Good afternoon. I'm Commander Ibad Khan, and I'm representing the Clinician Outreach and Communication Activity (COCA) with the emergency risk communication branch at the Centers for Disease Control and Prevention. I'd like to welcome you to today's COCA call, Update on the 2022 Ebola Outbreak in Uganda.

All participants joining us today are in listen-only mode. Continuing education is not offered for this webinar. After the presentations, there will be a Q and A session. You may submit questions at any time during today's presentations. To ask a question using Zoom, click the Q and A button at the bottom of your screen, then type your question in the Q and A box. Please note that we often receive many more questions than we can answer during our webinars. If you're a patient, please refer your questions to your healthcare provider. If you're a member of the media, please contact CDC Media Relations at 404-639-3286 or send an e-mail to media@cdc.gov.

I'd now like to welcome our presenters for today's COCA call. We're pleased to have with us Dr. Trevor Shoemaker. Dr. Shoemaker is an epidemiologist in the Division of High-Consequence Pathogens and Pathology in the National Center for Emerging and Zoonotic Diseases at CDC.

Our second presenter is Commander Mary Choi. Dr. Choi is a Medical Officer in the Division of High-Consequence Pathogens and Pathology in the National Center for Emerging and Zoonotic Infectious Diseases at CDC.

I'll now turn it over to Dr. Shoemaker. Dr. Shoemaker, please proceed.

Yes, thank you. And it's great to be here today to be able to provide an update on the Ebola 2022 outbreak in Uganda. Next slide please.

So today I'm going to give a brief background and update on the current situation of the outbreak in Uganda, and then I will also provide a little bit of background on previous outbreaks of Ebola virus disease in Africa and specifically in Uganda just to provide a bit of context of why we're talking about this particular outbreak today. So, the first confirmed case of Ebola virus disease was identified in a 25-year-old man who lived in Mubende District in the central region of Uganda. The case was quickly identified as a suspect viral hemorrhagic fever as they presented to the Regional Referral Hospital. A sample was collected and submitted to the National Reference Laboratory for Viral Hemorrhagic Fevers at the Uganda Virus Research Institute and confirmed by RT-PCR on September 19th. The next day, an outbreak of Ebola virus disease, due to Sudan virus, species Sudan ebolavirus was declared by the Uganda Ministry of Health n September 20th. Investigations after this first case was identified had found suspicious cases and clusters of deaths occurred in Mubende District up to one month prior to this case being identified. So there may have been some community transmission prior to the initial case that was identified. This confirmed case also had possible contact with probable ebolavirus disease cases in the healthcare clinic. So the first particular case that we identified for this outbreak did have community contact in the two subcounties where the outbreak was thought to have originated but also had contact at a local healthcare facility where there was other confirmed cases of ebolavirus subsequent to this first identification that were found and were linked back to. So there's possibly, there was possibly some hospital-based nosocomial transmission as well as community-based transmission prior to the outbreak being detected. So the current outbreak,

there are a total of 74 cases, 54 of those being laboratory confirmed, and 20 of those being probable deaths where no sample was able to be collected and testing performed. But they were epidemiologically linked to confirmed cases or to the locations where the outbreak was thought to have originated. The total deaths stands at 39. Nineteen of those deaths were in confirmed cases, also including the 20 probable deaths. The case-fatality proportion is just over 52%, and the total recoveries, meaning cases that were confirmed, that were admitted to the regional referral hospital for isolation and subsequently recovered and were released after a negative Ebola test is at 14. The primarily is restricted to five districts in central Uganda as well as two in western Uganda. You can see on the map there on the right, these three districts include Mubende, the three districts in the center of the map, Kagadi Kyegegwa, and Kassanda. Those are the three districts that were initially affected. The two districts that are a bit separate from those three primary districts were locations where either healthcare workers that had been infected or other members of the community traveled to those distant locations where they may have their primary residence and were identified in those locations. There hasn't been a lot of disease spread in those particular areas, but we did identify cases outside of the three primary districts. But the majority of cases still is occurring in Mubende District. The total infections among healthcare workers is at 10 with four deaths. Next slide.

A bit of laboratory data here. There are now just over 400 samples that were received and tested at the National Reference Laboratory at UVRI, and just a bit of context, CDC jointly runs a viral hemorrhagic fever program at Uganda Virus Research Institute, and they perform diagnostic testing, not just for ebolavirus but for other viral hemorrhagic fevers as well, and so, from that laboratory, as I said before, there were 54 samples that had been PCR positive for Sudan virus. Just over 100 samples have been tested on site in Mubende District in a field laboratory that was set up after the outbreak began by the Ministry of Health. And the test positivity rate is a little over 10%, and so this is also relatively low, but you can see that there is still a good rate of test positivity through this outbreak. We have completed six Sudan genomes. They have been fully sequenced, and I will talk a bit more about that in my subsequent slides. But I also want to point out that during the course of testing for this outbreak for looking for ebolavirus cases, three of those samples that have been tested that were negative for ebolavirus subsequently tested positive for another viral hemorrhagic fever called Crimean Congo hemorrhagic fever. And this virus, is known to circulate in Mubende District, and these three cases, two of them being fatal, it was not a dual infection of the ebolavirus and CCHF but was -- these are three independent infections of Crimean Congo hemorrhagic fever, but the virus presents very similarly to Ebola in the early stages, so it could very easily be recognized as a suspect Ebola case. So we just wanted to point out that it's also very important to look for other diagnoses for other viral hemorrhagic fevers in addition to Ebola for those cases that are testing negative. And contact tracing has improved over the last weeks. We currently have 668 active contacts being followed with 94% of those being followed in the last 24 hours. I also want to point out the epi curve on the right-hand part of the slide, you can see the blue bars indicate a majority of those probable cases that I mentioned, those 20 probable cases. These cases were traced back to initiate or at least have begun in early August, and then, those cases followed through all the way up until early September, where we had the first initial case identified, as I mentioned, on the 19th of September. But this is by date of onset, so the infections occurred prior to the initial confirmation. But you can also see that towards the later part of this graph, majority of those confirmed cases, there's two peaks there, and this data is a bit old, but you can see that the

separation of these peaks is anywhere from, you know, three to seven to ten days, which is the average incubation period for ebolavirus disease. And so it's very common to see these peaks. So we're probably in the third peak in this graph. When we send out our new update, we'll have updated this information. Next slide.

So now I'm going to talk a bit about previous ebolavirus outbreaks and try and put Sudan virus in the context of other ebolavirus disease outbreaks that people may be more familiar with. Next slide.

So, ebolavirus disease in humans is caused by infection with one of four viruses within the genus ebolavirus family Filoviridae. There are actually six species of ebolavirus, but only four are known to cause disease in humans. The first of those is the one that people are probably most familiar with, which is called ebolavirus or species Zaire ebolavirus. This has caused multiple outbreaks in the democratic Republic of Congo, formerly Zaire, Republic of the Congo, Gabon, Guinea, Sierra Leone, and Liberia, the 2014 to 2016 outbreak being one that probably people are most familiar with. The case fatality rate for ebolavirus tends to be a bit higher between 70 and 90%. The next ebolavirus that is known to cause disease in humans is Bundibugyo virus. There have been two documented confirmed outbreaks of this virus, on in western Uganda in 2007, and another in eastern, excuse me, in yeah, in eastern DRC, in 2012. The case fatality for Bundibugyo virus is about 40%. Tai Forest virus is another one that has been known to cause disease in humans. This is a one-human case retrospective identification. But lastly, as we are talking about today, Sudan virus, species Sudan ebolavirus, has also caused multiple outbreaks although not as many as Zaire, but these have been limited geographically to the countries of Sudan and now South Sudan and the country of Uganda, but the case fatality rate is approximately 50%. Next slide.

This map is a distribution of Filovirus outbreaks across Africa between 1976 when ebolavirus was first identified and 2022. I just want to point your attention to, one, you can see the large geographic spread of all different Filoviruses, but particularly, as I mentioned, Zaire ebolavirus are the ones represented in the red dots, and you can see predominantly those are confined to the central part of Africa as well as West Africa, as I mentioned before the 2014 and '16 outbreak as well as subsequent outbreaks that we've seen in Guinea this year and last year. You can see in the, on the right-hand side where you can see South Sudan and Uganda in the orange dots. Those represent Sudan ebolavirus, and there are many, there are fewer outbreaks of those, but you can see how they are geographically distributed more to Eastern Africa and not central and Western Africa. So they are a different ebolavirus, but yet, they have a lot of similarities, but geographically they are distinct. Next slide.

So I want to spend a bit more time detailing the Sudan ebolavirus outbreaks that we have for prior outbreaks of Sudan virus from 1976 now to 2022. So the first outbreak of Sudan virus was identified in present South Sudan in Nzara. That was an outbreak of 284 cases with 151 deaths with a case fatality rate of about 53%. The next outbreak was three years later. It was a smaller outbreak in the same area as well as Yambio, and that was an outbreak of 34 cases, case fatality of 65%. The next outbreak was not until many years later, in the northern district of Gulu in Uganda in 2000, and prior to the 2014 and '16 outbreak, this was the largest Ebola outbreak on record prior to that outbreak, of 425 cases and a case fatality rate of 53%. There was a small

outbreak in Yambio again in 2004 of 17 cases, case fatality of 41%. And not again until 2011 did we see an outbreak of Sudan virus in Uganda in now the central region of Uganda just about an hour north of the capital city of Kampala, there was a single case and a single death in 2011. But in 2012, there were two sequential outbreaks, one in a district called Kibaale, and also in Kagadi, which is just to the west of the current outbreak in Mubende District. This was an outbreak of 24 cases. The case fatality rate was 70%. And in 2012, there was a smaller outbreak, again, closer to that outbreak in 2011, of seven cases with four deaths at 54% case fatality. As I mentioned, we have done genomic sequencing of the current outbreak that's going on in Mubende, and I want to focus your attention on the map, in the lower part where there's a red square with a black outline. That's the current outbreak in Mubende District. You can see just to the left there. To the west is where the 2012 Kibaale outbreak occurred, but also, to the right of that, the current outbreak is, the two outbreaks are Nakisamata and Luwero. The current outbreak is genetically most closely related to the Nakisamata 2011 outbreak even though geographically it's closer to Kibaale. Now, the differences, genetically, are very small, and we want to just point out that this doesn't have any clinical implications, but what we want to point out is geographically these are all in a very similar region of Uganda, and the purported suspected viral host reservoir being what we think is a bat, is likely circulating in this area, and the virus is maintained in nature. And so it's actively occurring in this area, so it's not unexpected that there would be an outbreak where we've seen previous outbreaks in the central region of Uganda. Next slide.

So, as I mentioned just to compare the outbreaks of Zaire ebolavirus, which are the ones that people are most familiar with. Since 1976, there have been 33 outbreaks due to ebolavirus species, ebolavirus Zaire. This is, we've seen over 31,000 infected cases with over 12,000 deaths. So a very large number of cases have occurred since we've identified this virus, but prior to 2022, there have only been seven outbreaks due to Sudan virus. But the cases are not insignificant, but they are of magnitudes lower than the number of cases that we've seen for Zaire virus. And this is 792 cases total with 426 deaths. So most of knowledge of ebolavirus disease or what, you know, what we've studied epidemiologically, comes from outbreaks caused by Ebola Zaire, but we also anticipate that the lessons learned from those recent outbreaks of Ebola Zaire to be applicable to this outbreak. And we do have data for Sudan virus, but what we can also say is that there have been a lot of clinical interventions targeted to Zaire ebolavirus that we don't have for Sudan virus, and my colleague, Dr. Choi, will talk about that more in a minute. Next slide please.

So as it stands, the risk of ebolavirus disease spread at the regional and global levels the overall risk of spread has been assessed as low by the World Health Organization. Additionally, the risk of importation into the United States is currently assessed as low for the following reasons. The geographic scope of this outbreak in Uganda is still currently limited. The number of travelers to the United States is also low from Uganda, and there are no direct flights from Uganda to the United States. There is active exit screening of air passengers in Uganda at the national airport in Entebbe. Uganda, as I mentioned before, does have experience responding to ebolavirus disease outbreaks including multiple outbreaks of Sudan virus. And in addition to source control efforts that are being carried out in Uganda by the Ministry of Health as well as CDC and other partners including WHO, the U. S. government is taking steps to reduce the likelihood of import to ebolavirus disease into the United States. CDC has been working alongside the Uganda government in response efforts at the source of the outbreak. And I would like to at this time

pass it to my colleague, Dr. Choi, to talk about the domestic preparedness activities for ebolavirus as well as the clinical considerations. Next slide.

Thank you. Next slide.

Yep, thank you. so this is Mary Choi from Viral Special Pathogens. So even though the risk of importation of disease is low, CDC has been very active on the domestic preparedness front to ensure that we are prepared to respond.

CDC has activated its emergency response structure at headquarters and has dedicated staff focusing on responding to and managing this outbreak. We are also working to stand up the CDC Ebola response team, a team composed of subject matter experts including medical officers, epidemiologists, infection control specialists, and laboratorians, who can mobilize anywhere in the United States in response to a domestic case of EVD. We are also working to update guidance on the management of patients with suspected EVD and outlining a process for accessing the experimental Sudan virus monoclonal antibody therapeutic. Next slide.

CDC is also coordinating with the 10 regional special pathogen treatment centers. These facilities have specialized high-level isolation units equipped with infrastructure, laboratory capabilities, and staff to care for patients with highly hazardous communicable diseases. On the laboratory front, we are also working to expand testing capabilities for Sudan virus at 28 Laboratory Response Network facilities and laboratories at the 10 Regional Emerging Special Pathogen Treatment Centers. Finally, CDC is communicating with public health departments, public health laboratories, and healthcare workers to raise awareness about this outbreak. On October 6th, CDC issued a health alert network health advisory to the medical and scientific community with information regarding the EVD outbreak and clinical recommendations. We will be reviewing this material in the coming slides. Next slide. Next slide.

Ebolavirus disease is a serious, often fatal disease in humans. Without treatment, EVD has a high mortality rate. As Dr. Shoemaker mentioned already, for Sudan virus this is around 50%. Based on evidence and the nature of other similar viruses, we believe that Ebola is a zoonotic disease and that bats are the most likely reservoir. Next slide.

In an infected person, the virus can be found in all body fluids to include those listed here, blood, feces, vomit, urine. The virus is transmitted through contact through broken skin or mucous membranes with the body fluids of a person that is sick or has died of Ebola. Now, this contact can be direct, such as a splash of infectious materials onto mucous membranes or indirect, such as contact with items contaminated with body fluids of an EVD patient such as contaminated clothing or bedding. Finally, it's important to keep in mind that EVD is not spread through airborne transmission. Next slide.

The most common signs and symptoms of EVD are listed here. As you can see, these signs and symptoms are nonspecific and can be seen in many other infectious diseases. There is no sign or symptom that is pathognomonic for EVD. A couple of things to note on the signs and symptoms. First, fever is not universally present in EVD patients. Instead, it can wax and wane throughout the day and is detected in about 70 to 80% of confirmed EVD patients. This underscores the

importance of asking patients about all signs and symptoms of Ebola and not just the presence of fever. Second, bleeding is not universally present in EVD patients. In general, it is a late manifestation, and it is seen in less than 50% of cases. The other thing I would like to note is I do have an asterisk just explaining what I mean by unexplained bleeding and bruising. So this does include bleeding from the gums, mouth, nose, bloody vomit, bloody stools, bleeding from injection sites, and vaginal bleeding outside of a menstrual cycle. Next slide.

I will now review the typical course of illness in EVD. Infection occurs after exposure to a person who is sick or has died of Ebola. Next slide.

Following infection with the virus, there is an incubation period. The incubation period is between two and 21 days, but on average it is between four and 17 days. During the incubation period, the infected individual has no signs or symptoms of Ebola, and they are not contagious. Next slide.

The first symptoms that appear are what we call dry symptoms and include fever, headache, muscle aches, and joint pain. Once signs and symptoms appear, the patient is contagious and is capable of transmitting the virus to others. Next slide.

At or around day four of illness, patients develop vomiting and diarrhea, or what we call wet symptoms. At this point, the patient is very contagious. To minimize transmission of the virus, it is critical to identify and isolate EVD patients as soon as they develop symptoms, but especially before they develop wet symptoms. Next slide.

In fatal cases, individuals die around seven to ten days after illness onset. The quantity of virus in the body is highest at the time of death. Next slide.

With regards to diagnostic testing, the Biofire FilmArray Warrior Panel is an FDA-cleared assay developed by the Department of Defense. The Warrior Panel can detect several viruses within the ebolavirus genus, and they are listed here. Currently, nine laboratories within the Laboratory Response Network are able to test for Sudan virus under CLIA using this platform. There are 19 additional LRN laboratories that are currently verifying the Warrior Panel under CLIA and will be able to test clinical specimens in the coming weeks. Next slide.

Prior consultation with CDC is required prior to shipping a specimen to us for Sudan virus testing. Because a shipment contains a specimen collected from a patient with suspected EVD, it will have to be packaged and shipped as a non-select agent Category A shipment. Next slide.

It is important to keep in mind that the symptom onset date is critical for interpreting the PCR test result. A negative PCR result from a blood specimen collected less than 72 hours after symptom onset does not rule out EVD. In this situation, another specimen would need to be collected 72 hours after symptom onset and testing. A negative PCR result from a blood specimen collected from a symptomatic patient more than 72 hours after symptom onset does rule out EVD. Finally, positive PCR results are considered preliminary until confirmatory testing at CDC. Next slide.

Currently, there is no FDA-licensed treatment for Sudan virus. However, there is a promising experimental two antibody cocktail therapy called MBP134. In nonhuman primate studies, the cocktail has demonstrated efficacy in preventing mortality due to infection with Sudan virus, Ebolavirus, and Bundibugyo virus. It is important to note that supportive treatment such as IV fluids and symptomatic treatment for vomiting and diarrhea can improve chances of survival when provided early in the disease course. Next slide.

Currently, there is no FDA-licensed vaccine for Sudan virus. However, there are two vaccine candidates that are undergoing evaluation. It is important to note that based on the available evidence, Ervebo, the FDA-licensed vaccine against the Zaire strain, will not provide cross-protection against Sudan virus infection. Next slide.

I will now review recommendations for clinicians. Next slide.

First, we are asking the clinicians collect travel history for ill patients presenting with a clinical picture suggestive of an infectious etiology. For ill travelers recently arrived from Uganda, it is important to ask where did they travel? Were they in the districts currently affected by the outbreak? Why did they travel? For work? To visit family? What activities did they take part in during the 21 days before illness onset? Did they attend or participate in a funeral? Did they care for anyone who was sick or died? Did they travel with others? If yes, are their travel companions ill? Did they have contact with anyone who was diagnosed with Ebola or anyone suspected of having Ebola? Next slide.

We are also asking healthcare providers to include EVD in the differential diagnosis for ill returning travelers from Uganda, but at the same time, it is important to keep in mind that malaria is the most common cause of undifferentiated fever after travel to sub-Saharan Africa. As we discussed the signs and symptoms of EVD are nonspecific and nearly all can be seen in patients with malaria. Malaria infection, especially falciparum, can progress rapidly, so early diagnosis and treatment is key to survival. Malaria testing should not be delayed. Also, it is important to ask ill travelers about malaria prophylaxis and adherence, but remember that a history of taking malaria prophylaxis does not exclude the possibility of malaria infection. Bottom line, test for malaria in any febrile traveler recently arrived from Uganda. Guidance on malaria testing in suspect EVD patients can be found in the resource materials for this call. Next slide.

We are also asking clinicians to place suspect EVD patients in a private room with a door while performing their clinical evaluation. Follow CDC guidance on PPE selection and wear, including donning and doffing. Where possible, use dedicated and disposable medical equipment and limit the use of needles and other sharps. Procedure that can increase environmental contamination with infectious materials or create aerosols should be minimized. If performing aerosol-generating procedures, follow guidance to reduce exposures to include limiting personnel present during the procedure, and if available, utilizing an airborne infection isolation room. Next slide.

If healthcare providers are concerned that their patient may have EVD, we are asking that you first notify your state, local, tribal, or territorial heath department and follow jurisdictional protocols for patient assessment. As such, it is important to identify points of contact and contact

information for your state and local health departments now. The CDC Emergency Operations Center can also assist in identifying contact information for state and large jurisdictional health departments, and you can reach them by calling the 24/7 telephone number listed here. As a resource for public health departments, CDC's Viral Special Pathogens Branch is available 24/7 for consultations by calling the CDC Emergency Operations Center. Next slide.

Now, I will review what to expect from an initial consultation with CDC. First, you will be connected with SMEs at CDC including members of Viral Special Pathogens Branch.

SMEs will also be available to provide guidance on hospital infection control practices and laboratory biosafety. During the call, we will discuss the patient's travel history, epidemiologic risk factors, their clinical course, and review what diagnostic testing has been performed. We will also want to know what infection control measures are in place. Based on all this information, we, meaning all the stakeholders on the call will make a collective decision as to whether testing for Sudan virus is recommended. Now, you might ask, why not test everyone? When we decide to test a patient for Sudan virus, as we reviewed, strict infection control measures must be put in place that may limit the patient's access to care.

And the length of time these patients remain under strict precautions can be prolonged. It takes time to get the specimen to the lab. It takes time to run the assays. Also, as we reviewed, there are caveats when interpreting the Sudan test results. So if the specimen is collected early on in the disease course, precautions will have to remain in place until a second test is performed.

Once a decision has been made to test, we will work with state health departments and the hospital to arrange for shipment and testing of the specimen. Following this, we will want to get daily updates on the patient's clinical status and updates on specimen shipment. And of course, when the test results are available, we will convene a call to discuss the results and next steps. Next slide. And that concludes my remarks.

I will now turn it over to the moderator for Q and A. Thank you.

Presenters, thank you for providing this timely information to our audience. Before we go into our Q and A session, I want to emphasize what Commander Choi had shared about resources. There were a lot of resources discussed during this COCA call. You can find most of them posted on this COCA call's landing page. So if you direct your browser to emergency.cdc.gov/coca and click on the link for this COCA call, you can scroll and click on additional resources where you will find direct links to a lot of these resources. So now we will go into our Q and A session. For our audience, please remember to ask a question using Zoom. Click the Q and A button at the bottom of your screen and type your question. Please note that we often receive many more questions than we can answer during our webinars. In addition to our presenters, Dr. Shoemaker and Commander Choi, we have CDC subject matter experts from across the agency joining us for the Q and A session today. So for our subject matter experts, please remember to identify yourself before answering the questions.

The first question we have is can the presenters please discuss if there's any connection between this particular outbreak and recently Ebola outbreaks in DRC.

Hi. This is Trevor Shoemaker. I'll take that. At this time, no. As I have mentioned before, all the outbreaks that occurred in DRC were either Zaire virus or Bundibugyo. And this is Sudan virus, so it's a different species, and it's distinct enough that we can assume or we know that there's no relation or direct connection between the previous outbreaks in DRC and the current outbreak in Uganda. Thank you.

Thank you for that. We have multiple questions regarding infection prevention and control. One question asks do you have any PPE recommendations when transporting waste?

Hi. This is David Kuhar from Division of Healthcare Quality Promotion. So I suppose it depends at what part in handling waste. In general, if you're handling waste inside a patient's room, you're going to be wearing the personal protective equipment. Once this is, of course, packaged for transport, etc., and assuming the outside of the packaging is clean, personal protective equipment for moving a clean container is not necessarily needed. The packaging, of course, needs to be done according to Department of Transportation requirements.

Great. Thank you so much. Our next question asks, how are you able to distinguish the Sudan ebolavirus from CCHF?

Yeah, this is Trevor Shoemaker again. We, so, just to get in a bit more detail, at the National Laboratory where they test for viral hemorrhagic fevers, every suspect viral hemorrhagic fever sample that's submitted, as Dr. Choi pointed out, a lot of the initial symptoms that people will present with at the health facilities are nonspecific. And so they can be one of a number of things including a non-VHF. But particularly for VHF, there's a high enough level of suspicion. We don't just test for one virus, you know, Ebola or another particular VHF. We run a panel of diagnostic tests that include three different Ebola species, which would be Bundibugyo, Zaire, and Sudan, the three most likely Ebola viruses that may be in Uganda, even though we've never detected Zaire indigenously in Uganda. But in addition to those Ebolas, we do Marburg virus, which is a related filovirus, as well as Crimean Congo hemorrhagic fever and Rift Valley fever. Now, Crimean Congo hemorrhagic fever is a completely different viral species, and so genetically they are very distinct, and the diagnostic tests are unique to each one. Thank you. Over.

Thank you very much for that. We have some questions regarding traveling, you know, traveling across airports, etc. , so the first question asks if the incubation period is seven to ten days, is it possible that we may not pick this up during airport screenings?

Yeah. Good afternoon. This is Reshar Raheed from the Division of Global Migration and Quarantine. That is correct. So exit screening being done in Uganda as well as entry screening done in the United States is part of layered strategy in addition to the other recommendations provided on todays call what providers can do. So it is possible that people will be missed during the screening processes, but the idea is to have many layers of intervention and screening. Over.

Thank you very much for that. As a follow up question, the question asks, is it possible for travelers to use fever-reducing agents to travel undetected, and if there is any kind of guidance you have for that?

It is possible that people can take fever-reducing medicine, and that would reduce the fever-detection component, will not be valid if they are taking that medicine. But, you know, like I mentioned earlier, there are -- this needs to be based on multiple layers of intervention, and we do ask questions, particularly for those travelers coming into the United States that five ports of entry, questions related about the risk factors and where they've been, similar to what Commander Choi was talking about earlier, asking questions about the risks factors and what activities they've had when they were in Uganda. Over.

Thank you for that. And as a segue, as followup to that, in addition to those type of questions, for clinicians, for providers, can you reiterate on what are some questions that they can ask when getting a travel history that will allow them to make a judgment about this, considering this outbreak, if they're caring for a patient who may have traveled from the affected region?

Yeah, I will --.

Go ahead Mary. That's sounds like a question for you.

Sorry. Yeah, sorry. This is Mary Choi, CDC Viral Special Pathogens Branch. You know, I think I went over some of those kind of key questions during my presentation, but really, we do want to know about the details of their travel, you know, where they were. You know, as Trevor mentioned, you know, we are particularly concerned about the affected districts. So if they had travel within the affected districts. We also do want to know about exposures, you know, and activities in the 21 days before symptom onset. You know, did they care for somebody who might have been a suspect or confirmed EVD patient. Did they care for anyone that was sick or maybe was sick and then died? You know, I think that's also quite important. When they first became ill is, obviously, an important part, as I discussed during the presentation as well. And, you know, I think that probably this list is clearly not comprehensive. You know, depending on each person's, you know, itinerary and activities, there could be additional questions that could be asked. Again, you know, if there's any questions or concerns about assessing risk and, you know, things that concern you on a travel history that you get on a patient, you know, again, you know, I would say that we here at Viral Special Pathogens are available, as are healthcare and public health officials at your state and local health departments. And so, we're all resources to you. So you're not in this alone. So if you have questions, you know, please ask your public health departments. And, you know, if there are questions that they cannot answer, you know, you're more than welcome to call us on the, at the CDC Emergency Operations Center, and that's why we are here, to serve as a resource. We do not want you to feel like you have to do this alone. Over.

Thank you very much for that answer. We have quite a few questions asking about vectors, and they generally boil down to can you talk about the animal vector for this particular virus, and how does it compare to other ebolaviruses and other hemorrhagic fevers.

Hi. This is Trevor Shoemaker. I'll start with that and see if there's any other colleagues on the line that might be able to add to this. So, as I mentioned, we suspect that there's a species of bat that is the natural host reservoir for ebolavirus, and the reason for this is that we do know the natural host reservoir for a related filovirus, Marburg virus, that is a cave-dwelling fruit bat,

Rousettus aegyptiacus. We also suspect this because there was identification of a species of ebolavirus that I didn't talk about but it was named Bombali virus, that wawas identified in a bat that was collected during an ecological investigation, but we've not identified that particular virus to infect humans. So we do suspect it's a species of bat, but since there are many different species of bat that live in Africa that could potentially carry ebolavirus, we do not know which particular one carries Sudan virus in particular. We do have team working with local Ugandan officials that are currently there performing some of these follow up and additional ecological investigations to try and answer this exact question. So, I hope that provides an insight. But if there's anyone else on the line, I'll stop there, over.

Thank you. Another sort of related questions asks, this particular outbreak, you shared a lot of history of other outbreaks. How do you consider this outbreak to be different from the other outbreaks?

Hi. This is Trevor Shoemaker again. So I think I'll just, I'll talk about Sudan virus to start. So this Sudan virus outbreak, in comparison to the previous outbreak, and as I mentioned, there has kind of been long intervals between the Sudan virus outbreaks, the last one being 10 years ago. So, in a lot of people's minds, they don't really know about Sudan virus as much as they do about Zaira because that is the one that's caused very large outbreaks. But the previous Sudan outbreak in 2012, I was actually there and investigated that one, there are a lot of similarities actually between this outbreak and that outbreak in that they started in a very rural area in these districts. There was likely additional spread either within families or communities prior to the first laboratory confirmed cases being identified, and that's just because, you know, there's not a lot of healthcare being sought, but there's also a low index of suspicion as well as people don't necessarily go seeking healthcare, but you know. So there's a bit of time that lapses between when an outbreak maybe first spills over from the natural reservoir into the human population. There may be a few small clusters of family or community spread before a case actually presents to a larger regional hospital where it's recognized as a potential VHF. So in that way, they're very similar. I think one difference in this outbreak is that there has been a bit more nosocomial transmission than in previous outbreaks, and that's probably led to the additional number of cases. But I just also want to stress, even though we have 54 laboratory-confirmed cases, it's still a relatively small outbreak, and regionally confined at this time. Over.

Thank you very much. And a followup question we have to this is based on the size and sort of the curve of the outbreak, do you anticipate cases to continue rising in the coming weeks?

Yes. This is Trevor again. You know, as I mentioned, we currently have multiple CDC staff there assisting the Ministry of Health as well as there is a very large Ministry of Health response and international partner response. They're doing a very good job, as I mentioned, increasing the case contact follow up and investigations. So in that sense, we may still identify a few additional cases that have been infected, but I think there's a very good chance that those cases will be recognized early and put into isolation. It's very hard to predict at this time how much longer this outbreak will go on. It just really depends on how well they can quickly identify cases and put them into isolation so they don't cause additional secondary cases. But I'll just stop there. There's a very good chance it will be under control, but as I said, there's, it's very hard to predict, so I

don't want to make any predictions, but there's a lot of very experienced people working on this. Over.

Thank you very much. We have a question regarding treatment. The question asks, is the supportive care treatment success rate similar to other ebolaviruses?

So, you know, supportive care in general has been found to be, you know, obviously very good for a multitude of these diseases including, you know, past experiences with Zaire. So as Trevor mentioned, with Zaire, the mortality rate tends to be higher, 70 to 90%, and studies have shown that in Zaire supportive therapy has gotten that mortality down to 40%, which is a significant drop considering you're starting at 70 to 90. So, supportive care is an important part of the treatment for Sudan virus and should not be neglected. You know, when we talked about the vomiting and the diarrhea that happens, it's not just a little bit of vomiting and a little bit of diarrhea. It tends to be voluminous, you know, so with, you know, massive dehydration and electrolyte loss. So supporting patients with IV fluid with electrolytes, symptomatic treatment of the fevers, of the vomiting, of the diarrhea, all of this is critical to improving mortality. Thank you.

Thank you very much. Follow up question we have related to that is what do you attribute the difference of fatality, in fatality rate amongst the different viruses? What do you attribute that difference of fatality rate to?

This is Trevor. I'll start, and then I think I can pass it to Dr. Choi, for additional, from the clinical side. I think it really depends, you know, as I showed on the slide, you know, in 2011, we had a single case. That was a fatality. So the case fatality was 100%, but when you have a, you know, more cases, it tends to be more moderate in the, you know, approximately 50% range for Sudan. You know, surveillance wise and epidemiologically, some of the case fatality could just be due to identification of the more severe cases. So you tend to identify the cases that are more severe at later stages, and they tend to be fatalities, and that could lead to higher case fatality. But in terms of, you know, a lot of the recent outbreaks, there's been some interventions, and that could have also reduced as well as, you know, both physical and pharmaceutical, but I'll pass it to Dr. Choi to follow up on that.

Yeah, this is Mary Choi from Viral Special Pathogens. I don't know that I have really that much more to add. You know, certainly it's possible that there are some things specific about these species that are just different, you know, as I mentioned, even though these, as Trevor, as Dr. Shoemaker mentioned, even though these species are all the same family, you know, there are differences in the viruses and so that, you know, for example, the vaccine for Zaire won't cross protect against Sudan. So it's possible that there are differences with the virus itself that maybe from a biological standpoint may contribute to differences in mortality rates, but I don't know that we have a clear answer on that.

Thank you.

Thank you very much. We have a question asking about the role of state-designated special pathogens treatment centers and how they can coordinate with the regional treatment centers as well as the CDC, if you can kind of talk about that?

Yeah, this is Mary Choi from Viral Special Pathogens. Yeah, so, okay. I guess just to set the scene, there are, as I mentioned, 10 regional emerging special pathogen treatment centers. And that is one per HHS region. And these are those specialized centers, you know, perhaps you remember from 2014, like the Emorys and the Nebraska, University of Nebraska, they kind of fall into these 10, and they are funded by ASPR. And then, there are special pathogen treatment centers that are also supported by ASPR, and these facilities are located throughout the United States, in more states, and there's at least 53 of them that are supported by ASPR. And so they do form a form, a bit of a network in terms of capacity for being able to treat and care for a patient with a highly infectious disease like Ebola. And so, we at CDC are coordinating with ASPR to make sure that we understand the landscape and what the current, you know, the current landscape is in terms of capacity and make sure that when we, if and when we have an imported case that the transfer of care is clear. And then, maybe I would also see if Dr. Kuhar has anything else he would like to add.

Hey, thanks Mary. No, I think that was very well said. Nothing to add here.

Thank you very much, and I just want to direct everyone's attention to the chat box because the, one of the links posted is regarding those centers, the regional centers. So you can click that link as well. So thank you to Julie for that. Our next question is regarding travel, and the question asks, do we have an estimate of how many people travel from Uganda to U. S. in a given period of time?

Yeah. Yeah. Good afternoon, again. This Reshar Raheed with the Division of Global Migration and Quarantine, and maybe I'll sort of backtrack and provide a little bit more perspective on the travel space, not just about the numbers. So, we can start with the numbers. Based on the historical information, we expect that there are about 145 travelers that arrive from Uganda into the United States daily, and those passengers have begun being funneled to five U. S. airports starting at the end of the day on Monday on October 10th, to the Atlanta airport, Chicago O'Hare, Newark, JFK in New York, and Washington Dulles Airport. So all of the passengers from Uganda arriving in these airports they undergo a fever check as well as a risk assessment questionnaire upon entry. Now, this is in addition to the exit screening process that's done in Uganda. I hope that provides better perspective. Over.

Thank you for that. A followup question we have to that is, is there any plan for a followup with travelers that may have a negative screening at the airports but were coming from affected areas? So, you know, we talked about that 21-day possible period. Will there be any follow-ups to negative screenings?

Yeah, there is, and I'll pass that to Dr. Mickey Cohen to give a quick talk line on that, over.

Thank you. This is Dr. Mickey Cohen from the Division of Global Migration and Quarantine. So we have posted guidance for state health departments who will be following up with these

travelers. We're also providing health departments with contact information for these travelers, and the contact information is being sent securely to the states where travelers have their final destination. And I can provide a link to the guidance for health departments in the chat. Over.

Thank you very much for that. We have a couple of questions regarding sample collection, and they essentially boil down to can you talk a little bit about what are the ideal samples to submit for testing?

Hi everyone. This is Julie Villanueva from CDC. I can take that question. Right now, we are asking for whole blood EDTA to be collected for testing. And that's both for the Biofire Warrior panel as well as testing at CDC. Over.

Thank you very much. And we have time for one last question. So, I'll sum up a couple of questions that we've gotten about transmission. The first part is, do we have any data on how long the virus lasts on surfaces to spread to others, and the second part is, is there a possibility of transmission via aerosol-generating procedures?

Hi. This is Brian Harcourt with Viral Special Pathogens, and I can address the first question about surfaces. In general, I actually brought up a paper while you guys were talking. So, in general, if it's in a liquid, whether it be blood or water, the virus is going to persist longer, especially if it's a blood. Drawing blood, the virus will dissipate or become inactive a little bit more quickly, but it can be on the order of days. Temperature can also play a factor. There's a study done looking at stainless steel, plastic, and Tyvek, looking at 21 C, like a regular room temperature for the U. S. and a room temperature for Western Africa. This is what the study was based on. So a warmer temperature, like say 80 degrees and a high humidity, the virus persisted. It could be detectable down to it looks like three or four days. If it was a little bit cooler with a relative humidity a little bit lower, that persistence could go out to a week to two weeks, especially if it was on Tyvek. Plastic and stainless steel was a little bit reduced in time, but it was still a week to ten days we could actually detect infectious virus. So in this study, they were looking at infectious virus not just detecting nucleic acid. If you're detecting just nucleic acid, you don't know if it's infectious. So you always want to see a study that looks at infectious virus. So the general word of thought is if it's cooler and drier, the virus can persist a little bit longer. If it's in a liquid, it can persist quite a bit longer. So it's just best to use disinfectant anytime you can. Over.

Great. Thank you. Which brings us to the second part, which was regarding the possibility of transmission via aerosol-generating procedures.

This is Brian Harcourt, again, I'll -- from VSPD. I'll take the first crack at that. I think you want to be careful on how you use your terminology. If you make splashes, as Dr. Choi said, you can make fomites that can then land on mucous membranes and be infectious. So anything that's producing such a splash or large droplets would and could possibly be infectious, but beware of the term aerosol route because that's only a short step to people thinking it's airborne. So, know if you're making large droplets, then that could be transmitted that way. Over. Anybody have anything else to add? Over.

Thank you very much. That's an important distinction that I'm glad you were able to share with our audience. So let me thank everyone for joining us today with a special thanks to our presenters, Dr. Shoemaker and Commander Choi, and thanks to our CDC subject matter experts who shared their time and expertise with us.

Today's COCA call will be available to view on demand a few hours after the live call at emergency.cdc.gov/coca. A transcript and closed caption video will be available on demand on COCA's webpage later this week. Again, like I mentioned, you can find those resources at that page as well. We invite you to join us tomorrow, Thursday, October 13, at 2 p. m. Eastern for our next COCA call. The topic will be Melioidosis in the United States, What Clinicians Need to Know Following Newly Discovered Endemicity. Continue to visit emergency.cdc.gov/coca to get more details about upcoming COCA calls. We invite you to subscribe to receive announcements for future COCA calls by visiting emergency.cdc.gov/coca/subscribe.asp.

You will also receive other COCA products to help keep you informed about emerging and existing public health topics. You can also stay connected with COCA by liking and following us on Facebook at Facebook. com CDC Clinician Outreach and Communication Activity. Again, thank you for joining us for today's COCA call and have a great day.