MARBURG VIRUS DISEASE FREQUENTLY ASKED QUESTIONS

1. What is Marburg virus disease?

COMMUNICABLE DISEASES

Marburg virus disease (MVD) or formerly known as Marburg haemorrhagic fever, is caused by a filovirus named Marburg virus. This virus is similar to the Ebola virus and the disease can cause haemorrhaging, fever, and other symptoms also similar to Ebola virus disease (Ebola virus disease - NICD). Marburg virus disease was first described in 1967, in the German cities of Marburg and Frankfurt and the Yugoslav capital Belgrade. This virus was discovered among laboratory workers who were exposed to tissues of infected African green monkeys (*Cercopithecus aethiops*) imported from Uganda. Natural outbreaks of MVD have been few and only reported from Africa.

2. Who can get Marburg virus disease and where does it occur?

Rousettus aegyptiacus (Egyptian fruit) bats are considered the natural host of the virus. These bats prefer habitation in caves and similar structures. As such, miners working in caves inhabited by these bats and visitors to these caves are at risk of infection. Human-to-human transmission of Marburg virus is mostly associated with direct contact with blood and/or bodily fluids of infected persons, so healthcare workers, family members or friends in close contact with infected people, other close contacts of confirmed or suspected MVD cases, persons that attended funerals of persons that are suspected or confirmed to have MVD, are at high risk.

The knowledge of the occurrence of MVD is informed by the few historic outbreaks of the disease and research that has detected the virus in the host species.

1



3. Where have Marburg virus disease outbreaks been reported?

Following the initial laboratory outbreaks in Germany and Yugoslavia, outbreaks in other countries have been documented (Fig. 1).

1975: South Africa	1980: Kenya	1998: The Democratic Republic of the Congo	2004: Angola	2008: Netherlands ex Uganda	2012: Uganda	2014: Kampala	2021: Guéckédou Guinea
Travellers from Zimbabwe (3 reported human cases and 1 (33%) reported deaths among cases)	Kenya, (1 reported human cases and 1 (100%) reported deaths among cases)	Durba in 1998-2000 (154 reported human cases and 128 (83%) reported deaths among cases)	Uige Province in 2004-2005 (252 reported human cases and 227 (90%) reported deaths among cases)	Cave in Maramagam bo forest in Uganda, at the southern edge of Queen Elizabeth National Park in 2008, two independent cases were reported in travelers who had visited a cave inhabited by Rousettus species bat colonies in Uganda	Kabale in 2012 (15 reported human cases and 4 (27%) reported deaths among cases)	Kampala in 2014 (1 reported human cases and 1 (100%) reported deaths among cases).	A recent Marburg positive case (August 2021) was reported from, from a patient who has since passed away.

Figure 1 After initial detection, the timeline of Marburg Virus Disease outbreaks.

4. How is Marburg virus transmitted?

Natural hosts for the Marburg virus are thought to be *Rousettus aegyptiacus* bats. The hypothesis is that the virus may enter the human population either through direct contact with these bats. Once the virus has entered the human population, human-to-human transmission sets off a transient and controllable outbreak, the route of human-to-human transmission is described in section 2 of this document.

5. How does Marburg virus disease affect animals?

The specific fruit bats that are implicated as the natural host of the virus appear to be disease-free. The effect of Marburg virus infection in animal species are limited. Non-human primates such as African Green monkeys are susceptible to infection and may develop fatal haemorrhagic fever. Experimentation have indicated the susceptibility of swine, but the importance of pigs as possible amplification hosts for the virus in nature has not yet been observed.

2

6. What are the signs and symptoms of Marburg virus disease in humans?

The incubation period varies between two and 21 days. Early symptoms include conjunctivitis, pharyngitis, chest/abdominal pain, arthritis, malaise, myalgia, fatigue, nausea, anorexia, oral/throat lesions, persistent diarrhoea, vomiting, dehydration, dry throat, epigastric tenderness, or non-itching maculopapular rash (torso and limbs) around day five of onset. Additionally, splenomegaly, non-icteric hepatitis (no jaundice), severe/fatal cases progress to a haemorrhagic state on days 5-8 of illness, including bleeding from needle puncture sites, mouth/gums, haematemesis, malaena, epistaxis, and the following neurological symptoms: aggressive/altered behaviour, confusion, and somnolence (drowsy, tired). The average fatality rate in MVD cases is around 50%.

7. How is Marburg virus disease diagnosed?

COMMUNICABLE DISEASES

Only a specialized laboratory blood test can confirm the presence of MVD. There is no test available to detect infection while a person is in the incubation period, so MVD can only be diagnosed once signs and symptoms appear, as is the case with most viral infections. Serological testing for IgG and IgM antibodies, RT-PCR detection of the virus (RNA), and virus isolation are all examples of specific laboratory tests. Antigen detection is especially useful when a disease is still in its early stages. It is classified as a pathogen of risk group 4 and there for most specialized investigations listed here are conducted in containment laboratories such as those found at the National Institute for Communicable Diseases. In South Africa, the virus is classified as a Category 1 Notifiable Medical Condition (NMC), in order for prompt public health responses to follow once a case has been identified.

8. How is Marburg virus disease treated?

Currently there are no vaccines or antiviral treatments approved for MVD. In 2020, the European Union approved the use of a recombinant vaccine (called ZAbdeno-Mvabea) for use against Ebola virus disease. This vaccine also include Marburg virus antigen, and therefore may potentially be used to protect against MVD. This vaccine, has however to date, not been tested for efficacy against MVD.

Currently, patients with MVD are managed symptomatically and supportively. This will include rehydration with oral or intravenous fluids – and treatment of specific symptoms, improves survival. The average fatality rate in MVD cases is around 50%. In previous outbreaks, case fatality rates ranged from 24% to 88%, depending on virus strain and case management.

9. How are Marburg virus disease outbreaks prevented?

People should avoid or spending only the required amount of time in mines or caves where fruit bats thrive, such as mine workers or tourists on cave excursions. Contact with individuals or remains suspected of having MVD should be avoided, and patients and burials should be handled by qualified health care staff and burial teams.

10. Where can I find more information?

More facts about Marburg virus disease are available from:

- Marburg fact sheet (in 6 UN languages): https://www.who.int/news-room/factsheets/detail/marburg-virus-disease (accessed on 7 September 2021)
- Marburg virus disease health topic: https://www.who.int/health-topics/marburg-virusdisease (accessed on 7 September 2021)

Inquiries on medical/clinical matters in South Africa:

• NICD Hotline at 0800 212 552 (for use by healthcare professionals only).

Inquiries on laboratory test results and related issues:

- National Institute for Communicable Diseases, Center for Emerging Zoonotic and Parasitic Diseases, Special Viral Pathogens Lab (Tel) +27 11 386 6376 or 38, jacquelinew@nicd.ac.za and naazneenm@nicd.ac.za
- The guidelines for submitting samples and requesting tests can be found on the NICD website at <u>www.nicd.ac.za</u> under the 'Diseases A-Z' category.