Travel and transport risk assessment: Interim guidance for public health authorities and the transport sector

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Travel and transport risk assessment: Interim guidance for public health authorities and the transport sector

This document is an update to the WHO document dated 21 April 2014 *"Travel and transport risk assessment: guidance for public health authorities and transport sector"*.

1. Background

- The incubation period of Ebola virus disease (EVD) (the interval from infection to the onset of symptoms) ranges from 2 to 21 days. People are not infective during the incubation period, but become infective with the onset of symptoms.
- Person-to-person transmission by means of direct contact with infected, symptomatic persons or their body fluids/secretions is the principal mode of transmission. Airborne transmission has not been documented.
- The risk of infection during the transport of persons can be reduced through the use of basic infection, prevention and control measures.
- In the current outbreak, infected travellers have crossed land borders with neighbouring countries or have travelled internationally. More EVD cases might be exported to non-affected countries.

2. Emergency committee recommendations

- An Emergency Committee for Ebola, convened 8 August 2014, under the International Health Regulations (2005), concluded that:
- The Ebola outbreak in West Africa constitutes an "extraordinary event" and a public health risk to other States.
- The possible consequences of further international spread are particularly serious in view of the virulence of the virus, the intensive transmission patterns both within the community and in health-care facilities, and the weak health systems in the currently affected and most at-risk countries.
- A coordinated international response is deemed essential to stop and reverse the international spread of Ebola.
- The WHO Director-General declared the Ebola outbreak in West Africa a Public Health Emergency of International Concern (PHEIC) and issued specific recommendations for the response to the Ebola outbreak (more information at http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/).

3. Risk of EVD for different groups

3.1 Travellers returning from affected areas

The risk of a traveller becoming infected with Ebola virus during a visit to the affected areas and developing disease after returning is extremely low, even if the visit included travel to areas where primary cases have been reported. Transmission requires direct contact with blood, secretions, other body fluid or tissues of infected persons, or with infected dead bodies or animals, all unlikely exposures for the average traveller. Travellers are strongly advised to avoid all such contacts.

3.2 Travellers visiting family and friends

The risk for travellers visiting family and friends in affected areas is similarly low, unless the traveller has direct physical contact with a sick or dead person or animal infected with Ebola virus. Visitors are strongly advised to avoid all direct physical contact with a sick or dead person infected with Ebola virus.

3.3 Patients travelling with symptoms and fellow travellers

There is a possibility that a person who has been exposed to Ebola virus and developed symptoms may board a commercial flight or other mode of transport, without informing the transport company of his/her status. Such patients should seek immediate medical attention upon arrival, and then be isolated to prevent further transmission. Although the risk to fellow travellers in such a situation is very low, contact tracing is recommended in such circumstances.

3.4 Health care workers in affected areas

There is a risk for health care workers and volunteers, especially if involved in caring for EVD patients. The risk can be considered low, unless adequate infection prevention and control measures (such as use of clean water and soap or alcohol-based hand rubs, personal protective equipment, safe injection practices and proper waste management) are not followed, including at medical services at ports, airports and ground crossings.

4. Guidance for public health authorities and transport sectors

4.1 Guidance for all countries

4.1.1 Raise the awareness and knowledge of travellers

Travellers leaving or arriving in an area where EVD transmission is occurring should be provided with information on the potential risk of EVD (see proposed template below) at points of departure and entry (e.g. in airports or ports, in boarding or arrival areas or at ground crossing points. Information should also be spread among communities with cross-border travellers and near relevant international borders. The information should emphasize that, to minimize the risk of infection, travellers or residents in the affected areas of countries should avoid:

- contact with blood or body fluids (e.g. saliva, vomit, urine and faeces) or tissues of an Ebola-infected person or dead body;
- contact with or handling of wild animals, alive or dead, or their raw or undercooked meat;
- having sexual intercourse with a sick person or with a man who has been infected with Ebola for at least 7 weeks after he has recovered;

- contact with used needles and any used objects that may have been contaminated by an Ebola-infected person or dead body, even if no blood or body fluid is visible.

Travellers should be informed about where to obtain medical assistance at their destination and whom to inform should they become ill (e.g. through hotline telephone numbers).

Visitors who have returned from the affected areas should be informed that if they develop symptoms such as fever, weakness, muscle pain, headache, sore throat, vomiting, diarrhoea, rash, or bleeding) within 3 weeks after return or if they suspect that they have been exposed to Ebola virus (e.g. volunteers who worked in health care settings) in the affected areas, they should seek immediate medical attention and mention their recent travel to the attending physician.

Template message for travellers

- Infection occurs through contact with blood, body fluids or tissues of an infected symptomatic person or by contact with contaminated objects.
- Persons who come into direct contact with an infected symptomatic person or infected animal are at risk.
- Avoid all contact with blood, body fluids, and tissues of sick people, even after their death.
- Do not handle items that may have been in contact with an infected person.
- Symptoms include fever, weakness, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, and, in some cases, bleeding.
- Cases of Ebola have recently been confirmed in Guinea, Liberia, Nigeria, Senegal and Sierra Leone. In these countries, care should be taken to avoid infection by EVD.
- Simply being in proximity to a healthy-looking person (for example, in a public transport conveyance) does not constitute a risk.
- There is no approved vaccine.
- Practise careful hygiene, especially hand hygiene with an alcohol-based hand rub solution (hand sanitizer), if available, and with soap and water when hands are visibly soiled. Practise hand hygiene especially before touching eyes, nose or mouth, and after using the toilet or touching objects at high risk of being contaminated.
- If you stayed in the areas where Ebola cases have been recently reported seek immediate medical attention if you feel ill (fever, headache, achiness, sore throat, diarrhoea, vomiting, stomach pain, rash, or red eyes). Early treatment improves the chance of recovery.

4.1.2 Raise the awareness and knowledge of health care providers

Health care providers managing travellers returning from affected areas need to ask them about their travel history and consider the possibility of EVD. A person suspected of having been exposed to Ebola virus should be evaluated to determine whether the traveller had direct physical contact with a sick or dead person with proven or suspected EVD (see section 3).

If the risk of exposure is considered low, the person should be reassured, asked to monitor his/her temperature and symptoms for 21 days and seek immediate care if symptoms develop. Other possible diagnoses (e.g. malaria) should be investigated and the patient monitored regularly. Admission to hospital in these observation phases is not necessary.

Essential information given to health care providers should include the following:

- The most common symptoms experienced by persons infected with the virus are the sudden onset of fever, intense weakness, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, impaired kidney and liver function, and, at an advanced stage, may include both internal and external bleeding. Laboratory findings include low white blood cells and platelet counts and elevated liver enzymes.
- The incubation period ranges from 2 to 21 days.
- People are infectious as long as their blood and secretions contain the virus. Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness.
- Malaria, typhoid fever, shigellosis, leptospirosis, yellow fever, dengue and other viral haemorrhagic fevers are among the differential diagnoses to consider in these patients.
- If the risk of exposure is deemed high (e.g. a health care worker having experienced a needle-stick injury with a potentially contaminated needle), transfer to a specialized centre should be considered.

More information can be obtained at:

- Disease Outbreak News (DON) (http://www.who.int/csr/don/en/)
- Frequently asked questions on Ebola (http://www.who.int/csr/disease/ebola/faq-ebola/en/)
- Ebola virus disease fact sheet (http://www.who.int/mediacentre/factsheets/fs103/en/)

4.1.3. Prepare health system response

In anticipation of EVD introduction, public health authorities need to:

- sensitize staff working at "points of entry" (ports, airports and ground crossings), in health-care settings or involved in first response (emergency departments, ambulance services, general practitioners' offices, fire departments, civil defence, airport operators, aircraft operators, port health authorities) for early and advanced symptoms of EVD;
- establish a protocol to notify the responsible public health authorities at an early stage if an EVD case is suspected;

- ensure basic training of staff working at points of entry or in emergency teams, and health care workers on principles of infection prevention and control, including hand hygiene, waste management, injection safety, and use of personal protective equipment, and other precautions to apply when in close contact with a suspected or confirmed case of EVD;
- emphasize to personnel working in the travel sector the importance of infection control and prevention measures for their own protection;
- keep the regulatory authorities (e.g. national civil aviation authority, maritime and port authorities, customs, immigration, etc.) informed and involved in decision-making.

Suspect cases coming from areas affected (e.g. passengers with symptoms identified on an aircraft) should immediately receive medical attention. Health-care professionals attending the individual should apply the same procedures as if the EVD has already been confirmed (WHO 2014 "*Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola*", available at http://www.who.int/entity/csr/resources/who-ipc-guidance-ebolafinal-09082014.pdf).

These include:

- isolating the suspected patient in a single room or in an isolation area where other suspected patients are grouped and kept separate from confirmed EVD cases and other patients;
- making personal protective equipment and hand hygiene facilities (alcohol-based hand rub solutions, running water, soap, and single-use towels) available and instructing health-care workers and visitors to use them appropriately;
- notifying immediately the relevant public health authorities;
- implementing contact tracing for all individuals who have been in direct contact with the suspected patient or their body fluids and setting up medical monitoring of identified contacts (for fever and other early symptoms); retaining waste and any type of body fluids in the isolation area until appropriate decontamination and disposal provisions are in place, including at points of entry;
- facilitating handling and shipping of patients' samples according to the international procedures for the transport of dangerous goods, Division 6.2. Ebola patient specimens should be transported as Category A, UN2814 and the proper shipping name is **Infectious Substances, Affecting Humans.**

Authorities should also emphasize systematic recording in health clinics of travel history of those with relevant symptoms; establish a standard diagnostic procedure for EVD and for common differential diagnoses at an early stage (e.g. malaria, dengue, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, relapsing fever, meningitis, hepatitis, yellow fever and other viral haemorrhagic fevers); and identify and establish operational channels with reference laboratories able to perform viral haemorrhagic fever diagnostics.

4.2 Guidance for public health measures at points of entry

WHO does not recommend travel restrictions to or from the countries affected, except for EVD patients, contacts of EVD patients and corpses of EVD patients.

4.2.1 Recommendations for States with Ebola transmission

- States should conduct exit screening of all persons at international airports, seaports and major land crossings, for unexplained febrile illness consistent with potential EVD. The exit screening should consist of, at a minimum, a questionnaire, a temperature measurement and, if there is fever, an assessment of the risk that the fever is caused by EVD.[1]
- Any person with an illness consistent with EVD should not be allowed to travel unless the travel is part of an appropriate medical evacuation.
- EVD patients to be repatriated or sent for medical care in another country, or seeking repatriation or medical care abroad, should be transferred only under special transport arrangements, such as properly equipped aircraft (air ambulances).
- Ebola contacts or cases should not travel internationally, unless the travel is part of an appropriate medical evacuation.
- To minimize the risk of international spread of EVD:
  - confirmed cases should immediately be isolated and treated in an Ebola treatment centre with no national or international travel until 2 Ebola-specific diagnostic tests conducted at least 48 hours apart are negative;
  - contacts (which do not include properly protected health workers and laboratory staff who have had no unprotected exposure) should be monitored daily, with restricted national travel and no international travel until 21 days after exposure;
  - probable and suspect cases should immediately be isolated and their travel should be restricted in accordance with their classification as either a confirmed case or contact.

4.2.2 All other States

- There should be no general ban on international travel or trade; restrictions outlined in these recommendations regarding the travel of EVD cases and contacts should be implemented.
- States should provide travellers to Ebola-affected and at-risk areas with relevant information on risks, measures to minimize those risks, and advice for managing a potential exposure.

4.2.3 Guidance for international air transport

National public health authorities should coordinate with aircraft and airport operators and ensure that passenger locator forms[2] are available in flight and/or at destination airports. Airport personnel and cabin crew should be appropriately trained for managing EVD

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[1] See: case definition recommendations for Ebola or Marburg Virus Diseases at http://www.who.int/csr/resources/publications/ebola/ebola-case-definition-contact-en.pdf?ua=1&ua=1

[2] ICAO passenger locator form Annex 9 Appendix 13 http://www.icao.int/safety/aviation-medicine/Pages/guidelines.aspx

cases/contacts, and medical and universal precaution kits should be available on board, in accordance with International Civil Aviation Organization (ICAO) guidelines.

Countries may consider requiring arriving aircraft to complete and deliver the health part of the ICAO aircraft general declaration (in those cases where the information is not communicated to the airport of arrival while in flight) concerning persons on board with communicable diseases or sources of infection (IHR Annex 9 and ICAO aircraft general declaration).

In case of a passenger presenting with symptoms compatible with EVD (fever, weakness, muscle pain, headache, sore throat, vomiting, diarrhoea, bleeding) on board an aircraft, the following measures, which are based on operational procedures recommended by the International Air Transport Association (IATA), should be immediately considered: http://www.iata.org/whatwedo/safety/health/Documents/health-guidelines-cabin-crew-2011.pdf.

Cabin crew should immediately apply precautionary and protective measures according to EVD protocol:

- distancing other passengers if possible and reseating them away from the symptomatic passenger, placing the ill traveller preferably near a toilet for his/her exclusive use;
- covering the nose and mouth of the patient with a medical facemask (if tolerated), if there are respiratory symptoms (e.g. coughing or sneezing). If the mask cannot be tolerated, the sick passenger should be provided with tissues and asked to cover his/her mouth and nose when coughing or sneezing and to perform hand hygiene thereafter;
- providing the sick passenger with a plastic bag for disposing used tissues and an air sickness bag, if experiencing nausea or vomiting;
- storing soiled items (used tissues, face masks, linen, pillows, blankets, seat pocket items, etc.) in a biohazard bag if one is available. If not, using a sealed plastic bag and labelling it "biohazard";
- limiting contacts of the passenger to the minimum necessary. Only one (or two if a sick passenger requires more assistance) cabin crew should care for the ill passenger and preferably only cabin crew that have already had contact with that passenger. This cabin crew member or anyone in direct contact with the sick passenger should be using the universal precaution kit (see below). They should wear gloves and perform hand hygiene after removing them;
- instructing cabin crew members to perform hand hygiene by hand rubbing with an alcohol-based hand-rub solution for about 20-30 seconds or hand-washing with soap and water for about 40-60 seconds if hands are visibly dirty, after any direct contact with the sick passenger or with his/her personal belongings or any objects/surface potentially contaminated with blood or body fluids from the sick passenger, and after removing gloves. If gloved hands are visibly dirty with body fluids (e.g. vomit) gloves should be removed at the site of the sick passenger and hand hygiene performed immediately.
- immediate notification of authorities at the destination airport in accordance with procedures endorsed by the ICAO;
- immediate isolation of the traveller upon arrival;

- a dedicated crew members assisting the ill traveller should use suitable personal protection equipment such as contained in the universal precaution kit recommended by ICAO (ICAO Health Related Documents): http://www.capsca.org/CAPSCARefs.html) and IATA Operational Safety Audit Standard Manual for dealing with the traveller and for cleaning procedures on board as needed.

The possibility of transmission to other passengers and crew on board the aircraft should be assessed by health care providers on arrival. If the investigation concludes that the passenger has symptoms compatible with EVD and has travelled and or stayed in a country that has reported at least one confirmed case of EVD within a period of 21 days before the onset of symptoms, passengers and crew members may be at risk if they have had direct contact with the affected individual or his/her body fluids or heavily contaminated objects.

The following measures based upon proximity to the index patient should be considered:

- **Passengers and crew with reported direct contact**

  To gather this information, any records of significant events on the flight should be obtained from the aircraft operator. Co-travellers and crew members who report direct body contact with the index case should undergo contact tracing.

- **Passengers seated adjacent to the index case**
  As direct contact is the main route of transmission for Ebola virus, only passengers who were seated adjacent to the index case on the side, in front or behind, including across an aisle, should be included in contact tracing.

- **Staff cleaning the affected aircraft section**

  Staff cleaning the affected aircraft section (where the sick passenger was seated and any other contaminated area, such as toilets) should be instructed to treat any remains of blood or body fluids as infectious. The cleaners should be trained to put on and remove personal protective equipment (WHO 2014 "*Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola*", available at http://www.who.int/entity/csr/resources/who-ipc-guidance-ebolafinal-09082014.pdf) and to apply the following precautions carefully:

  - wearing rubber gloves, impermeable gown and closed shoes (e.g. boots) when cleaning the environment and handling infectious waste;
  - wearing facial protection (mask and goggles or face shield) and overshoes if boots are unavailable, when undertaking cleaning activities with increased risk of splashes (e.g. cleaning surfaces heavily soiled with vomit or blood or disposing bags containing body fluids);
  - performing hand hygiene by hand-rubbing with an alcohol-based hand-rub solution for about 20-30 seconds or hand-washing with soap and water for about 40-60 seconds if hands are visibly dirty, after the removal of personal protective equipment.

Environmental surfaces or objects contaminated with blood, other body fluids, secretions or excretions should be cleaned and disinfected as soon as possible using detergents/disinfectants approved by the airline/aircraft manufacturer. Application of disinfectants should be preceded by cleaning to prevent inactivation of disinfectants by organic matter.

If the seat soiled with body fluid is made of non-cleanable fabric, it should be removed before the plane is used again.

If the case is suspected or diagnosed after the passenger has left the aircraft, the staff who cleaned the section and seat where the sick passenger was seated (or the toilet or any soiled part of the aircraft, if the patient experienced vomiting or diarrhoea during the flight) without wearing the personal protective equipment indicated above should also undergo contact tracing.

At the request of airport or port health authorities, airlines may also ask some or all passengers to provide information on their itineraries and their contact details where there is reason to believe they may have been exposed to infection on board an aircraft (e.g. as per the ICAO public health passenger locator form)[1].

Passengers, crew members and cleaning staff identified through contact tracing should be assessed for their specific level of exposure. Passive self-monitoring of temperature (e.g. monitoring temperature only if feeling feverish) and symptoms or active self-monitoring (e.g. by regular temperature measurement twice a day) for those at higher risk level should continue for 21 days.

These measures should also be considered after arrival if an individual who experienced symptoms during the flight is suspected of having EVD.

All at-risk persons should be provided with information on how and where they should seek medical care, should they develop relevant symptoms or require treatment.

References

ACI Airport preparedness guidelines for outbreaks of communicable disease http://www.aci.aero/About-ACI/Priorities/Health/Documentation

IATA guidelines for air crew to manage a suspected communicable disease or other public health emergency on board: http://www.iata.org/whatwedo/safety/health/Documents/health-guidelines-cabin-crew-2011.pdf

IATA guideline for cleaning crew for an arriving aircraft with a suspected case of communicable disease: http://www.iata.org/whatwedo/safety/health/Documents/health-guidelines-cleaning-crew.pdf

ICAO Health related documents (1) Procedures for Air Navigation Services; (2) Annex 6 – Medical Supplies; Annex 9 – General Declaration. http://www.capsca.org/CAPSCARefs.html

WHO Guide to Hygiene and Sanitation in Aviation which includes information on sanitizing of aircraft: http://www.who.int/water_sanitation_health/publications/aviation_guide/en/

4.2.4 Guidance for ships and shipping companies

Raise awareness among shipping companies of the need to immediately notify the port health authority prior to arrival if a person on board is suspected of having contracted Ebola (EVD). Ensure the ship's master, doctor or crew member appointed for health issues on board is fully informed and is educated about the risks of EVD, and the precautions and protective measures to be taken by crew members to prevent them from contracting the virus. In the case of a crew member or passenger presenting with symptoms compatible with EVD (fever, weakness, muscle pain, headache, sore throat, vomiting, diarrhoea, bleeding) on board a ship, the following precautions should be applied:

- keep the affected person's cabin doors closed, if not placed in an isolation room on board;
- provide information about the risk of EVD transmission to persons who will take care of the patient or enter their cabin or isolation room;
- maintain a log listing all people entering the cabin or isolation room, all of whom should be considered contacts unless a diagnostic test is reported as negative;
- ensure that anyone who enters the cabin or isolation room to provide care to the affected person or to clean the cabin uses personal protective equipment as follows:
  - non-sterile examination gloves or surgical gloves; gloves (cleaners should preferably use heavy duty/rubber gloves);
  - a disposable impermeable long-sleeved gown to cover clothing and exposed skin, a medical mask and eye protection (eye visor or goggles or face shield) when coming in close contact with the affected person and/or if any exposure to blood or body fluids is expected; if unavailable, a waterproof apron should be worn over a non-impermeable gown;
  - rubber boots or closed, puncture- and fluid-resistant shoes with overshoes.
  - before exiting the cabin or isolation room personal protective equipment should be removed in such a way as to avoid contact with the soiled items and any area of the face (WHO 2014 "*Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola*", available at http://www.who.int/entity/csr/resources/who-ipc-guidance-ebolafinal-09082014.pdf).
- Anyone providing care to the person in isolation should perform hand hygiene by hand-rubbing with an alcohol-based hand-rub solution for about 20-30 seconds or hand-washing with soap and water for about 40-60 seconds if hands are visibly dirty, before putting on gloves, after any direct contact with the affected passenger or with his/her personal belongings or any objects/surface potentially contaminated with his/her blood or body fluids and after removing personal protective equipment.
- Limit the movement and transport of the affected person from the cabin or isolation room to essential purposes only. If transport is necessary, the affected person should wear a medical mask.

- Clean and disinfect spills without spraying or using an aerosol. Used linen, cloths, eating utensils, laundry and any other item in contact with a patient's body fluids should be collected separately and disinfected in such a way as to avoid any contact with persons or contamination of the environment. Surfaces or objects contaminated with blood, other body fluids, secretions or excretions should be cleaned and disinfected as soon as possible using standard detergents/disinfectants (e.g. a 0.5% chlorine solution or a solution containing 1000 ppm available free chlorine) with a recommended contact time of 30 minutes. Application of disinfectants should be preceded by cleaning to prevent inactivation of disinfectants by organic matter. Soiled linen and cloths should not be reused and should be disposed of in infectious waste bags.
- All waste produced in the cabin or isolation room should be handled according to the protocol of the ship for clinical infectious waste. If an incinerator is available on board, waste should be incinerated. If waste must be delivered ashore, special precautions are needed and the port authority should be informed before waste delivery.
- Begin contact tracing immediately. Personal protective equipment is not necessary when interviewing asymptomatic individuals, when a distance of one metre is maintained.
- Close contacts of the affected persons (e.g. passengers, crew members or cleaning staff) should be identified, assessed for their specific level of exposure and asked to do passive self-monitoring of temperature (e.g. monitoring temperature only if feeling feverish) and symptoms or active self-monitoring (e.g. by regular temperature measurement twice a day and for 21 days).

In the event of a suspected diagnosis of EVD on a ship, immediate expert medical opinion should be sought and the event should be reported as soon as possible to the next port of call by the ship's master.

The affected crew member or passenger with symptoms consistent with EVD should disembark in such a way as to avoid any contact with other persons on board the vessel and wear a medical mask. Personnel in contact with the affected individual during the medical evacuation should wear a medical mask, a long-sleeved gown and eye protection or other suitable personal protective equipment.

Depending on the situation, the competent authority at the relevant port may need to arrange medical evacuation or special arrangements for disembarkation, hospitalization of the patient and laboratory diagnosis.

At the mandatory request of a governmental port health authority, shipping companies shall facilitate obtaining information on the itinerary and contact details of some or all persons on board if there is reason to believe they may have been exposed to infection on the ship. Countries may require arriving ships to complete and deliver the Maritime Declaration of Health (IHR Annex 8). Measures taken on board should also be noted on the IHR Ship sanitation control certificate (IHR Annex 3).

References

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