Review: Ebola haemorrhagic fever

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Abstract

This is a review paper, on the spread of Ebola haemorrhagic fever (Ebola) on the African continent and beyond, and provides guidelines for its prevention, diagnosis and treatment, for family doctors.

Key words: Ebola, prevention, diagnosis, treatment

Background

Ebola haemorrhagic fever (Ebola) was first documented in Zaire (Democratic Republic of the Congo) in 1976. The reported number of human cases at the time was 318. Of those, 88% died. The disease was spread by close personal contact and by use of contaminated needles and syringes in hospitals/clinics.

In the same year there were 284 cases in South Sudan, where the disease was recorded as Sudan fever. The disease was spread mainly through close personal contact within hospitals. Many medical care personnel were infected.

With few cases in the ensuing years it emerged again in 1979, in South Sudan with 34 cases. 65% of the infected died.

1994 saw a major re-emergence in Gabon (52 cases, 31 deaths) and in 1995 there were 315 cases in the Democratic Republic of the Congo (formerly Zaire).

There was 1 death in Russia in 1996, the first case out of Africa, and a further death in Russia in 2004. 6 asymptomatic cases were found in the Philippines in 2008.

2000-2001 saw a major outbreak in Uganda with 425 cases with a 53% death rate. Major outbreaks also occurred in Gabon and the Republic of Congo in the same year.

Varying levels of outbreaks have occurred since that time.

2014 has seen major outbreaks in Guinea, Liberia, and Sierra Leone, with local transmission of Ebola in Spain, (2 cases) and the USA (2 cases). Senegal has had cases of travel-associated transmission.

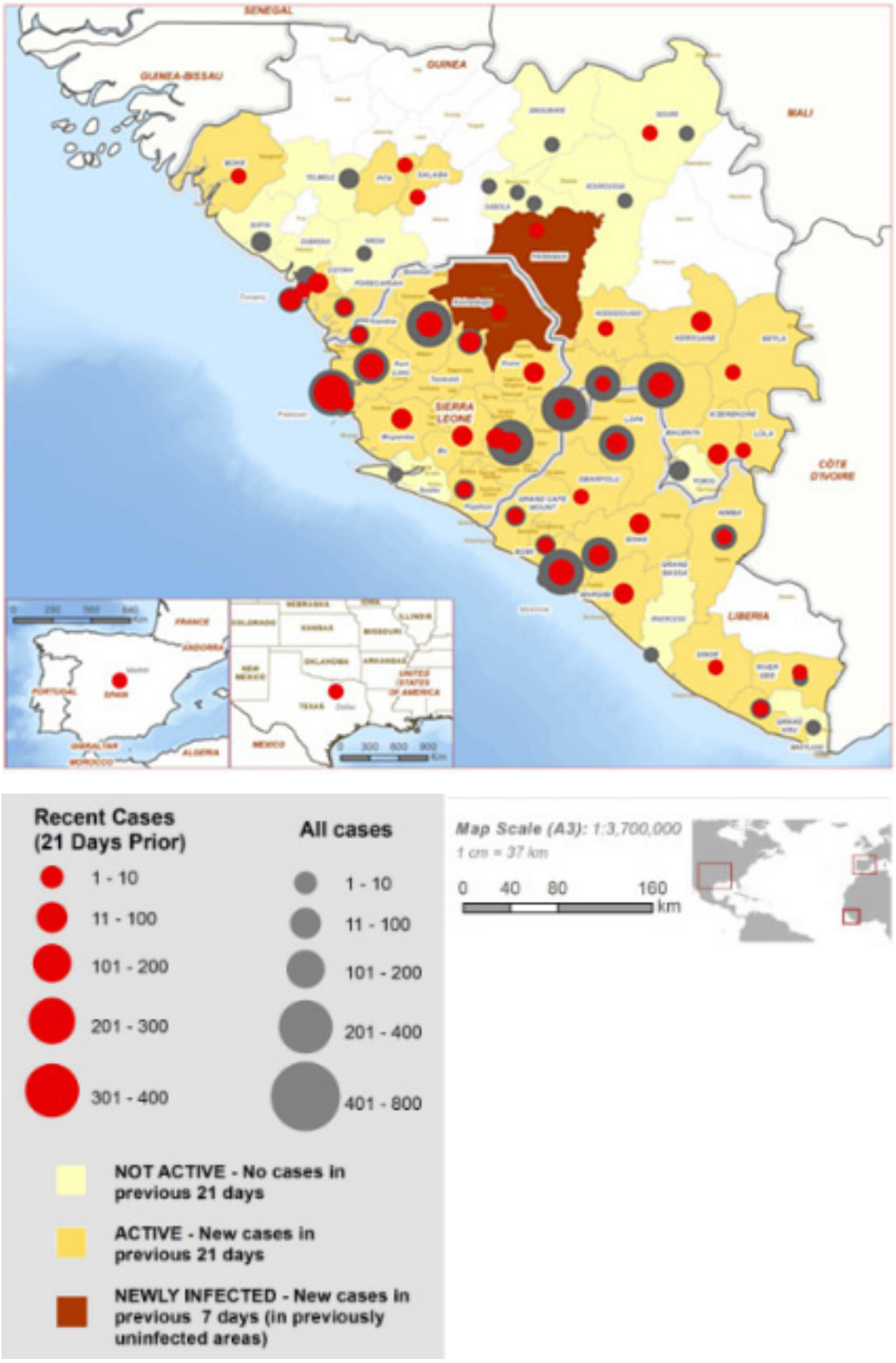
Currently there are 10,000 expected new cases of Ebola in West Africa, every week. Unfortunately the major outbreaks are in developing nations with limited resources, with minimal foreign aid or assistance to these countries being generated, Ebola now threatens the global population. (1,4)

Ebola Outbreak Response Maps

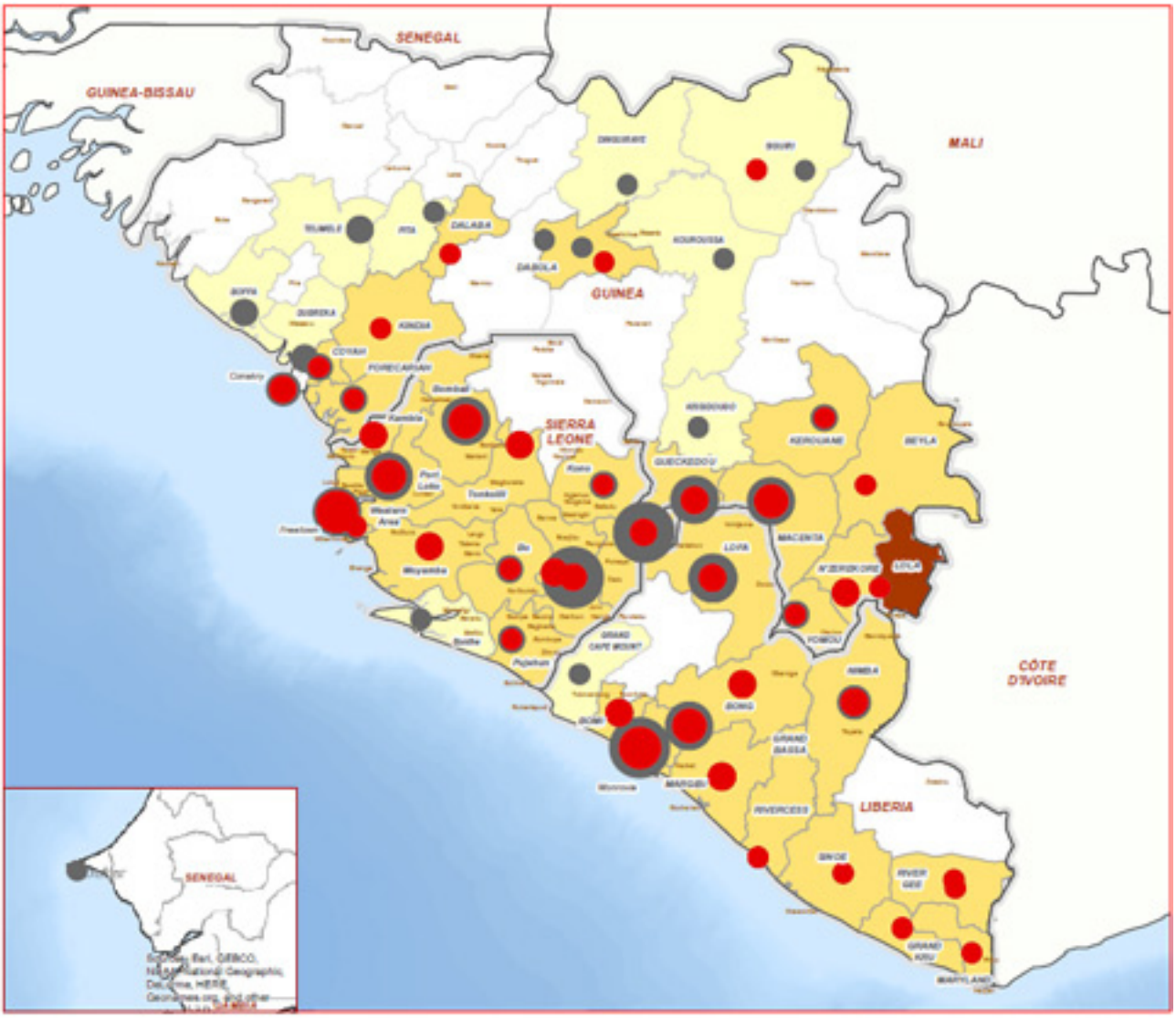
WHO 2014

(Reproduced with permission from: http://www.who.int/csr/disease/ebola/maps/en/)

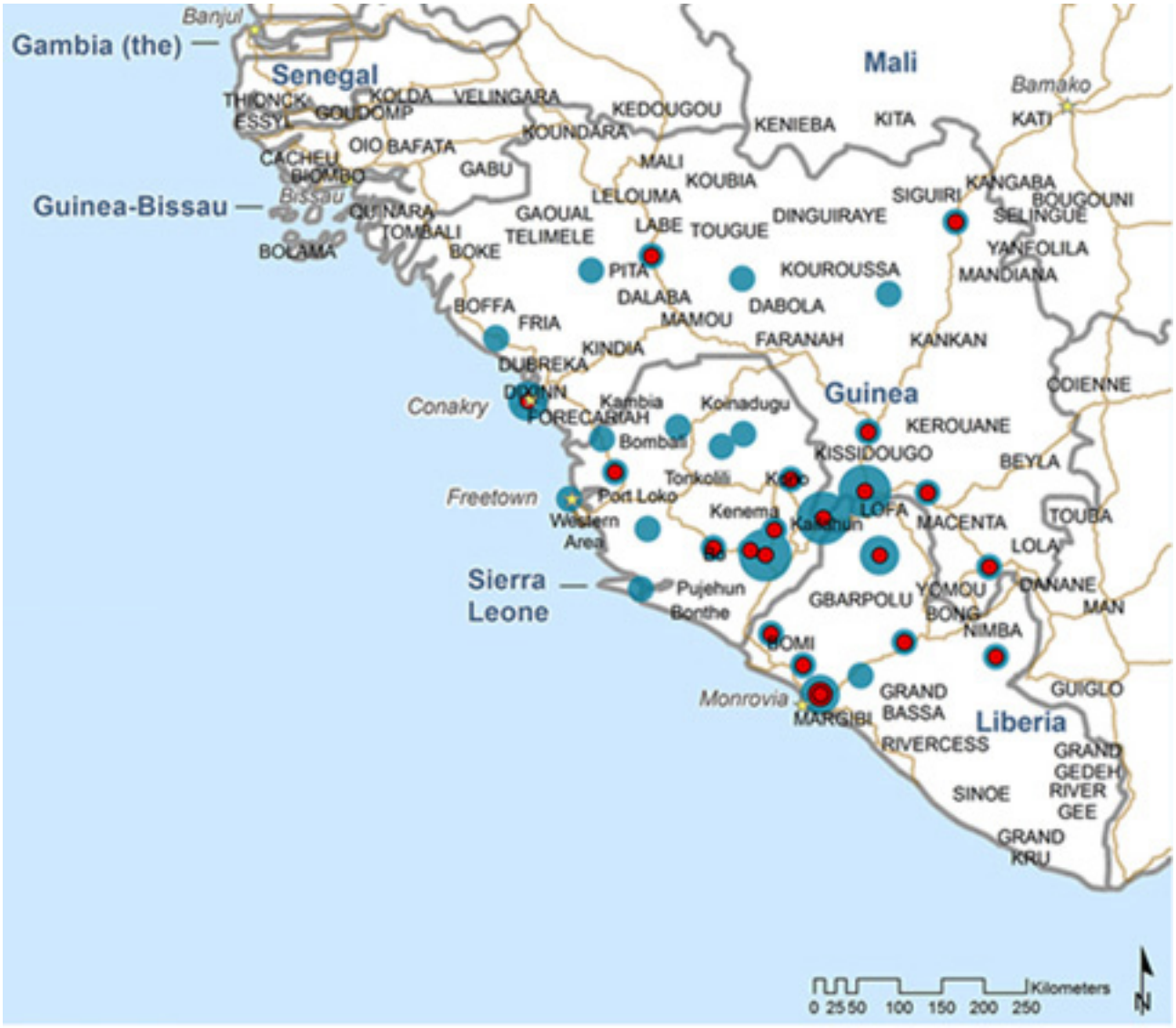
Map 1: Regional confirmed and probable cases - 20 October 2014

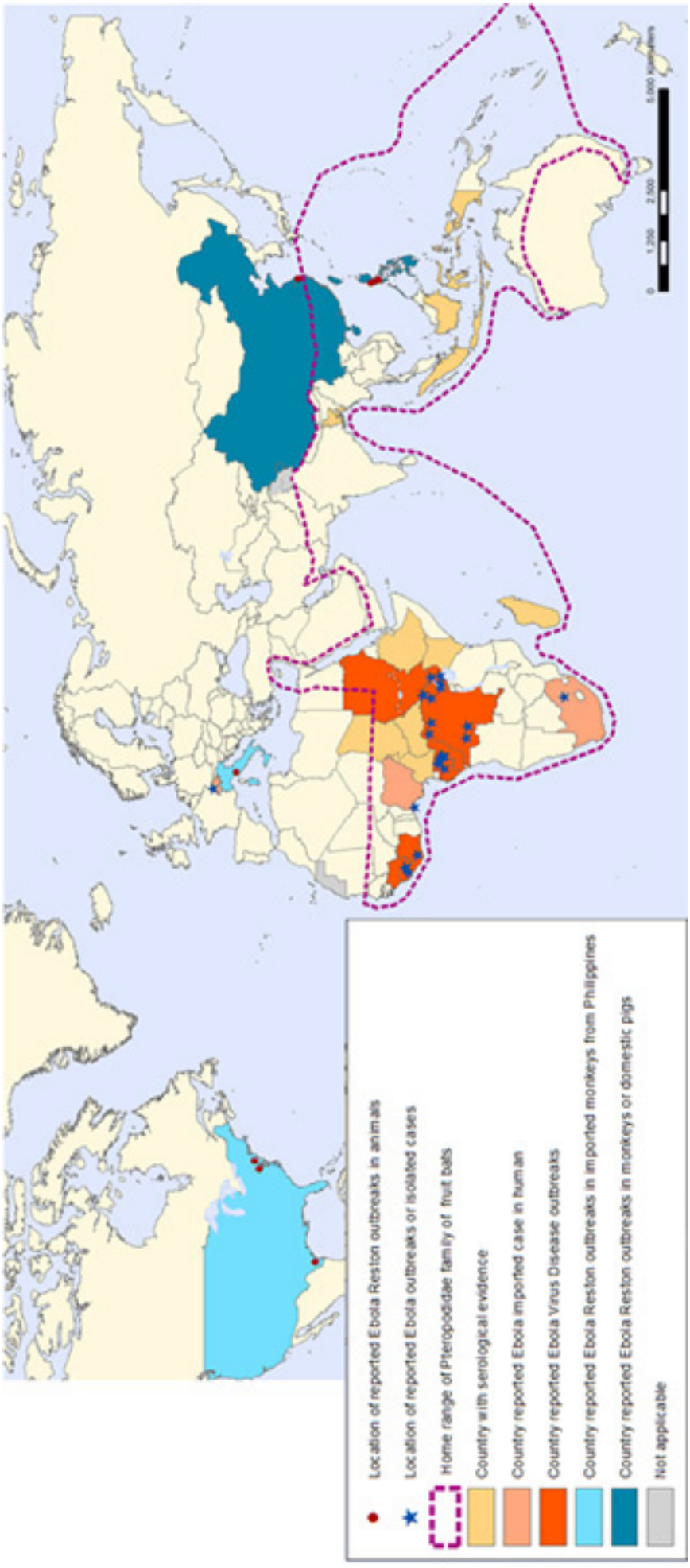


Map 2: Regional confirmed and probable cases - 3 October 2014



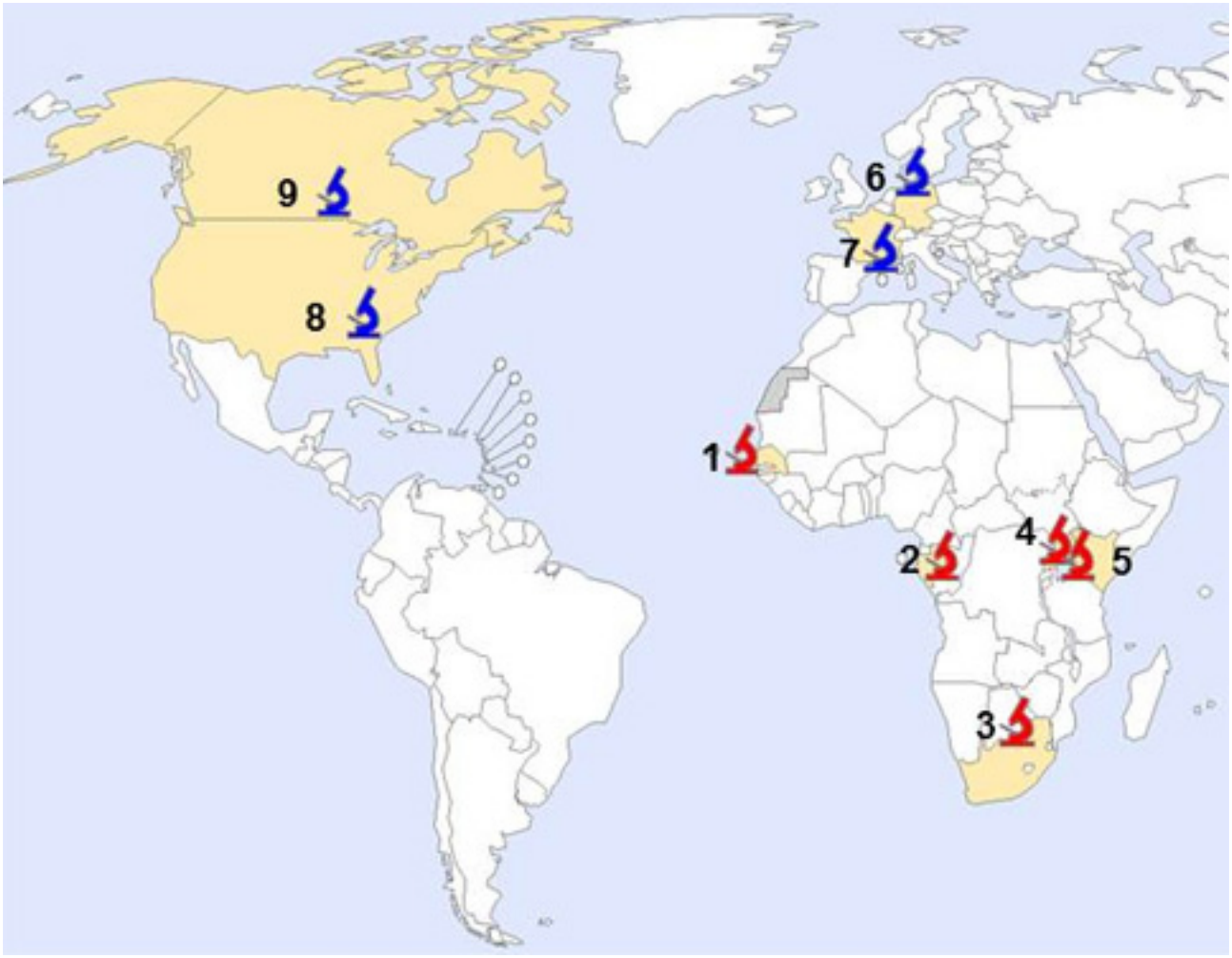
Map 3- Confirmed cases of Ebola – 7 August 2014





Map 4- Geographic distribution of Ebola virus disease outbreaks in humans and animals - 2014

Map 5 - Laboratories for Ebola virus diagnostic - 10 April 2014



Species and Epidemiology

Ebola virus is one of a group of zoonotic viruses that can cause severe disease in humans. Other viruses that cause viral haemorrhagic fever include Lassa virus, Crimean-Congo haemorrhagic fever virus, Marburg virus, and emerging viruses such as Lujo virus.

In previous outbreaks 2,387 cases have been reported, with a case fatality risk of 66.7%. (2) Of the five species of Ebola virus, three (Zaire, Sudan and Bundibugyo) have been associated with significant human to human transmission, with the other two (Tai Forest and Reston) associated with limited or no human disease.

The current outbreak has been caused by a new emergence of the Zaire species.(2)

Data from previous outbreaks suggest Ebola is moderately transmissible in the absence of infection control, even in resource limited settings. Studies have estimated the basic reproductive ratio (R0) at 1.3 to 2.7 in different outbreaks (2,3) meaning that in a completely susceptible population with no interventions to reduce spread, each infected case resulted in secondary transmission to an average of fewer than three people.

Symptoms

Symptoms of Ebola include

- Fever
- Severe headache
- Muscle pain
- Weakness
- Diarrhoea
- Vomiting
- Abdominal (stomach) pain
- Unexplained hemorrhage (bleeding or bruising)

Symptoms may appear from 2 to 21 days after exposure to Ebola, but the average is 8 to 10 days.

Recovery from Ebola depends on good supportive clinical care and the patient's immune response. People who recover from Ebola infection develop antibodies that last for at least 10 years.
(1, 4)

Transmission

Because the natural reservoir host of Ebola viruses has not yet been identified, the way in which the virus first appears in a human at the start of an outbreak is unknown. Scientists believe that the first patient becomes infected through contact with an infected animal, such as a fruit bat or primate. Person-to-person transmission follows and can lead to large numbers of affected people. Ebola is spread through direct contact (through broken skin or mucous membranes in, for example, the eyes, nose, or mouth) with “ blood or body fluids (including but not limited to urine, saliva, sweat, faeces, vomit, breast milk, and semen) of a person who is sick with Ebola” objects (like needles and syringes) that have been contaminated with the virus” infected fruit bats or primates. (1,2,4)

Healthcare providers caring for Ebola patients and the family and friends in close contact with Ebola patients are at the highest risk of transmission because they may come in contact with infected blood or body fluids of sick patients.

Diagnosis

Diagnosing Ebola in a person who has been infected for only a few days is difficult, because the early symptoms, such as fever, are nonspecific to Ebola infection and are often seen in patients with more commonly occurring diseases, such as malaria and typhoid fever.

However, if a person has the early symptoms (http://www.cdc.gov/vhf/ebola/symptoms/index.html) of Ebola and has had contact with the blood or body fluids of a person sick with Ebola, contact with objects that have been contaminated with the blood or body fluids of a person sick with Ebola, or contact with infected animals, they should be isolated and public health professionals notified. Samples from the patient can then be collected and tested to confirm infection.

The following basic interventions, when used early, can significantly improve the chances of survival:

- Providing intravenous fluids (IV)and balancing electrolytes (body salts)
- Maintaining oxygen status and blood pressure
- Treating other infections if they occur

Experimental vaccines and treatments for Ebola are under development, but they have not yet been fully tested for safety or effectiveness.

Prevention and Control

- Practice careful hygiene.
- Do not handle items that may have come in contact with an infected person’s blood or body fluids (such as clothes, bedding, needles, and medical equipment).
- Avoid funeral or burial rituals that require handling the body of someone who has died from Ebola.
- Avoid contact with bats and non-human primates or blood, fluids, and raw meat prepared from these animals.
- Avoid hospitals in West Africa where Ebola patients are being treated.

Healthcare workers exposed to people with Ebola should:

- Wear protective clothing, including masks, gloves, gowns, and eye protection.
- Practice proper infection control and sterilization measures.
- Isolate patients with Ebola from other patients.
- Avoid direct contact with the bodies of people who have died from Ebola.
- Notify health officials if direct contact has been made with the blood or body fluids, such as but not limited to, faeces, saliva, urine, vomit, and semen of a person who is sick with Ebola. The virus can enter the body through broken skin or unprotected mucous membranes in, for example, the eyes, nose, or mouth
- Laboratory workers are also at risk. Samples taken from humans and animals for investigation of Ebola infection should be handled by trained staff and processed in suitably equipped laboratories.

Good outbreak control also relies on applying a package of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilisation. Community engagement is key to successfully controlling outbreaks. Raising awareness of risk factors for Ebola infection and protective measures that individuals can take is an effective way to reduce human transmission. National risk reduction messages should focus on several factors:

- **Reducing the risk of wildlife-to-human transmission** from contact with infected fruit bats or monkeys/apes and the consumption of their raw meat. Animals should be handled with gloves and other appropriate protective clothing. Animal products (blood and meat) should be thoroughly cooked before consumption.

- **Reducing the risk of human-to-human transmission** from direct or close contact with people with Ebola symptoms, particularly with their bodily fluids. Gloves and appropriate personal protective equipment should be worn when taking care of ill patients at home. Regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home.

- **Outbreak containment measures** including prompt and safe burial of the dead, identifying people who may have been in contact with someone infected with Ebola, monitoring the health of contacts for 21 days, the importance of separating the healthy from the sick to prevent further spread, the importance of good hygiene and maintaining a clean environment.

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