SUMMARY

The Ebola virus disease (EVD) outbreak in Guinea was first reported in a World Health Organization communiqué on 23 March 2014. Available evidence suggests that the outbreak began in Guinea’s Guéckédou Prefecture during December 2013, with subsequent spread to other prefectures in Guinea (including the capital Conakry), as well as neighbouring Liberia.

In Guinea, as of 12 May 2014, a cumulative total of 248 cases of EVD, including 171 deaths (case fatality rate 69%) were reported from five districts and the capital Conakry.

Liberia has reported a total of 12 EVD cases (including 11 deaths). No new clinical cases of EVD have been reported in Liberia since 06 April 2014.

Suspected cases were reported in Mali and Sierra Leone, but have all tested negative for EVD to date.

CURRENT OUTBREAK IN GUINEA AND LIBERIA

The terminology Ebola haemorrhagic fever was replaced by Ebola virus disease (EVD) in line with the International Classification of Diseases (ICD-10). This is the first recorded outbreak of EVD in these Western African countries, where Lassa fever is commonly reported. Epidemiologic analysis suggests that the first case of the outbreak was a 2-year-old child in Guéckédou Prefecture who died on 06 December 2013. An infected healthcare worker is thought to have triggered spread of EVD to three other provinces. A businessman who travelled from central Guinea to the capital city Conakry and died there a day later triggered spread of EVD in Conakry. In Liberia, EVD first appeared in the northern town of Foya on the Guinean border when a woman travelled from Guinea to visit family in the town, and infected her sister.

Zaire ebolavirus is responsible for the current outbreak, and full-length genome sequencing and phylogenetic analysis has shown it to belong to a separate clade from the known Zaire ebolavirus strains from DRC and Gabon. This suggests that the ebolavirus strain from Guinea was not introduced from DRC or Gabon, but rather that the strain has evolved in parallel and may have been circulating in the West African region for some time. Zaire ebolavirus is typically highly lethal, with CFR of up to 90% reported in previous outbreaks.

As this is a rapidly changing situation, the number of reported cases and deaths and their geographic location are apt to change daily due to consolidation of case, contact and laboratory data, enhanced surveillance and contact tracing activities, and ongoing laboratory investigations. A summary of case numbers to date is shown in the Table, and geographic location of affected countries is shown in Figure 1.
Guinea

According to the World Health Organization (WHO), as of 12th May 2014, the cumulative total of 248 clinical cases including 171 deaths (CFR 68.9%) has been reported. A total of 133 cases (including 83 deaths) have been laboratory confirmed by PCR as EVD.

The median age of all clinical cases is 35 years (range 25-47 years). The female to male ratio remains unchanged at 1.2 : 1. The age breakdown is as follows: 0-9 years (11%), 20-59 years (72%) and ≥60 years (11%).

Liberia

Following the reclassification of suspected cases, a total of 12 clinical EVD cases (including 11 deaths) have been reported. Six of these cases have been laboratory-confirmed. No new clinical cases have been reported since 06 April 2014.

Mali

To date, no laboratory-confirmed EVD cases have been identified in Mali. No new suspected cases have been reported.

Sierra Leone

To date, no cases of EVD have been confirmed in Sierra Leone. No new suspected cases have been reported.

Ebola virus disease: the basics

The ecology of the Ebola virus is not completely understood. The current prevailing hypothesis is shown in Figure 2: the virus is introduced into the human population through close contact with infected animals (including chimpanzees, gorillas, bats, monkeys, forest antelope and porcupines). The likely reservoir of the virus includes specific species of arboreal bats, and contact with these animals and/or their excretions/secretions may also result in transmission of the virus to humans. Human-to-human transmission often occurs, and is a predominant feature of outbreaks. The disease can be spread from person to person through contact with blood, secretions, organs, or other body fluids. EVD outbreaks have been reported most commonly from the Democratic Republic of Congo, Uganda, South Sudan, Congo and Gabon.

The incubation period of the disease is 2 - 21 days. An acute onset of prodromal symptoms which include fever, malaise, myalgia, diarrhoea, vomiting and abdominal pain is usual, followed by progressive multisystem disease with bleeding as a cardinal feature in the majority of patients. Currently, there is no known specific treatment or preventative vaccine for this highly contagious virus.

Risk of imported Ebola virus disease cases to South Africa

The risk of infection for travellers is very low since most human infections result from direct contact with the body fluids or secretions of infected patients, particularly in hospitals (nosocomial transmission) and as a result of unsafe procedures, use of
contaminated medical devices (including needles and syringes) and unprotected exposure to contaminated body fluids.

Since the current outbreak is reported in countries and areas which are not frequented by many tourists or travellers, the risk of EVD cases being imported into South Africa is low. However, healthcare or international agency workers etc. involved in the outbreak response may travel to and present in South Africa for medical care, and a high index of suspicion is important for such cases. A detailed history regarding travel and level of contact with suspected/confirmed EVD cases is extremely important.

**Recommendations for travel to/from Guinea, Liberia, Sierra Leone, Mali and West Africa**

The World Health Organization (WHO) does not recommend that any travel or trade restrictions be applied to Guinea, Liberia, Sierra Leone or Mali. There are no special precautions or directives for commercial flights, passengers or crew departing on flights bound for or returning to Guinea, Liberia, Sierra Leone or Mali. The regulations for evidence of a valid yellow fever vaccination certificate apply.

Any ill persons reported on flights from Guinea, Liberia, Sierra Leone or Mali and neighbouring countries will need to be evaluated by the relevant Port Health officials. All requests for medical evacuation of persons from Guinea, Liberia, Sierra Leone or Mali with febrile illness or suspected infectious disease will need careful evaluation by the Port Health officials.

While the risk of introduction of Ebola virus into South Africa is considered low, we strongly recommend that surveillance for viral haemorrhagic fevers (and at present, particularly EVD), be strengthened. This should be done primarily through Port Health services, but it is also extremely important that public and private practitioners are on the alert for any ill persons that have travelled to viral haemorrhagic fever risk areas. There needs to be a high index of suspicion for EVD in health workers from the affected region with unexplained fever.

**Evaluation of illness in travellers from Guinea, Liberia, Sierra Leone, Mali and West Africa**

It is critical to maintain a very high index of suspicion for common causes of febrile illness in persons who have travelled to Guinea, Liberia, Sierra Leone, Mali and surrounding countries, including: malaria, dengue fever, Lassa fever and other endemic diseases (e.g. typhoid fever). These may be severe and life-threatening, and healthcare workers are urged to do appropriate tests and institute appropriate therapy as a matter of urgency. Malaria is the most likely cause of an acute febrile illness in returning travellers from most African countries and has to be prioritised for testing. However, Lassa fever is endemic in certain West African countries, including Nigeria, Sierra Leone, Guinea and Liberia - and needs to be considered in the differential diagnosis for any traveller from these countries who has unexplained febrile illness and has visited rural areas.

Lassa fever virus is transmitted to humans through direct contact with urine and droppings of infected multi-mammate rats, which contaminate the environment and food items. Transmission can also occur through the inhalation of aerosolised
infected rodent excreta. Person-to-person transmission is also important, being common in both village and healthcare settings, and occurs through direct contact with blood, tissue, secretions or excretions of an infected person; therefore, VHF isolation precautions are recommended for nursing patients with Lassa fever. The incubation period is 1-3 weeks; symptoms include fever, retrosternal pain, sore throat, back pain, cough, abdominal pain, vomiting, diarrhoea, facial swelling and mucosal bleeding. Mortality rates approach 20%, with pregnant women in their third trimester being at highest risk for severe disease and death. Given that the incubation periods and clinical presentations of Lassa fever and EVD may overlap, both diseases must be excluded in persons who have a suggestive travel history and present with a febrile illness.

Suspected Ebola virus disease case definition and laboratory testing

The case definition for suspected Ebola virus disease is as follows:

Any person* presenting with an acute onset of fever that has:

- Visited or been resident in Guinea, Liberia, Sierra Leone or Mali in the 21 days prior to onset of illness AND
- Had direct contact or cared for suspected/confirmed EVD cases in the 21 days prior to onset of illness, or been hospitalised in Guinea, Liberia, Sierra Leone or Mali OR
- Has unexplained multisystem illness that is malaria-negative

*Healthcare workers in particular are at high risk

Testing for viral haemorrhagic fever viruses (including Ebola virus) in South Africa is only available at the NICD.

EVD testing is neither warranted nor useful for persons that are not suffering from a clinical illness compatible with EVD, even in the event of compatible travel histories. The tests cannot be used to determine if the patient has been exposed to the virus and may develop the disease later.

Requests for testing (with a detailed clinical, travel and exposure history) should be directed to the NICD Hotline at 082 883 9920 (a 24-hour service, for healthcare professionals only).
**Figure 1:** Geographic distribution of Ebola virus disease in West Africa as at 03 May 2014. Adapted from World Health Organization (www.who.int).

**Table:** Ebola virus disease outbreak in West Africa: summary of cases as at 12 May 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>Total cases (laboratory-confirmed, probable and suspected)</th>
<th>Total deaths</th>
<th>CFR</th>
<th>Laboratory-confirmed cases</th>
<th>Laboratory-confirmed deaths</th>
<th>Date of illness onset in most recent case</th>
<th>Number of cases in healthcare workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>248</td>
<td>171</td>
<td>69%</td>
<td>133</td>
<td>83</td>
<td>11 May 2014</td>
<td>25 (including 16 deaths)</td>
</tr>
<tr>
<td>Liberia</td>
<td>12</td>
<td>11</td>
<td>92%</td>
<td>6</td>
<td>6</td>
<td>06 April 2014</td>
<td>2</td>
</tr>
</tbody>
</table>
Ebolavirus Ecology

**Enzootic Cycle**
New evidence strongly implicates bats as the reservoir hosts for ebolaviruses, through the means of local enzootic maintenance and transmission of the virus within bat populations remain unknown.

**Ebolaviruses:**
- Ebola virus (formerly Zaire virus)
- Sudan virus
- Tai Forest virus
- Bundibugyo virus
- Reston virus (non-human)

**Epizootic Cycle**
Epizootics caused by ebolaviruses appear sporadically, producing high mortality among non-human primates and dinkens and may precede human outbreaks. Epidemics caused by ebolaviruses produce acute disease among humans, with the exception of Reston virus which does not produce detectable disease in humans. Little is known about how the virus first passes to humans, triggering waves of human-to-human transmission, and an epidemic.

Following initial human infection through contact with an infected bat or other wild animal, human-to-human transmission often occurs.

Figure 2: Current hypothesis regarding the ecology and transmission of Ebola virus disease. Adapted from Centers for Disease Control and Prevention (US-CDC).