RAPID RISK ASSESSMENT

Outbreak of Ebola virus disease in West Africa

8 April 2014

Main conclusions

An outbreak of Ebola virus disease (EVD) in West Africa, with onset in early February 2014, is evolving in Guinea and Liberia. This is the first such outbreak in the area. The first cases were reported from the forested region of south-eastern Guinea. As of 7 April 2014, the Ministry of Health in Guinea reported 151 clinically compatible cases of EVD, 54 of which were laboratory-confirmed by PCR. Ninety-five of these patients died. Liberia has reported 21 cases clinically compatible with EVD, including ten deaths. In Mali, the Ministry of Health has reported six suspected cases as of 7 April 2014, two of which have tested negative for Ebola virus infection. Samples from the four remaining suspected cases have been sent to CDC and the Institut Pasteur in Dakar for testing.

This is the first documented *ebolavirus* outbreak in West Africa. However, this outbreak was not entirely unexpected as Guinea shares an ecological system known to be associated with *ebolavirus* outbreaks, and some limited serological evidence of *ebolavirus* infections in humans has been documented.

Given the incubation period of up to three weeks and the challenges of containing this outbreak, it is likely that more cases will be identified in the coming weeks, especially among highly exposed groups in Guinea and Liberia. In addition, active case-finding and contact monitoring may identify additional cases.

For tourists, visitors or residents in affected areas, the risk of infection is considered very low if some elementary precautions are followed, e.g. avoiding contact with symptomatic patients and/or their bodily fluids or with corpses and/or bodily fluids from deceased patients. In addition, generic precautions for travelling in West African countries also apply for preventing infection with Ebola virus, e.g. avoiding close contacts with alive or dead wild animals and consumption of 'bushmeat', washing and peeling fruits and vegetables before consumption, practising 'safe sex', and following hand-washing routines.

Those who are providing medical care in the outbreak area are advised to wear protective clothing, including masks, gloves, gowns, and eye protection and practice proper infection prevention and control measures. The risk related to seeking medical care in affected countries depends on the implementation of precautionary measures in those settings.

Source and date of request

ECDC internal decision, 28 March 2014.

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Public health issue

To assess the risk of introduction and transmission of ebolavirus in the EU associated with the ongoing and rapidly evolving outbreak of Ebola virus disease in Guinea and neighbouring countries.

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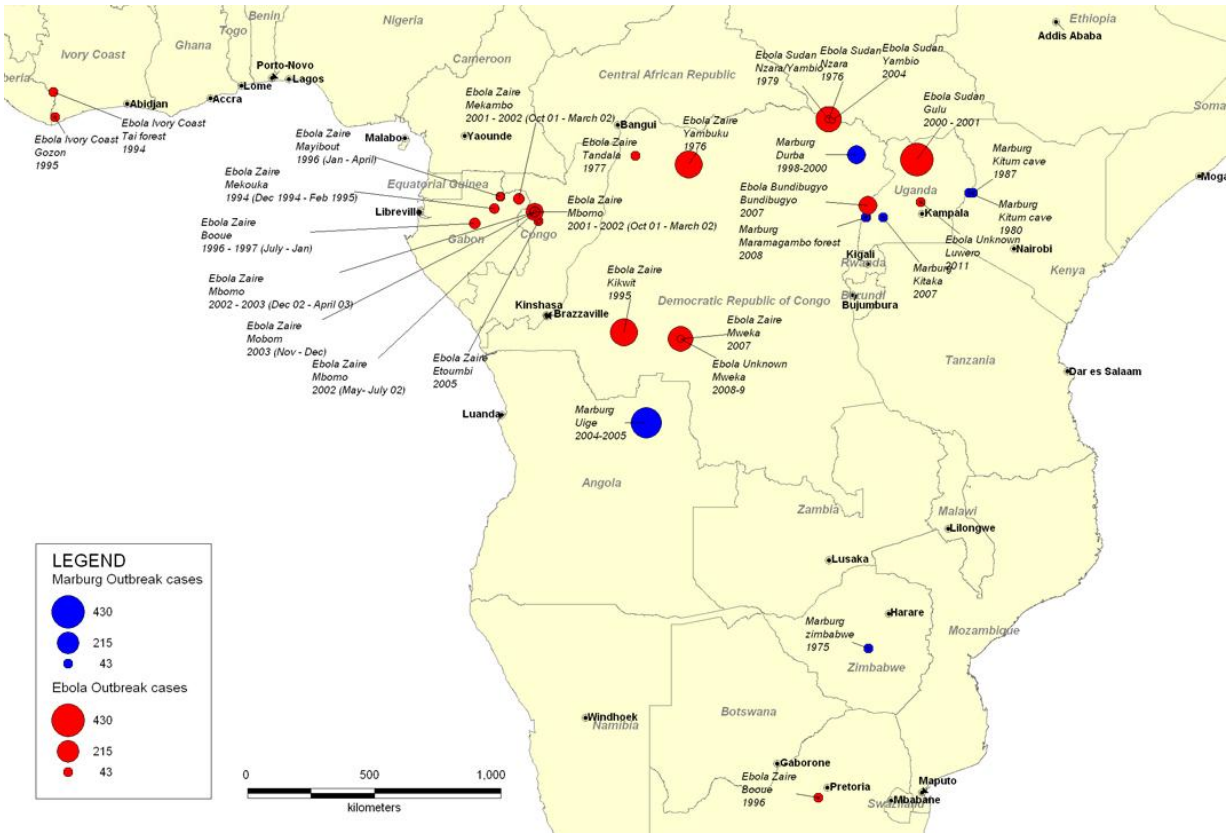
Disease background information

Infections with Ebola viruses originating from Africa cause a severe disease in humans, Ebola virus disease (EVD). Since the first documented EVD outbreak in Zaïre (now: the Democratic Republic of Congo) in 1976, five species of the genus *Ebolavirus* (Filoviridae family) have been identified from samples collected from humans and non-human primates during outbreaks of the disease: *Zaïre ebolavirus* (EBOV), *Sudan ebolavirus*, *Reston ebolavirus*, *Taï Forest ebolavirus* and *Bundibugyo ebolavirus* [1,2]. Ebola viruses and Marburg virus, another member of the Filoviridae family, are classified as biosafety level 4 pathogens (BSL-4; risk group 4) and require special containment measures and barrier protection, in particular for healthcare workers. The map below presents the geographical distribution of Ebola outbreaks from 1976 to 2011 in Africa.

Figure 1: Distribution of Ebola virus disease outbreaks and Marburg haemorrhagic fever outbreaks in Africa, 1976–2011



Source: Public Health England. Available from: http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Ebola/Maps/

The onset of EVD is sudden and early symptoms include flu-like illness, fever, muscle pain (myalgia), fatigue (weakness), headache and sore throat. The next stage of the disease is characterised by symptoms and clinical manifestations from several organ systems. Symptoms can be gastrointestinal (vomiting, diarrhoea, anorexia and abdominal pain), neurological (headaches, confusion), vascular (conjunctival/pharyngeal injections), cutaneous (maculopapular rash), and respiratory (cough, chest pain, shortness of breath), and can include complete exhaustion (prostration). During the first week, patients often deteriorate suddenly, while diarrhoea and vomiting are getting worse. All of these symptoms correspond to the prodromal phase of EVD. After one week,

haemorrhagic manifestations can appear in more than half of the patients (bloody diarrhoea, nosebleeds, haematemesis, petechiae, ecchymosis and puncture bleedings). Some patients develop profuse internal and external haemorrhages and disseminated intravascular coagulation [3,4]. Patients in the final stage of disease die in the clinical picture of tachypnoea, anuria, hypovolemic shock and multi-organ failure.

The incubation period is usually four to ten days but can vary from two to 21 days. The case-fatality ratio for *Zaïre ebolavirus* (EBOV) infections is estimated to be between 50% and 90% [5].

Ebola viruses are highly transmissible by direct contact with infected blood, secretions, tissues, organs or other bodily fluids of dead or living infected persons. Airborne transmission has not been documented and person-to-person transmission is considered the principal mode of transmission for human outbreaks regardless of how the index case was infected. Burial ceremonies are known to play a role in transmission [6]. Transmission through sexual contact may occur up to seven weeks after clinical recovery, as observed for Marburg filovirus, and it is supposed to be possible for Ebola viruses [7].Transmission to humans can also occur by contact with dead or living infected animals, e.g. primates (such as monkeys and chimpanzees), forest antelopes, duikers, porcupines and bats [4]. Hunting and butchering of wildlife (great apes and fruit bats) has been identified in previous outbreaks as a potential source of infection [8]. Bats remain the most likely, but still unconfirmed, reservoir host for Ebola viruses [9-11]. To date, the reservoir of virus in West Africa is unknown.

EBOV can survive in liquid or dried material for a number of days [12]. However, EBOV can be inactivated by UV radiation, gamma irradiation, heating for 60 minutes at 60 °C or boiling for five minutes. The virus is susceptible to sodium hypochlorite and disinfectants [13]. Freezing or refrigeration will not inactivate Ebola virus [40-42].

The risk of getting infected with Ebola virus according to type of contact with a human case is summarised in Table 1 below. [5]

Table 1. Levels of risk of transmission of Ebola virus according to type of contact with an infected patient

Risk level	Type of contact
Very low or no recognised risk	Casual contact with a feverish, ambulant, self-caring patient. Examples: sharing a sitting area or public transportation; receptionist tasks.
Low risk	Close face-to-face contact with a feverish and ambulant patient. Example: physical examination, measuring temperature and blood pressures.
Moderate risk	Close face-to-face contact without appropriate personal protective equipment (including eye protection) with a patient who is coughing or vomiting, has nosebleeds or who has diarrhoea.
High risk	Percutaneous, needle stick or mucosal exposure to virus-contaminated blood, bodily fluids, tissues or laboratory specimens in severely ill or known positive patients

A review of the literature indicates a low risk of transmission in the early phase of symptomatic patients (prodromal phase around seven days) [5]. Risk of transmission may increase with transition to later stages of the disease with increasing viral titres [14]. In a household study, secondary transmission only took place if direct physical contact occurred. No transmission was reported without direct contact [15]. During an outbreak of *Sudan ebolavirus* in 2000 in Uganda, the most important risk factor was direct repeated contact with a sick person's bodily fluids during the provision of care. The risk was higher when exposure took place during the late stages of the disease. Simple physical contact with a sick person appeared not to be sufficient for contracting Ebola infection. Transmission through fomites heavily contaminated with bodily fluids is possible [14].

For Ebola infections, notably with EBOV, the goal of outbreak control is to interrupt direct human-to-human transmission through the early identification and systematic isolation of cases, timely contact-tracing, proper personal protection, safely conducted burials, and improved community awareness about risk factors of Ebola infection and individual protective measures [6,15]. Quarantine of infected patients has been shown to effectively stop the spread of the disease in previous outbreaks.

Healthcare workers have frequently been infected while treating patients with suspected or confirmed EVD. This occurred through close contact with patients when infection control precautions were not strictly practiced. Healthcare workers can become infected through close contact with infected patients or contaminated hospital materials and medical waste. The risk for infection can be significantly reduced through the appropriate use of infection control precautions and adequate and strict barrier nursing procedures [4,16].

Surveillance of viral haemorrhagic fevers has been enhanced in several African countries [1,2]. In 2013, there were no reports of outbreaks of Ebola or Marburg viral infections in Africa. The present outbreak is the first documented human outbreak of EVD in West Africa, save one exception: a single non-fatal human case reported from Côte d'Ivoire in a person who had performed a necropsy on a wild chimpanzee in the Taï forest, in November 1994 [19]. The animal was part of a group of chimpanzees affected by EVD, and this remains the only isolation of *Taï Forest ebolavirus*. Guinea is at the western end of the rain forest belt, and some limited serological evidence of *ebolavirus* infections in humans has been documented in Guinea, although no human cases were reported [18,19].

There are no specific prophylactic (licensed vaccine) or therapeutic (antiviral therapy) options available to treat human infections, despite recent advances in research [20,21]. Severely ill patients require intensive supportive

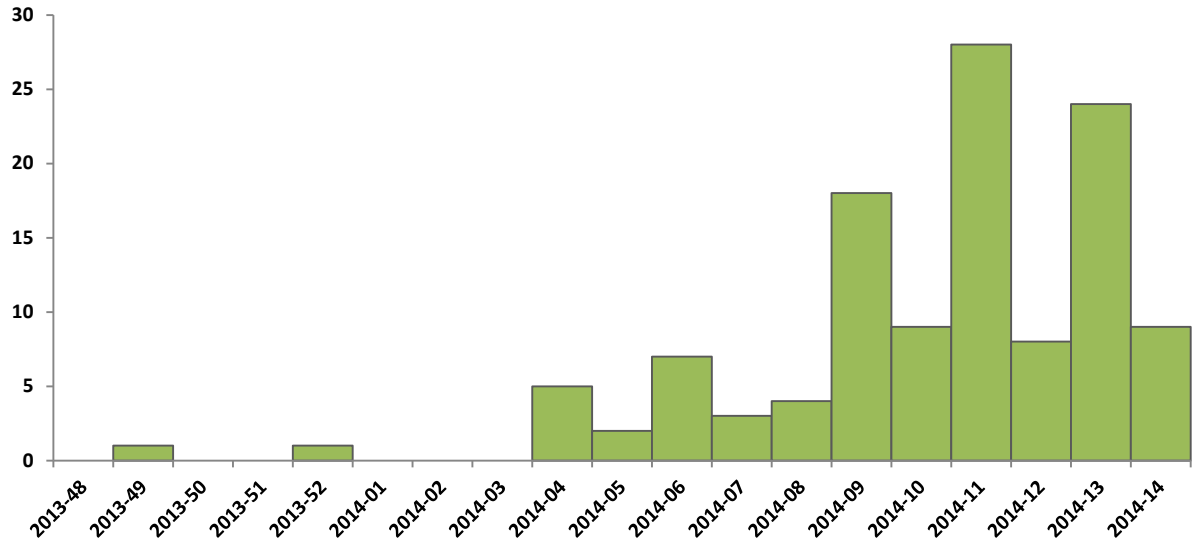
care. Patients are frequently dehydrated and require oral rehydration with solutions containing electrolytes or intravenous fluids.

Event background information

An outbreak of haemorrhagic fever due to EVD in Guinea and Liberia, West Africa, with onset in early February 2014, is ongoing. The first cases were reported from the forested region of south-eastern Guinea in Guéckédou prefecture near the border with Liberia and Sierra Leone. The Ebola viral aetiology was confirmed on 22 March 2014 by the National Reference Centre for Viral Haemorrhagic Fevers (Institut Pasteur, INSERM BSL4 laboratory, Lyon, France) [24]. Sequencing of part of the outbreak virus L-gene has shown that it is 98% homologous with an EBOV last reported in 2009 in Kasai-Occidental Province of the Democratic Republic of Congo [6,8,22-24]. This *ebolavirus* species has been associated with a high case-fatality during previous outbreaks.

As of 7 April 2014, the Ministry of Health of Guinea has reported 151 clinically compatible cases of EVD, including 95 deaths. Cases have been reported from Conakry, Guéckédou, Macenta, Kissidougou, and from Dabola and Djingaraye prefectures [27]. Fifty-four cases have tested positive for Ebola virus by PCR. At least 14 of the cases in Guinea have been healthcare workers, and eight of them have died, which indicates the need to further strengthen health facility-based infection prevention and control. Thirty-three patients had recovered after palliative treatment and were discharged from the isolation centres (Guéckédou 16, Macenta 9, Conakry 5, and Kissidougou 3). As of 7 April, 623 contacts are under follow-up [28].

Figure 2: Distribution of suspected and confirmed cases of EVD by week, Guinea, week 48/2013 to 14/2014



Source: Adapted from WHO Regional Office for Africa [30]

On 31 March 2014, the Liberian Ministry of Health announced an outbreak of EVD [27,29]. As of 7 April, five confirmed and 16 suspected cases have been reported from Lofa, Nimba, Bong, Montserrado and Margibi counties in Liberia, of which ten have been fatal. Three cases have occurred in healthcare workers, all of whom have died. The date of onset of the most recent confirmed case is 6 April, with six patients currently hospitalised. At present 28 contacts remain under medical observation [28].

Sierra Leone has reported two suspected fatal cases of viral haemorrhagic fever; both were subsequently laboratory confirmed as Lassa fever, an endemic disease in Sierra Leone. Active surveillance activities have identified no new cases [27,28]. However due to the proximity of the affected district to Guinea, a similar environment and cross-border movement of people, additional suspected cases compatible with EVD may be detected.

Guinea, Sierra Leone and Liberia have activated their national emergency committees, prepared response plans and carried out needs assessments [27].

Figure 3: Distribution of EVD cases by affected areas and confirmation status, as of 7 April 2014

Source: Adapted from WHO Regional Office for Africa [30]

The origin of this outbreak is currently unknown. However, exposure to bush meat has been suspected for the primary cases, as well as transmission through close contact with blood, secretions, organs or other biological fluids of infected animals. Most of the secondary cases participated in funeral ceremonies, and most were in direct contact with infected or deceased patients or had handled these corpses. This led local health authorities to consider human-to-human transmission as the main of mode transmission.

The Ministry of Health in Guinea has issued recommendations for early case detection, prevention of transmission in healthcare settings, and preventive individual and community measures (educational public health messages for risk reduction) to prevent further transmission [31]. According to the BBC, Guinea has banned the sale and consumption of bats to prevent the spread of the virus [32]. Control activities supported by WHO, UNICEF and Médecins Sans Frontières are being implemented, including contact tracing, enhanced surveillance and strengthening of infection control practices, free-of-charge access to healthcare for suspected cases, case isolation and management, and social mobilisation. Information and education materials have been developed and distributed, intensive multimedia communications are underway, and psychosocial support is being provided to patients, their families and the affected communities. There is ongoing training for carers in safe practices and the community in safe burials.

A team of scientists from the EU-funded project 'European Mobile Laboratory' (EMLab) has established a field laboratory to test suspect cases, working alongside Médecins Sans Frontières at an isolation centre near the borders with Sierra Leone and Liberia with partners from Germany, Italy, France, Hungary, Switzerland, Slovenia and the United Kingdom.

The French Ministry of Foreign Affairs issued a travel advisory warning to French citizens against travel to the affected parts of Guinea or areas of northern Liberia near the border between the two countries [33,34]. The Ministry of Health in France has implemented measures, including directives, and released information material regarding the outbreak, including travel advice and information for health professionals [35]. The Ministry of Health of Guinea has deployed a medical team at Conakry airport to check boarding passengers. Air France delivered thermal cameras and other equipment so health officials can check the body temperature of passengers.

On 26 March 2014, Senegal closed its land border with Guinea in an attempt to prevent the spread of the outbreak [36].

The Public Health Agency of Canada issued a travel health notice on 26 March 2014 recommending that travellers in Guinea should avoid direct contact with blood or bodily fluids of a person or corpse infected with the Ebola virus and avoid contact with, or handling, an animal suspected of having EVD [37].

In summary, two countries, Guinea and Liberia have reported confirmed cases of Ebola viral disease, while three others, Sierra Leone, Mali and Ghana are investigating suspected cases. Local transmission from person-to-person has occurred in several areas of Guinea and in Liberia according to the media. WHO indicates that every case so far has been traced back to a specific contact with an earlier case.

ECDC threat assessment for the EU

This is the first documented *ebolavirus* outbreak in West Africa. However, this outbreak was not entirely unexpected as Guinea shares an ecological system known to be associated with *ebolavirus* outbreaks, and some limited serological evidence of *ebolavirus* infections in humans has been documented [38].

The observed case-fatality ratio is currently of 63% and consistent with what has been documented in previous EBOV outbreaks. However, this case-fatality ratio should be interpreted with caution as laboratory testing is ongoing in order to confirm the status of suspected case with regards to EVD. Well-known risk factors commonly associated with such outbreaks include contact with animal fluids (to which primary cases were exposed) and with bodily fluids of patients (for example in connection with burials).

It is likely that more cases will be identified in the coming weeks, especially among highly exposed groups in Guinea and Liberia, given the incubation period of up to three weeks, and the challenges of containing this outbreak. In addition, active case-finding and contact monitoring may identify additional cases.

Risk for the EU

The capacity to detect and confirm cases of EVD in the EU is considered to be sufficient. The risk of EVD patients presenting in the EU can be assessed against the following possible situations:

Tourists returning from affected countries

There are two non-stop EU destinations from Conakry International Airport: Paris and Brussels. Monrovia International Airport has direct connections to Brussels, London and Paris. However, other EU destinations can be reached through a Royal Air Maroc hub in Casablanca, which offers connections to Paris, Nice, Lyon, Marseille, Toulouse, Barcelona, and Milan. Other non-stop destinations from Conakry include Senegal, Côte d'Ivoire, Mali, The Gambia, Mauritania, and Guinea-Bissau [39].

The risk of a tourists becoming infected with Ebola virus during a visit to the affected countries and developing disease after returning to the EU is extremely low, even if the visit included travel to the local areas from which primary cases have been reported. Transmission requires direct contact with blood, secretions, organs or other bodily fluids of dead or living infected persons or animals – all unlikely exposures for the average tourist.

Visiting families and friends

The risk for travellers visiting friends and relatives in affected countries is similarly low, unless the traveller has direct physical contact with a sick or dead person or animal infected with Ebola virus. Active contact tracing would identify the exposure and prevent further spread of the disease through active contact monitoring.

Exposed persons seeking medical attention in the EU

People who suspect that they have been exposed to Ebola virus may seek medical attention in the EU while incubating the disease. Examples include EU volunteers who worked in healthcare settings in the affected districts. These persons are likely to seek immediate medical attention and should be taken care of immediately if they develop any symptoms in order to prevent any further spread of the disease.

Patients presenting with symptoms and seeking medical attention in the EU

There is a possibility that persons who were exposed to an Ebola virus and developed symptoms board a commercial flight to seek medical attention in the EU. It is highly likely that such patients would seek immediate medical attention upon arrival in the EU and then be isolated to prevent further transmission.

Aircraft passengers exposed to an Ebola case during a flight

A traveller on board an airplane may be or become ill during the flight, presenting with symptoms compatible with EVD. The possibility of transmission to co-passengers and crew on board the aircraft should be assessed using the guidance provided in the ECDC RAGIDA guidelines [40]. If the investigation concludes that the passenger has symptoms compatible with Ebola fever and had risk exposure in an affected country in the past 21 days, all passengers seated one seat away from the infected traveller, as well as crew members, may be at risk if they have been in direct contact with bodily fluids or heavily contaminated fomites such as contaminated clothing, towels or utensils.

Risk for EU residents in affected countries

The risk for EU citizens resident in the affected countries can be considered as very low, unless they are directly exposed to bodily fluids of dead or living infected persons or animals. There is a risk of transmission through unprotected sexual contact with a patient that has recently recovered from the disease.

Risk for healthcare workers in affected countries

There is a specific risk for healthcare workers and volunteers, especially if involved in caring for Ebola viral disease patients. However, if the recommended level of precaution for such settings is observed, it should effectively prevent the transmission of the disease.

Laboratory samples shipped to EU laboratories

There is a theoretical risk that an improperly labelled and packed biological sample is sent to an EU laboratory for further testing, without proper indication of a possible connection to *Ebolavirus*. However, compliance with sample shipment regulations and universal precautions in the receiving laboratory should mitigate this risk [41].

WHO does not recommend that any travel or trade restrictions be applied to countries involved in the outbreak.

Options for prevention and control

Prevention of infection for tourists, visitors and residents

For tourists, visitors or residents in affected areas, the risk of infection is considered very low if some elementary precautions are followed:

- Avoiding contact with symptomatic patients and/or their bodily fluids
- Avoiding contact with corpses and/or bodily fluids from deceased patients

In addition, generic precautions for travelling in West African countries also apply for preventing infection with Ebola virus:

- Avoiding any form of close contact with wild animals (including monkeys, forest antelopes, rodents and bats), both alive and dead, and consumption of any type of 'bushmeat'
- Washing and peeling fruits and vegetables before consumption
- Strictly practising 'safe sex'
- Strictly following hand-washing routines

It is advised to avoid habitats which might be populated by bats such as caves, isolated shelters, or mining sites.

Prevention for healthcare workers

In healthcare settings, the risk level can vary from very low to low. However, the risk is high in the event of mishaps that result in skin penetrations or mucosal exposure to contaminated materials (e.g. needle stick injuries).

Preventive approaches for healthcare workers include:

- Full compliance to vaccinations (notably yellow fever) and malaria prophylaxis as recommended for the target region (including documentation as a vaccination record);
- sensitisation for viral haemorrhagic fever symptoms before working in endemic countries; and
- strict implementation of barrier management, use of personal protective equipment, and disinfection procedures, as per specific guidelines [45].

Possible scenarios for the EU/EEA

Scenario 1: Suspicion of exposure to Ebola virus

An EU citizen travelling to or residing in an affected country who suspects having been exposed to Ebola virus should be evaluated and assigned a 'level of risk of transmission', using the criteria described in Table 1.

If the risk of transmission is considered low or moderate, the person should be reassured and asked to monitor his/her temperature for 21 days.

If the risk of transmission is deemed high, e.g. a healthcare worker having experienced a needle stick injury, active monitoring of health status should be implemented immediately and a medical evacuation should be considered at an early stage by specialised air providers under high containment provisions.

Scenario 2: Person presenting with symptoms compatible with EVD

Symptoms compatible with EVD include flu-like symptoms with fever, muscle aches, myalgia, weakness, headache and sore throat at the prodromal phase which may develop into various clinical manifestations with gastrointestinal symptoms (vomiting, diarrhoea, anorexia and/or abdominal pain), neurological symptoms (headaches, confusion, prostration), vascular symptoms (conjunctival/pharyngeal injections), cutaneous symptoms (rash) and respiratory symptoms (cough, chest pain, shortness of breath).

An EU citizen residing or visiting an affected area who develops such symptoms with EVD should be assessed for possible exposure:

- If the person did not experience an exposure or experienced an exposure at low risk, other pathologies such as malaria should be investigated.
- If the person experienced an exposure of moderate or high risk level, a medical evacuation should be considered at an early stage, carried out by specialised air providers under high containment provisions; investigations for other possible causes of disease should be initiated immediately.

Scenario 3: Passenger with symptoms compatible with EVD on board of an airplane

Cabin crew identifying a sick passenger with suspicion of infectious disease on board, as well as ground staff receiving the passenger at the destination, should strictly follow the IATA guidelines for suspected communicable diseases. These guidelines provide information on how to handle a sick passenger during the flight, how to reduce the risk of transmission on board the aircraft, how to communicate the event to the destination airport, and how to record contact details on passenger locator cards for the passengers in the two rows around the case. Public health authorities and emergency medical services at the airport of destination should be informed in advance of arrival. On arrival, the sick passenger should be put in a separate room awaiting medical assessment. The assessment of possible exposure to *ebolavirus* and of the compatibility of the symptoms with Ebola virus disease is out of the scope of the airline crew's actions and should be performed by medically trained ground staff.

The population incidence of Ebola virus infection is low, even during an outbreak, and it is considered highly unlikely that a passenger infected with Ebola virus boards an airplane. In addition, the prodromal presentation of the disease is not characteristic enough to distinguish an Ebola virus infection from many other viral diseases. The public health response to a sick passenger on an aircraft should be based on a thorough assessment of the patient's possible exposure to *ebolavirus* rather than on the clinical presentation. The evaluation of the exposure should check if, within the past three weeks, the passenger has:

- visited a country where ebolavirus disease has been confirmed (for the current outbreak: Guinea and Liberia); AND
- been in contact with a sick or dead wild animal (particularly bats) while there; OR
- cared for and touched a severely ill or dead person

A 'yes' to question 1 and to either question 2 or 3 would signify that the ill passenger has been potentially exposed to Ebola virus in an affected country in the past three weeks. If the investigation does not conclude a significant risk of exposure to *ebolavirus* (no specific exposure for the sick traveller, no symptoms during the flight), contact tracing is not indicated. If the passenger experienced a risk exposure to Ebola virus, the following epidemiological measures based upon proximity to the index patient should be considered (ECDC RAGIDA guidelines):

- **Passengers and crew with reported direct contact**
  Co-travellers and crew members who had reported direct body contact with the index case should be traced-back. To gather this information, any records of significant events on the flight should be obtained from the airline.
- **Passengers seated one seat apart from the index patient**
  As direct contact is the main route of transmission for Ebola virus, only passengers who were seated one seat apart from the index case in all directions should be included in the trace-back. If the index case occupied an aisle seat, the three passengers seated directly across the aisle from the index case should also be traced-back.
- **Crew members of plane section**
  Crew members who provided in-flight service in the section of the aircraft where the index case was seated should be included in the trace-back, as well as other crew members who had direct contact with the patient.
- **Cleaning staff of plane section**
  The staff that cleaned the section seat where the index case was seated and the toilet facilities (if used by the index case) should be traced-back.

Traced-back passengers, crew members and cleaning staff who have been identified should be assessed for their specific level of exposure. The risk for transmission is considered low if no direct contact with the passenger or with material potentially contaminated by the passenger's bodily fluids has occurred. Self-monitoring of temperature should be considered for 21 days for all contacts. The same measures should be considered when a patient reports symptoms during a flight but fails to alert the crew.

There is no reason to quarantine the airplane upon arrival when a passenger presents with symptoms during the flight.

Further reading

- ECDC Guidance. Risk assessment guidelines for diseases transmitted on aircraft (Part2): http://ecdc.europa.eu/en/publications/publications/1012_gui_ragida_2.pdf
- IATA guidelines: http://www.iata.org/whatwedo/safety/health/Documents/health-guidelines-cabin-crew-2011.pdf
- Interim guidance about Ebola virus infection for airline flight crews, cargo and cleaning personnel, and personnel interacting with arriving passengers: http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/ebola/Ebola_airline.pdf
- Case report of patient symptomatic with Lassa virus fever travelling from Sierra Leone to Germany by plane: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=3008

Scenario 4: Patients and healthcare workers having been exposed to an unrecognised Ebola patient

Unrecognised Ebola virus fever has a high potential for spreading within a healthcare setting. This is caused by close person-to-person contacts and possible exposure to bodily fluids as occurring during nursing, diagnostic and treatment procedures, including the manipulation of biological samples. The risk for other patients and/or healthcare workers may rise to 'moderate' or 'high', depending on the conditions of an undiagnosed patient. The minimisation of time lag in suspecting and subsequently diagnosing EVD in a symptomatic patient is essential for containing outbreaks in a healthcare setting.

Once a case of EVD is suspected, the procedures in the healthcare facility are carried out as if the EVD was already confirmed. The responses include:

- Contact tracing among staff and patients who have been in contact with the suspected patient
- Medical monitoring of identified contacts (fever and prodromal symptoms)
- Immediate notification of the competent public health authorities
- Improvised barrier management in all areas where the suspected patient has been treated (contaminated zone, transition or sluicing zone, 'clean' zone)
- Patient handling under droplet hygiene precautions; in case of invasive, potentially aerosol-generating procedures: airborne transmission precautions
- Retaining waste and any type of bodily fluids from the patient in the contaminated zone until appropriate decontamination and disposal provisions are in place
- Handling and shipment of patient samples according to the international procedures for 'transport of category A infectious substances assigned to UN 2814 or UN 2900' [41]

Hospital preparedness measures promoting early detection and safe handling of viral haemorrhagic fever cases:

- Sensitisation of staff working in 'ports of entry' in a healthcare setting (emergency departments, ambulance services, GP offices) for early and advanced symptoms of viral haemorrhagic fever
- Focussing on systematic recording of travel history and vaccinations received
- Establishing a standard diagnostic procedure for ruling out common differential diagnoses at an early stage (e.g. malaria, yellow fever, dengue, Lassa fever, rickettsia and leptospirosis)
- Establishing a protocol for notification of the competent public health authorities at an early stage if suspecting an EVD case
- Knowing of, and establishing contact to, reference laboratories able to perform viral haemorrhagic fever diagnostics
- Knowing of, and establishing contact to, specialised treatment centres with high containment facilities
- Delivering basic training to healthcare workers on principles of provisional barrier nursing and use of personal protective equipment for droplet transmission precaution

Further reading

ENIVD guidance on management and control of VHF: http://www.enivd.de/NETZ.PDF [46].

VHF assessment chart for patients in emergency departments: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317135155050 [45].

RKI guidance on Ebola and Marburg virus (updated on 25th March 2014, German): http://www.rki.de/DE/Content/InfAZ/E/Ebola/Uebersicht.html?nn=2370426 [47].

Public Health Canada: Pathogen safety data sheet on Ebola virus: http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/ebola-eng.php [13].

Guideline for isolation precautions: preventing transmission of infectious agents in healthcare settings: http://www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf [48].

Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947382005 [45].

International guidelines for shipment of infectious substances: http://www.who.int/ihr/infectious_substances/en/ [41].

WHO Guidance on regulations for the Transport of Infectious Substances 2013–2014: http://apps.who.int/iris/bitstream/10665/78075/1/WHO_HSE_GCR_2012.12_eng.pdf [49].

Guidance on public health management of epidemics from unusual and high consequences diseases (pages 385-520, German): http://www.bbk.bund.de/SharedDocs/Downloads/BBK/DE/Publikationen/PublikationenForschung/BioGef-I_3Auflage.pdf [50].

Guidance on clinical treatment of VHF (pages 191-203, German): http://www.bbk.bund.de/SharedDocs/Downloads/BBK/DE/Publikationen/PublikationenForschung/BioGefahren-II-MedVers.pdf [51].

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