

Prevalence and Current Approaches of Ebola Virus Disease in ASEAN Countries

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ABSTRACT

As indicated by the World Health Organization as of year 2014, around 10,000 people have been influenced with Ebola infection. The episode of Ebola in African locale is courged with a high death rate. Notwithstanding, in the United States, people influenced by Ebola have been given brilliant wellbeing offices, as the U.S. is one of the highest nations that have taken sterner wellbeing measures and principles against Ebola. Aside from the U.S., individuals in Asia, where billions live in indigence and general wellbeing frameworks are frequently extremely powerless, are under more serious danger of the Ebola infection. Despite the fact that nations like Singapore, Malaysia, South Korea and Japan can take stretched out measures to battle against the infection, nations like Philippines and Indonesia have unfathomable quantities of poor who may be incredibly influenced by a conceivable episode. At this moment, the chances that Asia will take a critical hit from the Ebola infection appear to be genuinely little. Yet, while it is far-fetched that Asia will encounter a real flare-up, genuine concerns stay about the infection coming to urban communities like Hong Kong, Beijing, Shanghai and Singapore through their worldwide airplane terminals. Wellbeing priests from the Association of Southeast Asian Nations (ASEAN) reported key measures not long ago to keep the Ebola plague from coming to the locale and to backing influenced nations. This article accordingly will concentrate on the prevalence and current approaches of Ebola Virus Disease in ASEAN nations which is the need of the hour.

Keywords: Economic impact, Malaysia, Social impact

INTRODUCTION

World Health Organization has pronounced the impulsive episode of Ebola Virus Disease (EVD) in a few nations in West Africa as a general wellbeing crisis [1]. The primary point of this confirmation is to contain the current flare-ups and anticipate further spread of Ebola through a globally composed reaction. The declaration additionally serves as a global readiness with the goal that nations can plan for any conceivable cases. It will help activate outside support and motion to battle Ebola in influencing nations. As such, there are no instances of Ebola in the 11 nations of the WHO's Southeast Asia Region [2]. This is the time to venture up in readiness. An effective overall health reaction will require solid wellbeing frameworks with delicate observation, contamination control and group preparation [1,2]. The extensive number of cases in peri-urban and provincial settings makes this a standout amongst the most difficult Ebola flare-ups ever [2]. The 2009 pandemic of flu obviously exhibited the significance of IHR (2005) as nations communicated data on the sickness spread continue to empower the worldwide group to mount a composed reaction. Since the commencement of IHR (2005), the nations of the WHO's Southeast Asia Region have been endeavoring to reinforce their national limits [3]. Considerable advancement has been made. More work is yet to be finished. Numerous nations have created arrangements to accomplish the coveted level of skill before June 2016 [4].

Prevalence of EVD in ASEAN Countries

In Philippines, there is currently no confirmed EVD case being reported. However, 7 suspected cases happened before when workers returning from Sierre Leone showed similar symptoms of EVD. However, further surveillance from Department of Health showed negative results [5]. Fortunately, there were no suspected cases of EVD reported in Laos and Brunei [6-8].

In Vietnam, a suspected case was found in Hoan My Hospital which is based in Da Nang. The suspected patient had arrived

from Guinea [9]. However, there are no confirmed cases of EVD in Vietnam according to several sources [10-12].

The only suspected incidence of Ebola in Indonesia was a patient who came from Liberia, which is one of the countries around the world affected by Ebola outbreak [13,14]. This patient had been admitted to Dr. Soedono General Hospital in Madiun, East [14]. Apart from that, in Myanmar, one suspected EVD cases was notified, but Myanmar Center for Disease Control and Prevention has confirmed the absence of Ebola virus after a series of tests [15,16]. Hence, to date no known cases of Ebola has been identified in Myanmar. Whereas in Malaysia, nine suspected EVD cases has been notified to National Crisis Preparedness And Response Centre, Ministry of Health [17,18]. However, all cases were confirmed to be negative [17,18]. To date, there is no confirmed Ebola infection case in Thailand. Since June, almost 3000 suspects travelled from Ebola outbreak countries were being monitored closely [19]. The reason for the huge number of suspects might be due to direct flights from Africa at least twice a day. An Australian man who returned to Thailand from the Democratic Republic of Congo was tested for elevated body temperature at Bangkok International Airport [20]. After the full investigation, the man was confirmed as negative to EVD. The Health Ministry of Cambodia together with World Health Organisation authorities stated there were no reported cases of EVD in Cambodia so far [21]. Lastly, Singaporean media have reported at least two suspected cases of Ebola, but none tested positive. One of them, a Nigerian woman, was discharged while the other person was diagnosed with tonsillitis after travelling to affected countries [22]. Singapore follows Australia regarding entry visa for Ebola affected countries.

EBOLA CONTROL AND PREVENTIVE MEASURES IN ASEAN COUNTRIES

Philippines

After the announcement of Alert Level Status 2 among the affected countries by the Department of Foreign Affairs (DFA), new contract

overseas Filipino workers (OFWs) deployment is being suspended in Philippines [23]. Certain guidelines are being implemented by the Inter-Agency Task Force on handling returning OFWs. These include, current OFWs are required to coordinate with their recruitment agencies to assess their risk from the disease at their respective place of deployment [23,24]. Coordination between Philippine labour officials, DFA and the Bureau of immigration should be initiated to discuss about repatriation of OFWs [24]. Returning OFWs that are symptomatic require clearance from the local health authorities of the country of employment before being allowed to embark. Other than that, successfully repatriated Filipinos that are symptomatic will be referred to appropriate health facilities whereas asymptomatic individuals will undergo a 30 days close monitoring by the Health Emergency Management Staff (HEMS) [23,24]. Regional health officials are also being put on standby to assist in monitoring asymptomatic cases and aid in admission of possible suspected cases to the nearest Department of Health (DoH) hospitals or medical centres [23].

On the other hand, healthcare and laboratory workers dealing with samples from infected individuals, as well as individuals who are in close contact with those who are affected are considered high risk group of being infected with EVD [23]. DoH urges those who are considered high risk to follow certain measures [23]. A national summit on EVD was also held in Philippine and interim guidelines were developed including the roles of health facilities in preparing and identifying EVD cases, isolation procedures for suspected EVD cases, management of probable and confirmed cases and infection control from triage to waste management [25]. The formation of preparation plan on EVD outbreak also includes private sectors [25]. Specialized training program is conducted in conjunction with WHO Philippines, dedicated to healthcare workers to improve their skills and knowledge in diagnosing and treating EVD cases which in turn will reduce the probability of the disease spreading within the country [26]. The objective of this training is to increase the capacity of health workers on a nationwide level [26]. Training will be prioritized to participants from DoH-referral hospitals, private hospitals and local government hospitals [26,27]. Besides, public health advisory information regarding EVD such as the prevalence, epidemiology, transmission method, sign and symptoms and other national news related to EVD is published online [28] to increase public awareness and to avoid stigmatizing of suspected patients. The country's National Reference Center for Emerging and Re-emerging Infectious Diseases is known as the Research Institute for Tropical Medicine (RITM). RITM has contributed in the prevention of EVD by developing a triage system for suspected EVD cases and also made improvement in patient screening and evaluation as well as infection control. Revealing, management and restraint of potentially high-risk infectious agents in DoH's major laboratory hospitals are also being upgraded by RITM from Biosafety Level (BSL) 2 to BSL 3 or 4 [27]. This includes upgrades such as using molecular detection method for rapid diagnosis, ensuring that the Special Pathogens Laboratory has the capability of conducting the latest recommended diagnostic test for Ebola, and providing eight negative-pressure isolation rooms in the hospital [25]. RITM is also responsible for providing the specialized training course for healthcare professionals which is supported by the DoH and WHO [26,27]. Adequate supply of PPE has been provided by the DoH [25,29]. First-line healthcare workers are being trained in usage of PPE [27]. DoH has allocated 500 million pesos in purchasing additional 2000 PPE for different medical facilities, such as RITM and Ninoy Aquino International Airport (NAIA) personnel [27].

Next, an interim guideline has been developed to prevent spreading of infection during laboratory works. The guideline consists of referral and delivery, processing, management of spills, disinfection and decontamination, post-testing procedures and waste management [30]. In order to prevent panic among the public, Philippine peace

keepers who returned from Liberia were also quarantined for 21 days on an isolated island to be monitored closely for any symptoms [31].

Lao People's Democratic Republic

In Laos, the Ministry of Health has initiated an agreement with Pasteur Institute in preparing a proper diagnostic laboratory testing for any possible EVD cases [32,33]. Any suspected cases of EVD will be tested at the hospital in conjunction with surveillance team at the Centre for Laboratory and Epidemiology [32]. The centre would then collect a sample to be tested at Pasteur institute for further confirmation [32,34]. Analysis result is expected to be known within 5 to 7 hours [32,34]. Pasteur Institute has already set up and trained a specialized team to conduct any tests safely and is available around the clock [32]. This action is also supported by WHO Lao Country Office. Besides that, the Disease Control Department is working together with WHO to closely monitor arriving passengers in Luang Prabang and Wattay International airports, Lao-Thai Friendship Bridge and other international crossing border checkpoints [8,33]. Disease Control Department is also trying to increase the knowledge and capacity on EVD of Disease Communicable Prevention Unit officers to help improve pandemic works of main hospitals. Similarly, information about EVD is also shared with ministries, education institutions as well as communities to increase awareness [8,34].

Furthermore, an agreement was made between the health sector of Vietnam, Laos and Cambodia to prevent the spread of EVD by implementing health quarantine at their shared aviation and land ports of entry [34,35]. Under the action programme, compulsory quarantine will be conducted at four airports, nine sea ports, 19 land and waterway international border gates, four main and three auxiliary land border gates [35]. The health sector of the three countries also agreed to regularly exchange disease information, helping others to improve the quarantine system's capacity as well as organising meetings regularly to review the implementation of agreements [35]. Also, authorities are advised to be alert about news reports published in Laos and foreign media to be aware of its potential to spread [34]. The information gathered must be shared with the society to increase public understanding [34]. The Ministry of Health is also given the role to coordinate relevant sectors to closely monitor the situation [34].

Vietnam

The government of Vietnam has introduced mandatory temperature check at the international airports in Hanoi and Ho Chi Minh City to prevent the entry of the virus by the passengers [11]. The DOH of Vietnam, together with the police and Department of Tourism has strict observation on the visitors who are from Ebola affected country for three weeks upon their arrival and required the visitors to sign a medical declaration before entering Vietnam [12,36]. Besides, healthcare facilities such as treatment equipment, isolation wards, medicines, personal protective gear as well as workforce will be fully prepared in the hospitals [12,37]. Nevertheless, rapid response teams will be set up at all levels including central, regional and provincial [38]. Similar to Philippine and Laos, the government of Vietnam also established educational campaigns to increase the awareness of the people for Ebola prevention as part of the preventing measures [38]. The Ministry of Information and Communications also help to popularize information regarding Ebola virus to the public through mass media and also provide advice on measures to be taken to prevent the spread of Ebola virus [36].

Moreover, the Ministry of Transport has arranged isolation rooms and isolation areas to quarantine suspected Ebola patients. In addition, training is provided to the aviation staffs in handling patients with Ebola signs in both train and plane. Health Ministry of Vietnam also urged the Foreign Ministry to provide the lists of people in Ebola affected areas who are applying for visa to enter Vietnam. The

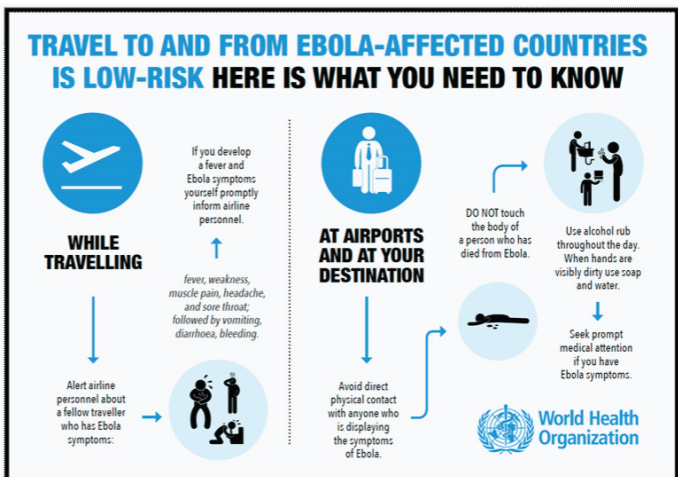
Foreign Ministry is also requested by the Health Ministry to provide basic knowledge of Ebola prevention to Vietnamese living in the Ebola hit countries and to those who intend to return to Vietnam from those countries [39].

Indonesia

The WHO recommends the government of Indonesia to implement policies to prevent Ebola cases by strengthening surveillance at airports and issuing travel advisories. The Ministry of Health of Indonesia has reinforced strict inspections on travelers from Africa and Middle East countries. As in Vietnam, thermal detectors had also set up at the arrival points such as airports and harbours to detect suspected symptoms of Ebola in people from Ebola affected countries. Like other countries, Indonesia government also continues to raise awareness of Ebola to public and healthcare workers [40]. Immigration offices will tighten and be extra cautious on issuing visas while potential visitors will also be required to go through medical checkups [40,41]. Universal precautions and contact precautions will be added to standard procedures in providing care to patients who are from countries with Ebola outbreak [40]. Besides, hospitals, laboratories and community health providers such as clinics and pharmacy has set up early detection and fast response mechanism in anticipating Ebola spreads in the country [41].

Myanmar

There are no established guidelines in the management of Ebola haemorrhage fever in Myanmar. Yet, Ministry of Health Myanmar has conducted intensive preventive measures at arrival and departure points for travelers in Myanmar [42,43]. Health workers at international entry point have been enforcing checks and trace history of travel [42,43]. They also check for vital signs and body temperature through infrared thermal imaging scan [42,43]. For those suspected of having EVD, emergency ambulances are prepared to transfer them to designated hospital [42,43]. As shown in [Table/Fig-1], WHO travel advisory to and from Ebola-affected countries is used as referral to enhance the local awareness and thus avoiding non-essential travel to EVD-endemic countries [42].



[Table/Fig-1]: WHO Travel advisory to and from Ebola-affected countries [44]

In healthcare settings of Myanmar, there are few established primary prevention measures. To minimise risk of transmission within health care clinics, health care workers must strictly adhere to and practise viral haemorrhagic fever isolation precautions or barrier nursing techniques [41]. These techniques include [42]:

- Wearing personal protective equipments (such as masks, gloves, scrubs and goggles).
- Adequate equipment sterilization and routine use of disinfectant.
- Isolation of Ebola Haemorrhage Fever patient.
- Proper cleaning and disposal of medical equipment such as needles and syringes.

Malaysia

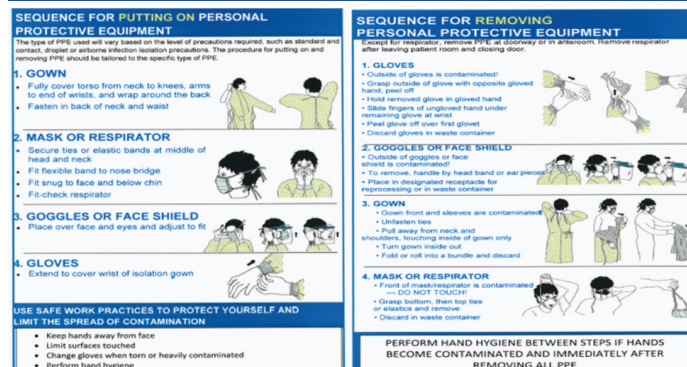
In Malaysia, The Ministry of Health (MOH) has strengthened five core components of preparedness and response to ensure appropriate control of outbreak [18]. The details of the five core components of preparedness and response are summarized in [Table/Fig-2-4] [18,19]:

Thailand

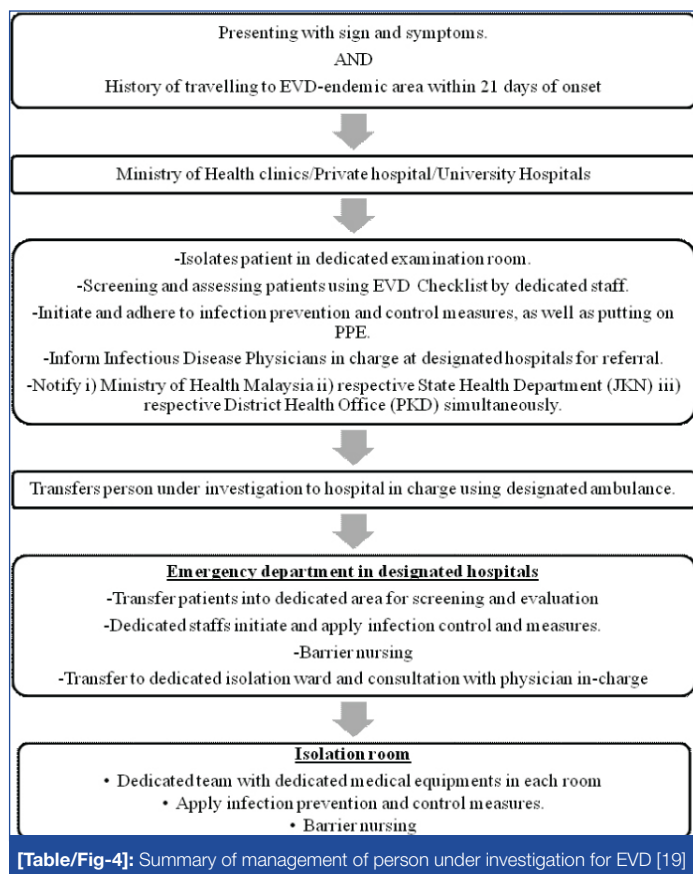
Thailand border authorities have strengthen the defence against testing for Ebola with the help of thermal imaging machines which

Core components	How it conducted	Purpose served
Command	Setting up of CPRC (Crisis Preparedness and Response Centre)	1. Act as central point, commands and monitors the development of the EVD circumstances at national level. 2. Involve in strategies establishment in addressing public health awareness.
Surveillance and risk assessment	All detected EVD cases must be reported within 24 hours via an online system known as 'eNotifikasi' [18] where these notifications will be issued simultaneously to the respective State Health Department and the Disease Control Division, via the CPRC [18,19].	To estimate overall level of risk, particularly returning travelers from affected countries [18].
Medical and laboratory response	The Institute for Medical Research (IMR) is responsible for running the laboratory diagnosis of EVD [18]. The laboratory personnel should be well-trained in the management of sample taking and strictly adhere to the guideline of pathology Laboratories in management of person under investigation for EVD [Table/Fig-4] [19]	To avoid the spread within health care settings
Public health intervention	Providing a set of patient cares as one of the infection control recommendations such as: 1. Visitors and staffs are advised on the correct sequences of wearing PPE before entering the isolation room [Table/Fig-3]. 2. Protocols in handling the contaminated environmental surfaces and proper way of disinfection. 3. Managing the linen used by confirmed EVD patients. 4. Recommending standard guidance in handling the infectious waste from confirmed EVD patients.	To limit the chances of EVD spreading
Communication	MOH Special communication is constantly disseminating press statements, or broadcasting EVD information through television, official MOH website and National CPRC Facebook pages [18]	1. To inform the general public to be more alert of symptoms and prevention of EVD as well alleviate anxiety among public.

[Table/Fig-2]: Summary of five core components of preparedness and response [19]



[Table/Fig-3]: Sequences for putting on PPE [19] (Left) and removing PPE (Right)



[Table/Fig-4]: Summary of management of person under investigation for EVD [19]

used to detect any tourist with body temperature of 37°C or above. Further medical examination will continue for suspected cases [21,45].

Cambodia

Cambodia has taken urgent measures to prevent the deadly Ebola virus by installing body temperature sensors at airports and border check points [46]. However, Cambodia has low public health risk for EVD because of the low travel connectivity between Cambodia with the West Africa. Standard Operating Procedures (SOPs) for airport personnel and airline staffs are also introduced in response to EVD [46]. The SOPs specify that returning travelers with a compatible travel history from Ebola endemic areas and symptoms that include sudden onset of fever, headache, muscle pain, fatigue, joint pain and sore throat will be isolated for deeper investigation. The Ministry of Health's Department of Communicable Disease Control (CDC) has selected five hospitals across the country (Calmette Hospital in Phnom Penh, hospitals in Siem Reap, Kompong Cham, Kampot and Stung Treng provinces) to quarantine anyone suspected as EVD carriers and specialists have been selected to manage the EVD suspects [47].

Singapore

Hospitals and healthcare in Singapore have been trained on infection control measures, including proper use of PPE. The hospitals should strictly adhere to stringent protocols when managing suspect and confirmed cases of Ebola. Suspected or confirmed cases should be managed at emergency department and quarantined from having all close contact, in an attempt to prevent the spread of disease [48]. Screening measures are done at arrival halls in Singapore Changi Airport, especially for travelers from Guinea, Liberia, Sierra Leone, Nigeria, Senegal and Democratic Republic of Congo through questionnaire and filling of Health Declaration Card. Returning travelers from affected countries should be transported immediately in appropriate ambulance to designated hospitals if any disease symptom is present within 21 days upon returning from affected areas. Surveillance including recent travel history should be assessed by physician [48].

Brunei Darussalam

The first prevention advised by the Brunei's government is to avoid travelling to Ebola-endemic countries [49]. Similarly to other ASEAN countries, medical checks are also available in airports for screening of travelers from Ebola affected countries. Since 17 October 2014, Brunei's Ministry of Health (MoH) requires completion of health declaration card from all travelers into the country through Brunei International Airport. It is also necessary for traveler from Ebola-affected countries to undergo health examination [49]. Apart from that, additional measure includes disseminating information on EDV to public, ensuring the preparation of the National Isolation Centre, sufficient treatment supplies such as drugs and PPE as well as carrying out test on the suitability of Ebola Virus Disease Preparedness Plan for Brunei [49]. Standard operating procedures (SOP) with guidance of WHO guidelines in management of EVD is also one of the preparation measure in handling EVD cases. Besides, the MoH also collaborate with local health organizations and WHO for clinical management of EVD which includes laboratory assessment [49].

Overall scenario, economic and social impact of ASEAN nations

Southeast Asia has a broad, if lamentable, experience managing profoundly irresistible illness flare-ups in the course of the most recent decade, which ought to place it in a generally solid position to react to any danger of an Ebola episode. The sudden appearance of extreme intense respiratory disorder (SARS) in 2002-2003 tainted more than 8,000 individuals and executed about 800, principally in Southern China, however brought about littler flare-ups and far reaching trepidation in Southeast Asia. Southeast Asia has been the epicenter of the battle to contain a harmful strain of H5N1 avian flu that arose in 2003. What's more, in 2009, another strain of flu called H1N1, or swine influenza, executed up to 18,500 individuals around the world, with episodes particularly extreme in Africa and Southeast Asia [10-15]. The World Health Organization acknowledges Southeast Asian countries for taking in the lessons from these episodes. Political pioneers, social insurance specialists, officials and others are vastly improved arranged to react as territorial collaboration has enhanced and nations have created composed reactions to episodes. In spite of the geographic separation between the two locals, Southeast Asia's ties with Africa have developed as of late as organizations have looked to grow exchanged and speculation opportunities [16-18]. Previous Prime Ministers of Thailand and Malaysia have both driven designations of business pioneers and government authorities on exchange missions to Africa looking for exchange, venture, and other business opportunities. The estimation of these financial ties has become rapidly [19-22]. In 2012 two-path exchange in the middle of Africa and Southeast Asia was worth \$42.5 billion, up from \$2.8 billion in 1990, making Africa the second-quickest developing landmass for ASEAN exchange. Southeast Asia's business ties have just been insignificantly influenced by the Ebola flare-up as such. Thailand's rice industry has maybe been hardest hit as the mass bearer vessels that convey its rice to West Africa have experienced issues discovering groups to man the boats because of apprehensions among mariners of contracting Ebola [22].

Ebola's fundamental effect on explorers has been on outbound Asian visitors who are dropping their treks to Africa. Asian voyagers appear to be particularly vigilant given their involvement with SARS and H1N1. Southeast Asia's commitments to battling Ebola have been restricted to roundabout backing. Malaysia, Thailand and others are giving nourishment, monetary backing and therapeutic gear, for example, elastic gloves [22-25]. ASEAN nations have declined to send medical staff to Africa, not withstanding requests by the WHO and worldwide wellbeing gatherings that such support is the most ideal approach to keep Ebola from spreading. However, every ASEAN part has apparently setup crisis operations places

for Ebola which are in contact with the WHO's provincial office in Manila and its base camp in Geneva. The Philippine government repelled a U.S. appeal to dispatch medicinal labourers to Ebola-hit regions, saying its need is boosting household resistances against any nearby flare-up [35-42]. The Philippines Red Cross scrutinized this choice while gets ready to send its own volunteers. Manila has likewise chosen to haul it's unforeseen of warriors out of peace keeping operations in Ebola-influenced Liberia. Southeast Asia's current reaction minimizes the district's capability to make a direct commitment to the worldwide group's push to battle Ebola at its source. The United States and numerous global associations would welcome a more prominent part and have been asking Southeast Asia to make a more dynamic commitment [44,46,47,50]. Hence, the public health organizations or the governments throughout ASEAN countries have carried out and improved surveillance and detection method against all potential transfer of fatal Ebola virus.

CONCLUSION

According to the data collected, it can be clinched that there is no EVD has been detected in ASEAN countries so far, though there were suspected cases. Nevertheless, the increase in EVD cases in West Africa remains as a concern in the ASEAN region. Hence, the public health organizations or the governments throughout ASEAN countries have carried out and improved surveillance and detection method against all potential transfer of Ebola virus.

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