a really similar pattern to what we saw 2023, 2024, where it started to come down, and then it stayed on this plateau, and now it looks like we're finally coming down. There is some light here at the end of this, but unfortunately, we're still seeing adults and children dying. Another 11 children died this last week from flu. We're up to 90 deaths so far this season in the children.

VR: If that's your kid, you're going to be upset.

DG: Yes. I hope you are. I hope no one told you that you did the right thing by not vaccinating your child if they end up in the hospital or they end up dying. It'll be interesting to see. The WHO has made some recommendations for the fall flu shot. We'll see what happens here in the U.S.

All right, RSV. Really weird with RSV, right? Activity is still pretty darn high. We're seeing a mix. There's still areas where it's growing. Down in the South, finally, it looks like it's declining. Quite an interesting dynamic of what we've got going on there.

Here, I like this because we talk about vaccines, and I'm going to tell a story in the COVID section. There's this whole idea that the virus, all we attribute to it is the trouble breathing, the respiratory symptoms. We've tried to point out with different diseases, maybe you get the flu, three weeks later, you have a heart attack. That heart attack, we realize, might be related to the flu. RSV, you have RSV, and then three weeks later, you have a stroke, or you have one of these blood clots. That's related to the RSV because, as we're going to see here, if you vaccinate someone, you can actually reduce the risk of those issues.

Here's the article, “Effectiveness of RSV Vaccines against RSV-Associated Thromboembolic Events.” They're looking at the RSV vaccines against RSV-associated thromboembolic events among community-dwelling Medicare fee-for-service beneficiaries 65 or older in the U.S. We're going to find that the RSV vaccine was effectiveness 79%. That's amazing.

VR: Yes, very good.

DG: Right? Because we always think about, oh, but keeping you from needing to see the doctor, keeping you out of the hospital, but this is pretty robust protection against this complication.

VR: What is a thromboembolic event, a clot?

DG: Basically a clot. Thromboembolic, it could either be just a clot in place, that might be a stroke. It could be a clot that forms in your legs and then embolizes to the lungs, so our pulmonary embolism.

All right. This is a little bit of a disconnect. Now we are into our COVID update. When you look at the wastewater, the wastewater has us going from medium to high, but then I go to

our multicolored lines, actually a little bit rosier story, multicolored lines, where it looks like things are actually going in the right direction with SARS-CoV-2 across the country.

I have to see what happens with that blip, but it looks like in almost all across the country, we're dropping down, coming off of this winter peak, and it's really consistent. I laid out, and maybe David can put this out on the screen, but from 2022, it's January of 2022, we had that really high peak to just this biphasic, this two-peak-per-year thing that we've been seeing. It really seems to be settling into this pattern.

VR: It's weird, people were asking about that last night. I can't explain it. I don't know why there are two peaks.

DG: It'll be interesting. A lot of it, is it that the immunity, like we see with our vaccine? It only gives us about a six-month protection. Is it that then we become susceptible, so it is based on immune? Is it based upon any kind of dynamic from the virus, or? This'll be something.

VR: You look back, the flu graph that you're talking about, the percent of visits for ILI, you've got the different seasons there, and most of them are one peak, but sometimes there's two, like 2024-'25, there were two peaks pretty close together. In general, flu makes one peak.

DG: Yes, it's winter. You see it coming end of the fall, and it's done by April. We get a six-month break. I think I'll tell the story right after this one. The article, “Characterization of Young Children Hospitalized with Acute Respiratory Failure from Infection with RSV, SARS-CoV-2, or Both, November 2023, March 2023.” Investigators used data from a U.S. pediatric respiratory virus hospitalization surveillance network, including children with ICU admission for acute respiratory failure. These are kids receiving high-flow oxygen or end up mechanical ventilation with RSV and/or SARS-CoV-2 during November 2023 to March 2024.

Demographic, clinical characterizations, and hospitalization outcomes were stratified by a positive test for RSV, SARS-CoV-2, or both. Overall, 1,406 children were included. 89% had RSV, 7.5% COVID, and 3.4% had both detected. Remember, Occam was not a doctor. You can have as many darn things as you please. You can have both. Children with RSV or RSV and COVID had lower median ages, a little younger, 3.9 versus 5.4. With SARS-CoV-2, it was 8.8 months. 20% of children with RSV and 43.8% with COVID-19 had an underlying medical condition.

Among infants aged less than 1, for whom preterm status was available, 31.5 with RSV, 50% with COVID-19 had either prematurity or comorbidity. Children with SARS-CoV-2 were more likely to require invasive mechanical ventilation, receive vasoactive infusions, or die compared to RSV with or without SARS-CoV-2.

VR: These probably are unvaccinated kids, right?

DG: That's really what it is. It is interesting, and this is the story that I'll tell. I was talking to an unnamed pediatric ICU nurse, and she was talking about a child that had COVID. The story was that child was unvaccinated. They developed COVID, young child, like under the age of 4. Developed COVID, ended up getting dehydrated, fell, hit their head, had a seizure, ended up in the hospital, was intubated, but they were extubated. They were able to transfer out to the floor, so they ultimately had a good outcome. She made this comment.

She goes, "But the COVID really wasn't that bad." I was like, "But what do you mean?" I said, "Do you realize that this child, if they had not gotten COVID, if they'd been vaccinated, they wouldn't have become sick. They wouldn't have become dehydrated. They wouldn't have fallen. They wouldn't have had a seizure. They would not have ended up intubated in the ICU." "Yes, but the respiratory symptoms weren't that bad." I'm like, "They required intubation." I don't know. I think it's really interesting. I think it's really important, I'm going to say, is it's the whole picture. It's not just the severity of the respiratory effort.

It's the whole picture. You get SARS-CoV-2, you might end up with a seizure. You might end up dehydrated. You might end up in the ICU. We saw with RSV, you might end up with a stroke, or with flu you might end up with a heart attack or really any of those from any of these. It's the whole picture. It's not just how bad was my respiratory effort.

VR: They say in this paper that most children in this study were previously healthy, highlighting the need for prevention measures. This is why RFK Jr. saying you don't need COVID vaccines in these kids is just wrong.

DG: I wish we could highlight that more because they will say, well, children who are at risk. I think we should just counter with, yes, which is every single child under the age of 4. If your child is under the age of 4, their risk of having a bad outcome with SARS-CoV-2, their risk of ending up in the hospital if they're unvaccinated is at the same level of an elderly person over 65.

VR: During one season, the cumulative hospitalization rate of infants less than a year of age with RSV and COVID were 1,300 and 250 per 100,000. It's not insignificant.

DG: No. We still have babies dying of flu, RSV, and COVID.

VR: If you look at the data, the public health data, you will know that you need to vaccinate. This is just wrong to say, as RFK Jr. does, they would be better off not being vaccinated.

DG: Yes. I think that's why there are these lawsuits, because the CDC is supposed to have this relationship where they can't willy-nilly advance their own agenda. It actually has to be based upon recommendations that improve the health of the population. As we've seen, vaccines are one of the most tremendous, safest things we can do for keeping people out of the hospital, keeping babies from dying, keeping adults from dying prematurely. All right.

In the sick times, closing on a little bit of a downer, we have the article, “Where Have All the Long COVID Clinics Gone?” I think those folks with Long COVID or those people that know people with Long COVID are aware of this concern. Not encouraging as we read that in 2022, more than 400 hospitals and clinics across the United States claim to offer Long COVID care. I'm going to leave a link into the *Science News* article. The COVID-19 Longhauler Advocacy Project, a patient support group, compiled a list of more than 400 Long COVID clinics. Then they sent out a survey to all those medical institutions to find out what type of care, treatment support they offered here three years later.

Only 30 responded. Many are now closed. This is not just an issue here in the U.S. The closing of clinics is part of an international trend. In the UK, fewer than half of its 120 Long COVID clinics remained open in 2025. In Australia, nearly all of the metropolitan Long COVID clinics have shut down.

VR: What's the reason for that, Daniel?

DG: Part of it is cut in funding, and part of it is that people weren't really able to find a way for this to make sense economically. It's not that these people got all better. There's still a tremendous need. It's just really difficult. On that sad note, I will say no one is safe until everyone is safe. We're going to continue to be here. We're going to continue to provide updated information as we learn more. No one is safe until everyone is safe. If you want us to continue doing what we're doing, whether you like it or not, parasiteswithoutborders.com, click on that Donate button.

We're in the middle of our Floating Doctors fundraiser. We're hoping to double your donations. Send out a maximum donation of $10,000 to Floating Doctors. Actually, my daughter and I are going to be meeting with them Monday evening. We're talking about financing for a lab down there in Panama.

VR: It's time for your questions for Daniel. You can send yours to daniel@microbe.tv. Brent writes, "Hello from Manitoba, Canada. I'm a 39-year-old male, 15 years in remission from autoimmune disease and leukemia, thanks to a bone marrow transplant and an amazing healthcare team. Since the transplant wiped out my old immune system, I had to get the full schedule of childhood vaccinations redone in the years that followed. I ended up receiving four doses of MMR since serology tests kept coming back negative for measles antibodies.

In 2017, when I still had no detectable measles immunity after the fourth dose, my doctor told me I was probably just one of the unlucky few with primary vaccine failure. Unfortunately, the area where I live is now leading the country in measles cases and shattering records every month. Vaccination rates here are shockingly low, with some areas as low as 50%. Meanwhile, our government and public health authorities seem unwilling to take any meaningful action. We don't even have school mandates for MMR. Pathetic. Since the outbreak has been predictably accelerating over the past year, my doctor sent me for a fifth dose in August, did serology, and I finally have measles antibodies.

I also had an immunology workup to check CD3, CD4, CD8 counts, which are all normal or close. While that was a big sigh of relief, it seems my new immune system is rather stubborn, and I'm still concerned about the possibility of measles. Is there still a risk of developing a symptomatic measles infection after a confirmed immune response to a recent vaccination, and should I go for a second dose now that my immune system is finally able to mount a response? Thank you for being voices of scientific sanity in these insane times."

DG: Wow. It sounds like quite a road to getting that serology response. I'll make a couple comments. When people got just one dose of the modern MMR, we saw in the low 90s, 93%, 94% of folks would have a serological response. We got that up to 97% with a second, and we have this idea of a correlate of immunity. As we've talked about, that's not the full story because we're not looking at your T-cell response as well. It's encouraging that you finally had this response, but if you look at our outbreaks, there's always a couple percent of folks that were vaccinated and still had a case of measles, came to recognition, was diagnosed, but it tends to be much milder.

I would say for you, even though there's potentially a chance that you might end up with a symptomatic measles case, you're not going to end up with encephalitis. You're not going to end up in the hospital. You're not going to end up with the immune amnesia. I think you're in pretty good shape at this point. Just talk to your doctor a little bit about what level of

response that serology is at, and then navigate going forward.

VR: Gusten writes, Gusten, "I've been listening to you since very early in the COVID pandemic, possibly as early as December 2019, when people were still talking about rumors of mysterious deaths in China. As Brianne says, thanks, I learned a lot. An observation first. Today, Episode 1302, Daniel mentioned a mentee. This term is a pet peeve of mine, and you two are the kind of people who might listen. A mentor is not one who ments, and a mentee is not one who was mented.

A mentor is someone whose relationship to another is similar to the relationship between mentor, the old wise advisor, and Odysseus, might I suggest, protégé. My question, what is the course of disease for COVID-19? In all these years, I do not remember hearing a clear summary. Essentially, I want to know what damage is caused by SARS-CoV-2 and what damage is caused by the immune response. I'm sure the answer is murky."

DG: All right. Let's start off with the first part because it's fun. I've always been a fan of looking at the etymology of terms. Yes, mentor, mentee, it is an interesting etymology there. My wife and son, Barnaby, and I were just watching *O Brother, Where Art Thou?* I don't know if you've ever seen that.

VR: No, I haven't.

DG: It's entertaining. It's worth. You've got Ulysses as the main character. You've got a nod to Homer. Yes, this is an interesting comment about the language. What is the best language? Protégé, is that the best word? It almost sounds like you're not colleagues. I feel like sometimes a mentee and a mentor can have almost an equivalent relationship. My goal is always for the people I mentor to rise above and surpass me. I definitely appreciate that. Now, let's get into a little bit of science, moving from This Week in Etymology.

How much of it is caused by the virus? How much is caused by the immune response? If you think about the phases, we have that first week, the viral phase. That's when the people are teeming with virus. You can imagine who I'm channeling when I say that. This is when you might spread it to others. This is usually when people have the lowest amount of symptoms, the lowest amount of pathology going on. They usually weather this outside the hospital. Then the second week when they get the COVID, when they have their inflammatory response, that's when we were seeing people end up in the hospital struggling to breathe.

Really, the sort of thing that we're seeing here, it looks like it's the overexuberant immune response that is causing most of the damage.

VR: Cat writes, "Last week you recommended a 1980s baby get a second MMR shot. I am a 1980 baby, and my vaccine record says I had a measles singular shot as well as MMR. Does this count as my two shots, or should I get a second MMR?"

DG: Oh, that's odd. Kind of wondering about your shot record there. Yes, because I was pretty sure that it was the MMR shot, then you would get another MMR shot. Do you know, Vincent, was there ever a single measles shot licensed in the U.S. that someone in the 1980s would get?

VR: No, it was much earlier, right?

DG: Yes, earlier there were individuals. It would be odd. I don't know. Maybe the pediatrician had some hanging around from one. That's weird.

VR: That's a long time because, yes, the last time were the '80s.

DG: Yes, because I think by the '80s, it was already bundled in an MMR shot. Yes, I would review this. There's no harm if you're unclear here of getting another MMR. I'll go through and review the history on this. I think by the '80s, we had already moved on to the bundled MMR shot.

VR: Yes, 1971 is when we switched. Maybe the pediatrician had a lot in the freezer.

DG: Maybe just the way it was mischecked or something, because I think by the '80s, that's nine, 10 years past.

VR: That's too long. Lori writes, "I'm reaching out with a question about MMR vaccine and how it might impact my current condition of polymyalgia rheumatica. I am approaching the one-year mark since the onset of PMR and have successfully tapered my prednisone dosage from 20 mgs to 2. My goal is to be completely off prednisone by early summer. My main concern is whether receiving MMR at this stage could increase my risk of triggering another large flare of PMR. I do not have any records indicating I was previously inoculated with MMR, so I'd like to address this gap.

My rheumatologist has given me the green light, but when I consulted with the pharmacist, she advised against it primarily because the vaccine contains infectious virus, which could further compromise my weakened immune system. While I realize no one can guarantee that I won't be negatively impacted by MMR, I would value your perspective. Your expertise would help me make an informed decision as I try to balance protecting myself from preventable diseases with minimizing the risk of another PMR flare."

DG: Lori, this is a great question, and there's subtleties here, so I'll try to answer it broadly. I spent about a decade as a primary care doc in northern rural Colorado up by the Wyoming border, and I took care of several patients during that tenure with PMR. One was actually a famous character from that book, *Fever*. I won't mention them by name, but someone who played a prominent role because CDC was out there in Fort Collins, and I took care of a number of the folks there. It took a long time to get them down to a low level of prednisone.

Some folks were able to completely taper off. Some were able to get down to less than 5 milligrams, kind of a magic, so there's 2 milligrams. Now, you're down at 2 milligrams. When an individual gets down to less than 5, they're really at a physiological level of prednisone. We're not seeing that they're having issues or risks associated with any of the replication-competent vaccines. You'd be safe from that point. I think your pharmacist raises the question of you should talk to someone, and we're addressing it a little bit here.

No, I think it would be safe from that replication-competent MMR vaccine. Much safer than risking, as we're seeing measles come back into our country all over the place. Yes, 2 milligrams should not be an issue.

VR: Vivian writes, "Dear Daniel, I had a nasty bug for most of February. I think it was COVID. It took me three weeks to recover. I asked my doctor if she could order an antibody test. She said no, so she paid for it out of pocket and had the test done, and here are the results. I

have no idea how to interpret them. Two spike readings are negative. The third spike antibody interp is positive. Can you please enlighten me what this means? By the way, I had a Pfizer COVID vaccine in late December."

DG: All right. We've got the data right here in front of us to look at. First, we're seeing SARS-CoV-2 semi-quantitative spike. Actually, apparently, the level is so high that they say dilution, so they're going to dilute it. Then, when they do the dilution, they're going to give us a dilution result of 11,956. This is actually pretty high. This is units per milliliter. Negative is less than 0.8. Positive would basically be 1, and this is 11,000 above that. Basically, yes, you've got a lot of SARS-CoV-2 spike antibodies. This is positive. What's really tough, though, is that these are IgG assays.

All they're telling you is whether or not you've been vaccinated, whether or not you've had it in the past, whether or not you've had multiple vaccines or multiple exposures in the past, but doesn't tell you specifically about the recent infection. That's where with some infections, we would do an IgM and an IgG. Yes, you've got a lot of spike-targeted antibodies.

VR: It's hard to know if that's from an infection plus the vaccine or what, right?

DG: Yes, because she mentions having had the Pfizer COVID vaccine booster in December. You really can't tell. The way to know whether or not an acute infection is COVID, is RSV, is flu, is really to do that test during the first few days.

VR: She had the COVID vaccine in December and then got sick in February.

DG: Yes, this isn't going to allow you to discriminate.

VR: Getting really sick, it's unlikely that it was COVID because she'd just been vaccinated, but you never know, right?

DG: It's true.

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

DG: Oh, thank you. Everyone, be safe.

[music]

[00:51:45] [END OF AUDIO]