Call Date

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Call Agenda

Welcome
Sean Courtney, CDC Division of Laboratory Systems

Evaluating and Testing an Ill Patient for a Viral Hemorrhagic Fever
Joel Montgomery, CDC Division of High-Consequence Pathogens and Pathology

Clinical Laboratory Biosafety Recommendations, Following Standard Precautions
Nancy Cornish, CDC Division of Laboratory Systems

Clade I Mpox Update
Christina Hutson, CDC Division of High-Consequence Pathogens and Pathology

Transcript

Sean Courtney: All right, good afternoon, everybody. Thank you for joining our call today. My name is Sean Courtney, and I'm in CDC's Division of Laboratory Systems. On the screen is the agenda for today's call. But before we get started, I do want to cover some housekeeping items and some just general announcements.

So, as you've heard on previous calls, DLS is the CDC division that works closely with clinical and public health laboratories across the country to support laboratory emergency preparedness and response activities. And we've been hosting these calls since March of 2020. DLS supports this work across four goal areas—quality, workforce and training, preparedness and response, and informatics.

All right, so the CDC/APHL Next Generation Sequencing Quality Initiative is excited to announce the Pathway to Quality-Focused Testing. It's a free, comprehensive, interactive tool that's designed to guide laboratory personnel in method validation of NGS workflows. The pathway provides laboratories with the flexibility and adaptability needed to navigate the complexities of method validation. It offers a structured five-phase approach to address general NGS quality requirements, validation, and maintenance of testing. To learn more, please visit the website that's on the slide or contact NGSQuality@cdc.gov.

And the DLS ECHO Biosafety Program was created to address biosafety challenges in clinical and public health laboratories. The next session is scheduled for tomorrow, Tuesday, November 19, and will focus on *Biorisk Management Performance Evaluation*. These monthly sessions are tailored for laboratory biosafety professionals, and provide a platform to bridge gaps, build a community of practice, and enhance biosafety.

You can scan the QR code on the slide to register for the next session. And to view upcoming sessions and access resources from past ones, please visit the ECHO Biosafety Program website. For inquiries, please contact DLSBiosafety@cdc.gov.

And as always, we want to hear from you. So our Training and Workforce Development Branch is interested in hearing more about the education and training gaps that your laboratories are currently experiencing. And so we invite you to send your feedback via email at labtrainingneeds@cdc.gov.

And we will be sharing slides from today's call, along with the audio and transcript. We'll try to get them posted online within the next week or two. You can find them on our CDC Laboratory Outreach Communication Systems page at the link shown at the bottom of the slide.

And as we try to explain each time, if you have any questions, we ask that you please use the question-and-answer function within Zoom, so that we can address it during the call, and to not use the chat function. We'd like you to also please include your email so that we can follow it up if we're not able to answer it during the call. If you're from media, we ask that you please send any questions to CDC Media Relations at media@cdc.gov. And if you're a patient, we ask you to please direct any questions that you have to a healthcare provider.

And lastly, I'd like to remind everyone that these slide decks may contain presentation material from panelists who are not affiliated with CDC, and that presentation content from external panelists may not necessarily reflect CDC'S official position. Please keep that in mind when you go back and look at some of the slides that we have posted on our LOCS web page.

And with that, I'm going to introduce our first speaker today. We have Dr. Joel Montgomery from CDC's Division of High-Consequence Pathogens and Pathology. And he's going to provide us with a Marburg situational report. Joel?

Joel Montgomery: Yeah, great. Thanks, Sean. Thanks, everyone, for having me today. I also have Dr. Katrin Sadigh on from our branch in medical epidemiology, so she'll be helping me field questions at the end today. And as Sean said, I'm going to talk a bit about the current ongoing outbreak of Marburg viral disease in Rwanda. But I also want to start with a bit of background, too, and the steps for evaluating and testing for ill patients that may arrive-- ill patients with a suspect VHF case to the United States.

But before I do that, and then talk about the Rwanda outbreak, I want to just set the stage, and provide a little bit of foundation or background on what we consider a viral hemorrhagic fever for those who may not be completely familiar. So the VHFs are actually a very diverse suite of viruses that actually span several different viral families. They can affect many organ systems of the body, damaging the overall cardiovascular system and reducing the body's ability to function on its own.

The VHFs are endemic or enzootic in areas of Africa, Asia, Middle East, North, Central, and South America. So they're actually quite widespread. And the risk of VHFs being brought into the U.S., even though they are quite widespread, is quite low.

Most of the ill travelers returning from a VHF-affected area do not have VHFs, but typically in our experience-- and I'm sure yours as well-- are more commonly diagnosed illnesses such as malaria. So next slide, please.

So to help illustrate this point, the base of the triangle here represents travelers arriving to the U.S. from viral hemorrhagic fever-affected countries, whereas a portion of those travelers will fall ill and seek health care while in the U.S., shown here in the gray section at the bottom of the pyramid. Providers may suspect a VHF in a small portion of these cases and will contact their state health department for

consultation, which is shown here in the yellow section. And after this consultation, the state health department may continue to suspect a VHF in a small portion of those cases and will loop in subject matter experts at the CDC, including our branch, to provide a consultation.

And CDC actually can leverage resources around the world. We do have quite a few field sites globally, including in broader East Africa, West Africa, Central and South America, as well as Southeast Asia. So we can actually provide important context and clarity on the patient's travel activities and other epidemiologic risk factors.

And again, I'll talk more about the Rwanda outbreak here momentarily. But for this outbreak, we have staff on the ground, both from our branch, but other parts of the agency. So we have good information that can help in this clinical consultation session.

So a very small number of consultations are actually then referred on to viral hemorrhagic fever testing. And just a point-- and I think this is a really important point to stress, see here on the slide, Only a very few number of cases are positive. In fact, since 1967, we've only had 14 VHFs diagnosed in the U.S. Next slide, please.

So if a patient is suspected of having a VHF, a systematic assessment is conducted to screen and evaluate the patient. This process includes assessing the patient's signs and symptoms and their epidemiologic risk factors. A travel history is collected, and includes location of travel, specific activities carried out while traveling, timeline of activities, and any sick travel partners.

The infographic on the right-- and apologies for the eye chart there, but you can print this off, and perhaps blow it up a bit. This infographic describes the process-- the signs and symptoms of VHFs to look for, and some of the questions that help determine potential exposure risk. You can find this infographic, of course, on the web page. And I think it's in the link as well here in the presentation. So next slide, and I'll jump over now to the current situation. So next slide.

The current outbreak of Marburg viral disease in Rwanda was declared in October of 2024, but I'll give you some compelling information that would actually suggest it dates back farther than that. So Marburg virus disease is a VHF. It is quite rare. It's similar to Ebola virus disease. Next slide.

Here's a little on the disease itself. So the etiology of Marburg virus disease is caused by infection with Marburg virus. It belongs to a family of viruses within the family *Filoviridae*. The species specifically is *Orthomarburgvirus marburgense*. And within the species of *marburgense*, there are actually two viruses that cause disease, either Marburg virus or Ravn virus. So Marburg virus disease is caused by infection with one of these two viruses. Next slide.

So as opposed to Ebola virus, which we don't know what the reservoir is, or what maintains it in nature, we do know from Marburg virus-- and this is from work that has been done actually here in the Viral Special Pathogens Branch. We do know the reservoir host is *Rousettus aegyptiacus*, or the Egyptian rosette bat. It's found in forests and savannas across sub-Saharan Africa.

It is actually quite widespread. A big part of the continent of Africa, you can find *Rousettus aegyptiacus*. And this is an important point, actually. It is primarily found in caves, mines, and abandoned buildings. And it is a fruit bat, so it eats fruit at night. They typically are nocturnal, so they'll travel large distances. And we've actually done some GPS collaring of these bats in Uganda. And they will fly as far as 50

kilometers per night to forage for figs, mangoes, bananas, and other fruits, often around compounds where people live. They spread the virus through their blood, saliva, urine, and feces, so any bodily secretion is usually heavily laden with the virus. Next slide, please.

So this is the geographic distribution of known outbreaks of Marburg virus. Again, they've mostly been reported from sub-Saharan Africa, although as the name would imply, we actually have identified cases. In fact, in 1967, this virus was discovered not because it started from there, but because of imported monkeys, specifically for experimental research and for kidney cell development. Individuals in the laboratories in Marburg, Germany, were infected, hence the name Marburg virus.

The cases occur where the fruit bats live. And I mentioned, it's pretty widespread. In fact, this goes all the way up to-- the Egyptian fruit bat goes all the way up to Egypt. So it's quite widespread.

We've had a number of cases imported with travelers. We've identified a case in Colorado many years ago. And typically, what we see are individuals going into these caves or mines are highest at risk, and also scientists, of course, working with infected animals in the field, particularly bats in this species. I mentioned already, this was first identified in 1967, so it's actually the oldest known filovirus. Next slide, please.

So again, it's maintained in nature in the fruit bat-- *Rousettus aegyptiacus*. We do know that it can spill over. And we've seen outbreaks among non-human primates-- chimps, and gorillas. And they can actually serve as an amplifying host to spill over into human populations.

And of course, you can have direct transmission from bats to humans, either through contact directly with the bats or indirect contact, which is what we typically see, either contact with fruit that's contaminated. Or what happens more frequently, and we suspect this is actually how this outbreak started in Rwanda, individuals entering caves are exposed to the bat excretion, primarily urine and feces. And then once it gets into a human population or into the index case, we often see amplification or spread, explosive outbreaks in the health care facility, which is exactly what happened in Rwanda, and what's happening right now. Next slide, please.

I talked a little bit about this already. But to highlight a couple in the top bullet there, a number of different bodily fluids are infected or contaminated with Marburg virus in human infections, including saliva, sweat, blood, vomit, feces, urine, fetal fluids, and breast milk, and also semen, much like we see with Ebola. And in fact, the last two cases in Rwanda have been associated with sexual transmission. So we know that as a source too.

People with Marburg are infectious only when they have symptoms. So we don't see asymptomatic transmission. And mentioned with transmission through sexual contact or through semen. So technically, you can have a persistent infection. And much like Ebola, we see the virus residing in immunoprivileged sites or sanctuary sites, including the eye, the brain, and reproductive tissue-- the tissue in this case, testicles. So we have seen transmission through these immunoprivileged sites, primarily sexual transmission. And of course, fomite transmission is possible. Next slide.

So the symptoms typically start with headache and fever, although fever is not always 100%. Typically, we see myalgia muscle joint pain, rash with flat and raised bumps, often on the torso. So that's what we refer to as kind of the dry phase. That then can progress into what we refer to, similar to Ebola, as the wet phase. And that includes nausea, vomiting, diarrhea.

And then not as frequent as some of the other symptoms, but sometimes bleeding from the nose, mouth, skin, as well as bloody diarrhea and vomit. Incubation period is typically four to 17 days, so typical for a virus. But the range can be as short as two days, up to 21 days with possible persistence-- and I mentioned this already, in immunoprivileged sites, including the brain, eyes, testicle, and placenta. Next slide, please.

So as far as treatment and prevention, there are unfortunately currently no FDA-licensed treatments for Marburg, although there is monoclonal antibody that's being evaluated right now in Rwanda, MBP-091. It has shown really good efficacy in non-human primates. And it's shown some limited efficacy.

Although the sample size has been pretty small, we've shown some promise in individuals in Rwanda. What we typically do-- and the Rwandans are actually doing a very good job at this, intensive supportive care. And that improves survival.

I didn't mention earlier, the case fatality rate for Marburg can be as high as 90%. It can be as low as 22% This outbreak is currently the third largest outbreak with the lowest case fatality rate.

The largest outbreak was in 2005. That was in Uíge, Angola. The outbreak there was close to 300 individuals with a 90% case fatality rate. And then a few years later in Durba-Watsa, DR Congo, was the second largest outbreak. It was around 150 individuals, with about an 88% case fatality rate.

In this current Rwanda outbreak, we're seeing about 23% case fatality rate, which is similar to what we saw with the outbreaks in Marburg, Germany. So the point there is the Rwandans are doing a really good job at clinical case management, and are really preventing death in these cases. Next slide, please.

So since 2021, there's actually been five outbreaks of Marburg virus, all in new countries. So that includes Guinea, Equatorial Guinea, Tanzania, Ghana, and now Rwanda. So this outbreak, as of today, we're still holding at 66 confirmed cases with 15 deaths, so about 51 recoveries, with again a 23% case fatality rate.

Since 1967, there's been 18 MVD outbreaks. And I mentioned this earlier. We did have one imported case of MVD to the U.S. in 2008. This was a traveler that developed illness four days after visiting a cave in Uganda that was implicated in prior MVD cases, and part of the reason why we also discovered the reservoir for this virus. Next slide, please.

So what is CDC doing to support Rwanda? I mentioned already, we do have staff on the ground. We're really primarily focusing on a few key areas, which is CDC's expertise. One is laboratory testing. The second is surveillance and case investigation, contact tracing, and data analytics.

We're also providing-- and here, you see a photo. We took quite a few lab supplies, and we've provided them with additional provisions since then. We're also supporting them with infection prevention and control and assisting to some degree in investigating the vaccines and treatments. But really, the three areas we're focused on are laboratory, epidemiology, data analytics, and infection prevention and control. Next slide.

There have been no Marburg cases in the U.S. And the risk, again, remains quite low. There are no direct commercial flights from Rwanda to the United States. And in fact, the number of travelers coming in from Rwanda has dropped from, before this outbreak began, around 120 travelers per day.

It's dropped down to around 50 to 60 individuals per day coming in from Rwanda. And so since October the 16th, DHS redirected flights with travelers from Rwanda to three airports that were funneling. That's still ongoing. Those airports include JFK in Newark, Chicago O'Hare in Illinois, and Washington Dulles in Virginia.

CDC are providing public health screening to detect travelers from Rwanda at these airports and who could be sick or exposed to Marburg. But again, fortunately, we have no one who's tested positive. So we have screened a number of travelers and they're being monitored. But so far, and fortunately, no one has been positive for Marburg. Next slide, please.

So CDC has also developed and published a number of recommendations for travelers seen here coming from Rwanda. It's U.S.-based personnel traveling to Marburg-affected areas and post-arrival management of travelers. We learned early on-- and the links were posted here in the chat as well, quite a few universities are active and have been working in Rwanda for quite a number of years. And so those were some of the high-risk contacts early on in this outbreak that we were monitoring. But again, none of these individuals have been positive for Marburg. Next slide, please.

We also have guidance for healthcare providers to bring awareness of the outbreak to clinicians and health departments in the U.S., and to guide them on what to do if they believe they have a patient who may have MVD, including contact with CDC, with any MVD-related questions. So we did issue a HAN several a couple of months ago now, and then the guidance for health facilities on what to do. And it's posted, again, on CDC's page.

And then we have CDC staff available through Viral Special Pathogens, as I mentioned earlier, 24/7. And they've had the numbers there too. You can get that from the link. Next slide, please.

So on to routine clinical testing, laboratory testing-- next slide. So what happens if a suspect MVD patient is identified in the U.S.? If a patient is determined to meet the criteria for Marburg testing, the patient should be managed under isolation precautions in a health care facility throughout the evaluation and testing process. Again, I mentioned that the lion's share of suspect cases coming into the U.S. generally have another source of their illness, including malaria. So VHFs like Marburg virus can be detected in the blood only after the symptoms begin.

And similar to Ebola, and I'm sure you've all heard this, it can take up to 72 hours before someone has PCR-positive detection levels in their blood. So if the result is negative within 72 hours, and the patient is still symptomatic, repeat testing is necessary to confirm the case. While in the hospital, responsible patient care requires hospitals and laboratories to evaluate patients for other causes of illness, whether testing for a VHF is indicated. Next slide, please.

Routine testing to monitor a patient's clinical status and diagnostic tests for further potential causes of illness should be pursued while VHF testing is underway. So bottom line there, we should not delay diagnostics and treatment for other more likely causes of their illness. So risk of VHF transmission in a clinical laboratory is like that of other bloodborne pathogens, including HIV, hepatitis B, and hepatitis C.

So it is our opinion we fully feel that laboratories can safely perform common diagnostic testing by following standard precautions when handling all laboratory specimens. With that, I think I'll turn it over to Nancy. And she can carry on from that last point. Thanks.

Sean Courtney: All right. Thank you for that update, Joel. Nancy, are you able to continue on? You are still muted.

Nancy Cornish: So I hit video, but I don't see myself. [Chuckles]

Sean Courtney: Well, we can hear you, and I can see you. So you look good to go.

Nancy Cornish: OK.

Sean Courtney: Thank you.

Nancy Cornish: So good afternoon, everybody. We want to share with you a lot of work that we've been doing in the Division of Laboratory Systems to build educational tools and training that will help you with following standard precautions in the laboratory. And we want to stress that this is all areas of the laboratory. This is not just microbiology. But these standard precaution procedures should be also followed in core lab and in surgical pathology and autopsy, pathology, hematology, and every part of the laboratory, including specimen receiving areas. Next slide.

So what we did was, we have developed an appendix that goes with the BMBL. The BMBL was originally designed for research laboratories, not clinical laboratories. And we know that clinical laboratories have a different set of needs.

One thing about clinical laboratories is, we never know what is in our specimens. And so we have to have safety and standard precautions for every single specimen that we handle without knowing what's in it. So these were developed to address clinical laboratory needs as critical responders and one of the first lines of public health defense. Safe and effective operation of clinical laboratories, as you all know, is critical for patients, laboratory professionals, community, and the environment. Next slide.

So one of the most important things you can do is conduct a risk assessment. That is the first line. All of us have conducted risk assessments in our everyday life.

Here in Atlanta, I conduct a risk assessment every time I drive in to work. The traffic is terrible, and people are not good drivers. And so whether we're aware of it or not, we're always assessing the situation. Next slide, please.

So these are some of the risk assessment resources that we've developed and what I have done is included links for each of them, which are on a separate slide. However, the general area to find this information is under Safe Labs. And I see that Nette is giving you the links there. Next slide, please.

So in order to conduct a risk assessment, we have come up with a series of trainings. We have General Considerations for Laboratories. We've also included APHL Risk Assessment Best Practices and Examples, and a template for how to do a risk assessment for Ebola virus, for example. And then we also have a risk assessment in the BMBL in Section II.

The other place we have a discussion about risk assessment is in our ECHO presentations. So we have a series of ECHO presentations that cover all different subjects concerning biosafety in clinical laboratories. And this one is for risk assessment.

We have some other ones for waste management, for example, which will also give you the links to. These are held monthly, as Sean mentioned. And you are welcome to join those. Next slide, please.

So one of the things about biosafety considerations and the hierarchy of controls is that we, in the clinical laboratory, cannot utilize elimination or substitution. Our specimens come to us and we don't know what's in them. And we need to test those specimens for what may be ordered.

So the first thing we have is engineering controls, and this would be something that you would evaluate during your risk assessment. You want to reduce hazards and provide barriers to blood and body fluids. And that would include things like biosafety cabinets, sharp containers, and splash shields. Also, administrative controls-- so changing work practices so that you avoid exposure to blood and body fluids. And then written standard operating procedures that you follow routinely.

The next thing is personal protective equipment. And we really rely pretty heavily on that in the clinical laboratory, especially in anatomic pathology. So PPE is worn to minimize exposure to blood and body fluids. And that would include, as you all know, gloves and safety glasses, face shields, masks, respirators, and that kind of thing.

And then waste management is something that's not included on this. But it is also very important because you can transmit disease by fomites. So you want to take all of your waste and you want to sequester it and make sure that it is disposed of properly. Next slide, please.

So one of the things in Appendix N is written is engineering controls. This is your special section for clinical laboratories. So I hope that everybody reads it.

Engineering controls can reduce hazardous conditions and place a barrier between the laboratory professional and the hazard. So barriers that are commonly used are class II biosafety cabinet, sharps containers, centrifuge safety cups, removable rotors, splash shields, directional inward airflow into the laboratory, closed automation systems, automated decappers or cap-piercing test systems, and handwashing sinks. So you have to sit there, and you need to go through each of your risk assessments from the time the specimen hits the laboratory to the time you have a result, and you dispose of the specimen. And in fact, you also need to be careful before the specimen is collected, especially if you have phlebotomists going out to collect these specimens.

When specific engineering controls are not possible, one option may be to include alternative containment devices, such as an enclosed workstation, in combination with additional work practices, and/or enhanced PPE. So when I worked in anatomic pathology, we had closed workstations. And we had a lot of PPE on because we needed to cut in a lot of specimens that had blood in them and body fluids in them.

So we really needed to keep a barrier between us and those specimens. Also, in the core lab, when you're decapping tubes, you're causing some splatter, which you may or may not see. But you'll want to do that behind a shield and wearing PPE, so that you don't get contaminated by that blood. Next slide, please.

Also in Appendix N we've included administrative controls, and examples of those. So having an active medical surveillance program, for example, an occupational health program immunizations where possible, and written standard operating procedures. And we have included also work practice controls and examples of those, which you can see here. Next slide, please.

So we have developed a series of resources. And these are for biosafety cabinets. I want to draw your attention to the fact that we have Fundamentals of Working Safely In a Biological Safety Cabinet through OneLab REACH. And we also have a checklist that you can use for training.

We also have a new resource, which is our virtual lab. And this is really cool. And for those of you who like to game, this turns into a game for you. And what's going to come soon is Safe and Proper Use of Biosafety Cabinets.

And what I included here is a link to the tutorial, so you can see what it looks like. But this is a large state-of-the-art lab. It's all virtual. And there's, I think, over 1,000 instruments that have been designed to put into that laboratory.

And then what we can develop in that is scenarios that you can actually go in, for example, and use a biosafety cabinet virtually, and learn how to use it correctly. So this is very cool. And I recommend you go and give it a try. Next slide, please.

So for personal protective equipment, we have Donning and Doffing. And that's a YouTube video that we created for training. There's other trainings. OneLab REACH has some trainings on there. We also have Fundamentals of Bloodborne Pathogens on OneLab REACH, Fundamentals of Laboratory Safety-- and that is also on OneLab REACH, and then other biosafety trainings on the Safe Labs portal. Next slide, please.

We have trainings on waste management. So we also have that on OneLab REACH. And we have a VR, a virtual reality scenario, on Packing and Shipping Dangerous Goods, as well as an ECHO session. So we actually have all three of our modalities for training in waste management. Next slide, please.

So what I would like to do is ask you to review the information that we've provided, and tell us what works and does not work, and what you need in addition, because we serve the clinical laboratories and public health laboratories. And we want to hear from you for what you need. And then we'll go out and create that.

So we do have a contact information slide. But that's been cut off there. So could you share that with them, Sean, where they would reach out to us.

Sean Courtney: Yeah, we must not have that slide on this deck. But we can find it and try to put into the chat so that everybody has access to it.

Nancy Cornish: Yeah, it's DLS Inquiries [DLSinquiries@cdc.gov]

Sean Courtney: At cdc.gov?

Nancy Cornish: Yes.

Sean Courtney: Perfect. OK, Nette can put that in for us.

Nancy Cornish: OK.

Sean Courtney: All right, well, thank you for that update, Nancy. Really appreciate you joining our call. Joel, you as well-- thank you for joining today. This was a fantastic update.

It's really useful information for the laboratories out there, especially when dealing with suspect VHF patients. We do have a couple questions that came in while you guys were presenting, and I'll start with one. And it was actually around whether CDC is doing any sequencing in Rwanda, and that it's just been really hard to get information regarding sequencing in the databases.

Joel Montgomery: Yeah, no, it's a really good question. It's actually a source of frustration, as the person asked in the chat. So we've been engaged with them. We're not supporting them on sequencing.

And I think it was also mentioned, too, in the chat, the sequences were eventually released in GenBank. That was one of the issues I pushed very, very hard on early on, and then several of us did, to make the sequence available for better understanding the chains of transmission, but also to determine if there's any mutations in the GP that could interfere with the diagnostics, but also the monoclonal antibody binding site. So they've uploaded it, and I think people probably have seen it.

I think they've uploaded 17 sequences. It's got about 88% to 90% coverage. Unfortunately, big chunks of the GP are missing. So that's a bit of a challenge. So we're still pushing on them.

And also, we've been encouraging them to use Oxford Nanopore versus Illumina, so they could get a bit better read. But yeah, it's actually been a bit of a frustration for the global community on the sequence and making those data available in a timely manner. I'll stop there.

Sean Courtney: All right, great. Thank you for that, Joel. Appreciate that.

All right, the next question was around-- one question was, the original hospital VHF plans included point-of-care testing within the high-risk isolation unit. However, if routine testing can be performed under standard precautions, is point of care testing necessary in the hospital setting? Or can specimens be carried to the lab for testing?

Nancy Cornish: So I can answer that. I think what you have to do first is a risk assessment. Every hospital is different. Every laboratory is different. You need to sit down and do a risk assessment and decide what is going to be the best way for you to handle that.

So some laboratories and hospitals have decided on-- sometimes, they bring the specimen to the laboratory. And sometimes, they have a point-of-care instrument. It really depends on your situation, and that's why the risk assessment is so important. We can put in the link, the paper that we wrote. We call it the gaps paper.

And in that paper is a very nice description of how Texas Health, who had three Ebola patients, handled their testing. And some of it was point of care, and some of it was actually done in the laboratory. And

they walk you through how they did their risk assessment and what they did. That won't necessarily apply to you, but it will give you an idea of what they did, and why they did what they did.

Sean Courtney: Great. Thank you, Nancy. That's a great answer there. All right, so one last question. And Nancy, I think this one's probably going to actually go back to you, or Joel as well. And it's around if we can comment on warranties for lab machines and point-of-cares that can be negated with the use of samples from patients with VHF. And I know that this has been a topic that we've been working on with companies as we identify them. I will say that the rest of you out there, if you are hearing of other companies to please let us know. But yeah, Nancy, I'll let you talk about the work that we're trying to do when we've heard these conversations come up.

Nancy Cornish: So when this comes up, we would very much appreciate if you would share with us the manufacturer or company that's giving you this information and the documentation of what they're asking you to do. And as Sean said, we're following up with each company to help them update their procedures and get the correct procedures in place. So we're more than happy to help and to reach out to the companies. We need you to send that information in to us.

Sean Courtney: Great. Thank you for following up on that, Nancy. I really appreciate that. Yeah, go ahead.

Joel Montgomery: I think Matt Simon had a question too, in the chat. I don't know if you want to answer that.

Sean Courtney: Yeah, that's great. Yeah, I appreciate it.

Joel Montgomery: Yeah, I didn't get into the details, just for, really, limited time. But this outbreak, we actually saw spillover in health workers in King Faisal Hospital. We actually saw two clusters. We saw one at King Faisal, and then spillover into the teaching hospital, CHUK, which is nearby. It's likely through-- and we have pretty good evidence, that it was actually a healthcare worker that worked at both locations.

So the cluster at King Faisal was exposure to one case. Several health care workers there became infected. And that actually is supported by the sequence data. A lot of the sequence data, they actually uploaded into GenBank. So it was clonal, so almost identical sequence among these health care workers. But we do have now pretty good evidence of the index case that came into the hospital. And it was all actually associated with a miner-- so a miner with an “e”, so an individual that was working in mines nearby King Faisal Hospital, who likely was exposed to bats in that cave. And that's likely how this outbreak got started. But again, as I showed in the description of these outbreaks, the index case was likely through exposure to bats. And then it spilled over in the healthcare facility.

Sean Courtney: Excellent. Thank you. Yeah, thanks, Joel, for seeing that question and responding to it. And again, I just want to thank you both for joining our call today. I think this has been a fantastic update, just providing resources and knowledge to our labs, so they know if there are any suspect cases of VHF of the proper ways to go about handling them. So I really appreciate you guys joining our call today.

All right, and with that we're going to go to our last topic, which was added-- sorry. There go the other slides. Sorry about that.

That was added the last second based on some evidence that was found this past week around clade I mpox in the United States. And we have Dr. Christy Hutson joining our call today to provide an update around that. So Christy, I will let you talk about that. So thank you.

Christina Hutson: Thanks, Sean. Thanks for the invite. And yes, probably most people have seen the news reports. So I just wanted to provide a little information in case it's interesting and relevant to you. So we do have our first case of clade I in the United States. And for those who don't know, there are two different what we call clades-- clade I and clade II. Clade II caused the global outbreak that began in 2022. And then clade I is endemic to Central African countries. And we really consider it a little bit more virulent than clade II based on animal studies and studies done within Central African countries.

We're learning a lot about the viruses, particularly clade I, during these outbreaks. And so we have seen spillover from African countries into non-African countries. And for the United States, this was the first time that we saw clade I in the U.S.

So this was somebody who lives in California. They had traveled to East African locations where we know there are clade I cases within those areas. Thus far, there are no additional cases. We just have the one.

We're obviously doing ongoing case investigation and contact tracing. But overall, the risk to the general public in particular is quite low. This is a virus that takes close physical direct contact to spread, so it doesn't spread through casual contact between people.

And for the test results I'll just mention a little bit. So the California lab does have a pan-clade I test. And so we know this is clade I.

We are assuming it is clade Ib based on additional testing that was done with the test that is considered a clade Ia test, and that was negative. So likely, this is clade Ib. But both CDC and California will be sequencing the specimens to do additional viral characterization, including determining that it is Ib.

And one of the really important things that I wanted to mention to you all is that the way that this potential clade I case was identified was that it was tested at a commercial entity initially. And it has an orthopox generic, or what we call NVO-- non-viral orthopox-positive result with the clade II negative result. So we had been alerting labs to please be on the lookout for this, that this could indicate clade I, and that is what was seen here.

And upon further investigation, it was determined this person had traveled to parts of East Africa where we know there are clade I cases. And so additional testing was done to determine it is clade I. So it's just really important that we have this strong communication with the labs, and that they're aware of doing these sorts of surveillance for clade I in the United States.

The other thing I wanted to mention, because there are some labs starting to bring up clade-specific tests. And what we've seen with monkeypox virus, which is a DNA virus, it doesn't typically mutate as much as RNA viruses. However, when sexual transmission occurs-- and so the 2022 outbreak was predominantly in the MSM demographic. This clade I outbreak, we're actually primarily seeing transmission through heterosexual contact, particularly in sex trade workers with their clients, that we

do tend to see some more mutations occur as it's transmitted human to human through these sexual interactions.

And so clade Ia had a gene drop out. And so now we call that subclade clade Ib And that is what is spread, as I mentioned, outside of Eastern Africa, and what we believe this California case is.

That gene seems to be part of the virulence difference in clade Ia and clade II. So we actually see lower case fatality rate with the Ib compared to Ia. Probably multiple factors contribute there, but it is interesting. But, unfortunately, the previous test to differentiate clade I and clade II were using that gene to say that this is clade I. So we've messaged previously to just be cautious about what tests you're using if you're doing clade-specific testing, and be aware that mutations could impact that test.

And if you want any more information, I'll share my email with Sean. Well, he has my email. You can email him. And we'll get in contact so we can share additional information about test development. We've also been sharing material for labs that are working on bringing up clade-specific tests. So I'm happy to have some more technical discussions if that's helpful. And I think I'll stop there Sean, but happy to take any questions.

Sean Courtney: Excellent. Awesome. Thank you, Christy. Thank you for joining the call, especially literally last minute here today. So that was really good to provide this update.

I don't see any questions right now in the Q&A. But I'm sure we'll get some later. I did like hearing that you mentioned that the algorithm worked to identify clade I, which was exactly what you guys were setting out to do. So that was a great news to hear here. So hopefully, we don't have more cases, like you said, but yeah.

All right, well, I'm not seeing any questions. So if somebody does send a question in, again, you can reach out to us through our LOCS mailbox or DLS Inquiries, like Nancy mentioned earlier. And we can get those sent to the right SMEs. So if something does come up, Christy, we can get them to use it for answering later.

So again, thank you for joining our call today, especially the last second. And as I was taking time, there was a question that came in. So it says, can we say that the PHEIC declaration for mpox is exaggerated?

Christina Hutson: Oh, that's an interesting question. I actually haven't seen that before. So no, I think the important thing to know is that the DRC, the Democratic Republic of the Congo in particular, is dealing with the largest number of cases that they've ever seen.

We knew that likely, we would see increases year after year since the smallpox eradication campaign ended. And so you have more and more people that have no antibodies to orthopoxviruses. So, unfortunately, that outbreak is quite severe. And then now it's spilled over, particularly into Burundi, and also Uganda and Rwanda.

So the PHEIC is really important to make sure there's good collaboration and coordination across both USG and non-USG groups so that we can support those countries dealing with the outbreak, and also ensure we're prepared in the United States. And I think we all assume that we would get a case imported. We've seen these cases imported to other countries.

So I think it's showing that our surveillance system, as Sean mentioned, is working. And we have other measures in place. But I think the PHEIC is important in particular to support those African countries as they deal with this outbreak.

Sean Courtney: Great. Thank you. I guess one last thing-- and I think you touched on it during your update, too, is just around laboratories that are currently not performing clade-specific testing. They're just doing of a generic MVO test. And CDC is still requesting positives being forwarded onto our labs here for further testing, correct?

Christina Hutson: Yeah, and I actually didn't capture that, Sean. So thanks for asking that. We are still requesting that any lab that's using an orthopox generic or monkeypox generic test, including the NVO test, sends us duplicate specimens.

Even if we cannot test those under CLIA, we always test them under surveillance. And it does inform our public health response and understanding which clade is circulating. So yes, if you're not already doing that, please do reach out. And we would really appreciate getting those specimens into our laboratory.

Sean Courtney: Excellent. Thank you. And I think the email is poxviruslabs@cdc.gov, right? Yep, so poxviruslabs@cdc.gov. You can reach out directly to PRB there.

So yeah, all right. Well, again, thank you, Christy, for joining our call last second, providing this update on the case that happened this past week. So thank you.

All right, and with that, we found the slides that were missing. Apologies for that. But we'll go ahead and wrap up today's call.

So again, I want to thank all the speakers that were able to join today's call, providing updates around VHF, how to work safely in the laboratory, and obviously the clade I mpox case that Christy just presented. And to let you all know, we typically hold these calls the third Monday of each month. Our next call is currently scheduled for Monday, December 16, from 3:00 to 4:00 PM Eastern time.

As always, please let us know if you have any ideas for topics for future calls, so we can look forward to discussing these and answering any of your laboratory testing or community's needs. Like we mentioned before, we'll try to get the audio, the slides, and the transcript posted online within the next week or two. And obviously, you can find CDC across social media-- Facebook, X, Instagram, and LinkedIn.

And again, I just want to thank everybody for joining us today. And we continue to be really grateful for all of your work. And we will talk to you guys again on Monday, December 16. Thank you. Bye.