TWiV 1288 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 1288, recorded on January 15, 2026. I'm Vincent Racaniello. You're listening to the podcast all about viruses. Joining me today from New York, Daniel Griffin.

Daniel Griffin: Hello, everyone.

VR: It's quite a bow tie, yellow with some virus particles on it.

DG: They're prions.

VR: They're prions.

DG: This is my bright yellow prion. I've got the matching - well, the pocket square is getting near the end of a busy day. The pocket square that matches is falling down.

VR: I can't see the structure there, but it looks to me like a virus particle.

DG: Yes, it's like these interlocking proteins, but it's really just one misfolded protein.

VR: OK, prions, they're very good.

DG: Occasionally, it's a great assay, I should say, for testing. If you're concerned that someone might have prion disease, what you do is you take a little bit of the CSF or whatever tissue from sample, but CSF is often what we're doing. Then you add it to where the proteins are, and it triggers this cascade of misfolding.

VR: It's like protein PCR.

DG: It is. It's the RT quick, but the RT is not reverse transcriptase. It's real-time. What they do is it's a quake. They shake it, and that triggers them all to make contact and do this PCR cascade. Amazing stuff.

VR: It's very cool.

DG: Let's jump in.

VR: Before you eat your meat, you can check it for prions.

DG: Yes, do a little RT quake on all my meat. All right. I don't know if we have a lot of Grateful Dead fans. Are you a Grateful Dead fan, Vincent?

VR: I do like the Dead, yes.

DG: It's one of those things among Grateful Dead fans, you always ask, where were you when Jerry died back in 1995? Bob Weir just died.

VR: He did.

DG: Yes. I looked through, so I was going to quote Bob Weir, but then at the end of the day, I went with Jerry. Jerry Garcia, "Constantly choosing the lesser of two evils is still choosing evil."

VR: That's true.

DG: That was clever.

VR: I have a feeling like we're in that mode right now here in this country.

DG: Yes. I don't know if you can see in the show notes, Vincent, but I have a link to Danish cheese because I have to tell you, Vincent, Denmark is one of my favorite places. I was listening to the last deep dive on *TWiV*. The last time I was in Denmark, I gained a pound a day because I love the Danish food.

VR: Yes, very rich.

DG: They do this thing where they'll take this dark rye bread and they put things on top of it, like just some incredible smoked fish, the smoked salmon and the herring. The fish and the cheeses. I don't mind that it’s dark in the winter.

VR: This is a great website. It's The Cheese Professor.

DG: Yes, right. Cheeseprofessor.com. There's a special blog on Danish cheese, as you should know.

VR: It's great. It's making me hungry.

DG: Yes, I think Havarti is probably the most famous. For all the Danes who are listening, I just want to give you a little love in contrary to some of the comments from the deep dive. All right, public service and - [crosstalk]

VR: Were we dissing the Danes? Is that OK?

DG: I think you were dissing the Danes. You're like, you'll love Denmark if you don't mind it getting dark at noon.

VR: Noon. It was what they told me. I guess you could get used to it.

DG: I used to work up in Alaska. I did that for a number of years. I would do the night shifts, which I used to joke with a friend of mine. You can't even tell when I was up there in the winter because it gets light for two hours a day. Then we would joke when he was down visiting. It'd be like 11 o'clock at night. It's dark out. We're like, "Joe, Joe, it's just like being

back in Alaska during the winter. I can't see anything. It's dark."

No, the summers, 17 hours of light. It's just really an incredibly warm and friendly. I think we're hearing a lot about the Greenlanders. They're like, "We don't want to join the U.S. Do you know how good it is to be Danish?" They have healthcare. They have a great social support system. Education is free. I love your cheeses. I love your country. I love your sailboats. They make the best sailboats.

VR: That's right. You have a Danish sailboat.

DG: All right. We're going to talk about lots of infectious things today. Just by the way, in addition to SARS-CoV-2, influenza, and RSV, human metapneumovirus and norovirus are at high levels. Wash your hands and be careful out there. I feel like it's - what was that TV show about the police or something, and they tell them every day, "Be careful out there."

VR: A human metapneumo, would that cause a common cold or more severe infection?

DG: It can cause a more severe respiratory. I think of it as in the top four. They don't really test for it, because they have this quad where they do influenza A, influenza B, RSV, and SARS-CoV-2. You almost need it to be a five. I don't know. Maybe we just like the quad thing. Human metapneumovirus is another one. It causes an incredible amount of bronchospasm. We actually see people get pretty sick and in the hospital with human metapneumovirus.

VR: This is a winter respiratory disease, correct?

DG: Yes. I used to say it was my favorite virus because it's winter, but usually it doesn't start appearing until early April, end of March when usually I'm like, "Oh my gosh, human metapneumovirus. What am I doing? Time to put my sailboat back in the water." Here we are at high levels in January. The world is all just upside down. Norovirus, winter vomiting disease, yes. Tis the season. All right.

VR: I had it a while ago. I'm good.

DG: There's dozens of different variants. You can get it more than once. All right. The article, “Maternal Vaccine Receipt and Infant Hospital and Emergency Visits for Influenza and Pertussis,” was published in *JAMA Network Open*. I put this right up front. Now, these results are from a population-based cohort study that used the healthcare utilization databases from the Lombardy region of Italy. I'm just back from Italy. Pregnant individuals who received the influenza and Tdap vaccine among all live-birth pregnancies in 2018 to 2022 were included.

Each vaccinated mother was matched with a nonvaccinated counterpart based on month and year of delivery, gestational age at birth, and pregnancy multiplicity. Analyses were performed. Primary outcomes were infant hospitalizations or emergency department visits due to flu and pertussis. This study included 53,448 pregnant individuals who received the Tdap vaccines. That's tetanus, diphtheria, acellular pertussis; 5,347 who received the flu vaccine. Infants born to mothers who received the Tdap vaccine had a lower risk of hospitalization or ED visit. Vaccine efficacy, 88.6. Pretty impressive, right?

VR: It's very impressive. This is keeping babies out of the hospital if the mother's vaccinated,

right?

DG: Yes, keeping babies safe by mom getting vaccinated. This is the policy that we try to have in the U.S., but we don't have quite the robust universal healthcare that Denmark has. We try to get moms vaccinated for pertussis, try to give them a Tdap during pregnancy. Then we also try to get everyone who's going to be around that baby vaccinated because children can die. We've had a lot of children die here in the U.S., down in the South. Now, infants born to mothers who received the flu vaccine had a lower risk of hospitalization or ED visit for flu. That was an efficacy of 69.7%, almost 70%.

VR: Yes. It's really good.

DG: Basically, should mom get her Tdap during pregnancy to protect her baby? Yes. Should moms get flu vaccines during pregnancy to protect the babies? Yes. Study found that maternal influenza and Tdap vaccinations were associated with reduced influenza and pertussis-related hospitalization or ED visits in infants younger than 6 months. Vaccine coverage in this study was not great. Here's this overwhelming data. The proportion of vaccinated pregnant individuals among those eligible who actually got vaccinated, only 6% for flu and only 41% for Tdap.

VR: I don't know why it had such an effect with low uptake. Does that make any sense?

DG: I think this is getting the vaccine, right?

VR: Yes. Also, there are probably a lot more people got flu vaccine than Tdap, right?

DG: No. Interesting enough, I think - Here we have -

VR: Oh, 53,000.

DG: Yes. Kind of crazy. You've got all these people and the - Yes.

VR: What's the policy in the U.S. with respect to maternal immunization with these vaccines?

DG: We encourage it. Yes.

VR: It hasn't gone by the way yet.

DG: True. Not yet, but just they're coming for this too.

VR: I'm thinking about the Cheese Professor. Does the U.S. have any native cheeses at all?

DG: Yes. Did we invent any or do we just have cheese from all around the world? I don't know.

VR: We just steal others, right? That yellow crap is not really cheese.

DG: Yes. What is that American cheese, which is not - [crosstalk]?

VR: Process spread or something. It is not cheese.

DG: It's definitely not cheese.

VR: I don't think we have any American cheese. All these nice Bries and Emmentalers, they all come from Europe, not from the-- They make them-- [crosstalk]

DG: Where does cheddar come from? I'm not sure.

VR Maybe that's an American cheese. Let me look it up.

DG: You look it up while I start talking about measles. Measles, it's the new year, and I guess we've decided we're going to keep going. South Carolina and Utah. South Carolina, we heard the state now has 434 measles cases; 124 new cases were confirmed. There currently are 409 South Carolinians in quarantine, 17 in isolation with some quarantines extending to February 6.

Utah, another 25 new cases. The state there is now more than 200. Now, it's really interesting, I guess, through those numbers at the state, but let's go to the CDC. As of January 13, 2026, 171 confirmed measles cases reported in the US. What are we doing? About 85 a week. You can do the math. We're going to be like over 4,000 at this current rate. We were over 2,000 last year. We're already starting out twice as fast.

VR: When do we lose our measles elimination? At the end of January?

DG: Supposedly, but they're arguing that, we may have thousands of measles cases in the U.S., but they're variants. They're different measles viruses.

VR: It's ridiculous.

DG: We want to keep our measles elimination status on a technicality. We have thousands of cases of measles here, but it's been still eliminated.

VR: It's not eliminated. This is BS. I call BS.

DG: Yes. We're going to lose our status this month. Up there in Canada, the year ended with over 5,000 cases. Not good. All right.

VR: Anyway, we do have cheeses here in the U.S.

DG: Tell me.

VR: Colby cheese, you probably recognize. Farmer cheese, string cheese, Monterey Jack, Muenster, and others we have. None of these you'd write home about.

DG: I like string cheese. I like Muenster. I like Colby. Colby's kind of reasonable.

VR: You know what the ones they have in Wisconsin? Cheese curd. They're big on that. You ever have that?

DG: I don't know if I ever had, but boy, Wisconsin, they love their cheese.

VR: Yes. We do have some native cheeses that were developed here, but I don't - Here, an American cheddar. I just don't think they're as good as cheeses from other countries. Sorry, ,.

DG: All right. Moving on from this week in cheese. [laughter] Flu, a lot of flu activity. If you

look at our map, you get to see very high and lots and lots of the country. Everyone's moderate and above.

VR: Oh, look at even Arkansas.

DG: We actually got some data. Look at that. In Arkansas is very high.

VR: Although the pediatric flu deaths, there's a graph down there without Arkansas. I don't understand what that is. Pediatric flu deaths, maybe?

DG: Oh, I don't know. Maybe they're not giving us data there. I know when we look at the epidemic trend, because we're like, here's where we are now, lots of flu everywhere. Then the next question is, is it over? Have we reached the peak yet? A lot of the country does look like it's declining, but certain areas like Wyoming and Utah and Arkansas, we're not getting any data. We're not sure what's going on.

VR: For flu, Arkansas is definitely high level they're reporting.

DG: They're very, very high for flu levels. We just don't know.

VR: The next one, that teal-colored graph, I don't know what that is.

DG: We've got the multicolored graphs. Hopefully, David will have this up for people. This says, where are we right now as far as the activity? Then we have an epidemic trend. The epidemic trend is, are the rates declining, likely declining, not changing, likely growing? The only place it's likely growing is actually out in Oregon. I think a lot of places, we've reached the peak and we're on our way down.

VR: This map doesn't have Arkansas and Nevada and - No, Utah and - [crosstalk]

DG: Utah and Wyoming. That's the epidemic trend.

VR: They're not reporting?

DG: Yes.

VR: Got it.

DG: Yes. We are getting pediatric deaths. For the first time in 10 years, North Dakota reported flu-related deaths, a couple children. Children were under the age of 10. We don't know much more about them. We're up to 17 pediatric deaths already. It takes a while to, not only for the children to die, but for them to verify that it really was related to flu.

I really like this. I love when my wife is like, "Have you read this article?" It was in *The Atlantic*, the article, “The Best Flu Drug Americans Aren't Taking,” by Sarah Zhang. It's worth a read. Now, what is she talking about? I want our *TWiV* listeners to think, what would be this flu drug that we've talked about that's really good, maybe better than Tamiflu, that just no one really takes? What are we talking about, Vincent?

VR: Yes, baloxavir.

DG: Baloxavir. Xofluza, the girl you don't want to bring home to mom.

VR: Sarah was on *TWiV* some time ago, I think.

DG: Oh, she was.

VR: I'm sure she got it from listening to us because who else talks about baloxavir and it's not being used? Remember we got an email from Bob Krug, who discovered the endonuclease, and baloxavir is an endonuclease. He said this is a really good drug. I bet she listened and picked up the story from that. Where else is she going to get this from?

DG: I don't know. I love to take credit. We read: “Actual numbers are hard to come by, but compare the estimated 1.2 million prescriptions for Tamiflu and its generic form in 2023 with the some 40 million people who likely got the flu in the winter of 2023, 2024. Xofluza is even less popular and exact prescription numbers even harder to find, but they are possibly somewhere from just 1% to 10% that of Tamiflu.” Basically, most people are not getting treated. You've got flu, there's something that can get you feeling better.

They say the two antivirals are equally effective at allaying symptoms, both shortening the duration of flu by about a day. When you get the flu, if you're like, hey, you could be better a day sooner, one day less of this. Now, Xofluza was approved in 2018, and it has some, as Sarah says here, tangible benefits over Tamiflu. Xofluza is simply more convenient, a single dose compared with Tamiflu's 10, which are taken over five days twice a day.

It also causes fewer of the gastrointestinal side effects, such as vomiting and nausea, that patients on Tamiflu will sometimes experience. I actually think of this as, though my wife thought this was great, there's that psychological, "I took the Xofluza and the next day I was still sick," where the Tamiflu, you take it until you're just about to get better anyway.

VR: Yes, anyway. Yes. [laughter]

DG: Now, second, Xofluza makes you less contagious to the rest of your family. When my family gets sick, I want them to take Xofluza because I don't want to get it. It drives down the amount of virus spewed by sick patients more quickly than Tamiflu, possibly because - [crosstalk]

VR: I like that word.

DG: You like that?

VR: Spewed.

DG: Yes, the spewing of virus, possibly because of differences in how the two drugs work. Whereas Xofluza stops the virus from replicating, Tamiflu can only prevent already replicated viruses from exiting infected cells to infect others. Third, Xofluza is better at heading off serious post-flu complications such as pneumonia or myocarditis. Patients on Xofluza needed fewer ER visits and hospitalizations than did those on Tamiflu, and we've talked about those studies. But: Tamiflu, first approved in 1999, is available as a generic for less than $30, even without insurance.

Xofluza is still patented and runs $150 to $200. - they say a person, but it's really a pill. Because it's less popular, pharmacies are less likely to stock it, making doctors less eager to prescribe it, and so on. In October, though, the company that markets Xofluza in the U.S. launched a direct-to-consumer program, and I'm going to leave in a link, xofluza.com/save-

on-xofluza/coupon.html#cash-pay Basically, you go there and you can just get it for $50 without insurance. Same-day delivery in most areas.

VR: You still need a prescription, right?

DG: You do.

VR: How do you do that online?

DG: I should go through and check it out, but I think you would go online. You have to have your doc send them a script.

VR: Maybe I'll have you send me a script, so I'll have it when I get flu.

DG: Yes, because I don't want to come and hang out with you, and you've got the flu, spewing virus everywhere.

VR: I got vaccinated back in October, and I'm OK.

DG: OK. So far so - [crosstalk]

VR: So far.

DG: All right. RSV is also high, and that's a little surprising, I have to say. We'll circle back to that because the usual seasonality with RSV is it starts in October down in the south, it heads up and peaks and then runs down. I want to talk a little bit about an article, "Impact of Universal Nirsevimab Prophylaxis in Infants on Hospital and Primary Care Outcomes Across Two Respiratory Syncytial Virus Seasons in Galicia, Spain: A Population-based Prospective Observational Study," published in *The Lancet Infectious Diseases.*

Here, we're looking at an ongoing, population-based, prospective, longitudinal study in Galicia, Spain. For this study, they included all infants eligible for nirsevimab in the 2023-2024 RSV campaign in Galicia, follow-up for their first RSV season, 2023-2024, until the end of their second season. Primary endpoint was RSV-related lower respiratory tract infection hospitalization, so ending up in the hospital for RSV.

They also looked at a number of secondary endpoints. The first recurrences of these endpoints were also assessed as secondary endpoints. They're basically going to look at first and second season. 12,492 eligible infants, 94% of them are going to get covered. Compared with historical cohorts, the RSV-related lower respiratory tract infections decreased by 86%. In the first season, 55% in the second, with an estimated 123 infants needing to be immunized to prevent a second-season admission.

VR: That's really good coverage: 94%.

DG: Excellent. Look at that, 86% reduction in RSV hospitalizations.

VR: It's just great. Now, what have we done with this recommendation here in the U.S.?

DG: The current blokes in charge are not on board with this. We just let the kids end up in the hospital because that's what happens in other places. This is what I go off on. This is a monoclonal antibody. This is the stuff that saved Trump's life. They're anti-vax.

VR: Yes. The birth dose they got rid of for RSV.

DG: Isn't that crazy? Come on.

VR: Now you don't have one - Well, I don't see any in the first years of life for kids. No, there's no more RSV. That's crazy.

DG: It's crazy.

VR: It's been the biggest cause of pediatric hospitalization in the winter, and you don't vaccinate against it?

DG: Look at this efficacy, 86%. Then there's the rollover. You hit this population, and then you also protect the adults, the people around them. Hey, Grandpa, can you watch my kid? Now, next thing you know, Grandpa's got RSV, and they're in the hospital. Then they're back in the hospital four weeks later with their post-viral pneumonia, which is what I'm dealing with a patient today. I mean, come on. The weird thing, if we look at epidemic trends, like what's going on with RSV, now, it probably is declining down in Florida, maybe South Carolina, down. We've still got it growing in a lot of the country.

VR: Yes, for sure.

DG: Still, a lot of RSV going strong.

VR: Looks like the middle of the country is really getting hit.

DG: Yes, it's basically growing and likely growing in most of the Midwest and the West.

VR: Although New York is declining, it says, and New Jersey is declining.

DG: Yes, I think we've reached our peak. It's really interesting Vermont, New Hampshire, it's growing. There's a little bit of a disconnect there.

VR: At least people can make their own decisions, right?

DG: Yes, you still can. In most states, you're going to have access. Your pediatrician's going to be like, "Yes, those guys are giving you bad advice. Let's keep your child out of the hospital." Not only can the baby get the monoclonal antibody, but we also have getting vaccinated during pregnancy. We have the research letter, “Interim Safety of RSVpreF Vaccination During Pregnancy,” published in *JAMA.* The analysis, led by Harvard Medical School researchers and including authors from Pfizer, draws on data from five U.S. health plans, 54,000 pregnancies.

Of all participants, 19% received the Abrysvo vaccine from 32 to 36 weeks gestation. That's what it's recommended. No statistically significant increase in preterm birth, hypertension, high blood pressure disorders, premature rupture of membranes, premature rupture of membranes. Basically, safe, no issues. The safety monitor is still ongoing. "Continual safety monitoring is crucial," write the authors. Continuing to see safety and this coupled with the efficacy that we continue to share.

VR: How long will they do safety follow-ups, do you think?

DG: They really follow it for years and years, and then if they start getting reports of any issues, they'll do specific targeted. All right, COVID, where it all started.

VR: Well, that's where this program started, right?

DG: That's true. The clinical update goes back to February of 2020, end of February, beginning of March. Wastewater data, look at that. We were thinking maybe that was that little bit of a dip, but it was just a false summit.

VR: We have a full-on epidemic right now.

DG: Yes. In some of the areas, the Midwest, it's in the very high. The Northeast, tons of SARS-CoV-2, lots of folks with COVID. I think that we have reached the peak. If we look at our ER visits epidemic trend, it looks like it's growing in Florida, maybe growing up in the Northwest, in the main New Hampshire area. Hopefully, we're peaking in a lot of the rest of the country. We'll keep you updated.

VR: If you look at last year's trend, it keeps coming down. It's still in February, but it's declining. By March, it's pretty low, March, April. It may be declining, but it's still cases, right?

DG: Yes. I suspect that's what's going to happen. I suspect we'll peak here in the coming weeks, and then we're going to drop down and then get some nice low levels for that. We'll get that spring low, and then we'll get our summer double peak.

VR: It's so weird that there's a peak in the summer, SARS-CoV-2.

DG: It is interesting.

VR: I don't get that at all.

DG: Is there something you could do? I keep getting this. It's really funny. I get this over and over, like, "Are we still recommending those COVID vaccines?" I think what the question should be is, do they still work? Should we still be recommending them? The answer is, repeatedly, the science is yes. We keep getting more and more data. It's consistent, same directionality. “Evaluating the Effectiveness of 2024–2025 Seasonal mRNA-1273 Vaccination Against COVID-19-Related Hospitalizations and Medically Attended COVID-19 Among Adults Aged 18 or older years in the US.: An Observational Matched Cohort Study,” published in *Infectious Diseases Therapy.*

This study evaluated the effectiveness of the Moderna mRNA-1273 vaccine targeting the KP2 variant compared to people who did not receive an updated vaccine, and looking at preventing COVID-19-related hospitalizations and medically attended COVID-19. These results come from a retrospective matched cohort study, 596,248 vaccine recipients matched one-to-one. Approximately 70% of individuals had an underlying medical condition, making them high-risk.

Vaccine efficacy was 52.8% against COVID-19-related hospitalizations, so more than 50% reduction in ending up in the hospital. About 40% against medically attended COVID-19, over a median follow-up of 55 days in the interim analysis. The vaccine efficacy was sustained throughout the entire study period, 45% against COVID hospitalization, 33% against medically attended COVID-19, median follow-up 127 days.

VR: What do you think is the reason for the low - 30% is almost like placebo effect. Do you think most people don't bother to go see a doctor when they get COVID?

DG: I think a lot of people don't at this point, yes.

VR: Of course, if you get in the hospital, you have no choice over that, right? [crosstalk]

DG: If you get sick enough that, yes, you show up and you end up getting hospitalized, yes.

VR: I think a 50% reduction in hospitalization is really good, right?

DG: Huge at a population level. It's crazy, right? You're thinking, "I'm at the CDC. I want to make recommendations that are going to really help this country." You look at the hundreds of thousands of COVID hospitalizations. If you get folks vaccinated, you can basically cut that in half. We struggle. You go to the ER and it's like, "Oh, this person is in red hallway." I'm like, "Red hallway." Now, the hallways are where you end up hanging out because we have ER borders, which anyone who watches *The Pitt* is familiar with.

We have full hospital beds because we've got all these respiratory infections bringing people in. They're needing oxygen. They're needing support. All right, get those vaccines. All right. I got a couple of my colleagues reached out and said, "When you go through the COVID early viral phase, can you just sort of go a little slowly and remind people because it looks like people are getting sloppy." COVID early viral phase, what do we recommend? Early effective antiviral therapy for people that are at risk of progression.

In the outpatient setting, that's pretty much Paxlovid here in the States. Some situations remdesivir, maybe molnupiravir. Here's the big one: no steroids in the first week. Our docs are getting really sloppy here. Person comes in, I don't know, could be COVID, could be flu. Let's give you a Medrol Dosepak for some ridiculous amount of money for like a dollar worth of steroids, but it's packaged in a cute way, and no steroids in the first week.

We've repeatedly discussed the data in COVID. It's the same in flu. Even in flu, not recommended and may increase mortality. I'm going to leave in a link. I'm going to point out to all those - I don't know if you're bots or just disgruntled people that leave comments on YouTube. I reference everything I say. If you have an issue, go look at the data and then you can decide.

VR: How long after test positive can you get Paxlovid?

DG: The studies were out to five days, but I don't think you need to be a stickler. If it's within the first seven days, a lot of us can still prescribe. Studies were done within the first five, but it still was pretty robust getting it even on day five.

VR: When can you start thinking about steroids?

DG: That's that second week, so that's after day seven.

VR: Not everybody needs steroids.

DG: No, no. The second week, the early inflammatory phase, they looked at who benefited, and not everyone. There's side effects. There's adverse issues with steroids. The people who it's recommended for are the folks that get enough inflammation that they actually get

hypoxic. They've got resting oxygen saturations less than 94%. You can even get more granular looking at CRP and those that have significant inflammation.

All right. We've got one last article before we hit our emails, and this is in the Long COVID section. Is Long COVID still a thing? Unfortunately, it is. The article, “Incidence and Severity of Postacute Sequelae of SARS-CoV-2 Infection in the Omicron Era: A Prospective Cohort Study,” was published in *JID*. Here we've got a prospective cohort study looking at almost 3,000 non-hospitalized adults with acute SARS-CoV-2 infection. They collected this data as part of the VISION study. We've talked about the VISION study before.

They enrolled a little over 3,000 non-hospitalized adults in North Carolina. This is October 5, 2022 to March 31, 2024. This is during a period where it starts off with the Omicron sub-variants, mostly BA.5, about 80%, some BA.4.6. Then by the end, most of them, 56%, are JN.1. That evolution of the Omicron. The participants complete this daily online symptom diary for 14 days after enrollment. Then they're going to do it at eight, 12, 26, 36, 52, and 72 weeks to assess their health status. Now they got a really high percent.

Now they're reporting that 37% of the non-hospitalized adults were self-reporting experiencing PASC, so post-acute sequelae. I was trying to look through. This is still at a pre-print and you blow it up and the images are blurry. It's always hard for me to know what does that 37% actually mean? We're still seeing it. There are certain factors that increase your risk. Being older, female more than male, rural residence, high BMI, if you've had prior infection, so this wasn't your first, chronic lung disease, how severe that acute infection is. Just your general health status.

Here's the big one, that sort of like what can I do? Recent within the last six-month COVID-19 vaccination was associated with both reduced incidence and lower severity of PASC. In this study, getting antiviral therapy was not evident as far as decreasing your risk of PASC.

All right. We're still in January. We are in the last leg of our *MicrobeTV* fundraiser. Go to parasiteswithoutborders.com, click Donate. We're hoping to get up to that maximum donation of $20,000. I like to say if you like what we do or you just want us to keep doing it, send in a donation. All right.

VR: All right. It's time for your questions for Daniel. You can send yours to daniel@microbe.tv. Eli writes, "What is the current recommendation for COVID booster vaccination for people over 75? Once or twice a year?"

DG: God, Eli, who knows? [laughter] What is the science? I think I mentioned early on, that's the whole thing. It's, as we just mentioned, within six months, as we saw that benefit for decreasing your risk of Long COVID. Within six months, you're seeing your decreased risk of hospitalization or end up seeing the doc. Older folks, 75 and older, once a year, it looks like it's not quite as effective as getting it once every six months. That would be what the data would show.

VR: Twice a year then?

DG: Twice a year.

VR: All right. When would you get it?

DG: That's interesting. Looking at when our peaks are. If you think about, OK, maybe I get it in November, early November, because we tend to see that winter peak. Then it's going to be May when you get your next one.

VR: Theodore writes, "Dear hosts, I had flu-like symptoms from January 6-7. The symptoms were minimal as I am vaccinated; scratchy throat, little cough, fever. I had a positive RAT test for flu B on January 8, so I started Tamiflu. The minimal symptoms subsided. One week after symptom onset, I had a second test, same brand, still positive, but symptom-free. Knowing that you can't measure infectivity like that, only plaque assay does, I assume that the positive test was due to inactive, probably non-contagious, leftover viral antigens. Please comment."

DG: Yes, that would make sense. Some of these tests can stay positive for quite a while. As you point out, they're not plaque assays. You're not looking for viable virus that you might be spewing out into the environment. You're just testing for the antigens.

VR: Theodore is listening. He's got it right.

DG: Good job, Theodore

VR: He's from Athens, Greece. You can listen to *TWiV* even in Greece. How about that, Daniel?

DG: I want to go to Athens next. Unfortunately, my wife lived in Athens. She's like, "I already lived there for three years. I don't need to go visit." I'm like, "All right, but I want to go visit."

VR: Go in the summer where it's nice weather.

DG: I'll do that.

VR: Jen writes, "I'm about to turn 50 and wondering about two vaccines for which I'll be eligible: shingles and pneumonia. Is there any advantage to waiting a few more years before I get them? I would be happy to gain the protection as soon as possible, but I don't want the benefits to be waning in my older years when I would need the protection the most. What's the sweet spot for this timing? Also, I hear shingles vaccine is a doozy. I definitely plan to get it, but any advice for making it more tolerable?"

DG: When you hit 50, I would just go right ahead. Now, let's just talk a little bit about these vaccines. The shingles is this protein-based, really good, robust response. As we've been talking, not just protecting you from getting shingles, but really seems to be like a dementia vaccine as well, particularly for the ladies, Jen. Go ahead and get that shingles. You're going to get one shot, and then one to three months, you get the second. I say three months is fine. Let those germinal centers really be ready for that second shot.

The pneumonia, you're going to have the conjugate vaccine, either the 20 or the 21. The 20 is probably better market share out there, and they'll argue about which is better. Go ahead and get that. It would be interesting to see, as we're learning more about the dementia impact with the shingles, do we do a booster every 10 years? Does that make sense? Is the durability really what we think it is?

We're just starting to roll out the PCV20 at this 50 age. Do we need to do that more often? Because some of us might live for 50 years past then. Now, what about the doozy? Yes, it's

true. The shingles vaccine, for some folks, they're down for about a day. Get it on a Friday afternoon, lay low on Saturday. Just going to take a little time. You'll feel better.

VR: I had two shots of Shingrix, and I didn't feel anything. It really depends on the person.

DG: It's true.

VR: I don't think it's universally a doozy. Leandro writes, "I listen to the show every week. Thank you for providing excellent information. Recently, RFK Jr. announced the reduction in the number of recommended childhood vaccines to more closely align with countries like Denmark. This alarms me simply because, as I understand it, there is not a valid reason to reduce the number of recommended vaccines since there's no evidence of harm of any of them.

My question is, why do other countries not recommend the same vaccines as we used to? For example, the newborn hep B and chickenpox vaccines aren't universally given in a lot of rich countries. Is there evidence that they see more cases and more child deaths than they would otherwise? What would your argument be for saying that we shouldn't model our vaccine schedule on Denmark? Surely, the Danish public health professionals also use data and evidence in their recommendations," and cheese.

DG: Yes. [laughs] Leandro, this is great. I think this is worth having just a brief little discussion here. You want to be looking at your context. Denmark, as I mentioned, people in Denmark are the highest happiness index, great universal health. Apparently, they say they're the happiest of all the Scandinavians. Universal healthcare, they pay for education. Basically, if someone is pregnant, they're getting prenatal care. They're getting tested. They know what the hepatitis B prevalence is in the population. They know who to target.

We don't have that in the U.S. In the U.S., 20% of ladies give birth and no one's ever tested. No one knows what their hepatitis B status is. We also don't know what the hepatitis B status of the caregivers. Hepatitis B, for instance, that's not great because in Denmark, they can make it work. That's one. If you say, OK, we're going to do away with hepatitis B vaccination, but we're going to provide universal healthcare coverage in the United States, and everyone in the U.S. is going to get tested and get excellent prenatal care, I'm on board with that. We're not saying that. The RFK Jr. and folks are not giving us anything. They're just taking stuff away.

Now, the chickenpox, interesting. As we're starting to see, maybe getting chickenpox as a kid is related to getting dementia as an adult and all these other problems. I'm looking forward to the day when, instead of an attenuated chickenpox exposure, which is what we're doing to the kids now in the chickenpox vaccine, maybe we're going to use this protein-based Shingrix vaccine, and maybe we'll grow up in a world without chickenpox, without the varicella zoster virus reactivating in our brains and making us all demented.

VR: Also, the rotavirus vaccine that we used to use, we still can use it. They don't use it in Denmark. They're thinking about it now because they have kids getting infected and they don't want that.

DG: Yes, it's a problem.

VR: Maybe they're going to model themselves over the way we used to be. Jeff writes,

"Thank you for all you do. You remain an anchor of scientific rigor and sanity for us all. The story about the lab leak hypothesis has resurfaced on social media as the most read story of the year, triumphantly arguing that the contrarian scientist involved has finally been proven right after five years. Has the science on any of this changed?"

"Is there anything new to report other than the CIA changing its position? I thought the weight of evidence and the opinions of relevant experts was pointing mostly towards a natural origin. I'm sorry to be a skeptic, but I think we've gotten to the point where government agencies changing their positions does not necessarily mean there's new evidence, only different people in charge. Interested to hear your thoughts."

DG: Vincent, I'm going to let you take this one. Can I do that?

VR: Sure. There's no new evidence that this is not a natural origin. Nothing. All these people who are trumpeting a lab origin, they have no evidence, zero. Someone said to me, "Racaniello, the evidence is that there was a lab in Wuhan working on the virus." Really, that's your evidence? There's zero evidence. There's nothing new. The CIA, nothing new there. It's just politics, so you can ignore it. You are right that there's no evidence, only different people in charge. I don't think it's the most read story of the year. I think a lot of people are fed up with it, frankly, and so am I. I will always argue that all the evidence points to a natural origin. We have lots of evidence, too. That's *TWiV* weekly clinical update with Dr. Daniel Griffin. Thank you, Daniel.

DG: Thank you. As we've been saying for years now, no one is safe until everyone is safe. Everyone, be safe.

[music]

VR: And go have some Danish cheese.

DG: Yes.

VR: Maybe that's why they don't vaccinate as much because their cheese is so good.

[00:44:49] [END OF AUDIO]