RAPID RISK ASSESSMENT

Outbreak of Ebola haemorrhagic fever in the Democratic Republic of Congo

22 August 2012

Main conclusions and recommendations

An outbreak of Ebola haemorrhagic fever is ongoing in the Democratic Republic of Congo (DRC) with 15 cases reported, including nine deaths in Orientale province.

It is the first time that the Ebola species *Bundibugyo* has been laboratory confirmed as the cause of an Ebola outbreak in DRC. This finding indicates that the current outbreak in DRC is not related to the recently ended outbreak in Uganda, which was caused by the Ebola species *Sudan*.

The epidemiological features of this outbreak are consistent with previous outbreaks of Ebola haemorrhagic fever, although the currently observed case fatality rate is significantly higher than the one observed in the first outbreak of Bundingbuyo virus in 2007 in Uganda. However, it is premature to draw final conclusions about the pathogenicity of this *Bundingbuyo* viral strain.

As the incubation period can last up to three weeks, it is likely that additional cases will be identified in the coming weeks. However, control measures currently implemented in DRC with the support of international partners, e.g. isolation of cases and active monitoring of contacts, should prevent further spread of the disease.

It is unlikely, but not impossible, that travellers infected in DRC could arrive in the EU while incubating the disease and develop symptoms while in the EU. These cases would seek medical attention and be isolated, preventing further transmission.

Local and foreign citizens in DRC are not at risk of being infected unless they are in direct contact with bodily fluids of dead or living infected persons or animals. Avoidance of such contact would effectively mitigate this risk.

WHO does not recommend that any travel or trade restrictions be applied to DRC.

Public health issue

To assess the risk at EU level associated with the current Ebola haemorrhagic fever outbreak in DRC.

Source of date of request

ECDC internal decision on 21 August 2012.

Disease background information

Infection with Ebola viruses originating from Africa causes severe disease in humans. The onset of symptoms is sudden and includes fever, muscle aches, weakness, headache and sore throat. The next stage is characterised by vomiting, diarrhoea, rash and malfunction of liver and kidneys. Some cases present with profuse internal and external bleeding. In a final stage, patients are affected by multi-organ failure.

The incubation period varies from two to 21 days. The mortality rate of for sick individuals is estimated to be between 25% and 90% depending on the Ebola virus species.

There are no specific prophylactic (vaccine) or therapeutic (antiviral drugs) options available.

Ebola viruses are highly transmissible by direct contact with blood, secretions, organs or other body fluids of dead or living infected persons. Transmission through sexual contact can occur up to seven weeks after clinical recovery. Transmission can also occur by contact with dead or living infected animals (e.g. monkeys, chimpanzees, forest antelopes and bats) [1]. Airborne transmission (as in measles or smallpox) has never been documented.

A review of the literature indicated a low risk of transmission in the early phase of symptomatic patients, even with high-risk exposure. Risk of transmission may increase with transition to later stages of the disease with increasing viral titres [2]. In a household study, secondary transmission only took place if direct contact occurred. No transmission was reported without direct physical contact [3]. In an outbreak 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 to be not sufficient for contracting Ebola infection. Transmission through heavily contaminated fomites is apparently possible [4].

In summary, physical contact with bodily fluids seems necessary for transmission, especially in the early stages of disease while in the later stages contact with heavily contaminated fomites might also be a risk for transmission.

Nosocomial transmission can occur. Healthcare workers can become infected through close contact with infected patients. The risk for infection can be significantly reduced through the appropriate use of infection control precautions and adequate barrier procedures [1].

Event background information

On 17 August 2012, the Ministry of Health of the Democratic Republic of Congo notified WHO of an outbreak of Ebola haemorrhagic fever in the Orientale province in eastern DRC. As of 19 August 2012, 15 (13 probable and two confirmed) cases have been reported, including nine deaths; 12 cases and eight deaths were reported from Isiro, including three healthcare workers; two cases (no deaths) were recorded in Pawa; and one fatal case was reported from Dungu.

Laboratory investigations conducted at the Ugandan Virus Research Institute (UVRI), Entebbe, Uganda, confirmed the species *Bundibugyo ebolavirus* as the causative agent. Two of three samples tested positive for *Bundibugyo ebolavirus*.

A National Task Force, supported by WHO, Médecins Sans Frontières and the US Centers for Disease Control and Prevention (CDC), has been convened by the DRC Ministry of Health to conduct a detailed epidemiological investigation. An additional team of experts from the Republic of the Congo, DRC and the Institut Supérieur de Technologie in Libreville, Gabon, comprised of an epidemiologist, a logistician, an anthropologist, and social mobilisation officers is in the process of being mobilised for possible deployment in the field. Ongoing control activities include active case finding and contact tracing, enhanced surveillance, case management, public information and social mobilisation, and reinforcing infection control practices [5].

ECDC threat assessment for the EU

DRC experienced several outbreaks of Ebola haemorrhagic fever in the past, all caused by the Zaire Ebola virus:

- 1976: Yambuku, Mongala province (318 cases, 88% fatal)
- 1977: Tandala, Equateur province (one case, fatal)
- 1995: Bandundu province, mainly in Kikwit, with additional cases in Mosango, Vanga, Fashi, Yassa Bonga, Gungu, Bulungu, Imbongo, Mukala and Idiofa (315 cases, CFR 81%)
- 2007: Kasaï-Oriental province, mainly in Mweka and Luebo (264 cases, CFR 71%)
- 2008: Kasaï-Occidental province (32 cases, CFR 44%) [6-10].

In 1999 and 2000, outbreaks of Marburg haemorrhagic fever occurred in Durba/Durba-Watsa, Orientale province [11].

According to currently available information, the current outbreak in DRC and the earlier one in Uganda are independent from each other as different Ebola species were identified. *Sudan ebolavirus* was confirmed in Uganda, while *Bundibugyo ebolavirus* was detected in DRC.

This is the second ever recorded outbreak of Bundibugyo virus, which was first identified in 2007 in the Bundibugyo District of western Uganda [12].

The epidemiological features of this outbreak are consistent with previous outbreaks of Ebola fever, although the currently observed case-fatality rate of 60% is significantly higher than the one observed in the 2007 outbreak (25–40%) [13-14]. This could be due to the fact that milder cases were probably not identified during the early stage of the outbreak.

The severity of the disease was shown to be related to viral load [15].

It is too early to draw any final conclusions on the pathogenicity of this *Bundibugyo* viral strain.

It is likely that more cases will be identified in the coming weeks, as active case finding and contact monitoring is in place, and given the duration of the incubation period of up to three weeks.

Risk of patients developing symptoms while in the EU

The risk for patients to develop symptoms of Ebola haemorrhagic fever while in the EU can be assessed as follows:

- **Tourists returning from DRC**
  The risk that tourists having visited DRC have been infected and will develop symptoms while back in the EU is extremely low, even if they visited the outbreak region, as transmission can only occur in the context of direct contact with blood, secretions, organs or other bodily fluids of dead or living infected persons or animals. Returning visitors from tropical countries that develop infectious disease symptoms such as fever, headache or general malaise within three weeks after return should always seek rapid medical attention and mention their recent travel to the attending physician.
- **Visiting families and friends**
  The risk for travellers visiting friends and relatives is equally low, unless they have been in close physical contact with sick or dead persons or animals. In such case, the active contact tracing implemented by DRC authorities would be effective to identify such exposure and prevent further spread of the disease through active contact monitoring.
- **Exposed persons seeking medical attention in the EU**
  There is a possibility that persons knowing or suspecting that they have been exposed to a patient might seek medical attention in the EU while potentially incubating the disease. This can be the case, for example, of EU volunteers working in healthcare settings in the affected district. In such a situation, these persons are likely to seek immediate medical attention, and could therefore be dealt with so as to prevent any further spread, should they develop symptoms.
- **Patients presenting symptoms and seeking medical attention in the EU**
  There is a possibility that a person having been exposed and starting developing symptoms would use a commercial flight to seek medical attention in the EU. Such patients would certainly seek immediate medical attention upon arrival in the EU and be isolated to prevent further transmission. Regarding the risk for co-passengers in the commercial flight, ECDC published a guidance document stressing the very low level of risk in such situation [16].

In Europe, laboratory capacity in for an adequate diagnosis exists within the network of high security (Level 4) laboratories [17].

WHO does not recommend that any travel or trade restrictions be applied to DRC [5].

Risk for EU and other residents in DRC

The risk for local and foreign residents in DRC, including those who live in Orientale province, is extremely low, unless they would be directly exposed to bodily fluids of dead or living infected persons or animals. Avoiding such contacts is an appropriate precautionary measure in this context.

The risk of acquiring the disease through exposure with contaminated fluids or equipment in healthcare settings in DRC would be very low if suspected, probable and confirmed cases are dealt with in isolation wards with appropriate level of precaution.

There is a specific risk for healthcare workers, especially if involved in caring for Ebola haemorrhagic fever patients (e.g. volunteers). However, the level of precaution taken in such settings should effectively prevent the transmission of the disease.

There is a risk of transmission through unprotected sexual contact with a patient that has recently recovered from the disease.

Conclusions

An outbreak of Ebola haemorrhagic fever is currently ongoing in Democratic Republic of Congo (DRC) with 15 cases reported, including nine deaths from Orientale province.

It is the first time that the Ebola species Bundibugyo has been laboratory confirmed as cause of an Ebola outbreak in DRC. This finding indicates that the current outbreak in DRC is not related to the recently concluded outbreak in Uganda, which was caused by the Ebola species Sudan.

The epidemiological features of this outbreak are consistent with previous outbreaks of Ebola haemorrhagic fever, although the currently observed case fatality rate is significantly higher than the one observed in the first outbreak of Bundingbuyovirus in 2007 in Uganda. However, it is premature to conclude on the pathogenicity of this Bundingbuyo viral strain.

As the incubation period can be up to three weeks, it is likely that additional cases will be identified in the coming weeks. However, control measures currently implemented in DRC with the support of international partners, e.g. isolation of cases and active monitoring of contacts, should prevent further spread of the disease through patients identified.

It is unlikely, but not impossible that travellers infected in DRC could arrive in the EU while incubating the disease and develop symptoms while in the EU. However, such cases would seek medical attention and be isolated, therefore preventing further transmission.

Local and foreign residents in DRC are not at risk of being infected unless they are in direct contact with body fluids of dead or living infected persons or animals. Avoidance of such contact would effectively mitigate this risk.

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