Transcript

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Welcome
Jasmine Chaitram
CDC Division of Laboratory Systems

SARS-CoV-2 Variants Update
Natalie Thornburg
CDC Division of Viral Diseases

H5 Situation Report
John Barnes
CDC Influenza Division

FDA's Resiliency Program
Tammy Beckham
U.S. Food and Drug Administration

Jasmine Chaitram: Hey, everybody. Thanks for your patience. I'm Jasmine Chaitram. I'm the Associate Director for Laboratory Preparedness in the Division of Laboratory Systems. Sean Courtney has been hosting these calls now for a couple of months, but he is on a much-deserved break, so I get the chance to be back here with all of you again.

And showing the agenda for today, we've got three really good topics to cover. Before we start the agenda, I will cover just a few reminders for everyone. And start off by reminding you all about the Division of Laboratory Systems. You've heard this so many times you probably could say it better than me, but our division is responsible for communicating and liaisoning with clinical laboratories throughout the U.S. And we host these calls to provide information to all of you on emerging issues in response-related topics and other things like the four gold areas that we are highly focused on, which include quality laboratory science, workforce and development, biosafety for laboratories, as well as preparedness topics, and accessible and usable laboratory data.

We do archive all of the information from our LOCS Calls on our webpage, which is being shown here. You can go there, and you can find a transcript as well as slides from previous calls. It does take us a couple of weeks to get that information posted, so appreciate your patience when you're looking for that information.

We always want your feedback on what we can be doing to improve these calls as well as what our division can be doing in the area of training and workforce development, and you can send those suggestions to labtrainingneeds@cdc.gov. And then reminder, which you probably all know this pretty well, too, when you're asking a question to please use the Zoom webinar system and the QA button at the bottom to submit your question. This allows us to track those questions. It also helps us if you include an email address in case we don't have the experts on the call to answer those questions. We can always try to get those answers for you after the call and then send them out.

So if you put something in the chat, though, it's not easy for us to track. That information goes away. So we do ask that you include it-- you submit those questions by asking them through the Q&A feature. And with that, just another quick reminder about those slide deck presentations, especially the ones that we post to the website after these calls, which is that the panelists may not be affiliated with CDC and may not necessarily represent CDC's official position on a specific topic. And with that, I think we will go to our first speaker, Natalie Thornburg, who has joined us before. And she's going to give us an update on the SARS-CoV-2 variants.

Natalie Thornburg: Hi, Jasmine. Can I share my screen, please?

Jasmine Chaitram: Yes. Let me stop sharing.

Natalie Thornburg: Sure.

Jasmine Chaitram: And I think you have it now.

Natalie Thornburg: Yeah, I do Thank you. All right can you guys see my screen, or are you just looking at-- let me stop and start that again.

Jasmine Chaitram: I was seeing it for a second.

Natalie Thornburg: Yeah, and then it disappeared. Having a little bit of technical difficulty. It is really not wanting to share my screen

Jasmine Chaitram: I'm seeing it now.

Natalie Thornburg: OK. It doesn't have a red outline. Unusual, so I'll just trust you guys. All right, so fortunately, the SARS-CoV-2 genomic and viral picture right now is much simpler than it has been many of the other times I've spoken with you.

So we did have a winter surge. I forget the last time I talked with you guys. I think it was right at the end of the winter surge or in the middle of the holiday surge, but we had a holiday surge as we expected. But really, the case counts have been decreasing since early January, which is shown here at the update from the COVID data tracker. We've seen a concomitant drop in deaths and hospitalizations during that time, as well.

Case counts have stopped being an accurate representation of what's going on with circulation. So we look at both case counts and percent positivity, and we did see a peak right around January 4th in that percent positivity, which is shown in yellow on the right y-axis has been dropping since then and is probably dipped below 10% at this point. The most recent data point that's shown is the end of January, so we believe it's been dropping since then. And that represents a lower surge than what we saw this

summer with the BA.5 wave, and most definitely much lower than what we saw with the first Omicron wave last holiday season.

All right, so this is the current view of the weighted and Nowcast estimates in the United States. We've changed the look of the data tracker a little bit to try to communicate more clearly what the data actually is. I think there was some general confusion about the differences between weighted estimate versus Nowcast estimates. So we made some subtle changes that we hope helps everyone understand those differences in the data.

So the weighted estimates, which is now shown separated on the left side, represents actual sequences that we've collected nationally that have been weighted proportionally to the number of case counts we get in each state. So this represents actual data collected. Now you, as laboratory professionals, understand data lag, and so you understand it takes time to collect a specimen from a patient, get that to PCR, transfer that physically from a diagnostic laboratory to a sequencing laboratory, actually do the sequencing assays which takes at least several days, if not more, and then look at the data quality, analyze the data, get that into a database, and then get that transferred to CDC. That all takes time. So it cannot be instantaneous.

And therefore, we have to rely on modeling predictions to get us into the current week of proportions of viral lineages, and that's what Nowcast is. It uses the weighted estimates to calculate growth rates and predict into the present proportions of viral lineages. So that is now shown separated a little bit from the weighted estimates on the right side of the graph and grayed out to make it more clear what is model data versus what are sequences that are actually collected. And so hopefully, that will help you communicate further what the data means if you ever utilize this system.

And so the data that was posted last Friday, the most recent weighted estimate, so actual sequences collected, were for the week ending February 4th. And nationally, XBB.1.5 was at about 62% of circulating viruses, and that's the actual sequences that were generated. The model data is for the three following weeks, and so the most recent model data is for the week ending February 25. XBB.1.5 was predicted to be the most prevalent lineage nationally and was predicted to represent about 85% of viruses circulating nationally. We've been seeing a decrease of BQ.1.1, which was the most prevalent lineage this fall after the BA.5 wave, really, since December-ish.

There is not much else interesting going on. Genomically, XBB.1.5, we often see when a lineage reaches saturation, which XBB.1.5 is reaching saturation, we start seeing diversification. So we'll see a couple of substitutions that may overtake, and so we are starting to see some diversification in XBB.1.5 viruses.

Now, this increase in proportion has really been happening at the same time as that decline in cases that I showed you earlier. And so the total number of cases caused by XBB.1.5 is not as large as some earlier lineages because that increase in proportion has been happening at the same time of the decrease in total cases. Regionally speaking, XBB.1.5 really emerged in the northeast and has met saturation. It has

been at saturation for quite a while. So the Northeast continues to be the super dominant-- predicted to be the super dominant lineage of viruses circulating.

There was a delay moving across to the West Coast, although this is really the first week, or maybe it was last week, that XBB.1.5 was predicted to be the majority of circulating viruses in all regions. So it is now the majority of circulating viruses in all regions. As far as growth rate goes, it is still the only lineage that is showing to be increasing in proportion. There are no other lineages that are increasing in proportion.

There have been a couple of MMWRs that have been published about this lineage recently. When I'm done presenting here, I will go ahead and copy and paste those in the chat for anyone who's interested. But there was a preliminary analysis of vaccine efficacy, and the vaccine efficacy of bivalent booster doses or updated vaccine was shown to be similar against XBB lineage viruses as other Omicron lineage viruses. And so that's really good news.

And then last week, there was this other MMWR posted from a group in New York who looked at severity of cases caused by XBB.1.5, and this group did not see increase in severity with XBB.1.5 infections. And that's all from us, and I'll copy and paste those into the chat. Questions? Or Jasmine, back to you.

Jasmine Chaitram: Hey, sorry. I was having my own computer difficulties. There is a question in the chat. If you want to take a stab at it, and then I can also fill in anything. The question is, how much of the case count decline is due to people testing at home and not reporting anywhere? How can we rely on this data when people are not testing or only testing at home?

Natalie Thornburg: Now that we have a lot of people testing at home, we have to do what we do with other respiratory viruses. And that is we can look at case counts, but we also look at percent positivity. So with other respiratory viruses like RSV, we absolutely depend on percent positivity to indicate when a season begins and ends. And so we're looking at that percent positivity, and that kind of information can still be gleaned even during passive surveillance.

And so I didn't mention in my presentation, but with the end of the public health emergency on May 11, states will no longer be required to report all tests to the CDC. And so some states will continue doing that, and other states will stop. So we'll have to rely more on passive surveillance, and in passive surveillance we can still get percent positivity information and can absolutely utilize that to look at if there is or is not a surge.

So if we're seeing a percent positivity of 15%, yes, there is a surge happening. But we are seeing a decrease in percent positivity and have been sustained for-- the most recent data is the end of January, so expect it to be continuing.

Wastewater testing feeds into its own, and that's another arm of-- sorry, someone asked a question in the chat. Lisa Sanchez asked, does passive surveillance include wastewater testing? That's not what we consider for-- true passive surveillance would be respiratory virus specimens, labs just reporting data for

some systems. For example, we use nerves for a lot of the other respiratory viruses, and we can look at total positives, and then we can look at positives, as well.

And that's really just respiratory specimens in diagnostics. Wastewater sampling is another metric that I think is important to look at potential surges. Of course, because those are pooled specimens, we can't get information like percent positivity. But we can look at increased signal, and I think those are great indicator to give us an indicator that a community is having, in general, increased transmission.

Jasmine Chaitram: Great, thank you. And I'll just add to that that CDC is still receiving hospitalization emergency department and death certificate data which we feel will give us a good information to be able to track COVID-19 nationally and appropriately focus on the most medically significant outcomes. And as you mentioned, we have other surveillance systems such as COVID-NET, which will continue to provide more in-depth clinical and epi information to inform the impacts to specific populations. So thank you very much for your answers and your presentation today, Natalie. I really appreciate it.

All right, we are going to move to our next speaker today, which will be John Barnes from the CDC Influenza division. And he is going to be providing an update on highly pathogenic avian influenza A(H5N1). John?

John Barnes: Thank you very much, Jasmine, and Hello, everybody. This is a ongoing investigation that we're looking into upon the spread of the H5 situation. And so I just wanted to give an update. Unfortunately, as of this weekend these slides even need an update, so I'll be going through some of the most recent data, actually, just verbally. But next slide, please.

So there have been several human H5N1 cases in the last couple of years. What I was going to say is most recent case was actually Ecuador, but actually, this end of last week we did receive word of two cases that we're currently doing an investigation on in Cambodia. And so those two, the investigation is ongoing, but they are a very different clade of H5N1 than what we're going to be spending most of the time talking about today.

And so one of them was a fatality, a 11-year-old girl in Cambodia, and the other one was her father. Thus far, it looks to be a bird-to-human transmission of the virus, and therefore-- but investigations are still going on on both the epi and lab side to look at that. The full genome sequence is available as of this weekend, and so genetic analysis is going on on those cases right now. No additional cases have been found.

So in Ecuador, we had one case in January of 2023, the one case in China in 2022 in November, and Vietnam, Spain. And then we had the U.S. case back in April of 2022 coming up on a year of that, and then the UK case. And these are all from a clade of H5N1 called 2344B, which has been causing these large avian outbreaks. And you can see the amount of wild birds detected plus poultry affected in the U.S. over here in this other graphic.

So quite a number of cases that we have in avian species, and very limited number of human cases. And this is consistent with what we see from this virus is really, really avian-adapted virus. And although there has been some detections in mink and other mammalian species, they have yet to make a good and sustainable jump to human. And it's really kind of not very adapted to do that. So next slide.

So here's the distribution of the highly pathogenic avian influenza H5 thus far in North America, and you can see the number of cases. The red dots indicate commercial poultry. The yellow are non-commercial poultry and backyard flocks. And we see a lot of those. And then we also see a lot of wild bird detections. And you can see the blue diamonds are actually where we have wild mammals. A lot of these are carnivores-- predators, mammals that it's not unusual for that to happen. And due to the large number of cases that we have in poultry and other bird species, this is not uncommon. And so we've seen quite a few of these thus far. Next slide.

So when we get a new virus like this H5N1 2.3.4.4b strain, we use a risk assessment tool which we call the IRAT to look at the potential pandemic risk, and it engages a lot of different categories looking a transmissibility, looking at data associated with the genetics of the virus, how well it would be managed by antivirals, et cetera, et cetera. And so all of these conditions are actually put into this risk assessment, and we come up with a basic score of this and score an impact score.

And this virus, as you can see, is actually that we scored is this American wigeon which is actually one of the first viruses that was introduced into-- first isolated viruses out of the H5N1 introduction into North America is American wigeon/South Carolina 2021 virus. And you can see it actually has a very just moderate score here. It is really expected to be a very low risk for a pandemic risk because the virus is very avian-adapted and really does not do well when it gets into humans or transmit well in mammals. Next slide.

So influenza H5 surveillance, a little bit about what we have going on. CDC and state and local health departments actively are monitoring people exposed to infected birds and poultry for 10 days after exposure. And so these are all poultry workers that are basically involved in these culling operations that have to happen when they find an exposed farm. We're actively monitoring those people, and thus far over 6,000 people have been monitored in 52 jurisdictions. Only 162 of those people were reported symptoms, and just a single person tested positive of those. So one case from Colorado was actually that one.

So we use our existing seasonal influenza surveillance to help us identify these human cases of avian influenza, and basically, in the state and local public health laboratories the CDC actively has developed and provides those states and local jurisdictions with H5 kits that they can actually use to diagnose the influenza H5 virus. And so these kits are available there, or there are usable of both in the public health laboratories and are available for monitoring of this situation. So they're available in 99 U.S. public laboratories in all 50 U.S. states, and 129 international labs. Next slide.

So a little bit of a review of the guidance that we have. Anybody that has been on one of the-- is to monitor birds for signs and symptoms of avian flu and report sick birds to animal health authorities, avoid direct contact with sick birds and their environment, and then take precautions around wild birds and wash your hands, avoid touching your face, and wear PPE if you're in contact with potentially infected birds. And the PPE guidance is actually being put into the chat by George, thank you, and on this page. And then we monitor symptoms for 10 days after the last exposure. And then if they're symptomatic, we avoid contact with others and actually go into a quarantine type of situation. Next slide.

So a bit about the H5 infections in mammals. H5 has been, as I mentioned earlier, have been detected in mammals. And in October, an outbreak in mink farms suggested a possibility of mink-to-mink transmission.

But overall, these don't really affect the CDC's threat assessment. The viruses contained one genetic change related to RNA replication that may have added transmission in mink, but did not necessarily contain changes that would suggest an increased risk to humans. And so we will continue monitoring this situation highly, but thus far, our assessment of the situation is still it's a very low risk to the public. Next slide.

So medical countermeasures that are in place, the sequence analysis that we are doing currently indicates that most of these strains, our antiviral treatments would be very effective against them. And so over 99% of them would be a good candidate to be mitigated by antiviral treatments. And then we have candidate vaccine viruses for this strain, and it was given to manufacturers in early 2022.

The candidate vaccine virus in the mink H5 were 100% identical for the part that matters, HA1. And so this is likely a good candidate. And the CDC continues to analyze viral sequence data for any additional genetic markers that might be associated with severity, transmissibility, et cetera. And so really have not seen anything in the outbreak that would indicate any additional risk. Next slide.

So our priorities at this point are really to be in a posture of readiness. We're continuing our pandemic planning activities, and should the situation change, we've got surveillance activities and monitoring of exposed individuals. We're continuing our viral genomic analysis from the data that we're getting from the outbreaks. We have pandemic vaccine risk mitigation outlining for potential H5 if we need to use that in a vaccine.

National testing capacity readiness is something that we're working on. We've been engaging FDA and other interagency partners to see if they would be interested in making an H5-specific assay for use in their own platforms or our own networks, and we're exploring commercial interest for H5 assay development. And so we're continuing to look at vaccine effectiveness, safety, and immunization systems. Next slide.

So there are, I know, a couple of public health laboratories in here, just a quick reminder for the test that you may be running, if you are running the CDC assay, the specimen is only positive if it's positive for all

three targets, influenza A, H5a, and H5b. A result is inconclusive if only one of the H5 tests is positive. And the interpretation upon actually finding a presumptive positive in your laboratory, our current interpretation of USDA's Division of [Agricultural] Select Agents and Toxins means that that is positive for H5 or other avian viruses would be considered a select agent, and you may need to report that to APHIS by phone or email immediately even prior to confirmation by CDC. So next slide.

And with that, I would happily take any questions that you have.

Jasmine Chaitram: Thank you so much, John. We don't have any questions for you on your presentation specifically. Natalie, if you're still on, there may be a question in the chat that you might be able to-- sorry, not in the chat, in the Q&A that you might be able to respond to. I'm going to, though, keep us moving forward, because it's already 3:30 and we do have one more speaker. And I want to make sure she has enough time.

So I'm going to go ahead and welcome Tammy Beckham from the U.S Food and Drug Administration talking about FDA'S resilient supply chain program. And let me get your sides up for you. And welcome, Tammy.

Tammy Beckham: Great. Can you hear me?

Jasmine Chaitram: Yes, I can hear you.

Tammy Beckham: Awesome. Thank you, and thank you for inviting me today to speak on the resilient supply chain program in FDA. Very excited to be here and share a little bit about what we're doing with our program, and a little bit about what we have done during COVID to help mitigate supply chain issues. So next slide.

So most of you know COVID was a likely once-in-a-lifetime event where we saw huge increased demand for early on, obviously, testing supplies, diagnostics, PPE, and other critical devices like ventilators, et cetera, but we also know that there are times and other reasons that you might have medical device shortages. We've seen during COVID we've had logistical issues with transportation and containers getting medical devices off ships. We know that we've had some manufacturing interruptions due to the oil and gas industry shutdown because of the winter storm Uri back in 2021, and then we've also seen geopolitical events that are also leading to potential shortages that are more systemic in nature across medical devices. We also know that by taking proactive measures and looking where we have some of these vulnerabilities, we can better promote resilience and protect our patients, and promote the availability of devices for our patients. Next slide.

So during COVID, as you all know well, swabs, viral transport media like collection tubes, pipette tips, reagents, we experienced all kinds of shortages, again, largely due to increased demand. But also, we've continued to see across the public health emergency where we continued to see shortages because of, like I said, the resin shortages due to the oil and gas industry or semiconductor shortages, as well. The

medical device supply chain is facing other pressures like ethylene oxide and regulations around that putting pressure on small and large sterilization facilities. We've seen labor strikes abroad cause issues in labeling, for instance, for blood collection tubes and other devices, and then we've also seen geopolitical issues result in shortages of raw materials like silicone which are used in quite a few medical devices. Next slide.

So throughout COVID, CDRH - the Centers for Devices and Radiological Health at FDA - have been very active working across with our other USG partners at ASPR, the Administration for Strategic Preparedness and Response; with the White House; with the Department of Commerce; with the Department of Transportation; and CDC; as well as manufacturers, distributors health care systems, et cetera, working to mitigate shortages and in many cases even prevent the severity of shortages that we've seen. We, like I said, have received numerous signals over the last now it's been like three years for a variety of medical devices. And recently, as recent as pediatric trach tubes, which, as you know, are critical devices for airway support. Next slide.

So as an example, and I pointed out, it's not just during a public health emergency like COVID where we see shortages. But during the resin issue and the oil and gas industry shut down, there was just a perfect storm in which we saw allocations come from converters who provided resin that is used to make medical devices like blood collection tubes. All in all, our program saw over 30 manufacturers that were impacted, over 180 devices, and it did lead to patient impact. And we had several of our vulnerable populations that were exposed due to shortages. And as we saw during COVID, most oftentimes, it is our vulnerable populations that are most impacted by shortages of critical devices.

So using this as a case study, CDRH really worked closely with manufacturers and stakeholders. We worked with our government partners at the Administration for Strategic Preparedness and Response, and we performed impact assessments on each of these device signals that ultimately resulted in increased allocations to the MedTech sector. So we were here to advocate for the medical device industry and the MedTech sector, and it also resulted in priority assessments and Defense Production Act priority ratings, as well, for companies of testing and diagnostic devices. Next slide.

And just another case study we've seen throughout the public health emergency, too, and we're still experiencing issues with availability of semiconductors. And the medical device industry is such a small component of semiconductors that we've also seen some of those, as well. Go ahead and send the next slide. That's fine. Thank you.

And so even before COVID happened, CDRH was working on developing a more permanent program for supply chain resiliency-- a program that, like I said, was permanent but just much more proactive. During COVID, because of necessity we've been very reactive to supply chain signals and disruptions that we have seen. But what we're hoping that with this program in the future that we can be more proactive. We can work to identify some of these vulnerabilities early on through early warning signals, and we can work with the industry to build some resiliency and redundancy in the medical device supply chain.

And then obviously, all of this will help promote the availability of safe and effective devices for patients. And to do this, obviously, as well, it's going to have to be a medical device ecosystem-wide collaboration. And it's going to have to be a very strong partnership between the public and private sector. Next slide.

So the mission of any program, and I won't read this slide to you, but it's simply to work proactively to strengthen the public health supply chains. And to do this, we need to monitor, assess, and determine what our vulnerabilities are, and then work collaboratively to prevent the shortages of those devices. The success of this program will be dependent on the outcomes and the value add back to industry and to the patient and U.S. population, but we intend on using the products and assessments that are developed in this program to support evidence-based, data-driven regulatory mitigation to support effective and efficient collaboration with the industry and to build in those medical devices supply chain resiliency. Next slide.

Our program is going to be built around four pillars, or is built around four pillars, and that is resilience building, shortage assessment, product authentication to ensure that we are able to detect and prevent fraudulent and counterfeit items from coming into the US and being marketed, and we'll also have research and innovation focused on working with stakeholders to look at novel ways to build resiliency. And again, as I said throughout this, key to the entire premise and success of this program is going to be stakeholder input and stakeholder collaboration. Next slide.

So during COVID, I think we all, especially during the first few months and even into the next year or so, and still today, we perform a lot of basic shortage triage. So we'll receive a signal about a potential shortage of a medical device, and at that point, again, we're in reactive mode. We're doing a lot of manual work to determine some of the impacts of that. We do a lot of outreach to stakeholders to try to determine that the assessment or impact to patients, and we really have done a lot of, like I said, outreach and manual device assessments.

Where we would like our program to go in the future is to have more automated supply chain visibility and elimination. So understanding prior to the next event, like a COVID or other recall or hurricane that could lead to supply chain disruptions, having an idea of those interdependencies and some source components and raw materials that companies rely on, and where those vulnerabilities might be. In order to do this, obviously we have to have the data. We also have to have the ability to do some of the predictive modeling. And having this capability as a permanent part of CDRH will enable our ability to work with our stakeholders and really build that resiliency and even work collaboratively, like I said, to look at innovative potential regulatory actions and pre-positioning mitigations to prevent shortages. Next slide.

So back in June, we held a public workshop where we rolled out the resilient supply chain program formally. We invited folks from across the medical device ecosystem to attend that workshop, and we heard a lot about the potential value add to this program and the potential ways in which we can work together in the future. I will say that, again, ecosystem-wide collaboration is going to be the key for us moving forward.

This program has, and I think the USG has-- we have built quite a bit during COVID that we need to continue to leverage moving forward as in the way of processes and procedures and how we work together on supply chains, et cetera. We want to continue to do that moving forward, but formalize some of that. And then also continue to outreach to manufacturers, GPOs, distributors, and others health care providers and systems, as well so we can more formally establish those collaborative mechanisms to allow us to share information and to share those nuggets that we're going to need to have of data to help us understand what those vulnerabilities are and then address them. Next slide.

So this program, again, totally focused on medical devices. Pharmaceuticals and drugs fall under CDER, but this particular program within CDRH is a medical device supply chain program. We see ourselves as really value-add back to the device ecosystem by allowing us to streamline being that single point of contact for government engagement. I will tell you that we work with ASPR very closely. Like I said, we work with the Department of Commerce, Department of Transportation. And we inform any decisions that are made in those offices about the impact of potential supply chain disruption or shortage, and they turn to us for that expertise in medical devices.

We also are in a unique place in that we have the ability to see across the supply chain as far as potential alternatives. If there is a supply chain disruption to a specific device, we have the ability to work within the ecosystem to look at alternative suppliers, market share, potential impact. So we see ourselves as a very unique player in the supply chain. And then obviously, we, like I said, are the ones that assess those impacts through effective outreach and communication and have done so even prior to COVID.

But for sure, during COVID, especially at the beginning and even throughout today, we are conducting outreach to manufacturers, distributors, health care systems on a daily basis at a very high volume to understand some of the impacts to the supply chain, again, that we're continuing to see today as there are continuing threats. Whether that's silicone, we're continuing to see some of the issues around resins from that winter storm. We're also, as I said, seeing pressures, whether that's on ETO or other supply chain issues. So we see ourselves as the single point of contact being able to streamline government engagement and really being the place to go to for all things supply chain for medical devices within the USG. So next slide.

So with that, that is a brief introduction into the resilient supply chain program at CDRH. We're very excited, and we've spent time leveraging the lessons that have been learned during COVID and even before COVID to put this more permanent infrastructure in place to allow us to work in the future to help build this resiliency. And we're excited about the opportunity to work with you.

And I would be happy to answer any questions. And just know that if there are supply chain issues or supply chain topics that you would like to discuss, we'd love to have that outreach and that collaboration with you on an ongoing basis. And I thank you for the opportunity today to present to you. Thank you.

Jasmine Chaitram: Thank you very much, Tammy. And I'm not showing any questions for you right now. I just do want to remind folks that this is a clinical laboratory call, and so our questions and topics should be focused on laboratory issues. So if I didn't answer your question, it may be because it wasn't related to laboratory topic in particular.

But I'm not showing any, so thank you very much, Tammy, for today and for joining us. I'm going to go ahead and move us forward and wrap up a little bit early. Just a reminder that our calls do happen on the third Monday of each month, and that the next call will be scheduled for Monday, March 20th from 3:00 to 4:00 p.m. (ET). We do reserve an hour, but may not use the entire time.

And then, of course, there's a few CDC social media links that you can go to hear more about what CDC is doing in the lab area. And I just want to thank everybody again for joining us, and you can send us questions after the call or topics that you want to hear about on future calls by email. And you can do that at locs@cdc.gov. And I think that's it for today. So thanks, everybody, and enjoy the rest of your week.