

Marburg Virus Disease Frequently Asked Questions

1. What is Marburg virus disease?

Marburg virus disease (MVD) formerly known as Marburg haemorrhagic fever, is caused by a filovirus named Marburg virus (MARV). This virus is similar to the Ebola virus and the disease can cause hemorrhaging, fever, and other symptoms also similar to Ebola virus disease (Ebola virus disease - NICD). MVD 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. Outbreaks of MVD have been few and only reported from Africa (see section 3).

2. Who is at risk for Marburg virus disease and where does it occur?

Human-to-human transmission of MARV is through direct contact with the blood and/or bodily fluids of infected persons. Therefore, healthcare workers, family members or friends in close contact with infected people, other close contacts of confirmed or suspected MVD cases, and persons who attended funerals of persons that are suspected or confirmed to have MVD, are at high risk. MVD is a zoonotic disease, the *Rousettus aegyptiacus* (Egyptian fruit) bats are natural hosts of the virus. These bats prefer habitation in caves and similar structures such as mines. In previous outbreaks, miners working in caves inhabited by these bats and visitors to these caves were affected.



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).



Figure 1. After initial detection, the timeline of MVD outbreaks (*laboratory-confirmed case only) (Russian case of 1990 from laboratory contamination not included.)

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

The incubation period for MARV varies between two and 21 days (this is the time following exposure until the first signs and symptoms of the disease develops). Early symptoms include conjunctivitis, pharyngitis, chest/abdominal pain, arthritis, malaise, myalgia, fatigue, nausea, anorexia, oral/throat lesions, persistent diarrhea, 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), and severe/fatal cases progress to a haemorrhagic state on days 5-8 of illness, including bleeding from needle puncture sites, mouth/gums, haematemesis, melaena, epistaxis, and the following neurological symptoms: Aggressive/altered behaviour, confusion, and somnolence (drowsy, tired). The average case-fatality rate of MVD during previous outbreaks has been 50%.

5. How is Marburg virus disease diagnosed?

A healthcare worker may suspect MVD in a patient presenting with compatible clinical signs and symptoms and with a history that indicates a risk for exposure. Specialized laboratory blood tests can be performed to either confirm or exclude the diagnosis of MVD. There is no test available to detect infection while a person is in the incubation period, 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 (See NMC lab-confirmed case definition). 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 most of the specialized investigations described here are conducted in containment laboratories such as laboratories at the National Institute for Communicable Diseases. In South Africa, the disease is classified as a Category 1 Notifiable Medical Condition (NMC), for prompt public health responses to follow once a case has been identified. Notification is required on clinical suspicion.

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6. How is Marburg virus disease treated?

Currently there are no registered 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 includes a MARV antigen (a non-disease-causing part of the virus that can stimulate a protective immune response), and therefore may potentially be used to protect against MVD. The issue is that low MVD numbers in outbreaks impede comprehensive vaccine trails.

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. Cases should be managed with due consideration for infection prevention and control, in order to limit unward spread of the infection.

7. How are Marburg virus disease outbreaks prevented?

When MVD is suspected, the patient will be isolated to prevent further spread of the infection. Individuals who may have had contact with an MVD case will be traced and monitored to ensure that any additional cases of MVD can be rapidly detected and measures put in place to limit further spread. Contact with individuals or remains suspected of having MVD should be avoided, and patients and burials should be handled by qualified healthcare staff and burial teams.

Although the Egyptian Rousette bats have been implicated as natural hosts, many features of the natural biology of the virus remain unclear. The mode of transmission from infected bats to humans is not determined. It is recommended that people should avoid or spend only the required amount of time in mines or caves where these bats roost, and avoid direct contact with these animals. Culling of bats or destructions of roosts of bats are not recommended and strongly discouraged, as bats play an important ecological role in nature including their role in pest control (eating of insects) and pollination.



8. Where can I find more information?

More facts about Marburg virus disease are available from:

 Marburg fact sheet <u>Marburg virus disease</u>, <u>Marburg Virus Disease</u> | <u>Marburg | CDC</u> (accessed on 21 Jan 2025)

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 Laboratory (Tel) +27 11 386 6376 or 38, jacquelinew@nicd.ac.za, naazneenm@nicd.ac.za and/or cezd@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.