

RAPID RISK ASSESSMENT

Ebola virus disease outbreak in North Kivu and Ituri Provinces, Democratic Republic of the Congo

9 August 2018

Main conclusions and options for response

This is the tenth Ebola virus disease (EVD) outbreak in the Democratic Republic of the Congo (DRC) since the discovery of the virus in 1976 [1]. Genetic analysis of the viral strains showed that there is no link between this outbreak and the recent outbreak in Equateur province.

As of 5 August 2018, the DRC ministry of health reported 43 cases in the Provinces of North Kivu and Ituri. The ministry of health is currently implementing the EVD response plan in the affected areas, supported by the World Health Organization and several partner organisations. Contact tracing of case contacts has been initiated, and the rVSV-ZEBOV experimental vaccine will be offered to healthcare workers and case contacts.

The actual extent of the epidemic is still unknown; the fact that the epidemic has possibly been ongoing for almost three months in a densely populated area with high cross-border population mobility with Rwanda and Uganda is of particular concern.

Implementation of response measures may be challenging because the outbreak occurs in areas affected by prolonged humanitarian crises and an unstable security situation arising from a complex armed conflict.

The probability that EU/EEA citizens who live or travel in EVD-affected areas of DRC are exposed to the disease is low, provided they adhere to the precautionary measures recommended below.

There are no international airports in the affected areas that offer direct flights to EU/EEA Member States, which limits the risk of introduction of the virus into the EU/EEA. The overall risk of introduction and further spread of Ebola virus within the EU/EEA is very low.

WHO advises against any travel or trade restrictions.

Precautions for risk reduction

EU/EEA visitors and residents of affected areas

EU/EEA visitors and residents in EVD-affected areas face a low risk of becoming infected in the community if the precautionary measures below are followed:

- Avoid contact with symptomatic patients/their bodily fluids; corpses and/or bodily fluids from deceased patients; and wild animals, both alive and dead
- Avoid consumption of bush meat
- Wash and peel fruit and vegetables before consumption

- Wash hands regularly using soap or antiseptics
- Practice safe sex.

Screening of travellers

To reduce the likelihood of Ebola virus introduction into the EU/EEA, the following options for response can be considered:

- Currently, no exit screening is in place in DRC. However, should exit screening be implemented in the future, a traveller presenting with symptoms (e.g. fever >38 °C) at an airport should not be allowed to board a flight.
- A passenger who develops symptoms while on board a commercial flight should be isolated and his/her condition ascertained upon arrival. Should the passenger be confirmed as having EVD, contact tracing of passengers should be initiated in accordance with the recommendations for contact tracing in aircraft as set out in the RAGIDA guidelines [2].
- Travellers who stayed in a recently affected area should be made aware that if they developed symptoms compatible with EVD after arrival in an EU/EEA Member State, they should self-isolate and contact health services and mention potential exposure to Ebola virus. Secondary transmission to caregivers in the family and in healthcare facilities cannot be ruled out if no measures for infection prevention and control are taken.

For more information on individual exposure assessment, please refer to the rapid risk assessment on Ebola virus disease published on 18 November 2014 [3].

Source and date of request

European Commission request, 3 August 2018.

Public health issue

This rapid risk assessment addresses the public health risk associated with the current EVD outbreak in DRC and its implications for EU/EEA citizens.

Consulted experts

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Disease background information

Disease background

Infections with Ebola viruses originating from Africa 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* [5-7]. Ebola viruses are biosafety level-4 pathogens (BSL-4, risk group 4) and require special containment measures and barrier protection, particularly for healthcare workers.

The incubation period is usually four to ten days but can be as short as two days and as long as 21 days. The symptoms usually consist of a sudden onset of fever, malaise, headache, muscle pain and sore throat. This phase can be followed by symptoms and clinical manifestations from several organ systems (gastrointestinal, neurological, vascular, cutaneous and respiratory). Severe exhaustion, haemorrhagic manifestations and multi-organs failure are reported in the severe form of EVD. The case-fatality ratio for *Zaire ebolavirus* infections is estimated to be between 44% and 90% [8].

Ebola viruses are highly transmissible through direct contact with infected blood, secretions, tissues, organs and other bodily fluids from dead or living infected animals or persons [9]. Transmission via objects contaminated with infected bodily fluids (fomites) is possible [10]. The principal mode of transmission in outbreaks among humans is person-to-person through direct contact with symptomatic or dead cases. Airborne transmission has not been documented. The risk of transmission is low in the early phase of human disease. Burial ceremonies and the handling of dead bodies have had an important role in disease transmission in previous outbreaks, as have healthcare workers caring for EVD cases without appropriate infection prevention and control measures.

More information about EVD is available in the ECDC fact sheet¹ about Ebola and Marburg fevers and the WHO fact sheets² on Ebola virus disease.

Diagnosics and diagnostic capacity in EU/EEA

EVD is diagnosed by detection of Ebola virus ribonucleic acid (RNA) in whole blood, plasma, or serum during the acute phase of illness, using reverse transcription polymerase chain reaction (RT-PCR) [11]. Viral RNA can usually be detected up to a few days after the disappearance of symptoms. Viral RNA may also be detected in other body fluids, such as semen, saliva and urine [12]. Throat swabs are suitable for virus detection in deceased patients. Viral RNA has been detected in seminal fluid and in the breast milk of survivors months to years after acute illness, posing a risk for sexual or mother-to-child transmission. Identification of acute infections based on serology is uncommon.

According to the latest 2016 EULabCap survey, only one EU/EEA Member State does not have the capacity (or a formal agreement with external laboratories) to diagnose Ebola virus [13]. The majority of countries (n=22) surveyed by EULabCap are able to perform molecular detection at BSL-3 level or have formal agreements with a BSL-3 laboratory in another EU/EEA Member State. Seven countries were able to perform further characterisation at BSL-4 level [13].

A survey on the status of Ebola virus diagnostics, biorisk management and quality assurance in European countries was recently published by the EMERGE and EVD-LabNet laboratory networks [14]. A complete overview of Ebola virus diagnostic capacity in the EU/EEA can be found in the EVD-LabNet directory³.

Treatment and vaccine

Supportive care and treatment of specific symptoms improves survival [15]. There is no proven treatment for EVD, but health authorities are evaluating several potential treatments. In addition, several Ebola virus vaccine candidates are being evaluated; preliminary trials and vaccination campaign results showed a high level of protection against the Ebola Zaire species. See also: <https://ecdc.europa.eu/en/ebola-and-marburg-fevers/prevention-and-control/treatment-vaccines>.

No vaccine is currently available for tourists visiting DRC or any other affected areas (WHO, frequently asked questions on Ebola virus disease vaccine⁴).

Surveillance in EU/EEA Member States

Viral haemorrhagic fevers such as EVD are notifiable diseases in the EU/EEA and have to be reported in a timely manner. In 2014, ECDC published an Ebola case definition for reporting in the EU/EEA⁵.

Event background information

On 1 August 2018, the DRC ministry of health reported an EVD outbreak in North Kivu with four laboratory-confirmed cases [16]. An alleged primary case had onset of symptoms in May. A strike among healthcare workers in North Kivu delayed the detection and reporting of the outbreak. When the outbreak was officially confirmed, healthcare workers went back to work.

Since 11 May 2018 and as of 5 August 2018, the ministry of health reported 43 EVD cases [17]. Five health districts in North Kivu are affected: Beni, Malabako, Oicha, Butembo and Musienene. In Ituri Province, Mambassa and Mandima districts are affected. Of these 43 reported cases, 16 are confirmed and 27 are probable (Table 1 and Figure 1). Seven confirmed cases and 27 probable cases died; 31 suspected cases are being investigated. Two of the 43 cases were healthcare workers, and one of the two died.

North Kivu and Ituri Provinces are about 2 000 km away from DRC's Equateur Province where the last EVD outbreak occurred. All provinces are connected through roads and scheduled flights.

Contact tracing activities were initiated on 5 August 2018. So far, 966 contacts have been registered for follow-ups [18].

The results of the genetic analysis of the *Zaire ebolavirus* strain revealed that there is no link between the current outbreak and the earlier outbreak in Equateur province [19].

¹ Available from: <https://ecdc.europa.eu/en/ebola-and-marburg-fevers/facts/factsheet>

² Available from: <http://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease>

³ Available from: <https://www.evd-labnet.eu/evd-labnet-directory-search?genus=417-ebola-virus-generic>

⁴ Available from: <http://www.who.int/ebola/drc-2018/faq-vaccine/en/>

⁵ Available from: <https://ecdc.europa.eu/en/ebola-virus-disease-case-definition-reporting-eu>

According to WHO, the DRC ministry of health initiated response mechanisms in North Kivu and Ituri Provinces, with support from WHO and a number of local, national and international partners (e.g. UNICEF, MSF, ALIMA, OXFAM). Priorities include the establishment and strengthening of surveillance, contact tracing, laboratory capacity, infection prevention and control, clinical management, community engagement, safe and dignified burials, response coordination, cross-border surveillance, and preparedness activities in neighbouring provinces and countries.

In addition, public health authorities are currently reviewing the potential use of Ebola vaccines and therapeutics for the treatment of Ebola virus disease [20]. A temperature-controlled supply chain was established between Mbandaka, Equateur province, and Beni, North Kivu. Three thousand doses of experimental vaccine are already available on site, and WHO will be sending 3 000 more doses [18]. Starting on 8 August, the rVSV-ZEBOV experimental vaccine will be offered to healthcare workers and contacts of cases.

With the support of international partners, Ebola treatment centres are being established in Mangina, Beni and Goma.

A mobile laboratory has been established in Beni to facilitate the timely diagnoses of suspected cases [20]. An additional mobile laboratory will be set up in Mangina [21].

Activities to sensitise communities to the outbreak and promote hygiene and sanitation measures, mostly through news media and churches, have started in several affected communities and neighbouring countries (e.g. Uganda and Rwanda).

Burundi, Rwanda, Uganda and Zimbabwe have established entry screening [22-25]. Currently, exit screening is not implemented in DRC.

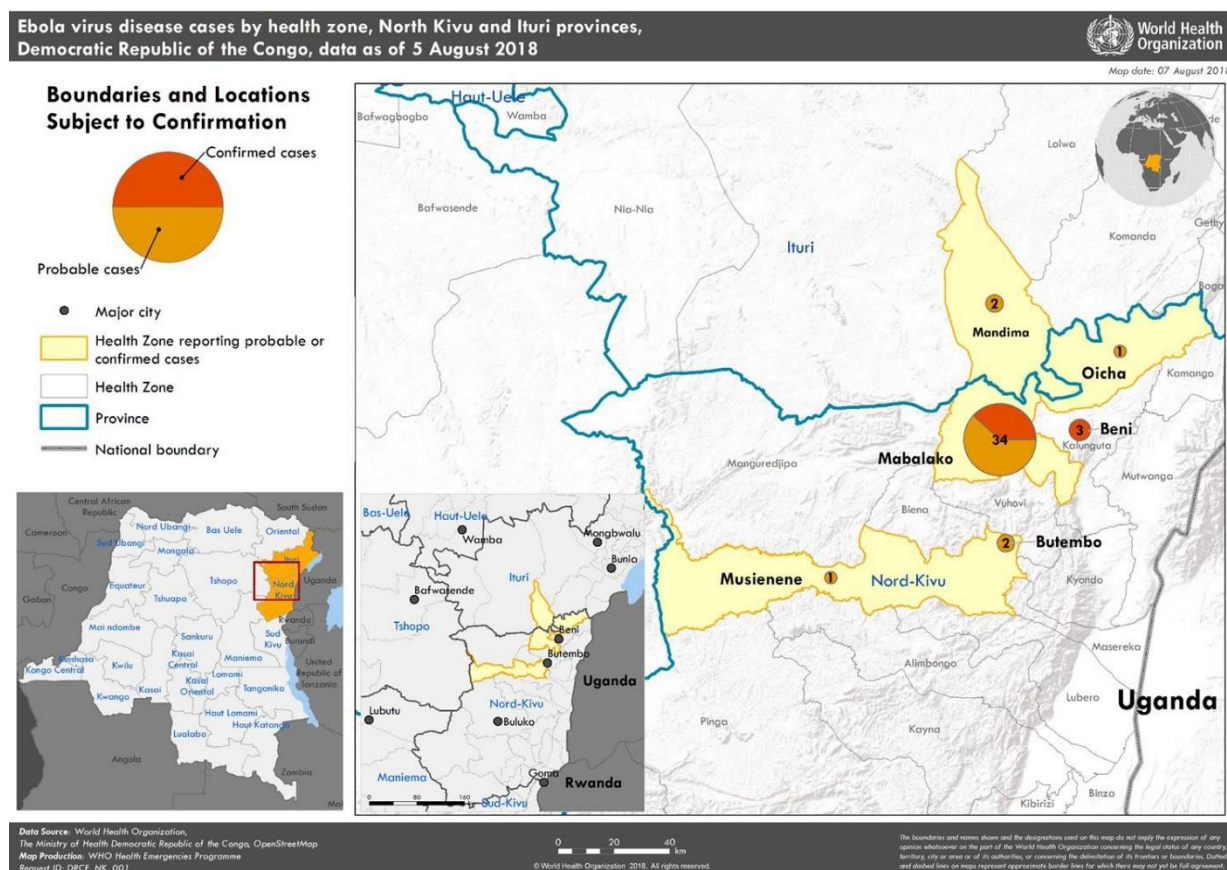
Table 1. Distribution of Ebola virus disease cases between 11 May and 5 August 2018

Province	Health district	Confirmed cases	Probable cases	Total cases	Suspected cases*	Deaths among confirmed cases	Deaths among probable cases
North Kivu	Beni	3	0	3	14	0	0
	Butembo	0	2	2	0	0	2
	Oicha	0	1	1	0	0	1
	Mabalako	13	21	34	17	7	21
	Musienene	0	1	1	0	0	1
Ituri	Mandima	0	2	2	0	0	2
Total		16	27	43	31	7	27

Source: Directorate-General for European Civil Protection and Humanitarian Aid Operations [18]

* Suspected cases are being investigated

Figure 1. Ebola virus disease by health zone, North Kivu and Ituri Provinces, Democratic Republic of the Congo, 5 August 2018



Source: World Health Organization [19]

ECDC threat assessment for the EU

This is the first EVD outbreak of *Zaire ebolavirus* detected in the Provinces of North Kivu and Ituri [1].

The actual extent of the epidemic is still unknown; the fact that the epidemic has possibly been ongoing for almost three months in a densely populated area with high cross-border population mobility with Rwanda and Uganda is of particular concern. The affected areas host over one million displaced people. The prolonged humanitarian crisis and the unstable security situation poses a challenge for the implementation of response measures coordinated by the ministry of health and support by WHO and several other partners.

Transport routes linking the affected areas to other regions in the DRC and several neighbouring countries (mainly Rwanda and Uganda) may facilitate the spread of the virus. The situation is aggravated by the displacement of people due to conflict and crisis. According to WHO, the public health risk is considered high at the national and regional levels [20].

A genetic analysis of the viral strains showed no link between the current outbreak and the earlier outbreak in Equateur province. The origin of the outbreak remains unknown.

Risk to EU/EEA citizens living or traveling in DRC

The probability that EU/EEA citizens who live or travel in EVD-affected areas of DRC are exposed to the virus is low, provided they adhere to the recommended precautionary measures outlined above.

Staff members of humanitarian, religious and other organisations, and especially healthcare workers who are in direct contact with patients and/or local communities in the affected areas are more likely to be exposed to the virus. EU/EEA citizens working for humanitarian aid organisations remain at low risk, provided they strictly adhere to the recommended precautionary measures.

Risk of introduction and further spread within the EU/EEA

The most likely mode of introduction of the virus into the EU/EEA is through infected travellers from affected areas travelling to Europe. Considering there are no international airports in the affected areas with direct flights to EU/EEA Member States and that so far the size of the outbreak appears to be relatively limited, the risk of EVD-infected individuals arriving in the EU/EEA is very low.

An infected case from one of the EVD-affected areas of DRC arriving in the EU/EEA (e.g. a returning traveller or medical evacuee) would pose a very low risk of further spread because EU/EEA Member States have the capacity to detect and manage imported EVD cases at a very early stage.

During the substantially larger EVD outbreak in West Africa in 2014 (approximately 28 600 cases and 11 300 deaths), only one local transmission occurred in the EU/EEA (Spain): a healthcare worker attending to an evacuated Ebola patient [26].

WHO advises against the application of any travel or trade restrictions against DRC [20].

More information on entry screening during the EVD outbreak in Guinea, Sierra Leone and Liberia can be found in an ECDC risk assessment published on 18 November 2014 [3].

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