



**NATIONAL INSTITUTE FOR  
COMMUNICABLE DISEASES**

Division in the National Health Laboratory Service

# **GUIDELINES FOR THE SPECIALIZED LABORATORY INVESTIGATION OF SUSPECTED EBOLA VIRUS DISEASE IN SOUTH AFRICA**

*Updated 30 Sept 2024*

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## 1. INTRODUCTION

Specific diagnostic tests for the Ebola Virus Disease (EVD) and other haemorrhagic fevers (VHF) are available from the Special Viral Pathogens Laboratory (SVPL), Centre for Emerging Zoonotic and Parasitic Diseases of the National Institute for Communicable Diseases, a Division of the National Health Laboratory Service. The Laboratory offers a full repertoire of specific testing for the laboratory investigation of EVD and other VHF. In order to investigate these cases securely and safely the Laboratory operates BSL3 plus and the only Biosafety Level 4 laboratory in Africa.

Ebola can be caused by different ebolavirus infections including Ebola virus (previously referred to as Zaire strain and causing Ebola virus disease, or EVD), Sudan virus (causing Sudan virus disease or SVD) and Bundibudyo virus (Bundibudyo virus disease, or BVD).

Marburg virus disease (MVD) is caused by the Marburg virus (MARV), which is a hemorrhagic fever virus from the *Filoviridae* family, which also includes the Ebola viruses. Although the Marburg virus is a single species, different lineages exist.

This document summarizes the procedure for submitting, types and interpretation of testing for EVD and other VHF. For further information, related to the specific VHFs or specific outbreak events, please refer to [www.nicd.ac.za](http://www.nicd.ac.za).

## 2. CASE DEFINITION

The case definition is updated based on current outbreak events. On 27 September 2024, Rwanda reported its first outbreak of MVD.

### The case definition for suspected MVD cases is –

Any person\* presenting with one or more of the following symptoms: an acute onset of fever ( $\geq 38^{\circ}\text{C}$ ), nausea, vomiting, diarrhoea, severe headache, muscle pain, abdominal pain, or unexplained haemorrhage;  
who has **visited or been resident in Rwanda**, in the **21 days prior to onset** of illness and **had direct contact** with or **cared for** suspected/confirmed MVD cases in the 21 days prior to onset of illness or has unexplained multisystem illness that is **malaria-negative**.

*\*Healthcare workers, family and other close contacts of confirmed or suspected MVD cases, persons that attended funerals of persons that was suspected or confirmed to have MVD, are at high risk*

### 2.1 Differential diagnosis

**Malaria** is the most likely cause of an acute febrile in returning travellers from most African countries and has to be prioritized for testing as a likely cause of disease in such patients.

Other common causes of febrile illness in returning travellers from African countries include **Dengue fever, Hepatitis A, tick bite fever and typhoid**. **Lassa fever** is an important cause of haemorrhagic fever in the West African region in mainly rural areas where there is potential exposure to rodent urine.

Specialized testing for EVD (and other VHF) is not warranted for patients without a compatible clinical picture and history or risk of possible exposure, even in the event of a history of travel to an affected Ebola area. The tests cannot be used to determine if the patient has been exposed to the virus and may develop the disease later. The tests are not indicated for healthy returning travellers.

### 3. PROCEDURE FOR SUBMISSION OF SPECIMENS FOR INVESTIGATIONS

#### STEP 1: REPORT THE SUSPECTED CASE TO THE NICD TO ALLOW A RISK ASSESSMENT TO BE CARRIED OUT AND GUIDE LABORATORY TESTING

Contact the NICD Hotline ☎ +27800 212 552

#### STEP 2: NOTIFY SUSPECTED CASE (VHF IS CATEGORY I NOTIFIABLE MEDICAL CONDITION),

See <https://www.nicd.ac.za/nmc-overview/overview/>

#### STEP 3: SUBMIT SPECIMENS FOR SPECIALIZED LABORATORY INVESTIGATION

- Complete and co-submit case investigation form (see [www.nicd.ac.za](http://www.nicd.ac.za), follow links to specific disease pages)
- Submit both a clotted blood (red or yellow top tube) and EDTA treated tube (purple top tube) per patient
- The specimens should be packaged in accordance with the guidelines for the transport of dangerous biological goods (triple packaging using absorbent material) and transported directly and urgently to:

**Centre for Emerging Zoonotic and Parasitic Diseases  
Special Viral Pathogens Laboratory  
National Institute for Communicable Diseases (NICD)  
National Health Laboratory Service (NHLS)  
No. 1 Modderfontein Rd  
Sandringham, 2131**

- See section 4 for transport requirements and complete Appendix 1 ((if couriered via air-transport on a flight to Johannesburg)
- Ensure the that completed case investigation form accompanies the specimens
- Samples should be kept cold during transport (cold packs are sufficient).

#### 4. PACKAGING OF SPECIMENS FOR TRANSFER TO NICD

The principle of triple layer packaging should be followed (see below).

UN/WHO approved shipping containers for hazardous specimens are commercially available, e.g. SAF-T-PAK® ([www.saftpak.com](http://www.saftpak.com)) or PATHOPAK® ([www.intelsius.com](http://www.intelsius.com)) (Figure 1 and 2). These are only examples.

**It is required that designated staff members per site are trained by approved provider in the packaging and transport of dangerous goods (see Appendix 1).** The IATA of WHO websites may be consulted for international regulations and guidelines in this regard.

**Primary specimen containers** such as blood tubes (properly labeled) should be wrapped in sufficient absorbent material (paper towels or tissues) to absorb the entire contents in the event of leakage.

The wrapped primary containers must be placed in durable, leak-proof **secondary containers** such as several layers of sealed plastic bags or, preferably, rigid screw-cap metal, plastic or similar containers (suitable containers are usually available from hospital dispensaries). The secondary container should be taped closed to prevent leakage.

The secondary containers and data forms, sealed separately in plastic, must then be placed in a **rigid outer (tertiary) container** such as a fibre carton or polystyrene cold box with cold packs. Specimens, particularly whole blood, should not be frozen.

The outer wrapping should be addressed to:

**The Centre for Emerging Zoonotic and Parasitic Diseases, Special Viral Pathogens Laboratory, National Institute for Communicable Diseases, 1 Modderfontein Road, Sandringham, South Africa.**

**Contact telephone numbers: 011 386 6376 or 6339, 082 903 9131**

The parcel should bear appropriate outer warning that it contains biohazardous material.

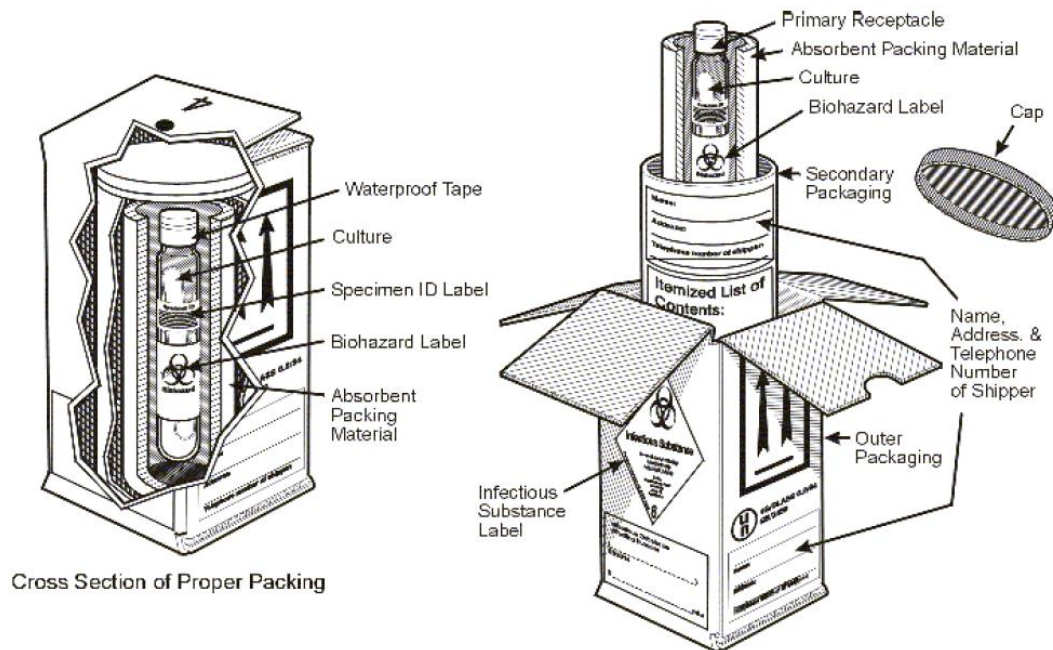
If transported by air, IATA regulations must be followed and appropriate labeling applied (refer to [www.iata.org](http://www.iata.org)). In addition to completing an ordinary air waybill for parcels sent by air, it is necessary to complete a shipper's declaration for dangerous goods (refer to [www.iata.org](http://www.iata.org) or your courier company).

#### Useful links:

**International Air Transport Association.** Dangerous Goods Regulations.  
<http://www.iata.org/publications/dgr/Pages/index.aspx>, (accessed 18 February 2021).

**World Health Organization.** Guidance on the regulations for the transportation of dangerous goods, 2019-2020. WHO/HSE/GCR/2015.2, Geneva, Switzerland.  
<https://apps.who.int/iris/bitstream/handle/10665/325884/WHO-WHE-CPI-2019.20-eng.pdf?ua=1>  
(accessed 18 February 2021)

National Road Traffic Act 93 of 1996, dangerous goods regulations.  
<https://dgrcompliance.co.za/national-road-traffic-act-93-of-1996/> (accessed 18 February 2021)



**Figure 1: Diagram displaying category A, triple layer packaging.**



**Figure 2: Commercially available category A packaging that will be available to NHLS Laboratories (Courtesy of World Couriers)**

#### **4.1 Transport of specimens to NICD**

##### **4.1.1 Private pathology laboratories:**

As per internal institutional arrangement

##### **4.1.2 National Health Laboratory Service (NHLS):**

Follow protocol as per GPS00059 (available on QPulse)

Specimens are delivered to the NICD Specimen Reception Office during office hours. For after - hour deliveries the specimens are deposited in a designated facility at the NICD Specimen Reception Office as directed by security staff at the main gate of the NICD Campus (location: - 26.13164715474383, 28.11757639766443). It is recommended that the laboratory is forewarned of such deliveries by calling 011 386 6338 or 082 903 9131.

## 5. SPECIFIC LABORATORY TESTS FOR VHF AVAILABLE AT THE NICD

The NICD offers a full repertoire of laboratory testing for VHF of public health importance in South Africa. Test requests need only specify for example “Ebola” or “VHF investigation”. The NICD will consult with the referring physician to determine most appropriate line of testing for each case.

Table 1: Summary of laboratory tests available at the NICD for VHF

Available tests	Turn-around time
Serology: fluorescent antibody test, IgG and IgM	24-48 hrs
Serology: ELISA, IgG and IgM	3-5 days
PCR (real time PCR assay or GeneXpert®*)	24-48 hrs

\*Only for EVD (or Ebola “Zaire”)



### **Declaration of Compliance for 6.2 Infectious Substances**

I hereby declare that this shipment of 6.2 Infectious Substances has been packed in compliance with IATA Packing Instruction 620 and consists of triple layer packaging which includes 1) primary leak-proof receptacle 2) secondary leak-proof rigid packaging and 3) rigid outer packaging.

I further declare that I am properly trained and certified to prepare a shipment of 6.2 infectious substances for air transport.

\_\_\_\_\_  
Shipper's Signature

\_\_\_\_\_  
Date

World Courier House Waybill Number \_\_\_\_\_





## APPENDIX 2

### USEFUL CONTACT NUMBERS

REQUIREMENT	CONTACT NUMBER	CONTACT PERSON/S
Reporting of suspected case	0800 212 552	NICD Pathologist on call
Clinical advice regarding suspected cases	0800 212 552	NICD Pathologist on call
Queries regarding laboratory testing	011 386 6339/6376 011 386 6338 <a href="mailto:jacquelinew@nicd.ac.za">jacquelinew@nicd.ac.za</a>	Dr Jacqueline Weyer
Queries regarding laboratory results	011 386 6339/6376 011 386 6338 <a href="mailto:jacquelinew@nicd.ac.za">jacquelinew@nicd.ac.za</a> <a href="mailto:naazneenm@nicd.ac.za">naazneenm@nicd.ac.za</a> <a href="mailto:cezd@nicd.ac.za">cezd@nicd.ac.za</a>	Dr Jacqueline Weyer Dr Naazneen Moolla
NHLS National Logistics Manager	<a href="mailto:Maropeng.lesibe@nhls.ac.za">Maropeng.lesibe@nhls.ac.za</a>	Mr Maropeng Lesibe