



# Gulf Rapid Risk Assessment: Sudan Ebolavirus Outbreak in Uganda

6 November 2022

This document has been developed by the Gulf Center for Disease Prevention and Control (GCDC) for the awareness of public health authorities within countries of the Gulf Cooperation Council. The rapid risk assessment provides guidance based on the information available to the GCDC as of 6 November 2022.

## Background

On 20 September 2022, the Ministry of Health of Uganda reported a case of Sudan ebolavirus in Mubende district. The case was a 24-year-old male developing symptoms on the 1<sup>st</sup> of September 2022 with no travel history. The case passed away on 7 October 2022. Outbreaks caused by Sudan ebolavirus have been reported seven times globally; 3 times from Sudan and 4 times by Uganda (2000, 2011, 2012, 2012-13) causing 792 cases and 426 deaths.

Ebola disease is a viral disease characterized by haemorrhagic fever and a high case fatality rate. The disease is caused by infection with one of 4 viruses within the genus *Ebolavirus*, family *Filoviridae*, order *Mononegavirales*. The genus includes six species of enveloped, filamentous, linear non-segmented negative-sense RNA viruses: Ebola virus, Sudan, Reston, Tai Forest, Bundibugyo, and Bombali viruses – only four of which have been known to cause disease in humans<sup>1</sup>.

Ebola virus (species Zaire ebolavirus)	Multiple outbreaks (Zaire/DRC, Gabon, Republic of the Congo, Guinea) 70-90% fatality
Bundibugyo virus (species Bundibugyo ebolavirus)	2007 Uganda and 2012 DRC outbreaks 40% fatality
Tai Forest virus (species Tai Forest ebolavirus)	One human case (survived)
Sudan virus (species Sudan ebolavirus)	Multiple outbreaks (Sudan, Uganda) ~50% fatality

The disease most commonly affects people and non-human primates (such as monkeys). Symptoms can take up to 2 to 21 days (average 8-10 days) to appear and initial symptoms include fever, headache, muscle and joint pain, fatigue, loss of appetite, gastrointestinal symptoms, and

<sup>1</sup> <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/sudan-ebola-virus>



unexplained bleeding. These unspecific symptoms are common with many diseases such as malaria, typhoid, rickettsial diseases, flu, and leptospirosis. The virus can be transmitted through:

- Direct contact with body fluids of an infected (sick or dead) person: blood, saliva, sweat, urine, feces, vomit as well as breast milk, semen).
- Direct contact with clothes, bedding, or any device contaminated with body fluids from an infected sick or dead person
- Infected fruit bats or nonhuman primates (such as apes and monkeys).
- Semen from a man who recovered from the disease: rare event.

## Situation Update

The Sudan ebolavirus outbreak in Uganda continues to grow. As of 2<sup>nd</sup> November 2022, a total of 131 confirmed cases have been reported by Uganda’s Ministry of Health, including 48 associated deaths (and 21 probable deaths). 54 cases recovered thus far. Approximately 3794 cumulative contacts have been identified for 21 days of monitoring; 1604 of these contacts are currently undergoing active follow up. 18 of the cases identified were healthcare workers, 4 of which died.

Epidemiological situation as of 26 October 2022	
Total cases	131 confirmed cases
Total deaths	48 confirmed deaths, 21 probable deaths
Case fatality rate	37%
Total recoveries	54
Districts affected	7 Central Region: Kampala Capital City, Kassandra, Mubende District, Wakiso District Western Region: Bunyangabu District, Kagadi District, Kyegegwa District
Contacts listed for follow up	3794 total, 1604 currently active follow-up
Healthcare workers	18 infected, 6 died

The spread of the disease in this outbreak is wider than previous Sudan ebolavirus outbreaks in Uganda as 7 districts (Bunyan Abu, Kagadi, Kampala, Kassandra, Kyegegwa, Umbanda, Wakiso) have now been affected. Moreover, 18 cases have been detected in the capital district, Kampala.

As of 2<sup>nd</sup> November 2022, no exported cases from Uganda were reported in other countries. Unofficial reports of suspected cases with history of travel to Uganda being investigated in border towns in South Sudan and in Kenya.

Challenges in response to this outbreak include: absence of a proven vaccine against the Sudan strain of the virus, absence of specific treatment, late recognition of the disease (3 weeks delay between occurrence of the first case and detection), spread to the country’s capital, questionable



awareness and training of healthcare workers, and unknown availability of personal protective equipment for healthcare professionals. Nevertheless, Uganda has experience from previous outbreaks to handle Ebola viral diseases, an operational Ebola Treatment Unit is in place in Mubende (the most affected district), two laboratories exist within the country (including one in Mubende), contact tracing is in place in different districts, response is being coordinated by a national task force with multiple stakeholders.

## Risk assessment

Risk assessed			
Low	Moderate	High	Extreme

Data from IATA and Cirium suggest that approximately 20% of outbound passengers traveling from Uganda head to Qatar, UAE, KSA as their first destination (BlueDot, 2022). Infectious Ebola cases are very unlikely to be fit enough to travel, however they may travel during the incubation period of up to 21 days. While exportation of Ebola cases has been extremely rare in the past, even during major outbreak in Africa, the risk of importation of individual Ebola cases (up to 10 cases with low probability) cannot be completely ruled out for all GCC countries, except for Kuwait (BlueDot, 2022). As such, it is rare for cases of Sudan ebolavirus from Uganda to be imported into the Gulf region by air travel and for secondary transmission to occur between 5 November to 5 December 2022.

Forecast of estimated number of air travelers and infected air travelers from Uganda to the Gulf countries between November 5 – December 5 2022, based on OAG itineraries (2022)

Destination	Estimated number of air travelers	Estimated number of infected air travelers
United Arab Emirates	14,426	Up to 10 cases
Bahrain	340	Up to 10 cases
Saudi Arabia	804	Up to 10 cases
Oman	244	Up to 10 cases
Qatar	1,514	Up to 10 cases
Kuwait	249	Negligible

Source: Insights by BlueDot

The severity of the disease can be high for the Gulf populations. However, the consequences of importation and secondary transmission of Ebola is estimated to be minor given the infrastructure and coping capacity of the GCC countries, despite these capacities not being revised or tested for tackling Ebola cases in recent years.



As such, the current risk for populations living in the Gulf is considered low.

## Recommendations

GCC countries should consider the following recommended actions for better preparedness, readiness, and response.

1. Increase awareness of healthcare workers, relevant stakeholders at points of entry (PoE) and rapid response teams of Ebola disease and appropriate infection prevention and control measures, review their roles and processes for handling potential cases.
2. Designate at least one hospital/facility with adequate supplies and isolation rooms to provide care for up to 10 potential cases with suspected Ebola. Disseminate the referral procedures to health facilities and PoE.
3. Ensure laboratory personnel are trained and equipped for differential diagnosis of viral hemorrhagic fevers and on safety procedures for specimen collection, packaging, labelling, referral & shipment. Detection of Sudan virus in blood after onset of symptoms is done by PCR. Sequencing would provide additional information about chains of transmission. Quantify diagnostic reagent needs and inform GCCDC if interested in joint procurement, sharing reagents, and requiring consultation.
4. Establish stand-by arrangements and ensure agreements are in place with reference laboratories across the GCC and internationally for confirmatory testing and sequencing.
5. Review and disseminate guidance (guidelines, case definitions and investigation forms) to all stakeholders involved in surveillance and contact tracing.
6. Support national authorities in Uganda in implementing exit screening for passengers traveling to GCC countries. Entry screening for travellers arriving from Uganda in GCC countries is not justified at this time.
7. Quantify the local needs in case any specific antivirals and vaccines become approved and available, in addition to quantifying PPEs should local outbreaks occur. The currently approved Ebola vaccine does not provide cross-protection against the Sudan Ebolavirus. There are currently 2 new vaccines in phase I trials by Walter Reed and Oxford University with their multiple international partners. There is a phase III trial planned to take place in Uganda by WHO and multiple international partners. This will evaluate a combination of 2 vaccines: First dose of Ad26.ZEBOV a human adenoviral vector that was used also to develop COVID-19 vaccine by J&J Janssen. Second dose is MVA-BN that has multiple antigens including the Sudan Ebolavirus glycoprotein antigen. Note, the MVA-BN as a vector is already approved as smallpox vaccine and recently used as Monkeypox vaccine. -Supportive treatment is recommended for managing patients. GCCDC continues to review the emerging evidence and developments.



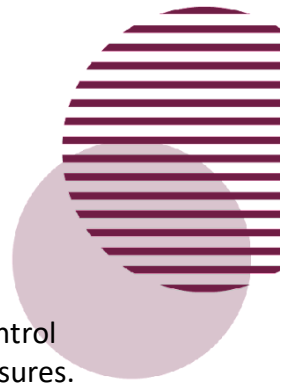
8. Develop/adapt targeted messages for the media, health care workers, and relevant stakeholders, to be shared rapidly in case of Ebola detection in the GCC countries.
9. Consider conducting a simulation exercise with all non-health relevant organizations to review and test surveillance and response system.

## Acknowledgements

- Consultation with GCDC Expert Panel
- BlueDot Insights

## References

1. Kuhn, J.H., Adachi, T., Adhikari, N.K., Arribas, J.R., Bah, I.E., Bausch, D.G., Bhadelia, N., Borchert, M., Brantsæter, A.B., Brett-Major, D.M. and Burgess, T.H., 2019. New filovirus disease classification and nomenclature. *Nature Reviews Microbiology*, 17(5), pp.261-263. DOI: [10.1038/s41579-019-0187-4](https://doi.org/10.1038/s41579-019-0187-4)
2. Aceng, J.R., Ario, A.R., Muruta, A.N., Makumbi, I., Nanyunja, M., Komakech, I., Bakainaga, A.N., Talisuna, A.O., Mwesigye, C., Mpairwe, A.M. and Tusiime, J.B., 2020. Uganda's experience in Ebola virus disease outbreak preparedness, 2018–2019. *Globalization and health*, 16(1), pp.1-12. DOI: [10.1186/s12992-020-00548-5](https://doi.org/10.1186/s12992-020-00548-5)
3. MacNeil, A., Farnon, E.C., Morgan, O.W., Gould, P., Boehmer, T.K., Blaney, D.D., Wiersma, P., Tappero, J.W., Nichol, S.T., Ksiazek, T.G. and Rollin, P.E., 2011. Filovirus outbreak detection and surveillance: lessons from Bundibugyo. *The Journal of infectious diseases*, 204(suppl\_3), pp.S761-S767. DOI: [10.1093/infdis/jir294](https://doi.org/10.1093/infdis/jir294)
4. Schuh, A.J., Kyondo, J., Graziano, J., Balinandi, S., Kainulainen, M.H., Tumusiime, A., Nyakarahuka, L., Mulei, S., Baluku, J., Lonergan, W. and Mayer, O., 2021. Rapid establishment of a frontline field laboratory in response to an imported outbreak of Ebola virus disease in western Uganda, June 2019. *PLoS Neglected Tropical Diseases*, 15(12), p.e0009967. DOI: [10.1371/journal.pntd.0009967](https://doi.org/10.1371/journal.pntd.0009967)
5. Nsubuga, P., Masiira, B., Kihembo, C., Byakika-Tusiime, J., Ryan, C., Nanyunja, M., Kamadjeu, R. and Talisuna, A., 2021. Evaluation of the Ebola Virus Disease (EVD) preparedness and readiness program in Uganda: 2018 to 2019. *The Pan African Medical Journal*, 38. DOI: [10.11604/pamj.2021.38.130.27391](https://doi.org/10.11604/pamj.2021.38.130.27391)
6. National Institute of Allergy and Infectious Diseases (NIAID), 2022. Clinical Trial: Ebola Sudan Chimpanzee Adenovirus Vector Vaccine in Healthy Adults. Trial ID: NCT04041570. Available at: <https://clinicaltrials.gov/ct2/show/NCT04041570>
7. University of Oxford, 2022. Clinical Trial: A Study of a New Vaccine Against Two Types of Ebola. Trial ID: NCT05079750. Available at: <https://clinicaltrials.gov/ct2/show/NCT05079750>
8. Watson-Jones, D., Kavunga-Membo, H., Grais, R.F., Ahuka, S., Roberts, N., Edmunds, W.J., Choi, E.M., Roberts, C.H., Edwards, T., Camacho, A. and Lees, S., 2022. Protocol for a phase 3 trial to evaluate the effectiveness and safety of a heterologous, two-dose



- vaccine for Ebola virus disease in the Democratic Republic of the Congo. *BMJ open*, 12(3), p.e055596. DOI: [10.1136/bmjopen-2021-055596](https://doi.org/10.1136/bmjopen-2021-055596)
9. European Centre for Disease Prevention and Control. Infection prevention and control measures for Ebola virus disease: Entry and exit body temperature screening measures. Stockholm: ECDC; 2014. Available at: <https://www.ecdc.europa.eu/sites/default/files/media/en/publications/Publications/Ebola-outbreak-technicalreport-exit-entry-screening-13Oct2014.pdf>
  10. Abet, T, 2022. Museveni puts kampala on high alert. *Monitor*. Available at: <https://www.monitor.co.ug/uganda/news/national/museveni-puts-kampala-on-high-alert-3987852>

## Further Guidance and Training Materials

[Personal protective equipment for use in a filovirus disease outbreak: rapid advice guideline](#)

[Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the national level](#)

[Optimized Supportive Care for Ebola Virus Disease. Clinical management standard operating procedures. WHO. 2019.](#)

[10 Ebola Response Planning Tips | Public Health Planners | Ebola \(Ebola Virus Disease\) | CDC](#)

[Emergency Response Guidance for Ebola Virus Disease - Prevent Epidemics](#)

[Public health message to all NHS service providers regarding Ebola virus outbreak in Uganda \(Sudan ebolavirus\) - GOV.UK \(www.gov.uk\)](#)

[Health emergency preparedness for imported cases of high-consequence infectious diseases \(europa.eu\)](#)

[Ebola outbreak in Uganda under ECDC monitoring \(europa.eu\)](#)

[Ebola: Introduction | OpenWHO](#)

[ePROTECT Ebola \(EN\) | OpenWHO](#)

[Ebola: Clinical management of Ebola virus disease | OpenWHO](#)

[Ebola: GO 2.0 | OpenWHO](#)