

CENTERS FOR DISEASE CONTROL AND PREVENTION

Moderator: Jim Crockett

March 15, 2017

2:00 pm EDT

Coordinator: Welcome, and thank you for standing by. At this time, all participant lines are in a listen-only mode. After today's presentation, you may have the opportunity to ask questions over the phone and, if so, at that time you may press star then one on your phone's keypad. Today's conference is being recorded. If you have any objections, you may disconnect at this time.

I will now turn the call over to your host for today, Mr. Jim Crockett, with the State Coordination Task Force within the Centers for Disease Control. Sir, you may begin.

Jim Crockett: Thank you, Brad and good afternoon and good morning to those calling in from the Pacific Island for this part of the call, which is primarily domestic focused. So again, welcome to the Sustaining the Zika Response in 2017 Laboratory-Specific National Call today. We understand this is a laboratory focused webinar for those that are on the call. However, as we all know, we've invited participants from state health officials and others, the state, local, and territorial preparedness and response levels.

This invite has been shared and further shared with others throughout the area, but what I ask if you're with the news crew at this point in time, media or press, to disconnect. This is more of an open discussion facilitated for public health participants primarily. The overall purpose of the day and the intent is to do about a 20 minute or less presentation on the laboratory topic as we go

through that. Then we want to follow that with more of an open two-way discussion and the questions, which will work in and out with the subject matter experts we have across CDC.

As a reminder, following this presentation throughout the month of March, we do have seven other functional presentations. I'll provide more details on that at the end, but of note, next week we will have a risk communications joint information focused discussion and an Epi surveillance task force focused discussion next week.

Keep in mind, we at CDC are continuing to update our guidance as we learn more through our research and other findings. And if you have any other topics that don't get addressed here today, you'd like us to address another format or something comes up after this meeting, feel free to email us at preparedness@cdc.gov.

So for our presenters who are representing our laboratory task force, I'd first like to turn it over to Dr. Eddie Ades, let you introduce your team both here and in Fort Collins, so we continue from there. Again, welcome sir. Thank you very much. Just a note, word from Eddie Ades initially back in 2009, during the -- what was that response? We had the flu pandemic, a very great guy to work with and easy to make things happen, easy to understand and all over good man. So sir, over to you.

Eddie Ades: Thank you. Good morning to those on the West Coast and afternoon to everyone else. So my name is Eddie Ades. I'm the senior science advisor for the Zika Response in the Lab Task Force. Joining me today are both Drs. Wendi Kuhnert-Tallman and Dr. Rob Lanciotti. Rob is at Fort Collins and Wendi is here in Atlanta. And what we'll do is, I'm going to quickly go through the slides and then on a couple of the slides you'll see some points

that I'm sure some of you are going to have questions about. So we will take those questions afterwards and try and answer them to the best of our ability.

So we'll just go quickly to Page 6, which is what's going on right now. We expect that travelers are going to continue to travel and they're going to go to areas where Zika virus is actually ongoing at this present time. And so we expect that we're going to continue to see cases from travelers here in the United States. We also expect that there will be local transmission potential. We're not exactly sure where that will be but we do expect that to occur again this year. As everybody on the phone knows, we clearly had that occurring in Florida last year, and we're just potentially getting ready for this coming season.

With regard to diagnostic test performance, as we all know, it continues to be a challenge because of the cross-reactivity issues with other flaviviruses. So we'll talk a little bit more about that in the Q&A period of time, but obviously we're well aware of these issues and we're trying to address them with some of the newer diagnostic tests that we're currently trying to work on or evaluate and working in collaboration with BARTA and some other people to try to get some of the other tests up and running.

It takes a lot of time to get them evaluated in an appropriate way to see if they're going to be additive or different or more significantly useful than the current algorithms that currently exist. So it's a challenge on all fronts with regard to the serology issue. But we'll talk more about that as we get into the Q&A period of time.

With regard to successes, there have been several. Obviously, the two major ones are the fact that we got the Trioplex assay out relatively quickly back in

February of 2016 and we got the -- I'm sorry -- we got in 2016 and then in February, we got out the MAC-ELISA which is the serology test.

Those are both still continuing to be manufactured by CDC and reagents for those assays as the assays themselves are being distributed, so that you can continue to get those through either IRR, or whatever through, the CDC mechanisms.

There is a, as you can see by the numbers at the bottom last year, we did a lot of confirmatory testing and surge capacity testing for the virus itself. And so, as you see, we expect that to be the same for this coming season with regard to our preparedness. Our Fort Collins lab is going to continue to be responsible for looking at or reacting to and receiving all specimens that are continental United States and those are not continental, such as Virgin Islands and so on and so forth will be sent to the Atlanta labs.

But the Atlanta labs are up and running and can do all three of the tests currently available now. Trioplex RT-PCR, MAC-ELISA for serology, and then also PRNT is done now here in Atlanta as well as at Fort Collins. With regard to concerns, I think that as I mentioned before, clearly the specificity of the diagnostic assays is still of concern and of course, the sensitivity and specificity, depending on the current assays that are commercially available. Since we currently have the MAC-ELISA being issued by CDC but with the commercial assay by InBios out there, there has been a tendency to move away from the MAC-ELISA because of the stipulations that when a commercial lab comes up with a serology test that's theoretically equivalent to the MAC-ELISA that the commercial labs would move across and start to purchase and utilize the commercial lab so that the federal government does not compete with a commercial entity.

However, as a lot of you on the phone know, we have seen some issues with regard to the InBios assay with the fact that the FDA also sent out an alert with regard to the fact that there were some issues about false positives with the assay and with the testing facilities themselves. We're working through those issues yet and those have not been rectified to our fullest ascent to the fact that we've decided to release a new information piece about how those are going forward.

For the moment, though, a lot of the commercial labs have gone back from using InBios to the MAC-ELISA for the current moment while InBios is currently working through some of the issues to get their sensitivity and specificity issues resolved so that we can make that recommendation to clearly move over again to the InBios assay.

At the current time, the InBios assay, the NovaTec, and the EUROIMMUN are listed here and, as you can see, the sensitivity and specificity are different depending on what test was run and by what assay. The way this test was basically done was the MAC-ELISA assay was used as a gold standard and then these three assays were run against the gold standard MAC-ELISA samples. And these are the numbers that were generated. So where we are with this is that we're working hard to try and figure out if and when we can make strong recommendations about utilization of InBios. We are also talking to other commercial entities that are working towards developing other types of serologic assays so that we can also test them to see how they play out against the current MAC-ELISA assay.

With regard to the viral persistence, there's been a lot of discussion with the state public health labs especially with regard to the fact that there have been discussions around the window of testing for Trioplex and whether one should limit the testing to 14 days or less. And some of the state public health labs

have looked at the algorithm and said yes the guidance is 14 days or less, but we're going to extend that window of testing a bit and look at beyond 14 days, maybe out to as far as four, or five, or six weeks total from onset.

And so we're collecting data at this point, right now, from a few of the labs that have done some of that testing to look at the ability to see if additional testing with the NAT assays or RT-PCR assays, if we would see a propensity to find additional patients who would be RT-PCR positive and therefore would automatically, based on the algorithm, be Zika positive. So therefore, they wouldn't require any serologic testing. Since we're trying to also think about ways to reduce the serologic testing, we thought that if we could extend that window and find that there were greater numbers of patients that we could detect using RT-PCR that this would help reduce the number of serologic people that would have to move over to that side of the algorithm.

When we look at some of the data that's been provided by some of the public health labs, the majority of the patients are clearly found in the first 5 to 7 days. Then it clearly - the curve dwindles off dramatically, and by 14 days the numbers are significantly lower than at 6 or 7 days. But if you look at the extended window beyond 14 days out to about 28 days, you will see or learn that another percentage or two of the population that would be tested for both symptomatic and asymptomatic is around 1% or 2%. So it's an issue that we are working through, trying to figure out if doing this additional testing will be worth the effort involved.

So we're having lots of conversations here in Atlanta at this present time, along with Fort Collins, to try and figure out the value of extending the algorithm window for NAT testing from 0 to 14 days to maybe 0 to 28 days. We'll be talking a little bit more about that in the Q&A if anybody wants more information, and we're trying to work that out in the next week or two so that

we can start to make suggestions going forward to leadership that this might be a way to reduce some of the serology testing for this new season that's coming upon us.

With regard to the PRNT, as you all know, PRNT is still a difficult assay, and we are trying to figure out if perhaps using a second serologic assay along with the MAC-ELISA might give us a greater degree of sensitivity or ability to say yes or no to the specific - to whether the individual is serologically positive for Zika. So those kind of test diagnostics are being looked - at worked on presently - as a replacement for PRNT. But at the present time, PRNT is still the secondary confirmatory test that we are currently using in conjunction with MAC-ELISA and that's going to continue to be the case for at least the next couple of months while we work through some of these other diagnostic issues.

With regard to the turnaround time for sample receipt, especially for PRNT, a lot of conversation has occurred around the length of time - and to be very honest with everybody on the phone - I think everybody realizes and understands that the test is a bit of a week-long assay itself and then to receive the sample, to process the sample, to do the work and then to get the result back to the public health labs and then back to the physicians extends that window of time.

We've done a lot to try to reduce that. We've had several conversations internally about making sure the turnaround times, whenever we get the samples in, is as quickly as feasibly possible. But we lack control on the other issues. So once we send the data back out, we don't have control of the timeframe going forth in terms of getting that data to the provider, so on and so forth.

So we're working to try to help reduce some of that by having health level seven messaging, and we're working right now to see if we can get some of that HL7 messaging developed. I don't know that it's going to be functional by this season, but we're working hard to try and get that up and running. And if we do that should also reduce the time from getting the result to the provider. But that's an ongoing process and one that we are clearly working through so we're approaching it. We don't have it resolved, and resolution is still a couple of months away.

On the next slide, we talk about the priorities for next year or this coming season. And clearly Dr. Lanciotti is a subject matter expert in Zika virus and clearly will be available with the whole team out of Fort Collins. As I said earlier, we are continuing surge planning. The Atlanta labs are up and ready and running as well as the Fort Collins lab. So we're prepared. We certainly hope the season will be minimal, but we have no way to know at this point what will actually occur. There's been conversation that it could be similar to dengue and it's going to be mild in the United States, but we don't know. That's our hope. But we'll have to wait and see how that plays out.

With regard to assisting the state and territorial labs, we're here. All we are is an email away. You just have to ask for and we'll do everything in our power to try and help assist in any way possible. As I've already said, we're doing other types of refining performance for diagnostic assays. We're doing a current evaluation right now on urine with stabilizers to see if that will help with regard to detecting the virus in urine, and so on and so forth. So we'll be doing some of that work and having that data in the next couple of weeks to try and help us. And if we find that that does help with regard to the ability to detect, we'll certainly get that word out as quickly as possible.

Again, we're working hard to increase the flexibility of the algorithm. As I said, the 14 days window is what's currently available. We are looking to extend that window out and make it more flexible for laboratories and clinicians to make decisions about whether it's appropriate to test people beyond the two week window with regard to NAT testing. Of course, the serology testing continues to go out to approximately 12 weeks. And I think that we are always trying to assist our commercial lab partners with regard to doing any and all assays as well, and we're always here to try and help in any way possible with regard to that.

So as a summary to everything on the slide, it's basically we are continuing to conduct new research with regard to diagnostic. So moving to the testing commercial labs in the next slide, I've already addressed most of this with regard to where we are currently. But as most of you are aware, there are already 12 PCR assays currently under FDA EUA and that includes the Trioplex assay, and there are currently two IgM assays for serology, one being the MAC-ELISA as well.

With regard to the next slide, which is new research, I think I've covered some of this to some degree already. There are ongoing studies to evaluate serum. We're looking at reducing amount of serum and then increasing by looking at the buffers, and looking at the enzymes, ways to do a better job of getting the same amount of virus from a smaller amount of serum by using different, or better, or alternative enzymes in the buffer system. We're looking at whole blood and urine, as you're well aware. We are clearly also trying to work on some multiplex bead assays both for IgM and IgG, since if we could distinguish between the two, I think it would help us in making assessments about Zika infectivity, so on and so forth.

With regard to the rapid and specific IgM diagnostic test, there is, using MALDI-TOF or mass spec; we're working on some diagnostics along those lines. It's very early in the study, so it's hard to say if there's anything promising at this point, but it's ongoing. And with regard to using recombinant antigens in platforms, we are currently working with those as well.

So there are several improvements that we're hoping to make over the next year. Clearly, we'd like to make some of them sooner than later because we know we have a season coming up. So we're working hard to try and get as much of that done as we possibly can in this timeframe right now, when we're in a little bit of a downtime.

Just to address Puerto Rico for a minute on the next slide, as most of you are aware, Puerto Rico last year during the season was overwhelmed. They had over 38,000 confirmed cases, and they clearly had -- their peak was somewhere around September. At one point, they were showing 500 positive cases in a week. So their labs were just totally overwhelmed, and some of that surge came to Atlanta and to Fort Collins as well. And we clearly now know that based on some of the results that we saw in Puerto Rico at the end of the summer towards September, we're now expecting some of the birth defects in some of the pregnant women to start showing up some time this summer. And so there's clearly several surveillance and epi studies that are in place to look at some of those issues, as well as some blood studies that will take place at the same time.

So those are all going to be ongoing this coming summer in Puerto Rico. With regard to the upcoming season in Puerto Rico, if it starts, which we expect it will sometime in May, we're certainly hopeful that it's going to be less intense, but we don't know. There is also always the possibility that we could have a high season for dengue or chikungunya depending on seasonality

as well. So those are all big issues that we're talking -- we're trying to get prepared for. And the Puerto Rico Department of Health, as well as the Dengue Branch in Puerto Rico, has been working closely and collaboratively to make sure that all of that testing is being coordinated with both groups.

With regard to the concerns, obviously there are concerns mostly - well clearly - not mostly but clearly about pregnant women. So they have decided to not only test trimesters one and two but also to test trimester three. So if they're negative negative for the first two trimesters, they're still getting tested for third trimester as well. Just to ensure the pregnant individual that they are negative for Zika and so on and so forth. And we expect that in Puerto Rico there's approximately 30,000 pregnancies per year.

So we also know that co-circulation of dengue and chikungunya require complex testing algorithms, especially for symptomatic cases. So in Puerto Rico at the present time, they are doing their NAT testing, RT-PCR testing, right out of the box. So they're doing that first and if they're positive then they're diagnosed as positive and if they're negative then they go on for serology.

PRNTs, as you know, in Puerto Rico have been shown to be very, very difficult to interpret because of the dengue being endemic there. So Puerto Rico applied and got permission from the FDA to not continue to do PRNT as a confirmatory test. So they stop at the MAC-ELISA and then deal with the serology testing as it stands at the present time. The anticipated plans for Puerto Rico are clearly that we're building up our capacity. We're supporting the Puerto Rico Department of Health arbovirus surveillance needs, and we have a surge plan in place and we're hoping to evaluate other commercial diagnostic tests so that some of the commercial laboratories can partner with us down in the Puerto Rico area for testing in the future.

And I think that with regard to clinical assessments and related epi studies, they're looking at GBS or Guillain-Barré. They're looking at the screening of pregnant women, cross-reactivity, viral persistence in body fluids, as well as testing of placenta on newborns or for confirmation. That becomes -- it's very interesting that we're looking at both frozen and fresh tissue. Hopefully, with the result being that with the placenta, if we find that we can do frozen tissue for placenta, we might be able to expand the testing of placenta as another way to look at potential issues with newborns that are born to women that are pregnant who have tested for Zika to be positive. So those are ongoing studies as well.

Again, we're also looking at improving automation for both Zika, dengue, and chikungunya as the Trioplex is currently being used and we're also looking at just reducing. Some of you are well aware, we've reduced it down to just a Zika-only test, but we also are now looking at doing a Zika and dengue test as well. So those are ongoing tests as well that we're looking at in terms of diagnosis.

In closing, I think I would just say that I hope I've raised enough issues, if some of you will have some questions to ask. And I will ask Dr. Kuhnert and Dr. Lanciotti to chime in or answer the questions, since they're much more knowledgeable about a lot of this information than I could ever wish to be.

So with that, I will open the floor and see if anybody has any questions. Thank you very much for listening and we appreciate your time, and I hope we've been helpful and I hope we continue to be helpful. And always send us emails and let us know how we can be more helpful. Thank you.

Jim Crockett: So Brad, can you see what questions we have online or set us up for a two-way discussion on these topics.

Coordinator: Certainly. At this time, if you have a question or a comment, please press star then one on your phone's keypad. Please be sure to unmute your phone when recording your name at the prompt. If at any time your question or comment has been addressed, you may remove your request by pressing star two. Once again that is star one if you have a question or a comment about this topic. Thank you.

Jim Crockett: While Brad's checking the callers in, we're also doing a similar type call about two and a half hours from now for the Pacific affiliated state and territory focus. So if you're available for that or listen to that in about two and a half hours from now, we'll set that session up for queue.

Coordinator: We do have one response, sir. Sarah Humphrey, your line is open.

Sarah Humphrey: Hi, there. This is Sarah Humphrey with the State Public Health Lab in Oregon and I have a particular question around plans for HL7 messaging and I'm wondering if plans for that are to pursue HL7 messaging with your public health funds or with providers and physician groups directly. And if physician groups directly, what are the plans to loop in the public health labs in the resulting? Thank you.

Wendi Kuhnert-Tallman: So this is Wendi Kuhnert and I can respond to that. With our LIMS platform here in Atlanta, we have actually recently received funding to try and move this process forward and our intent is as always, as it has been, to always continue to report back to the public health labs. Our hope is to be able to expand that reporting so that we can get test results to the providers

quickly, or more quickly than I think we were able to do this past season. But our first responsibility is always to go back to the public health labs first.

Sarah Humphrey: Perfect, thank you so much.

Coordinator: And once again, if you have a question or a comment, please press star then one and record your name at the prompt. Please stand by. Brian Hyatt, your line is open. Please go ahead.

Brian Hyatt: Hi, thank you. My name is Brian Hyatt. I'm calling from the Washington State Public Health Laboratory. So our plans right now, and so I would ask for you to confirm that these seem reasonable, we will not be funded for Zika testing beyond July of this year. So our intent is to move forward to try to transition that testing over to the private sector. So A, would that be appropriate, and B, are you looking for the public health lab to be the intermediary for PRNT testing so that the private labs send all PRNT requests to the public health lab and then we forward those to CDC? Or would you be open to receiving those PRNT requests directly from the private labs, which would reduce some of the burden on our PHL?

Wendi Kuhnert-Tallman: This is Wendi Kuhnert again. Dr. Lanciotti, if you could respond to that I think as the primary testing laboratory, I think it makes most sense if you could respond to that.

Coordinator: Dr. Lanciotti, if you are on the line please press star then zero at this time. One moment. Dr. Lanciotti has joined us.

Rob Lanciotti: I dialed in the wrong number, sorry.

Eddie Ades: Did you hear the question?

Rob Lanciotti: Yes, I did. So the way we had set this up was that samples would come to us through the public health labs, and we also set up a temporary arrangement where some of the commercial companies could ship samples to us. But they're still required to go through the public health labs in terms of informing them and filling out the appropriate paperwork that's required for us to test. So that's still how we would like to do it.

Brian Hyatt: So to summarize, some of the larger labs would fill out the DASH forms and send the CDC and notify us, and then the remaining smaller laboratories would send to the public health lab, we would work on the DASH form and submit to you.

Rob Lanciotti: Yes, that's correct.

Brian Hyatt: Thank you.

Coordinator: And once again, for questions or comments please press star then one at this time. One moment. Elizabeth Dufort, your line is open.

Elizabeth Dufort: Thank you. Can you hear me?

(Eddie Ades): Yes.

Elizabeth Dufort: Great. Hi, this is Liz Dufort at the New York State Department of Health. I just had a quick question. I know you mentioned that you all at CDC are working on IgG testing. It must have been a few months ago now, I remember hearing rumors from commercial labs that they were very close with IgG testing and

submitting for approvals and whatnot. So I didn't know if you could comment on the status of that at all, if it didn't go well or if it's still in process.

Eddie Ades: So I'll try. Wendi and I are sort of both looking at each other and trying to figure out how to respond because in reality, the commercial labs are not required to share that information with us. So, it's usually we find out after the fact, just like everybody else. We have heard a little bit about IgG testing, but in reality, I can't say whether it's gone good, or bad, or indifferent. I can only say that we haven't seen or heard anything about any commercial lab at this point applying for any EUA associated with Zika at this current moment.

That doesn't mean that there isn't somebody out there right now still currently working on it, trying to evaluate it. But I am not familiar with anything at this current time. And as far as I know with our colleagues at BARDA, I'm not familiar with them having any information but we can check on that and see and if there's anything out there I would be happy to share that with you. But at this present time, I don't have a good answer other than we're not privy to any other information.

Rob, you may have some other insight and be able to comment as well.

Rob Lanciotti: I don't know of commercial companies developing an IgG. I have not been in contact with any.

Wendi Kuhnert-Tallman: Yes, and this is Wendi. I think just to finally add, you know, generally speaking, these communications that occur between companies and FDA are kept confidential until the EUA is available. So these are things that even FDA wouldn't share with us if they were ongoing.

Coordinator: Our next question from Andrea Bingham. Your line is open.

Andrea Bingham: Hi, can you hear me? This is Andrea Bingham from the Florida Department of Health and I just had a question because we know that the clinicians aren't always necessarily ordering the correct tests. So samples that are getting forwarded to CDC for PRNT and say, for example, you had one where it really should have had PCR done and the PRNT came up being negative because the sample was collected too early. Do you recommend that we reach out to you to perform the PCR or to have the sample sent back to us to do the testing? I'm just trying to get clarification on that process.

Wendi Kuhnert-Tallman: Rob, if you could address that, ,that would be great.

Rob Lanciotti: Yes, I would just contact us and ask us to do the PCR because that's in fact happening, and because we get samples sort of blind from commercial sources that probably should have had PCR. So just send us a list and we will include those.

Andrea Bingham: Thank you.

Coordinator: Once again, if you would like to ask a question or pose a comment, please press star then one at this time. Please stand by. The name was not recorded for this next person but if you press star one, your line is now open. Please check your mute button on your phone.

Hanna Oltean: Hi, this is Hanna Oltean in Washington State. Can you hear me?

(Eddie Ades): Yes.

Hanna Oltean: Okay, great. So my question is in relation to commercial lab testing and then specimens being forwarded to CDC. So that's actually been a big problem for

us in Washington State to have specimens forward directly from commercial labs to CDC because we often aren't aware that those specimens are received, and then specimens are being tested without our knowledge at CDC on persons who otherwise would not have been approved for testing. So for example, we get a lot of results on asymptomatic men that way. Is there a plan to put a process in place to make sure that specimens received by CDC have approval from state public health labs?

Rob Lanciotti: This is Rob. So we tried to set up a system to avoid exactly what you're describing. We would prefer that every specimen go through the state lab, not only electronically, paperwork wise, but the physical sample itself. That's how we would prefer and that the state lab would do exactly what you described, would not forward to us inappropriate samples for testing.

The problem is we received a lot of pressure to just test everything and to receive everything. And so we started getting samples directly from commercial labs. So yes, it's a problem. I don't like the way it's going now. I think we should go back to the state being involved because we precisely don't want states unaware of samples that are being sent here for testing. So I don't know what the solution is, but I agree with what you've said. That's what I want to be the approach.

Coordinator: Our next question comes from Autumn Locklear. Your line is open.

Autumn Locklear: Hi, this is Autumn from North Carolina Division of Public Health. We've had a similar problem with some results not necessarily getting reported, especially the ones that went through LabCorp. There is a patient in our electronic database who says that she is positive by PRNT at the CDC, but our state lab has no record of receiving that report. So I was just wondering is

there any other way that we can access these reports if our state lab is having a hard time finding them?

(Eddie Ades): I think Rob, do you want to try to address that first or do you want me to try?

Rob Lanciotti: Well, again, I don't know what we can do because we're getting these samples, many of them from places like LabCorp and Focus. We don't even know if the state is aware of the specimen. We don't know if the state has ever been contacted. Sometimes we're not even sure what the state's involvement is at all. And so we wouldn't even know where to forward that report to. So that's why, again, we have a policy in place that every specimen should go through the state public health lab, again, even if it's just electronically by submission. But we've been asked to relax that process and just test everything.

So I would prefer that we go back to a situation where everything goes through a state lab; therefore, every state is aware of every specimen that gets here and only appropriate specimens get here. That's what I'm in favor of and I would like to go back to that.

Coordinator: Once again, if you have a question or comment please press star then one at this time. Please stand by. One moment. (Christine Mulbur), your line is open.

(Christine Mulbur): Hi, I had a question a little bit, I don't know if this is off topic or not, but there's been the assumption that a person can only be infected once. Is there any ongoing research to validate that?

Rob Lanciotti: This is Rob. I think the general accepted dogma in virology is that once you've been infected and develop cell and humoral-based immune response that you cannot be - at a minimum - you shouldn't show signs of disease again.

Whether you've achieved sterile immunity is another question. I think that - I know that there is a group working on that question in a more precise fashion, is there any evidence that there can be some ongoing replication a second time.

But nothing here at CDC, we're not pursuing that here.

(Christine Mulbur): Okay, thanks.

Coordinator: And once again, star one if you have a question or a comment. And currently, I am seeing no more responses in queue.

Jim Crockett: Thanks, Brad and if you don't mind, I'll turn it over to our three guests from the lab task force for any final closing comments and then I have a few just for the group at large. So Eddie, if I can start with you.

Eddie Ades: Sure. We appreciate the fact that you joined this afternoon and I would just stress that if you felt that the question that you might have had was either too specific or you just didn't feel comfortable, please feel free to send an email and we'll get that information back to you as quickly as possible, and/or we can even talk by phone if so need be.

So I thank you again for calling in, and we're here to help in any way we can. Thanks.

Jim Crockett: Wendi, any other comments? Rob, any other comments?

Rob Lanciotti: No, I don't.

Jim Crockett: Thanks for joining from Fort Collins and we appreciate that. So if I can advance to that next to last slide real quick. Just a reminder up on the screen, you should see the slide shot of the upcoming similar type discussions here, the two way discussions. Next week, again, the joint information center and communications function will have a discussion in the epi lab task force. That's on the 22nd and 23rd respectively, that's going to be the same time as this call. I would encourage you to join that. And again, to echo what Eddie had just said. Any question you have, feel free to use preparedness@cdc.gov. We'll be glad to capture those, get them into the right area, and make sure we get some answers.

That also applies to the upcoming discussions you see in the functional discussions. If you have some questions you'd like us to queue up before that, we'll be glad to set those up for you. So with that in mind, again that is preparedness@cdc.gov. Eddie, Wendi, Rob, thank you very much for your time and we'll conclude the call now. Brad, if you can stand by for a moment.

Coordinator: Certainly. At this time, all participants may disconnect from the conference call. Speakers, please stand by.

END