

Responding to the Potential of Ebola Virus Disease (EVD) Importation into Malaysia

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Abstract

The current Ebola outbreak, which is the first to affect West African countries, has been declared to have met the conditions for a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO). Thus, the Ministry of Health (MOH) of Malaysia has taken steps to strengthen and enhanced the five core components of preparedness and response to mitigate the outbreak. The National Crisis Preparedness and Response Centre (CPRC) commands, controls and coordinates the preparedness and response plans for disasters, outbreaks, crises and emergencies (DOCE) related to health in a centralised way. Through standardised case definition and mandatory notification of Ebola by public and private practitioners, surveillance of Ebola is made possible. Government hospitals and laboratories have been identified to manage and diagnose Ebola virus infections, and medical staff members have been trained to handle an Ebola outbreak, with emphasis on strict infection prevention and control practices. Monitoring of the points of entry, focusing on travellers and students visiting or coming from West African countries is made possible by interagency collaborations. To alleviate the public's anxiety, effective risk communications are being delivered through various channels. With experience in past outbreak control, the MOH's preparedness and response plans are in place to abate an Ebola outbreak.

Keywords: Ebola, Ministry of Health Malaysia, preparedness, response, outbreak

Introduction

Ebola virus disease (EVD) is a severe illness caused by infection with a virus of the family *Filoviridae*, genus *Ebolavirus*. There are five identified subspecies of *Ebolavirus*, of which four cause disease in humans. These subspecies are the Ebola virus (*Zaire ebolavirus*; EBOV), Sudan virus (*Sudan ebolavirus*; SUDV), Taï Forest virus (*Taï Forest ebolavirus*; TAFV) and Bundibugyo

virus (*Bundibugyo ebolavirus*; BDBV). The Reston virus (*Reston ebolavirus*; RESTV) has caused disease in non-human primates, but not in humans (1). EVD is associated with a case fatality rate of up to 90%. Recently, the term "Ebola virus disease" has begun to be used (rather than the earlier term of "Ebola haemorrhagic fever"), considering that haemorrhage is not observed

in all patients in the outbreak occurring in West Africa (2). To date, the 2014 Ebola outbreak is the longest, largest and most widespread Ebola outbreak in history and the first in West Africa (3). This outbreak started in Guinea in December 2013 but was only reported to the World Health Organization (WHO) in March 2014 and later spread to Liberia, Sierra Leone and Nigeria (4). On 8 August 2014, the WHO declared that the conditions for a Public Health Emergency of International Concern (PHEIC) had been met by the EVD outbreak in West Africa (5).

Preparedness and Response

Five core components of preparedness and response were identified by the Ministry of Health (MOH) in responding to the possibility of an EVD outbreak in Malaysia, as follows:

- a) Command;
- b) Surveillance and risk assessment;
- c) Medical and laboratory response;
- d) Public health interventions;
- e) Communication

These core components were strengthened to ensure an effective, appropriate and timely response, thus fulfilling the preparedness requirement.

Command

The National Crisis Preparedness and Response Centre (CPRC), which is the national command centre for infectious disease surveillance under the MOH, was established under the 9th Malaysia Plan (2006-2010) for the management of health-related crises and disasters (6). The sole purpose of the CPRC is to be a central nerve point for the command, control and coordination of the management of disasters, outbreaks, crises and emergencies (DOCE) at the national level (Table 1). The CPRC vigorously and continuously monitors the development of the EVD situation internationally and locally, with co-operation and collaboration with the respective agencies. In line with providing the latest updates on the development of the Ebola outbreak, the CPRC channels the information to the relevant local stakeholders for appropriate action.

Surveillance and risk assessment

Ebola is listed as one of the mandatory notifiable diseases in Malaysia under the

Prevention and Control of Infectious Disease Act 1988 (Act 342) (7). It is also one of nine notifiable diseases that need to be reported within 24 hours by telephone, in addition to submission of the prescribed form. With this legal provision in place, both public and private practitioners are required to promptly report EVD cases that have been detected. Commonly, notification of infectious diseases by medical practitioners who treat or become aware of the existence of an infectious disease case within their premises is made to the nearest District Health Office, where the information will be entered into an online system known as 'eNotifikasi'. The online system is accessible to the respective State Health Department and the Disease Control Division, Ministry of Health (MOH). In view of the timely response required for EVD management, an administrative directive has recently been issued to simultaneously involve the three parties in the notification process (i.e., the nearest District Health Office, the respective State Health Department and the Disease Control Division, MOH, via the CPRC). To date, the MOH has received several notifications of suspected EVD cases, better known as a person under investigation for EVD (PUI-EVD), but none was confirmed to be positive. To ensure smooth surveillance for EVD, a standardised case definition is being used (Table 2), which was adopted based on the case definition proposed by the Centers for Disease Control and Prevention (CDC), Atlanta, USA (8).

A risk assessment of the potential of EVD importation into Malaysia was conducted in response to the outbreak (the methodology for this assessment was adopted from the WHO manual) (9). Based on this assessment, the overall level of risk was estimated to be low, particularly if returning travellers and health care providers are properly informed and are aware of the risk. Information related to the EVD outbreak in West Africa has been disseminated to Malaysian travellers since April 2014 with the assistance of the Ministry of Foreign Affairs. Internally, within the MOH, this information has been circulated to the health care community nationwide through the State Health Departments at the same time.

Medical and laboratory response

The safety of health care personnel is of the utmost importance where Ebola is concerned. Therefore, these personnel are continuously reminded about the importance of adherence to strict infection prevention and control practices to avoid unintentional spread of Ebola infection within health care settings. The availability of

appropriate personal protective equipment (PPE) is taken into account to facilitate the success of such practices. To ensure safe patient triage throughout the health care system, 21 government hospitals were identified for immediate referral of each PUI-EVD nationwide. Once the individual is confirmed to be positive for EVD infection, he/she will be immediately transferred to one of the three designated hospitals for further management.

These hospitals are Sungai Buloh Hospital, Selangor (for managing confirmed cases within Peninsular Malaysia); Queen Elizabeth Hospital, Kota Kinabalu (for managing confirmed cases from Sabah and the Federal Territory of Labuan); and General Hospital of Sarawak (for managing confirmed cases within Sarawak). Nevertheless, health care personnel are reminded about prompt notification of each PUI-EVD through

Table 1: The National Crisis Preparedness and Response Centre (CPRC), Ministry of Health (MOH) Malaysia

Establishment

- The National CPRC has been established under the 9th Malaysia Plan (2005–2010) as part of the strategies to effectively manage disasters, outbreaks, crises and emergencies (DOCE) related to health
- Was officiated by the then Minister of Health, Dato' Dr. Chua Soi Lek on 7 May 2007

Functions

- General:
 - The primary responsibility is to act as a command centre for coordination of all public health activities related to crisis preparedness, response and recovery phases in managing DOCE
- Specific:
 - Strengthening the level of MOH preparedness
 - Establishment of strategies to address public health issues and recovery in the event of responding to disasters
 - Coordinate all health-related activities to ensure effective and immediate response
 - Reduce morbidity and mortality before, during and after the event through the adoption of multi-sectoral approach
 - Enhancing collaboration and coordination: international organizations, non-governmental organizations (NGOs), private sector including pharmaceutical companies and laboratories

Table 2: Interim Case Definition for Ebola Virus Disease (EVD)

Person under investigation for EVD (PUI-EVD)

- A person who has both consistent symptoms and risk factors as follows: Clinical criteria which includes fever of greater than 38.6 °C and additional symptoms such as severe headache, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage; and
- Epidemiologic risk factors within the past 21 days before the onset of symptoms, such as contact with blood or other body fluids or human remains of a patient known to have or suspected to have EVD; residence in or travel to an area where EVD transmission is active*; or direct handling of bats, rodents or primates from disease-endemic areas

Probable case

- A PUI who is a contact of an EVD case, regardless of the level of his / her exposure

Confirmed case

- A case with laboratory confirmed diagnostic evidence of Ebola virus infection

* Outbreak affected countries include Guinea, Sierra Leone and Liberia (as of 20 October 2014).

the established channel, which is critical for a timely response by those undertaking the field investigation.

The Institute for Medical Research (IMR), which is a biosafety level (BSL) 3 laboratory, is in charge of conducting the laboratory diagnosis of EVD by viral genome detection using real-time reverse transcription polymerase chain reaction (rRT-PCR). In preparation for a possible surge, with the availability of appropriate infrastructure, staff members from the National Public Health Laboratory (NPHL) Sungai Buloh were trained in the management of samples from a PUI-EVD and in laboratory testing for diagnosis of EVD. Due to logistic constraints faced by the health care facilities of East Malaysia, the ability to perform laboratory diagnosis of EVD was further extended to the Public Health Laboratory Kota Kinabalu, Sabah. In addition, as part of preparedness in dealing with an Ebola outbreak in Malaysia, the IMR organised training in BSL 3 practices among nine BSL 2 laboratories, comprising MOH laboratories and one laboratory from the armed forces. This training was for routine laboratory tests.

A guideline on EVD management in Malaysia was circulated nationwide in September 2014. The guideline covers various pertinent issues, as were mentioned earlier, including forensic management of EVD cases and management of clinical waste, linens, the environment, and other aspects with regards to EVD cases. A briefing session involving the key players was organised to ensure that a clear understanding was gathered from the circulated guideline. Furthermore, simulation exercises focusing on preparedness and response activities for EVD were conducted at various levels of the MOH of Malaysia. In addition, the MOH of Malaysia participated in an EVD simulation exercise that was organised by the Regional Office for the Western Pacific of the WHO in early October 2014.

Public health interventions

In the context of public health interventions regarding a potential EVD outbreak in Malaysia, priority is given to rapid deployment of the identified Rapid Response Team (RRT) and Rapid Assessment Team (RAT) for execution of the field investigation activities. These activities include contact tracing and referral of symptomatic contacts to the designated hospital using dedicated medical transportation. These teams are constantly reminded of the importance of practising optimal infection prevention and control measures at all time.

Malaysia is a popular destination for foreign students and tourists from the affected countries. Therefore, strengthening of public health interventions is warranted to prevent the potential occurrence of EVD infection in Malaysia. The required mechanism is in place to further enhance the interagency collaborations to curb such an undesirable outcome.

Through collaboration with the Ministry of Education, close monitoring of the health status of students arriving from the affected countries has been made possible. In addition, the MOH is working closely with partners at Malaysia's international points of entry (e.g., the Immigration Department of Malaysia and the airport/seaport/causeway authorities) to identify travellers coming from affected countries who show signs of illness. Such travellers will be referred to the Health Quarantine Centre or to health care personnel stationed at those premises for further management. Because Guinea, Liberia, Nigeria and Sierra Leone are listed as several of the countries at risk of yellow fever transmission, travellers coming from those countries are subjected to yellow fever screening at the international points of entry. With the ongoing EVD outbreak, the existing screening was further enhanced. Currently, there are no direct flights coming from the affected countries to Malaysia. Nevertheless, Health Alert Cards for EVD are distributed to incoming travellers and to the crew members of airlines from the EVD-affected countries arriving in Malaysia via various connecting flights.

With the assistance of Ministry of Foreign Affairs, a travel advisory has been issued to Malaysians, recommending avoidance of non-essential travel to the affected countries. The health status of Malaysian nationals stationed in the affected countries is monitored through feedback gathered from both the Ministry of Foreign Affairs and the Ministry of Defence. Concurrently, the potential transmission of Ebola virus through the importation of live animals or animal products is being closely monitored with assistance from the Department of Veterinary Services and the Department of Wildlife and National Parks (PERHILITAN), which are conducting a study acquiring local serological evidence of Ebola involving local wildlife, and especially fruit bats.

Communication

Effective risk communication is paramount in alleviating the anxiety of the general public. Hence, the MOH is constantly engaging the

public and concerned parties by utilising all of the available channels of communication. Regular updates are disseminated to the public through press statements issued by the Minister of Health or the Director General of Health, forums or talk shows broadcasted on television, the official MOH website and the MOH and its National CPRC Facebook pages. The public is being made aware of common signs and symptoms of EVD, preventive steps to be taken if they were to travel to the affected countries and what to watch for upon returning home from the affected countries. Through these measures, we are able to communicate and educate the general public, thus maintaining their awareness of and alertness towards EVD.

Conclusion

National preparedness in responding to potential EVD importation into Malaysia is vital to mitigate the negative impact not only on health but also on economic and social aspects. Strengthening of our national preparedness and response capacities should be built upon the foundation laid for pandemic influenza preparedness and the important lessons learned from responses to various outbreaks occurring locally, such as Nipah virus encephalitis in 1998–1999, severe acute respiratory syndrome (SARS) in 2002–2003 and the influenza A (H1N1) pandemic in 2009. Valuable experience has also been gained from dual incidents in 2014: the detection of our first laboratory-confirmed case of avian influenza A (H7N9), involving a tourist, and a report of a Malaysian national who succumbed to Middle East respiratory syndrome coronavirus (MERS-CoV) infection. In essence, preparedness and response capacity are prerequisites for effective risk reduction and effective evidence-based interventions for a potential EVD outbreak in Malaysia.

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References

1. WHO. Fact sheets on Ebola virus disease [Internet]. Geneva (CH): World Health Organization Media Centre; 2014 [cited 2014 Sep 2]. Available from: <http://www.who.int/mediacentre/factsheets/fs103/en/>.
2. Baize S, Pannetier D, Oestereich L, Rieger T, Koivogui L, Magassouba N, et al. Emergence of Zaire Ebola Virus Disease in Guinea – Preliminary Report. *N Eng J Med*. 2014;**371**:1418–1425. doi: 10.1056/NEJMoA1404505.
3. Briand S, Bertherat E, Cox P, Formenty P, Kieny MP, Myhre JK, et al. The International Ebola Emergency. *N Eng J Med*. 2014;**371**:1180–1183. doi: 10.1056/NEJMp1409858.
4. WHO. Global Alert and Response (GAR): Disease outbreak news: Ebola virus disease [Internet]. Geneva (CH): World Health Organization; 2014 [cited 2014 Sep 2]. Available from: <http://www.who.int/csr/don/archive/disease/ebola/en/>.
5. WHO. World Health Organization Statement on the Meeting of the International Health Regulations Emergency Committee Regarding the 2014 Ebola Outbreak in West Africa [Internet]. Geneva (CH): World Health Organization; 2014 [cited 2014 Sep 2]. Available from: <http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/>.
6. EPU. Ninth Malaysian Plan, 2006–2010 [Internet]. Putrajaya (MY): Economic Planning Unit; 2006 [cited 2014 Sep 10]. Available from: <http://www.epu.gov.my/en/ninth-malaysia-plan-2006-2010>.

7. MOH. Prevention and Control of Infectious Diseases Act 1988 (Act 342). [Internet]. Putrajaya (MY): Ministry of Health; 1988 [cited 2014 Sep 10]. Available from: http://www.moh.gov.my/index.php/database_stores/store_view_page/11/19.
8. US-CDC. Case Definition for Ebola Virus Disease (EVD). United States (US): Centres for Disease Control and Prevention; 2014 [cited 2014 Sep 17]. Available from: <http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>.
9. WHO. Rapid Risk Assessment of Acute Public Health Events [Internet]. Geneva (CH): World Health Organization; 2012 [cited 2014 Sep 2]. Available from: http://whqlibdoc.who.int/hq/2012/WHO_HSE_GAR_ARO_2012.1_eng.pdf.