



RAPID RISK ASSESSMENT

Outbreak of Ebola virus disease in West Africa

13th update, 13 October 2015

As of 6 October 2015 (week 41), WHO has reported 28 427 confirmed, probable and suspected cases of Ebola virus disease (EVD), including 11 297 deaths related to the West African epidemic.

Liberia was declared Ebola-free on 3 September 2015. Guinea and Sierra Leone continued to report low-level transmission after Liberia was declared Ebola-free, but the situation is improving as no cases have been reported for the last 14 days in Guinea and since mid-September in Sierra Leone. Seven countries reported imported cases, with or without local transmission: Italy, Mali, Nigeria, Senegal, Spain, the United Kingdom and the USA.

On 9 October 2015, the United Kingdom notified the occurrence of an unusual late complication, eight months after initial recovery, in an Ebola survivor who was infected as a healthcare worker in Sierra Leone. Close contacts are being monitored, and those who had direct contact with the case's bodily fluids have been offered vaccination. The risk for the public is assessed to be very low.

The risk of EVD being imported into the EU has decreased to an extremely low level as no new cases have been reported in the affected countries in the past two weeks. The risk of further transmission in the EU from an imported case remains very low. The risk reduction measures for individual protection and the options for mitigating the risk of importation and spread in the EU, as recommended in previous risk assessments, remain valid. These measures can be consulted in the [11th update of the Rapid Risk Assessment](#).

Source and date of request

European Commission, request on 9 October.

Public health issue

Re-assessment of the risk of importation of Ebola virus to the EU and the risk of onward transmission following the decline of the outbreak observed in Guinea and Sierra Leone.

Initial assessment of the risk for the EU, associated with a case showing an unusual late complication of her Ebola infection.

Consulted experts

ECDC experts in alphabetical order: Denis Coulombier, Niklas Danielsson, Dragoslav Domanovic, Josep Jansa, Kaja Kaasik Aaslav, Laura Espinosa, Thomas Mollet, Emmanuel Robesyn, Bertrand Sudre, Edit Szegedi and Hervé Zeller.

External expert reviewers: Deborah Turbitt (Incident Director for the Public Health England Incident Management Team for Ebola); Catherine Smith (Health Protection Scotland Lead, Viral Haemorrhagic Fevers, NHS National Services Scotland). World Health Organization Regional Office for Europe, World Health Organization headquarters in Geneva. Although experts from the World Health Organization (WHO) reviewed the risk assessment, the views expressed in this document do not necessarily represent the views of the WHO.

All experts have submitted declarations of interest and a review of these declarations did not reveal any conflicts of interest.

Disease background information

Infections with African Ebola viruses cause a severe disease in humans called Ebola virus disease. There are five species of the genus *Ebolavirus* (Filoviridae family): *Zaire ebolavirus*, *Sudan ebolavirus*, *Reston ebolavirus*, *Tai Forest ebolavirus* and *Bundibugyo ebolavirus*. The current outbreak in West Africa is caused by *Zaire ebolavirus*. More information on Ebola virus disease can be found in the ECDC factsheet for health professionals [1].

Epidemiological update

As of 6 October 2015 (week 41), WHO has reported 28 427 confirmed, probable and suspected cases of Ebola virus disease (EVD), including 11 297 deaths worldwide [2]. Two of the three countries with widespread and intense transmission, Guinea and Sierra Leone, continue to report low-level transmission, although neither has reported new cases in the most recent two weeks of WHO reporting. Liberia was declared Ebola-free on 3 September 2015, after 42 days have passed since the second negative test of the last case on 22 July 2015.

No cases of EVD were reported from West Africa during weeks 40 and 41 (28 September to 11 October 2015). This is the first time since March 2014 that no cases have been reported during two consecutive weeks.

Guinea: No cases have been reported for the last 14 days in Guinea. As of 9 October 2015, 509 contacts remain under follow-up in three prefectures in Guinea: Conakry, Coyah and Forecariah. All these contacts are associated with one chain of transmission centred in Ratoma commune in Conakry City. In the past 42 days, an additional 290 contacts were identified but could not be traced and contacted. The four most recent cases from two villages in Forecariah were infected by an unregistered contact of a probable case linked to the Ratoma chain of transmission.

A phase-3 efficacy ring vaccination trial ('Ebola ça suffit!'), initiated in April 2015, using rVSV-ZEBOV Ebola vaccine, is continuing in Guinea [3,4]. In the trial, contacts and contacts of contacts associated with confirmed cases receive immediate vaccination. On 1 September, the eligibility criteria for the trial were amended to allow the vaccination of children aged 6 years and above [3].

Sierra Leone: No cases have been reported since mid-September, and all identified contacts have now completed their follow-up. However, two high-risk contacts, one from Bombali and one from Kambia, remain untraced. The ongoing STRIVE trial (Sierra Leone Trial to Introduce a Vaccine against Ebola) uses rVSV-ZEBOV Ebola vaccine and focuses on the vaccination of healthcare and other frontline workers [3]. The ring vaccination trial of the rVSV-ZEBOV vaccine has been extended from Guinea to Sierra Leone.

Liberia: Heightened vigilance for new cases has been maintained throughout the country since transmission was interrupted [5].

Distribution of cases in countries with widespread and intense transmission, as of 6 October 2015:

- Guinea: 3 799 cases, of which 3 344 are confirmed, including 2 534 deaths
- Sierra Leone: 13 956 cases, of which 8 704 are confirmed, including 3 955 deaths.

Countries with previously widespread and intense transmission:

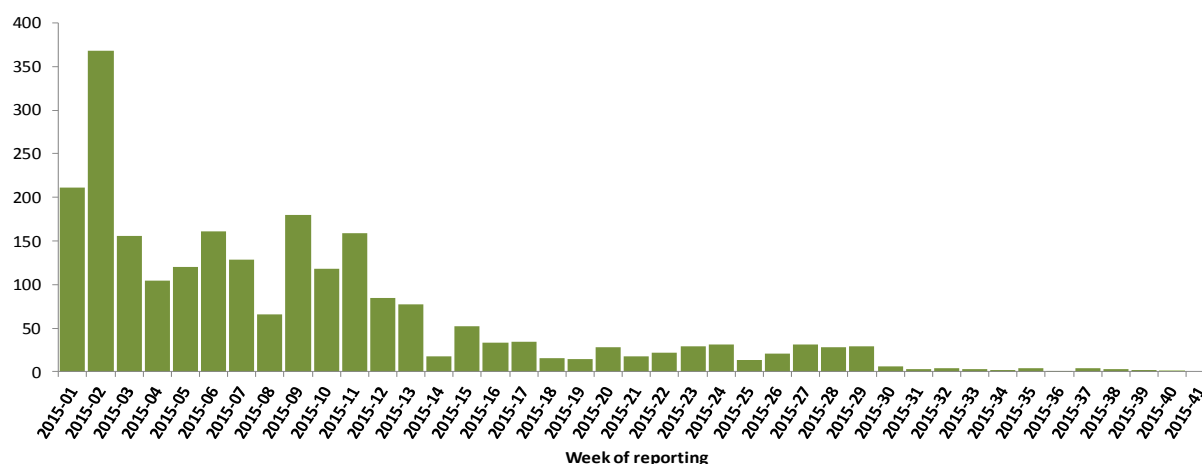
- Liberia: 10 672 cases, 3 157 of which are confirmed, including 4 808 deaths. Liberia was declared Ebola-free by WHO on 3 September 2015 [5].

Countries with importation-related cases or clusters, with or without local transmission, excluding repatriated cases

These cases represent patients who developed symptoms and were diagnosed with EVD in the country under which they are listed, irrespective of whether they were exposed in a third country (imported cases) or in the country under which they are listed (local transmission). Patients who were repatriated with established disease are not included.

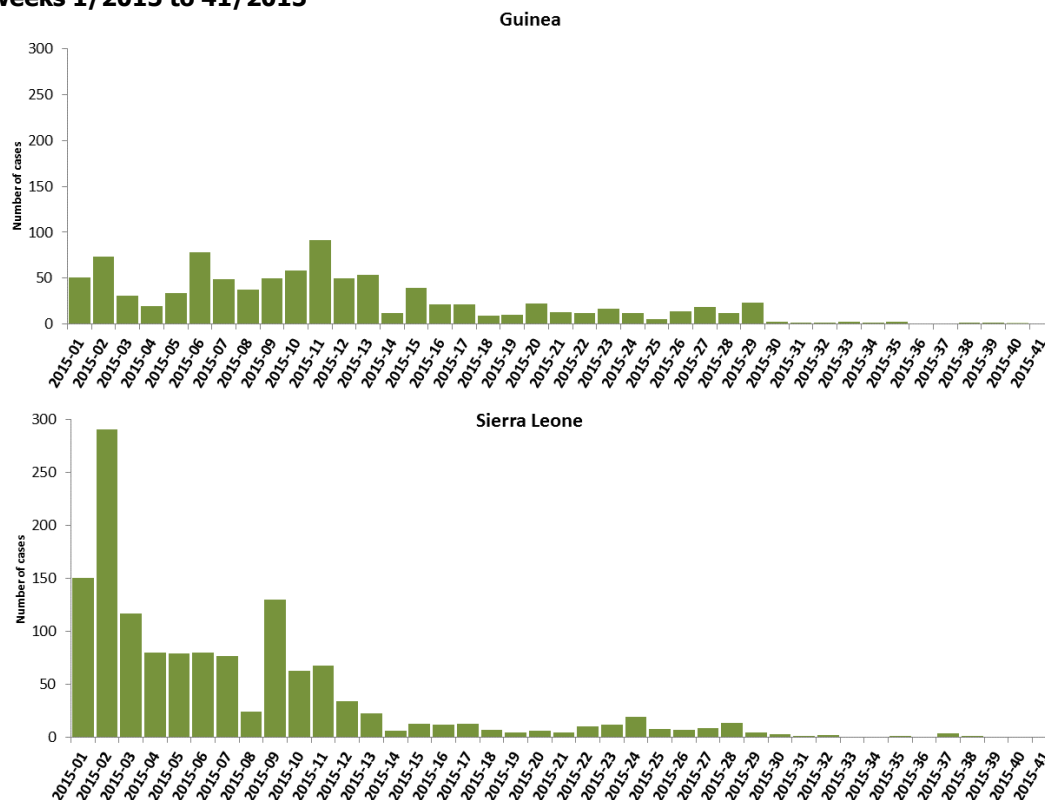
- United Kingdom: one confirmed case
- Spain: one case, no deaths
- United States: four cases
- Mali: eight cases, six deaths
- Nigeria: 20 cases and eight deaths
- Senegal: one confirmed imported case
- Italy: one confirmed case.

Figure 1. Distribution of confirmed cases of EVD, by week of reporting: Guinea, Sierra Leone and Liberia, weeks 1/2015 to 41/2015

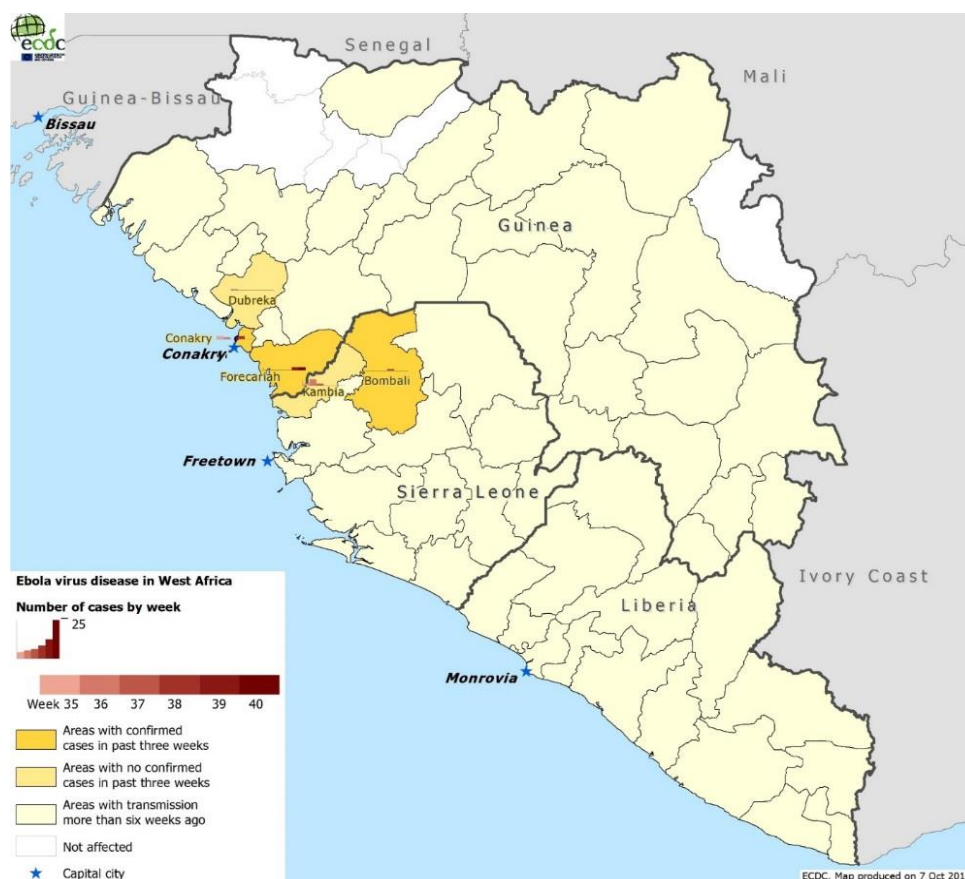


Note: Data for week 41 are incomplete

Figure 2. Distribution of confirmed cases of EVD by week of reporting: Guinea and Sierra Leone, weeks 1/2015 to 41/2015



Note: Data for week 41 are incomplete

Figure 3. Distribution of EVD cases in Guinea and Sierra Leone by week of reporting, as of week 40/2015

Source: Data from reports issued by the ministries of health

Healthcare workers

No new healthcare worker infections were reported recently. Since the start of the outbreak, 881 confirmed EVD cases among healthcare workers have been reported in Guinea, Liberia, and Sierra Leone, including 513 deaths. Outside of the three most-affected countries, infected healthcare workers have been reported from Mali (two), Nigeria (11), Spain (one, infected in Spain while caring for an evacuated EVD patient), UK (three, infected in Sierra Leone), USA (nine cases, including one death; two of the cases were infected in the US), and Italy (one, infected in Sierra Leone). The latest confirmed infection in a healthcare worker diagnosed and treated outside of the most-affected countries was in Italy on 12 May 2015 [6]. The latest confirmed EVD case among healthcare workers in the most-affected countries was reported in week 34 (17–23 August) in Guinea [7].

Table 1. Number of EVD cases and deaths among healthcare workers, as of 6 October 2015*

Country	Cases	Deaths
Guinea	196	100
Liberia***	378	192
Mali	2	2
Nigeria	11	5
Sierra Leone	307	221**
Spain	1	0
United Kingdom	3	0
United States	9	1
Italy	1	0
Total	908	521

* Listed by country of origin; ** Data as of 17 February 2015; *** Data as of 9 May 2015.

Source: Data are based on official information reported by ministries of health and WHO [8].

New developments

On 9 October 2015, the UK notified an unusual late complication in an Ebola survivor. The case is a nurse who was diagnosed with EVD on 29 December 2014, after returning from Sierra Leone to Glasgow, via London. The nurse was treated with blood plasma from an Ebola survivor and an experimental drug closely related to ZMapp. She was declared free of Ebola on 24 January 2015.

The nurse was transferred on 9 October from Queen Elizabeth University Hospital in Glasgow to the Royal Free Hospital in London, where she is treated – in accordance with national guidelines – in the hospital's high-level isolation unit.

As of 13 October 2015, the health authorities have identified 62 close contacts who will be closely monitored for 21 days. They will have their temperature taken twice daily, restrictions placed on travel and, in the case of healthcare workers, they were asked not to have direct patient contact during this period. Forty of the contacts had direct contact with the nurses' bodily fluids [9] and they have, as a precautionary measure, been offered vaccination with the rVSV-ZEBOV vaccine. This is the same vaccine that has proved to be effective in the ongoing ring vaccination trial in Guinea. Twenty-six of the 40 have been vaccinated while 14 have either declined vaccination or had pre-existing medical contraindications. All 58 close contacts are being closely monitored for 21 days after their last exposure. The 26 who were vaccinated will undergo additional monitoring because the vaccine is still being evaluated.

ECDC threat assessment

Less than ten cases per week have been reported in Guinea and Sierra Leone since the end of July 2015, and transmission has remained confined to small areas in both countries. No EVD cases have been reported worldwide during the last two weeks. This is the longest period without cases since March 2014. However, the risk of resurgence West Africa, and hence the risk of regional and global spread, will remain until all the most-affected countries have been declared Ebola-free.

The Scottish health authorities are following up the nurse's close contacts as a precaution. As of 13 October 2015, the health authorities have identified 62 close contacts, 40 of which had direct contact with the nurses' bodily fluids [9]. As a precautionary measure, close contacts having had direct contact with any type of bodily fluids were offered vaccination with rVSV-ZEBOV. These vaccinations have now taken place. Twenty-six of the 40 accepted the vaccine. Fourteen have either declined the vaccine or were unable to receive it due to existing medical conditions. All 58 close contacts are being closely monitored for 21 days since their last exposure. They will have their temperature taken twice daily, restrictions placed on travel and, in the case of healthcare workers, they were asked not to have direct patient contact during this period. The 26 who were vaccinated will undergo additional monitoring because the vaccine is still being evaluated.

In acute EVD, neurological symptoms of meningitis, encephalopathy, and seizures have been described [10]. In one case report, detectable viral load in CSF indicated that Ebola virus can cross the blood-brain barrier and thus have a pathogenic role in encephalitis. The authors concluded that treatment for Ebola virus disease should also target the central nervous system [11]. However, there is as yet no evidence that the detection of Ebola virus in CSF during the acute illness is linked to relapse with CNS symptoms.

Late manifestations of EVD, such as uveitis, were first described in 1999 [12]. Information about late manifestations of EVD in association with RNA/viral reappearance in body fluids is limited. The continued detection of RNA and live virus in semen has been documented [13]. Further, persistence of the virus with long-lasting symptoms has been described once for Ebola virus [14]. Viable virus was detected in aqueous liquid in the eye nine weeks after the clearance of viraemia and 14 weeks after disease onset in a patient presenting with uveitis.

Long-term sequelae occurring over two years after Bundibugyo virus disease have been described, including neurological manifestations [15]. The need for attention to the long-term sequelae in EVD survivors in the current West-African outbreak has been raised recently [16] and some studies are ongoing [17].

The risk of further transmission from the infected healthcare worker in the United Kingdom is considered very low, given the preventive measures taken and the continued monitoring of close contacts. Contacts most at risk are those having cared for the patient prior to the adoption of protection measures and have potentially been exposed to bodily fluids.

Further investigations are needed to fully understand the mechanism and impact of the re-appearance of viral RNA in this patient more than eight months after recovery. The patient received convalescent plasma when she was first treated for EVD eight months ago. It can only be speculated at this time whether treatment with convalescent plasma may influence an EVD patient's immune response to the infection and the ability to clear the body of the virus. Ongoing cohort studies will hopefully provide more information about EVD survivors' complications and long-term prognosis.

The re-emergence of EVD transmission in West-Africa remains possible as a result of transmission from a recovered case through contact with infected bodily fluids (e.g. through sexual contact) [13,18,19], unrecognised or asymptomatic cases [20], or from reintroduction from the animal reservoir.

Conclusions

Late manifestations of EVD, such as uveitis, were first described many years ago [12]. Information about late manifestations of EVD in association with RNA/viral reappearance in body fluids is limited. The continued detection of RNA and live virus in semen has been documented [13]. Further, persistence of the virus with long-lasting symptoms has been described once for Ebola virus [14]. Viable virus was detected in aqueous liquid in the eye nine weeks after the clearance of viraemia and 14 weeks after disease onset in a patient presenting with uveitis.

There is as yet no evidence that the finding of Ebola virus in the CSF during acute illness is linked to relapse with brain involvement [11].

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On 9 October 2015, the UK notified the appearance of an unusual late complication, more than eight months after initial recovery, in an Ebola survivor who was infected as a healthcare worker in West Africa (Sierra Leone). A number of close contacts are under follow-up. As a precautionary measure, close contacts having had direct contact with any type of bodily fluids of the case were offered vaccination. The risk for the public is assessed to be very low.

The risk of EVD being imported into the EU has decreased to an extremely low level as no new cases have been reported in the affected countries in the past two weeks. The risk of further transmission in the EU from an imported case remains very low. The risk-reduction measures for individual protection and the options for mitigating the risk of importation and spread in the EU, as recommended in previous risk assessments, remain valid. These measures can be found in the 11th update of the Rapid Risk Assessment.

ECDC resources

- Ebola and Marburg fevers – factsheet for health professionals [1]
- ECDC Rapid Risk Assessment: Outbreak of Ebola virus disease in West Africa, Eighth update, 18 November 2014 [21]
- ECDC Rapid Risk Assessment: Outbreak of Ebola virus disease in West Africa, Ninth update, 30 January 2015 [22]
- ECDC Rapid Risk Assessment: Outbreak of Ebola virus disease in West Africa, Tenth update, 14 April 2015 [23]
- ECDC Rapid Risk Assessment: Outbreak of Ebola virus disease in West Africa, 11th update, 11 May 2015 [24]
- ECDC Rapid Risk Assessment: Outbreak of Ebola virus disease in West Africa, 12th update, 1 July 2015 [25]
- Assessing and planning medical evacuation by air to the EU for patients with Ebola virus disease and people exposed to Ebola virus [26]
- Case definitions for Ebola patients in the EU [27]
- Algorithm for the laboratory diagnosis of Ebola virus disease [28]
- Public health management of healthcare workers returning from Ebola-affected areas [29]
- Public health management of persons having had contact with Ebola virus disease cases in the EU – update [30]
- Options for preparing for gatherings in the EU in the context of the current outbreak of EVD in West Africa [31].
- Treatment and vaccine development [32]
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