

# EBOLA VIRUS DISEASE: AWARENESS AND PRECAUTIONS FOR PEACEKEEPING PERSONNEL



PRODUCED IN COLLABORATION WITH  
The World Health Organization (WHO)



Peace Operations Training Institute®



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Cover: UN Photo #599548 by Andrey Tsarkov. *Peacekeeping Chief Visits Liberia, Assesses Ebola Outbreak*: A peacekeeper with the United Nations Mission in Liberia (UNMIL) wears a protective mask while on duty at UN offices in the capital city of Monrovia. Next to her is a hand-washing station to be used prior to entering the building.

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# EBOLA VIRUS DISEASE: AWARENESS AND PRECAUTIONS FOR PEACEKEEPING PERSONNEL

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# Foreword

Below is an excerpt from United Nations Secretary-General Ban Ki-moon's remarks to the Security Council on 18 September 2014 regarding the 2014 Ebola virus disease outbreak.<sup>1</sup>

*Excellencies,*

*The leaders of the affected countries have asked the United Nations to coordinate the global response . We are committed to do what is needed, with the speed and scale required.*

*Under the leadership of Dr. Margaret Chan, the World Health Organization is working to identify the best epidemiological ways to address the outbreak.*

*I have activated, for the first time, the system-wide organizational crisis response mechanism. Under the leadership of Anthony Banbury, an Ebola Response Centre is operational.*

*With the support of the Government of Ghana and UNMIL, the UN peacekeeping mission in Liberia, an air-bridge has been established in Accra to facilitate the influx of key health responders and equipment. The UN Humanitarian Air Service is operating between the countries.*

*UNMIL is adapting its tasks to the current context, and the Under-Secretary-General for Peacekeeping Operations, Hervé Ladsous, visited Monrovia last week to assure Liberia's leaders of the mission's support.*

*In addition to the many local and international workers already on the ground, WHO, UNDP, UNICEF, WFP and others are actively delivering emergency assistance. The UN Volunteers programme has identified more than 200 healthcare professionals and other experts willing to be trained and deployed.*

*Despite these wide-ranging efforts, the spread of the disease is outpacing the response. No single government can manage the crisis on its own. The United Nations cannot do it alone.*

*This unprecedented situation requires unprecedented steps to save lives and safeguard peace security. Therefore, I have decided to establish a UN emergency health mission, combining the World Health Organization's strategic perspective with a very strong logistics and operational capability.*

*This international mission, to be known as the United Nations Mission for Ebola Emergency Response, or UNMEER, will have five priorities: stopping the outbreak, treating the infected, ensuring essential services, preserving stability and preventing further outbreaks.*

*Under the leadership of a Special Representative of the Secretary-General, the Mission will bring together the full range of UN actors and expertise in support of national efforts. It will draw on the capacities of many international partners, and work in close coordination with regional organizations such as the African Union and the Economic Community of West African States (ECOWAS). And it will strive to ensure that these wide-ranging efforts avoid duplication, fill gaps and are aligned with the overall strategy...*

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<sup>1</sup> Remarks to the Security Council on Ebola, UN News Centre, <[http://www.un.org/apps/news/infocus/speeches/statments\\_full.asp?statID=2347#.VFp2APnF-cl](http://www.un.org/apps/news/infocus/speeches/statments_full.asp?statID=2347#.VFp2APnF-cl)>, accessed 4 November, 2014.

## Method of Study

The following are suggestions for how to proceed with this course. Though the student may have alternate approaches that are effective, the following hints have worked for many.

- Before you begin actual studies, first browse through the overall course material. Notice the lesson outlines, which give you an idea of what will be involved as you proceed.
- The material should be logical and straightforward. Instead of memorizing individual details, strive to understand concepts and overall perspectives.
- Set up guidelines regarding how you want to schedule your time.
- Study the lesson content and the learning objectives. At the beginning of each lesson, orient yourself to the main points. If you are able to, read the material twice to ensure maximum understanding and retention, and let time elapse between readings.
- When you finish a lesson, take the End-of-Lesson Quiz. For any error, go back to the lesson section and re-read it. Before you go on, be aware of the discrepancy in your understanding that led to the error.
- After you complete all of the lessons, take time to review the main points of each lesson. Then, while the material is fresh in your mind, take the End-of-Course Examination in one sitting.
- Your exam will be scored, and if you achieve a passing grade of 75 per cent or higher, you will be awarded a Certificate of Completion. If you score below 75 per cent, you will be given one opportunity to take a second version of the End-of-Course Examination.

### Key features of your course classroom:

- Access to all of your courses;
- A secure testing environment in which to complete your training;
- Access to additional training resources, including multimedia course supplements;
- The ability to download your Certificate of Completion for any completed course; and
- Student fora where you can communicate with other students about any number of subjects.

### Access your course classroom here:

<[http://www.peaceopstraining.org/users/user\\_login](http://www.peaceopstraining.org/users/user_login)>



# NOTE TO STUDENTS

This course is intended as a general introductory primer to Ebola awareness and prevention for peacekeepers who are *not* working in a medical or public health capacity.

This course is not fully exhaustive. It does not replace face-to-face interaction, which would provide an opportunity to answer individual concerns and queries. Those who are carrying out specialized tasks, such as working in direct contact with infected individuals, need additional hands-on training.

Every effort and care have been made to provide up-to-date information based on the WHO website (<<http://www.who.int/csr/disease/ebola/en/>>). As this is a fast-changing epidemic, users are strongly advised to consult the published guidelines on the WHO website. This course will be updated as necessary.

Information in this course is not meant to supercede or replace United Nations Ebola Virus Contingency plans for each mission.

***If you are working directly with Ebola patients, visiting health care facilities, working with burial teams, or performing any other work involving exposure to Ebola patients, you need to receive specialized training, which is not covered in this course.<sup>1</sup>***

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1 Reproduced, with permission of the publisher, from PROTECT-Basic Occupational Health and Safety Pre-deployment training. Geneva, World Health Organization, 2014 (Version 1.1; <<https://extranet.who.int/ihr/training/course/view.php?id=95>>, accessed 1 November 2014).





LESSON 1  
OUTBREAKS, TRANSMISSION,  
AND SYMPTOMS

# LESSON 1



WHO/Marie-Agnès Heine

## LESSON OBJECTIVES

By the end of Lesson 1, the student should be able to meet the following objectives:

- 1.1 General Information on the Ebola Virus
- 1.2 Modes of Transmission
- 1.3 Who is Most at Risk?
- 1.4 Clinical Symptoms
- 1.5 Diagnosis

- Have an increased understanding of the 2014 Ebola Virus Disease (EVD) outbreak;
- Learn how EVD spreads and who is most at risk of infection;
- Recognize the clinical symptoms and diagnosis of EVD.



*WATCH 'Ebola outbreak response and needs' by Dr Nestor Ndayimirije (<[http://youtu.be/vdPh8Huv\\_fo?list=PL9S6xGsoqIBU5u1OIs2eduxnxxGKudkcv](http://youtu.be/vdPh8Huv_fo?list=PL9S6xGsoqIBU5u1OIs2eduxnxxGKudkcv)>)  
Dr Nestor NDAYIMIRIJE, WHO Representative in Liberia, speaks about the Ebola outbreak here and in neighbouring countries, and WHO's effort to support the response. Photographs taken in July 2014 in this area illustrate his statement (Photo credits: WHO and Liberia's Ministry of Health and Social Welfare).*

## Introduction

The Ebola outbreak currently ravaging parts of West Africa is the most severe acute public health emergency in modern times. Never before in recent history has a Biosafety Level 4 pathogen infected so many people so quickly, over such a wide geographical area, for so long.<sup>1</sup> An awareness of the disease and proper precautionary measures are necessary to protect mission staff from the illness.

### 1.1 General Information on the Ebola Virus

The Ebola virus causes an acute, serious illness which is often fatal if untreated. Ebola virus disease (EVD) first appeared in 1976 in two simultaneous outbreaks, one in Nzara, Sudan, and the other in Yambuku, Democratic Republic of Congo. The latter occurred in a village near the Ebola River, from which the disease takes its name.

#### Current Outbreak

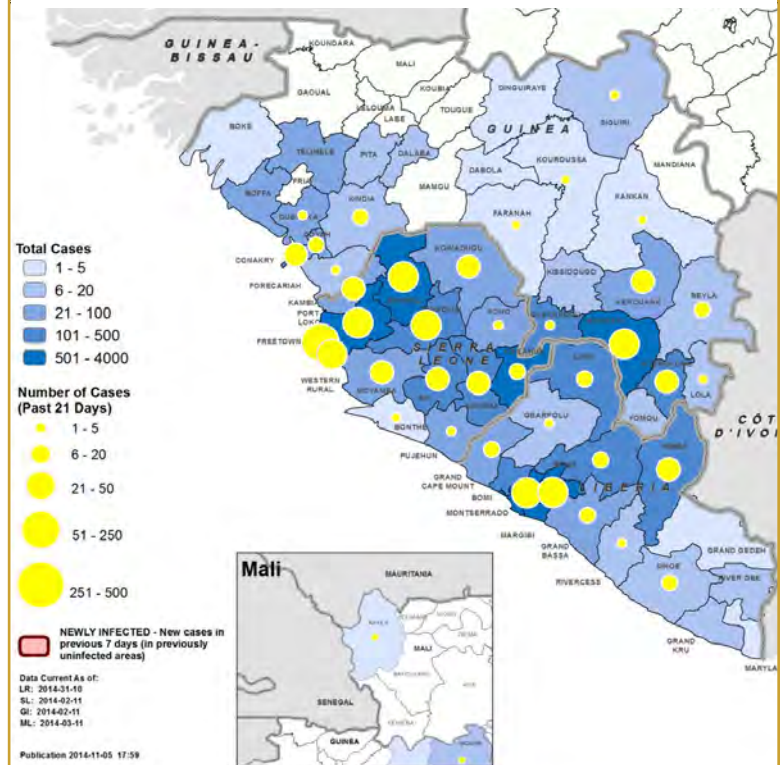
The current outbreak in West Africa, (first cases notified in March 2014), is the largest and most complex Ebola outbreak since the Ebola virus was first discovered in 1976. There have been more cases and deaths in this outbreak than all others combined.<sup>2</sup>

A total of 13,015 confirmed, probable, and suspected cases of EVD and 4,808 deaths were reported up to the end of 2 November 2014 by the Ministries of Health of Guinea and Sierra Leone, and 31 October by the Ministry of Health of Liberia. All districts in Liberia and Sierra Leone have now reported at least one case of EVD since the start of the outbreak (figure 1). Of the eight Guinean and Liberian districts that share a border with

1 Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Experimental Ebola vaccines; <<http://www.who.int/mediacentre/news/ebola/01-october-2014/en/index1.html>>, accessed 30 October 2014).

2 Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).

Figure 1: Geographical distribution of new cases and total cases in Guinea, Liberia, Mali, and Sierra Leone



Map caption: Data are based on official information reported by Ministries of Health. The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement. Reproduced, with permission of the publisher, from Global Alert and Response, Geneva, World Health Organization, 2014 (Situation report-05 November 2014; <<http://www.who.int/csr/disease/ebola/situation-reports/en/>>, accessed 5 November 2014).

Côte d'Ivoire, only one in Guinea is yet to report a confirmed or probable case of EVD.

A total of 546 health care workers (HCWs) were known to have been infected with EVD up to the end of 2 November: 88 in Guinea; 315 in Liberia; 11 in Nigeria; 128 in Sierra Leone; one in Spain; and three in the United States of America (two were infected in the USA and one in Guinea). A total of 310 HCWs have died.<sup>3</sup>

3 Reproduced, with permission of the publisher, from Global Alert and Response, Geneva, World Health Organization, 2014 (Situation report-31 October 2014; <<http://www.who.int/csr/disease/ebola/situation-reports/en/>>, accessed 1 November 2014).

## 1.2 Modes of Transmission

It is thought that fruit bats of the Pteropodidae family are natural Ebola virus hosts. Ebola is introduced into the human population through close contact with the blood, secretions, organs, or other bodily fluids of infected animals such as chimpanzees, gorillas, fruit bats, monkeys, forest antelope, and porcupines found ill or dead or in the rainforest.

The virus family Filoviridae includes three genera: Cuevavirus, Marburgvirus, and Ebola virus. There are five species that have been identified: Zaire, Bundibugyo, Sudan, Reston and Tai Forest. The first three, Bundibugyo ebolavirus, Zaire ebolavirus, and Sudan ebolavirus have been associated with large outbreaks in Africa. The virus causing the 2014 West African outbreak belongs to the Zaire species.<sup>4</sup>

Ebola then spreads through human-to-human transmission via direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and with surfaces and materials (e.g. bedding, clothing) contaminated with these fluids.<sup>5</sup>

**#Ebola enters your body through your mouth, nose and eyes, or a break in the skin**



<sup>4</sup> Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).

<sup>5</sup> Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).

## How is Ebola spread?

### EVD is spread through:

- **Direct contact with body fluids (stool, vomit, blood, urine, saliva, semen, breast milk) of a sick person with EVD.**
- **Direct contact with the deceased person's body or discharge (funeral or burial preparation or ceremonies) plays a role in the transmission of Ebola.**
- **By contact with surfaces or equipment contaminated by body fluids of a sick person with EVD.<sup>6</sup>**

### How Ebola is not transmitted:

- **EVD is NOT spread through casual interactions with other people (Meetings, dining rooms, sitting together in a car, etc).**

#### Note:

**The risk of infection with Ebola virus is minimal if you have not been in close contact with the body fluids of someone sick with EVD or recently deceased from EVD.**

**It is better to maintain "some" distance with others because we may not always know who has a fever or not.<sup>7</sup>**

<sup>6</sup> Reproduced, with permission of the publisher, from PROTECT-Basic Occupational Health and Safety Pre-deployment training. Geneva, World Health Organization, 2014 (Version 1.1; <<https://extranet.who.int/ihr/training/course/view.php?id=95>>, accessed 1 November 2014). Topic 1: Ebola Virus Disease, Slide 5.

<sup>7</sup> Ibid.

## EVD is not an airborne virus

Ebola virus disease is not an airborne infection. Airborne spread among humans implies inhalation of an infectious dose of virus from a suspended cloud of small dried droplets.

This mode of transmission has not been observed during extensive studies of the Ebola virus over several decades.

Common sense and observation tell us that spread of the virus via coughing or sneezing is rare, if it happens at all. Epidemiological data emerging from the outbreak are not consistent with the pattern of spread seen with airborne viruses, like those that cause measles and chickenpox, or the airborne bacterium that causes tuberculosis.

Theoretically, wet and bigger droplets from a heavily infected individual, who has respiratory symptoms caused by other conditions or who vomits violently, could transmit the virus – over a short distance – to another nearby person.

This could happen when virus-laden heavy droplets are directly propelled by coughing or sneezing (**which does not mean airborne transmission**) onto the mucus membranes or skin with cuts or abrasions of another person.

WHO is not aware of any studies that actually document airborne transmission of EVD. On the contrary, good quality studies from previous Ebola outbreaks show that all cases were infected by direct close contact with symptomatic patients.<sup>8</sup>

8 Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (What we know about transmission of the Ebola virus among humans; <<http://www.who.int/mediacentre/news/ebola/06-october-2014/en/>>, accessed 30 October 2014).

## Safe or not safe?<sup>9</sup>

### SAFE

- Drinking from clean cup in hotel: Yes, it is safe to use clean utensils as Ebola virus is easily killed with soap and water.
- Sleeping in clean hotel sheets: Yes, Ebola virus is killed in the laundry.
- Eating: Yes, Ebola virus is destroyed by heat. Eat only hot, freshly prepared food.

### THINK AGAIN

- Sitting in a Taxi: If it is absolutely necessary to use public means of transportation, try not to share a vehicle with strangers. Make sure the car is visibly clean without blood and vomit.
- Sitting in office where someone is hiding their fever: Remember that only direct contact with body fluids will expose others to the virus.
- Smoking a cigarette: Careful! Are your hands clean as you take out the cigarette and put it in your mouth?

### NOT SAFE

- Cleaning up vomit: No, this is not safe. Vomit is a highly contagious body fluid for Ebola virus. Only people wearing appropriate personal protective equipment and using correct disinfectants should clean up highly contagious body fluids like blood, vomit, and diarrhoea.
- Putting a pen in your mouth: No, this is not safe. You do not know who has touched that pen. If there is anyone else's body fluids on it, you can get exposed. Not only is Ebola virus an issue, but other germs that can give diarrhoea can be spread like this.

9 Reproduced, with permission of the publisher, from PROTECT-Basic Occupational Health and Safety Pre-deployment training. Geneva, World Health Organization, 2014 (Version 1.1; <<https://extranet.who.int/ihr/training/course/view.php?id=95>>, accessed 1 November 2014). Topic 1: Ebola Virus Disease, Slide 6.

You cannot get  
#Ebola  
by talking  
to people,  
walking in the street  
or shopping  
in the market



## Section 1.3 Who is Most at Risk?

During an outbreak, those at higher risk of infection are:

- Health workers;
- Family members or others in close contact with infected people; and
- Mourners who have direct contact with the bodies of the deceased as part of burial ceremonies.

Health care workers have frequently been infected while treating patients with suspected or confirmed EVD. This has occurred through close contact with patients when infection control precautions are not strictly practiced.<sup>10</sup>

Burial ceremonies in which mourners have direct contact with the body of the deceased person can also play a role in the transmission of Ebola. Persons who have died of Ebola must be handled using strong protective clothing and gloves and must be buried immediately. WHO advises that the deceased be handled and buried by trained case management professionals, who are equipped to properly bury the dead.



*Mobile laboratory in Guekedou, where laboratory personnel inactivates Ebola virus to analyse the samples. (WHO/Stéphane Saporito)*

People are infectious as long as their blood and secretions contain the virus. For this reason, infected patients receive close monitoring from medical professionals and receive laboratory tests to ensure the virus is no longer circulating in their systems before they return home. When the medical professionals determine it is okay for the patient to return home, they are no longer infectious and cannot infect anyone else in their communities. Men who have recovered from the illness can still spread the virus to their partner through their semen for up to seven weeks after recovery. For this reason, it is important for men to avoid sexual intercourse for at least seven weeks after recovery or to wear condoms if having sexual intercourse during seven weeks after recovery.<sup>11</sup>

More research is needed to understand if some groups, such as immuno-compromised people or those with other underlying health conditions, are more susceptible than others to contracting the virus.

Exposure to the virus can be controlled through the use of protective measures in clinics and hospitals, at community gatherings, or at home.<sup>12</sup>

<sup>11</sup> Reproduced, with permission of the publisher, from Global Alert and Response, Geneva, World Health Organization, 2014 (Frequently asked questions on Ebola virus disease; <<http://www.who.int/csr/disease/ebola/faq-ebola/en>>, accessed 30 October 2014).

<sup>12</sup> Reproduced, with permission of the publisher, from

**#Ebola is very infectious even after death. Pay respect from at least 1 metre away, without touching**



**The body of a person who has died from #Ebola should only be handled by trained staff**



<sup>10</sup> Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).



## Section 1.4 Clinical Symptoms

The incubation period, that is, the time interval from infection with the virus to onset of symptoms is 2 to 21 days. Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever, fatigue, muscle pain, headache, and sore throat. This is followed by vomiting, diarrhoea, rash, symptoms of impaired kidney and liver function, and in some cases, both internal and external bleeding (e.g. oozing from the gums, blood in the stools). Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes.<sup>13</sup>

- **Incubation period: 2 – 21 days**
- **Symptoms start with feverish syndrome: often characterized by the sudden onset of fever, intense weakness, muscle pain, headache, and sore throat**
- **EVD can look like many other febrile illnesses e.g. malaria.**
- **First symptoms are followed by vomiting, diarrhoea, rash, impaired kidney and liver function, and in some cases, both internal and external bleeding.<sup>14</sup>**

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Global Alert and Response, Geneva, World Health Organization, 2014 (Frequently asked questions on Ebola virus disease; <<http://www.who.int/csr/disease/ebola/faq-ebola/en>>, accessed 30 October 2014).

13 Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).

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## Section 1.5 Diagnosis

It can be difficult to distinguish EVD from other infectious diseases such as malaria, typhoid fever, and meningitis.<sup>15</sup>

- Diseases that should be ruled out include: malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, relapsing fever, meningitis, hepatitis, and other viral haemorrhagic fevers.
- The role of patient history and knowledge of exposure to areas/villages with ongoing outbreak and/or contact with confirmed cases is essential to diagnosis.

**#Ebola causes sudden high fever, extreme tiredness, headache, body pain, loss of appetite**



### The role of doing laboratory tests in diagnosis

Detection of viral RNA or viral antigens in blood are the recommended tests for early detection of Ebola virus.<sup>16</sup> One can only expect the specific Ebola Virus blood test to be positive once there are symptoms like fever.

- It takes 2-21 days for the virus to replicate and fever to develop. There is no point of asking a technician to do an Ebola test “just to check if you have been exposed.”
- If you have no symptoms, the test will be negative.
- Reserve the laboratory test for those who are truly infected and those who are symptomatic.<sup>17</sup>

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15 Reproduced, with permission of the publisher, from Media centre, Geneva, World Health Organization, 2014 (Ebola virus disease Fact Sheet No. 103; <<http://www.who.int/mediacentre/factsheets/fs103/en/>>, accessed 30 October 2014).

16 Ibid.

17 Reproduced, with permission of the publisher, from PROTECT-Basic Occupational Health and Safety Pre-deployment training. Geneva, World Health Organization, 2014 (Version 1.1; <<https://extranet.who.int/ihr/training/course/view.php?id=95>>, accessed 1 November 2014). Topic 1: Ebola Virus Disease, Slide 11.

## End-of-Lesson Quiz

- 1. Ebola virus disease (EVD) first appeared in:**
  - A. 1945.
  - B. 1976.
  - C. 1999.
  - D. 2014.
- 2. Ebola spreads through human-to-human transmission via:**
  - A. Indirect contact.
  - B. Direct contact.
  - C. Oxygen.
  - D. Casual interactions.
- 3. Individuals become contagious with EVD:**
  - A. When symptoms appear.
  - B. When they first become infected.
  - C. When they exhibit no symptoms.
  - D. 22 days after being exposed to an Ebola patient.
- 4. It is thought that \_\_\_\_\_ are natural Ebola virus hosts.**
  - A. insects of the Cleridae family
  - B. dogs
  - C. cats
  - D. fruit bats of the Pteropodidae family
- 5. The incubation period for EVD is:**
  - A. 1 day.
  - B. 1-50 days.
  - C. 2-21 days.
  - D. 3-5 weeks.
- 6. It can be difficult to distinguish EVD from other infectious diseases such as:**
  - A. Malaria, typhoid fever and meningitis.
  - B. HIV/AIDS.
  - C. SARS.
  - D. Hookworm and ringworm.
- 7. EVD is not generally spread through:**
  - A. Cleaning up the body fluids of an infected individual.
  - B. Direct contact with an infected individual.
  - C. Casual contact with an infected individual.
  - D. Direct contact with a deceased body of someone who had EVD.
- 8. Burial ceremonies in which mourners have direct contact with the body of the deceased person:**
  - A. Can also play a role in the transmission of Ebola.
  - B. Have no role in the transmission of Ebola.
  - C. Never have a role in the transmission of any infectious disease.
  - D. Are very rare occurrences.

### ANSWER KEY

1B, 2B, 3A, 4D, 5C, 6A, 7C, 8A

