ECDC TECHNICAL REPORT

Infection prevention and control measures for Ebola virus disease
Public health management of healthcare workers returning from Ebola-affected areas

7 November 2014

Proposed options

All healthcare workers (HCW) returning from affected areas should be provided with information upon their return. In addition they should undergo an individual exposure assessment as early as possible upon returning. Additional measures can be considered on the basis of the results of the exposure assessment, using the guidance in the table below.

Type of exposure	Proposed option(s) for measures
No direct contact with EVD patients or their bodily fluids (e.g. involved in training local HCWs)	Passive monitoring
Appropriately protected contact with bodily fluids of EVD patients (e.g. laboratory worker), fomites (e.g. bed linen) or during clinical activities	Active monitoring
Unprotected, inappropriately protected contact or known breach of protection while caring for an EVD patient, handling bodily fluids of a patient or fomites	Active monitoring Restriction of engagement in clinical activities No travel abroad
Mucosa or parenteral direct contact with bodily fluids of a patient (e.g. pricking a finger with a needle used for a patient or getting bodily fluid projection in the eyes).	Active monitoring Restriction of engagement in clinical activities Restriction of social interactions Restriction of movement

The proposed options in the table above should be modulated according to the individual risk assessment. Healthcare workers need to be informed of the measures they should expect upon returning from affected areas prior to departure. Upon returning from affected areas, all HCWs should be informed of the procedures for their monitoring, following an individual assessment of exposures.

Measures for returning HCWs should be proportionate to their risks, ensure the best possible management in case they become ill, while aiming at protecting public health and in respect of their personal rights. Current evidence on transmission, particularly that it has only been clearly documented in symptomatic patients, suggests that full quarantine of asymptomatic contacts, including HCWs, would be a disproportionate measure, unless there is evidence of non-compliance with recommended measures resulting in a potential risk for public health.

This document was presented to the Health Security Committee and discussed at a teleconference on 7 November 2014. The Health Security Committee noted the contents of the document.

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Background

The unprecedented magnitude and geographic extent of the Ebola virus disease (EVD) epidemic in West Africa has overwhelmed the local response capacity, posing an extreme challenge for epidemic containment [1]. This has led to an international response which has increased over time, although the epidemic is not as yet contained. Modelling studies suggest that further escalation of the response is needed in order to bring the epidemic under control [2].

The increasing international response has meant that a large number of European and international experts, particularly healthcare workers, have been deployed in affected countries through the Global Outbreak Alert and Response Network (GOARN) and various governmental and non-governmental organisations. Médecins Sans Frontières (MSF) has deployed over 700 individuals in the field [3] and many countries have deployed medical and military staff to the region [4-6].

Healthcare workers have been identified as being particularly at risk for Ebola infection and 450 have been infected, with 244 deaths in affected West African countries as of the 23 October 2014 [7]. The majority of these were local healthcare workers and many of these infections occurred following exposures in non-specialised units or in the community, rather than in Ebola treatment centres. A number of international healthcare workers have also been infected, with 15 having been medically evacuated to Europe or the United States for treatment, as of the 24 October 2014 [8].

Healthcare workers are at risk of infection at various points in healthcare settings:

- in the early stage of symptomatic disease when unprotected contact can occur, as patients are not very contagious [9] but their infection is not yet recognised
- in the later stages of disease, after EVD is confirmed, when patients may experience very high viral loads while undergoing contamination-prone invasive procedures as part of their medical care. This has been the case in Spain and the United States while taking care of repatriated or imported EVD cases [10,11].

Following the declaration of the Public Health Event of International Concern (PHEIC) on 8 August 2014, WHO recommended that affected countries conduct exit screening of all persons at international airports, seaports and major land crossings for unexplained febrile illness consistent with potential Ebola infection. WHO also recommended that there should be no international travel of known Ebola cases or contacts of cases, unless the travel is part of an appropriate medical evacuation [12]. Although these recommendations do not specifically address healthcare workers, any symptomatic healthcare workers are unlikely to travel outside of a medical evacuation. However, due to the 21-day maximum incubation period of EVD [9], healthcare workers might travel and develop symptoms in the days after leaving affected areas as happened in the USA, where a healthcare worker was screened on arrival in a New York airport and was asymptomatic, but developed symptoms days after arrival in New York [13].

This document outlines current monitoring processes for returning healthcare workers and provides different options for reducing the risk of transmission of EVD from infected healthcare workers returning to the EU/EEA.

Existing guidance

Public health agencies and non-governmental organisations have issued recommendations on measures which should be taken by healthcare workers upon returning from Ebola-affected areas. The following section summarises guidance issued by selected agencies and organisations.

US Centers for Disease Control and Prevention (CDC)

The Centers for Disease Control and Prevention (CDC) in the United States (USA) issued interim guidance for monitoring and movement of persons potentially exposed to Ebola virus [14]. The guidelines are based on risk categories. Any person who has unprotected exposure to blood or body fluids of a symptomatic case without personal protective equipment (PPE) is considered as 'high risk'. Healthcare workers using appropriate PPE in countries with widespread transmission are considered as having 'some risk', whereas healthcare workers using appropriate PPE outside countries with widespread transmission are considered as having 'low but not zero risk'.

Healthcare workers caring for symptomatic Ebola patients while wearing appropriate PPE (irrespective of whether this was in West Africa or the USA) are required to undergo 'direct active monitoring' which means that an official from the relevant public health authority assesses daily the presence of symptoms and fever through direct observation for 21 days following the return from an affected area.

Healthcare workers in the 'low but not zero risk' category do not have any restrictions imposed on travel, work, attendance at public gatherings and public transport use. Those in the 'some risk' category are assessed individually and might have restrictions related to the use of public transport, long-distance travel (airplane, bus, ship, train), attendance at mass gatherings or public places and workplaces. Persons in the 'high risk' category are restricted from the use of public transport, long-distance travel (airplane, bus, ship, subway, train), attendance at mass gatherings or public places and workplaces.

Following the identification of the case in a returning healthcare worker in New York, the states of Florida, Illinois, New Jersey and New York issued a mandatory 21-day quarantine on healthcare workers returning from affected areas [15-17]. Mandatory quarantine of healthcare workers has been criticised by the New York Health Commissioner and by other experts as it might lead to difficulties recruiting staff to work in affected areas [18,19] besides affecting their personal rights [20].

Public Health Agency of Canada

The Public Health Agency of Canada recommends that returning healthcare workers who have used appropriate PPE and not suspecting any breach should self-monitor for symptoms of Ebola for 21 days from the last contact with an Ebola case [21]. Symptomatic persons should contact their doctor prior to a planned visit to allow for safe management. Returning healthcare workers who 'provided care to cases or who have had other close physical contact with the case or deceased body, that may have resulted in unprotected exposure to blood or other body fluids from the case' are required to check their temperature twice a day and report a temperature above 38.6 °C, refrain from taking antipyretic medication, self-monitor for symptoms and self-isolate in case of any symptoms. They are advised that they should contact public health services as quickly as possible if any symptoms develop. No work restrictions are mentioned for asymptomatic healthcare workers.

Public Health England

Public Health England (PHE), on 26 September 2014, recommended that healthcare workers returning from affected areas should be assessed prior to returning to work involving patient contact in the UK in order to assess the degree of follow-up and work activities which may be undertaken in the following 21 days [22]:

- Persons who did not have contact with an Ebola case or body fluids from a case are allowed to return to normal activities without the need for monitoring or any reporting requirements.
- Persons who have been in direct contact with Ebola cases and/or body fluids from cases but with use of appropriate personal protective equipment (PPE) and without knowledge of any breaches are allowed to return to clinical work but with some restrictions. They are also required to check their temperature for 21 days following return and to report any temperature over 38°C.
- Persons who had direct contact with Ebola cases and/or body fluids from cases but who suspect having had breaches in PPE and/or did not use appropriate PPE are allowed to return to ordinary family and social contact, attend office-based work only (not patient care areas), and can take agreed UK transport (as discussed with the monitoring team at PHE). They are required to check their temperature twice daily for 21 days after return, and to report daily to a named monitoring team at PHE, even if they do not have a raised temperature (over 38°C) or other suspicious symptoms.
- Symptomatic persons should call a specific contact number or National Health Service or emergency services and provide information about symptoms and travel history to allow for safe management. The PHE monitoring team should also be informed.

Médecins Sans Frontières (MSF)

Médecins Sans Frontières, as one of the major organisations deploying healthcare workers in West Africa, has issued recommendations on self-monitoring for its workers [3]. The recommendations for the 21 days following return from affected areas include:

- checking temperature twice a day
- finishing a regular course of malaria prophylaxis (malaria symptoms can mimic Ebola symptoms)
- being aware of relevant symptoms, such as fever
- staying within four hours of a hospital with isolation facilities
- immediately contacting MSF offices if any relevant symptoms develop.

MSF does not recommend self-quarantine of returning staff. However, returned staff members are discouraged from returning to work during the 21-day period and MSF continues to provide salaries to returned staff during this time.

ECDC

The ECDC contact management document considers follow-up of healthcare workers who have cared for EVD cases as a specific group due to the continuous nature of occupational exposure even when with appropriate PPE [23].

Healthcare workers who have cared for EVD cases in EU/EEA hospitals should be registered and monitored as part of the occupational health practices of their country of practice. This usually involves registration, active monitoring of symptoms and a prompt investigation in case of any symptoms possibly related to EVD.

Potential measures for management of healthcare workers returning from affected areas

This section summarises the potential measures that can be considered for the management of asymptomatic HCWs returning from affected areas.

Registration

Establishing a register of healthcare workers engaged in providing care for EVD patients in affected countries and areas can facilitate contact with them and potential monitoring of their status on return.

Information to returning healthcare workers

The information provided should include:

- general information on EVD: incubation period, clinical presentation, transmission
- advice on general protective measures for contacts, with specific attention to family and close friends contact as well as co-workers
- advice on the monitoring regime recommended after deployment
- procedures and information on how to report symptoms and seek medical help in case of need
- contact number of the responsible public health office, available 24 hours a day, in case of onset of symptoms.

Healthcare workers should be advised to call their doctor or hospital should they develop symptoms within the 21-day period following their departure from an affected area prior to attending, and inform them of their travel history and possible exposure.

Individual exposure assessment

This measure consists of conducting an individual assessment of healthcare workers returning from affected areas, taking into account:

- the nature of activities in affected areas: clinical, laboratory, epidemiological
- possible exposure to EVD cases or bodily fluids using recommended personal protection procedures and equipment
- possible unprotected exposures having taking place
- known breach of personal protective measures.

The assessment should characterise the level of exposure for the HCW and should be used as the basis for determining the measures to be applied.

The assessment should result in the categorisation of the HCW exposure, in order of magnitude of risk:

- no direct contact with EVD patients or their bodily fluids (e.g. involved in training local HCWs)
- appropriately protected contact with bodily fluids of EVD patients (e.g. laboratory worker), fomites (e.g. bed linen) or during clinical activities
- Unprotected, inappropriately protected contact or known breach of protection while caring for an EVD patient, handling bodily fluids of a patient or fomites
- Mucosa or parenteral direct contact with bodily fluids of a patient (e.g. pricking a finger with a needle used for a patient or getting bodily fluid projection in the eyes).

The assessment represents an opportunity to offer psychological support to returning HCWs.

Monitoring of symptoms and body temperature

This measure relies on monitoring of symptoms and body temperature twice a day for 21 days after the last possible exposure. Monitoring can be:

- passive: self-monitoring by returning healthcare worker
- active: the returning healthcare worker having to report daily the result of the monitoring to a health authority or to the employer
- direct active: monitoring is done through direct observation of the HCW by a health officer.

Monitoring can use forms and checklists to ensure consistency with different HCWs over time.

Restriction of engagement in clinical activities

Clinical activities are situations where transmission of disease can occur from a HCW to a patient, because of the nature of the care provided and the status of the patient. This measure imposes that a HCW does not perform activities that will involve contact with patients.

Restriction of social interactions

This measure imposes voluntary social interaction limitations. It may be complemented by the maintenance by the HCW of a register of contact occurring during the 21 day monitoring phase. It may require non-attendance at the workplace during the monitoring period.

Restriction of movement

This measure considers the limitation of use of public transport and attendance to public events and celebrations. It may require that no travel abroad takes place or that the HCW remains within four hours of a health facility with isolation capacity.

Quarantine (self/mandatory)

This measure imposes that the returning HCW remains confined at home (self-quarantine) or in a dedicated facility (mandatory quarantine) for the duration of the monitoring. This measure results in a minimal number of interactions with contacts. This measure should be accompanied by psychosocial support and financial compensations should be considered.

Scientific evidence

The scientific evidence underlining the effectiveness of the measures indicated in the previous section is limited. Scientific evidence on the use of temperature for screening for infection is referenced to in the ECDC technical document on 'Exit and entry screening measures' [25]. Scientific evidence regarding the characteristic of the disease and its mode of transmission is referenced in the ECDC rapid risk assessments [1]. Measures related to restriction of movements and social interactions, including quarantine are effective during the period of infectiousness of a patient, but there is no scientific evidence supporting their appropriateness in the asymptomatic phase of the disease.

Proposed options

All HCWs returning from affected areas should be provided with information upon their return. In addition they should undergo an individual exposure assessment as early as possible upon returning. Additional measures can be considered on the basis of the results of the exposure assessment, using the guidance in the table below.

Type of exposure	Proposed option(s) for measures
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Unprotected, inappropriately protected contact or known breach of protection while caring for an EVD patient, handling bodily fluids of a patient or fomites	Active monitoring Restriction of engagement in clinical activities No travel abroad
Mucosa or parenteral direct contact with bodily fluids of a patient (e.g. pricking a finger with a needle used for a patient or getting bodily fluid projection in the eyes).	Active monitoring Restriction of engagement in clinical activities Restriction of social interactions Restriction of movement Post-exposure prophylaxis can be considered

The proposed options in the table above should be modulated according to the individual risk assessment. Current evidence on transmission, particularly that it has only been clearly documented in symptomatic patients, suggests that full quarantine of asymptomatic contacts, including HCWs, would be a disproportionate measure, unless there is evidence of non-compliance with recommended measures resulting in a potential risk for public health. Measures adopted by Member States may also vary according to national laws and regulations.

Conclusion

Healthcare workers need to be informed of the measures they should expect upon returning from affected areas prior to departure. Upon returning from affected areas, all HCWs should be informed of the procedures for their monitoring, following an individual assessment of exposure. Measures for returning HCWs should be proportionate to their risks, ensure the best possible management in case they become ill, while aiming at protecting public health and in respect of their personal rights.

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