

## Infectious Disease and Bioterrorism: Disaster to Public Health and Security in Malaysia

(Penyakit Berjangkit dan Bioterrorisme: Bencana terhadap Kesihatan Awam dan Sekuriti di Malaysia)

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### ABSTRACT

*World Health Organization (WHO) outlined that the emergence of infectious diseases represent a global threat that will require a coordinated and global response. The threat is considered as global because the nature of the diseases itself to emerge anywhere and everywhere in the planet and widespread to other regions. The recent emergence of infectious disease known as Zika virus which the WHO says is "spreading explosively" across the Americas. Malaysia had issued a health alert to the public in alarming its citizen to be in the state of precaution. The rise of security in the event of new and re-emerging infectious diseases on the national security agenda has provoked a number of debates among Malaysian stakeholders. There is an issue of linkage between public health and security as disaster issue under the national agenda. This article attempt to analyze the emergence of newly and existing infectious diseases having a potential of causing bioterrorism in order to identify the linkage between the public health issues with the security under the national agenda as disaster. Thus, there must be a turning point in the consideration of public health issue in linking it with the security issue especially in the event of any possibility of bioterrorism to ensure a world safe and secure from any possibility of bioterrorism in the form of emerging infectious diseases (EID). Thus, this article also plans to propose a public health and security policies on managing and handling the possibility of bioterrorism event as disaster in Malaysia.*

*Keywords: Infectious diseases; public health; security; disaster; bioterrorism*

### ABSTRAK

*Pertubuhan Kesihatan Sedunia (WHO) menggariskan bahawa kemunculan penyakit berjangkit mewakili ancaman global yang memerlukan kepada tindak balas yang selaras dan global. Ancaman seperti itu dianggap sebagai global memandangkan sifat penyakit itu sendiri yang muncul pada bila-bila masa dan di mana-mana sahaja di dunia ini sehingga merebak ke kawasan-kawasan lain. Baru-baru ini, kemunculan sejenis penyakit berjangkit yang dikenali sebagai virus Zika yang mana WHO mengatakan bahawa virus tersebut sebagai 'penyebarkan letupan' di seluruh Amerika. Malaysia telah mengeluarkan amaran kesihatan kepada orang awam sebagai ingatan kepada rakyatnya supaya berada dalam keadaan berjaga-jaga. Isu sekuriti pula timbul dalam keadaan di mana kemunculan penyakit berjangkit baru dan muncul semula dalam agenda sekuriti negara telah mencetuskan beberapa perbahasan di kalangan pihak yang berkepentingan di Malaysia. Terdapat perkaitan di antara isu kesihatan awam dan sekuriti sebagai bencana di bawah agenda nasional negara. Artikel ini akan menganalisis mengenai kemunculan penyakit berjangkit baru dan sedia ada yang berpotensi menyebabkan bioterorisme untuk mengenal pasti perkaitan di antara isu kesihatan awam dan sekuriti di bawah agenda nasional negara sebagai bencana. Oleh itu, perlu ada satu titik perubahan dalam menimbangkan isu kesihatan awam dengan mengaitkannya dengan isu sekuriti terutamanya dalam keadaan di mana terdapat kebarangkalian berlakunya bioterorisme untuk memastikan agar dunia bebas dan selamat dari sebarang kemungkinannya tercetus bioterorisme dalam bentuk kemunculan penyakit berjangkit. Oleh itu, artikel ini dirancang untuk mencadangkan beberapa polisi kesihatan awam dan sekuriti dalam menguruskan dan mengendalikan sebarang kemungkinan bioterorisme sebagai satu bentuk bencana di Malaysia.*

*Kata kunci: Penyakit berjangkit; kesihatan awam; sekuriti; bencana; bioterorisme*

### INTRODUCTION

#### DEFINITION OF BIOTERRORISM

Bioterrorism is defined as a threat or use of biological agents by individuals or groups motivated by political,

religious, ecological or other ideological objectives.<sup>1</sup> Model State Emergency Health Power Act 2001 (Model Act) defined bioterrorism as:<sup>2</sup>

...the intentional use of any microorganism, virus, infectious substance or biological product that may be engineered

as a result of biotechnology, or any naturally occurring or bioengineered component of any such microorganism, virus, infectious substance, or biological product, to cause death, disease, or other biological malfunction in a human, an animal, a plant, or other living organism in order to influence the conduct of government or to intimidate or coerce a civilian population...

The provision indicates that based on the intentional release of the agents by human, or resulted from a natural biological action due to improvement of biotechnology in human life is known as bioterrorism. In the context of threats made to use biological agents, it is done through distribution or release agents or viruses that have elements of the spread of biological agents or by the existence of high-risk diseases that have the capability to produce biological agent causing the infection can spread disease among humans.<sup>3</sup> According to Perrota, Rawlings and Eckman, they agreed that "...the use of the harmful chemicals, pathogenic microbes or plant or microbial toxins as weapons of terrorism should be known as bioterrorism."<sup>4</sup> It was proven that the effectiveness of the production and the use of biological weapons have been recognized compared to other weapons.<sup>5</sup> It is easy to develop as weapons as it requires no specific knowledge and expertise as well as its low cost and more difficult to detect. Weapons are no longer needed to cause war and terrorism. The new form of war by using the medical prospect is more effective to destroy people and cause harm. Albert Robida expressed his view in *Le Vingtieme Siecle* (The Twentieth Century) that

'...the times seem to me favorable for making medical war!... More than explosives as in former times, but only the artillery of outrescence, microbes, of bacilli sent into the territory of the enemy...'<sup>6</sup>

Centers for Disease Control and Prevention (Centers of Diseases Control and Prevention, CDC), enlightened that the biological attack is one of the release of viruses, bacteria or germs that are done intentionally by certain parties which in this case known as terrorist. It is naturally to be found and the possibility to make use of these viruses, bacteria or germs turn to be as an agent as it is easy to spread through air, food and water.<sup>7</sup> Among the biological agents, there are three types of agents that can be used in a biological warfare. First, smallpox, originated from the *variola major*, second, *anthrax* which is caused by the *bacterium bacillus anthracis*, and the third is *plague* caused by the *bacterium yersinia pestis*. In addition, there are several other types of biological agents that were used as a biological weapon in the war, such as tularemia, botulism, and hemorrhagic fevers (*Ebola* and *Marburg* strains). There are other 53 types of agents identified as a biological weapon that could be used in biological warfare.<sup>8</sup> The agents can cause infectious diseases and at the same time, in theory, a wide range of the infectious disease agents could be intentionally used to cause harm. The diseases caused also are not

only a public health issue but also a problem of national security as well.

#### DEFINITION OF INFECTIOUS DISEASE

An infectious disease or communicable disease is caused by a biological agent such as by a virus, bacterium or parasite. According to the Malaysian Prevention of Control and Infectious Disease Act 1988 as provided under Section 2, 'infectious disease' means any disease specified in the First Schedule that are listed as chancroid, cholera, dengue fever and dengue haemorrhagic fever, diphtheria, dysenteries (all forms), ebola, food poisoning, gonococcal infections (all forms), hand, foot and mouth disease (HFMD), leprosy, malaria, measles and etc. While according to the United Kingdom Infectious Diseases (Notification Act) 1889 in defining infectious disease as any infectious diseases such as small-pox, cholera, diphtheria, membranous croup, erysipelas, disease known as scarlatina and kind of fever such as typhus, typhoid, enteric, relapsing, continued, ataxic, and including any other diseases in the Act. Based on the definitions, there are too many infectious diseases in existence. The spread ignores the geographical boundaries and there are no limits of causing panic and fear.

The world is awakened by the recent emergence of infectious disease known as Zika. Zika has introduced a new chapter in the history of medicine in which the World Health Organization (WHO) says is "spreading explosively" across the South America, Central America and Caribbean and the potential of its spread had threatened United States over the past 20 years as an unexpected infectious disease. The emergence of Zika is found out to be existing infectious disease. Zika had been discovered in Uganda in 1947 and the re-emergence has turned out to be a pandemic which affects the world currently.<sup>9</sup>

Malaysia had never experienced any biological attack yet leading to any incidents of bioterrorism. However, Malaysia already dealt with such a threat that led to the emergence of newly and existing infectious diseases such as Nipah virus, Severe Acute Respiratory System (SARS), H1N1, Japanese Encephalitis (JE), and other kind of diseases. All these diseases can cause harm instead of creating panic and chaos in the society, economics, and the most crucial part is the level of preparedness and prevention in the security and public health. It is undeniable to debate that the threat to the public health is at par with the threat to the security.<sup>10</sup> According to Professor Lam Sai Kit in his article, the attack of Nipah virus that broke out in one of the Malaysian states in Peninsular Malaysia, Perak in September 1998 until May 1999 is said to have a potential as bioterrorism agent. He also concluded that Nipah virus is one of a naturally occurring infectious disease that has the potential of bioterrorism by creating panic and fear among the public.<sup>11</sup>

The transmission spread very fast among those who are directly deal with the infected pigs and humans who were already been inflicted with the virus. This is the first event of infectious disease attacked in Malaysia and during the time, Malaysia was lacked of experience to handle and manage the situation. However, when the time passed, the emergence of infectious disease has no boundaries to emerge at any time and place; Malaysia has taken a step to be in the state of preparedness. Thus, in February 2003, when Malaysia had to deal, handle and manage the emergence of SARS, the condition at the time has led to the public health issue in critical condition. Furthermore, the SARS has led to a very theatrical demonstration of weaknesses for the affected countries in responding, handling and managing the emergence especially when it involved the public health and security aspects.<sup>12</sup> Thus, the seriousness of the spread has opened the eye of public to be alerted and aware that the level of national security will automatically linked based on the threats of newly emerging infectious diseases.<sup>13</sup> It was a clear implication to Malaysian public health and security in handling the SARS during the period.

#### PUBLIC HEALTH AND SECURITY: A LINKAGE

Security and health are interchangeable word to be used in illustrating the connection between health and security. The emergence of newly and existing infectious diseases are considered as cross border issue. Whenever outbreak of any new or existing infectious diseases occurred in any countries in the world, such a threat will be considered as health security threat. Health security is essentially the protection from threats to health and it is also reflected as non-traditional security issue.<sup>14</sup> For example, the emergence of Ebola virus in West Africa become a cross border issue and became as dangerous disease event<sup>15</sup> when people with infection have travelled across border from Africa to any other countries without any limits and boundaries and accidentally give infliction to others. The chains of transmission follow from one country to another country in short. The situation is an unintentionally cause the emergence of such a disease to other countries from the moving of people. The same issue happened after the outbreak of SARS in 2003 no control at the international borders to prevent the spread of the diseases. It is beyond the control of issue in health and security. Another contagion infectious disease with human to human infection known as Middle East respiratory Syndrome Coronavirus (MERS) was found in Middle East in 2012 and it has been transmitted occasionally worldwide in 2014 and may be considered to have the potential of outbreak threat to health and security.<sup>16</sup>

War is no longer consisting of physical attack against human being. People are now applying another medium to start a war. They are now showing their interest to

develop a new method of starting the war by using chemical, biological, radiological or nuclear (CBRN) to cause mass casualties event or disaster.<sup>17</sup> As a matter of fact, the tendency to use unconventional weapon of CBRN is emergent instead of using the conventional weapons such as guns, firearms or any kind of explosive to attack people. The use of biological agents in causing the mass casualties event is one of the alternatives to cause bioterrorism or also known as biological warfare. This method of using biological agent has the value to produce extreme destructiveness in easy way. These situations are among the future type of war can lead to raise threat to health and at the same time will affect security as well.<sup>18</sup>

The history also stressed on the aspects of health and security. After the end of the World War II, it is proven that the focus was only given to the physical security such as the nuclear issue between United States and Soviet Union. However, the concept of security becomes wider after the end of war. The aspect of security's coverage includes not only economics, social but also healthy.<sup>19</sup> The perception of public had drastically changed after the incident of 11 September, 2001 in United State of America. It occurred under the Bush administration, and he was fully aware of the risks caused by bioterrorism which also affected the national security. In fact, during his period of administration, he treated HIV/AIDS as a threat to national security. Thus, anything that leads to any emergence of infectious diseases also will give similar effect to the public health. Bush argued that 'in the countries afflicted by epidemics and pandemics like HIV/AIDS ... growth and development will be threatened until these scourges can be contained.'<sup>20</sup> Based on the situation, he proved that infectious disease is serious as it will affect the health and security. Thus, there is a need to handle and manage the emergence of infectious diseases as well as to prevent the outbreak from spreading.<sup>21</sup>

#### THREAT OF INFECTIOUS DISEASE

Human has been exposed to the battle of war since a long time ago. Human had learnt a feeling of threats out of the war physically. Undoubtedly that war outbreak which involved microbial species of biological agents which caused infectious diseases was proven to kill more people silently than war itself. The war was started with an ongoing battle where no physical weapons were used. People have been exposed to the emerging threats that exist from the naturally occurring infectious diseases which reservoir into the human population. Some of the infectious diseases were unidentified viruses or biological agents either naturally or intentionally released by someone who misuse it as weapon. Thus, it has been identified that the infectious agents that can be used to create bioterrorism has two characteristics that is self-replicating and to spread by personal contact from victims to another victims as infectious diseases.<sup>22</sup> As a worldwide

of infectious disease example is smallpox. It cannot be detected within a few days and it may take weeks and maybe a few months to be identified. Thus, society's fear towards the outbreak of the disease and contagion is normal human reaction.

The experience from the past has recorded that more people died due to the infliction of infectious diseases in the World War compared to die because of the war itself. The increase number of death due the emergence of infectious diseases either deliberately or naturally occurring infectious diseases has the potential of causing bioterrorism. The public health and security experts in the United States believed that infectious diseases could trigger the major threat<sup>23</sup> directly or indirectly.<sup>24</sup>

In Malaysia, the outbreak of Nipah viruses in 1999 took a few months before it was detected as Nipah virus. The widespread had caused not only fear and panic among the farmers who were inflicted with the viruses at that time but also disability, social disruption and economic instability. Thus, the factor has led to the belief that the viruses were able and has potential to be a threat to human health.<sup>25</sup> In line with that, the existence of Severe Acute Respiratory Syndrome (SARS) in East and Southeast Asia in early 2003 had suggested the multidimensional threat to national security posed by infectious diseases. The attack of infectious disease should be treated as a part of security framework. If the world had changed due to event of September 11, 2001, the same thing happened to the impact of infectious diseases on security affected by SARS.<sup>26</sup> Malaysian has learnt a lesson due to the emergence of SARS in 2003 to be in the state of preparedness in planning and early preparation to handle and manage any possible emergence of infectious disease in the future. The spread of SARS is a yardstick to measure Malaysian ability to handle and manage the threat as did not only pose risks to the public health but also to the national security. In addition to SARS, the emergence of Nipah virus, Avian Influenza, H1N1, H5N1, JE have created phenomenon of such a threat in Malaysia. Despite of the emergence of infectious diseases do not cause any event of bioterrorism yet in Malaysia. However, the emergence of such infectious diseases cannot be overstated. The emergence of the diseases can be manipulated and misused by irresponsible party to create chaos and panic to the public.

According to Center for Disease Control and Prevention (CDC), bioterrorism agent is categorized into three.<sup>27</sup> Category A is considered the highest risk, Category B are the second highest priority due to its moderate easy of spreading and the last is Category C which are third highest priority which include emerging pathogens that could be engineered from mass dissemination from the easy availability, easy to produce but potential for high morbidity and mortality rates to cause major impact to health. Emerging infectious disease such as Nipah virus is among the agent/disease under Category C. In fact, the tendency of causing and effects depend on how

easily the agent can spread the length in causing illness and result to death. The easiness of using the biological agents as categorized has led to attract special interest among the criminals and terrorists. The development on biotechnology, pharmaceutical, environmental and health care industries have produced expertise in such area. In fact, the production and dissemination of the agents are readily available in open sources as anyone and everyone can obtain it.

#### DISASTER OF INFECTIOUS DISEASE

Disaster means 'something bad happened'<sup>28</sup> Disaster is divided into two types (i) triggered by natural (ii) human caused disaster.<sup>29</sup> Federal Emergency Management Agency defines disaster as '... a dangerous event that cause significant human and economic loss and demands a crisis response beyond the scope of local state and resources. Disaster is distinguished from emergencies by the greater level of respond required.' While the Management Training Programme Disaster United Nations (UNDMTP) and World Health Organization (WHO) adopt the same definition of 'a serious disruption of the functioning of a society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using only its own resources.'

Based on the definition, disaster is a situation in which the consequences will cause severe damage and require the skills and responses from various authorities to deal with it especially when it is out of control of human capacity. While Malaysian National Security Council under Directive No. 20 stated that disaster is '...any incident that occurs suddenly, is complex and result in loss of life, destruction of property or the environment and affect the activity of the local community' where it 'involves resources, equipment, and manpower frequency extensive than many agencies and effective coordination ...'<sup>30</sup> Human must always be ready to cope and deal with any event of emergencies whenever arises as disaster is not only unprecedented but always continue to happen. In the context of disaster, hurricane, tornado, storm, flood, water speed, waves, tsunami, earthquakes, volcanic eruptions, landslides, mudslides, snow storm are categorized as 'major disaster.' The impact is severe and cause massive destruction to the people.<sup>31</sup>

Despite of the use of biological agent turns out as biological weapon to cause bioterrorism, these agents (Category A, Category B and Category C) as discussed above, most of the agents can be found naturally by the existing of a virus resulting from the infectious disease as one of a kind that capable of producing biological agents or it can be modified genetically through the existing biological agents that are easily found in nature. Thus, infectious disease has the potential and high risk as threat to human health and security.

## PUBLIC HEALTH AND SECURITY POLICIES ON MANAGING AND HANDLING THE POSSIBILITY OF BIOTERRORISM EVENT AS DISASTER IN MALAYSIA

Prevention is one of the forms of action to be planned by the relevant authoritative parties to deal with any effect of disaster in the community. WHO also stressed that 'in order to protect and improve health around the world, much more emphasis is needed on preventing the actual causes of important diseases – the underlying risks to health ... 'Prevention is the best approach to tackle the threats of disaster especially resulting from the emergence of newly or existing infectious diseases which pose risks to human health as well as security. In order to achieve a new vision of better health and security in the event of new and re-emerging infectious diseases in the event of bioterrorism as disaster, prevention is better than cure. The effectiveness of prevention is important as precautionary measures to face any eventuality in public health and security. Prompt response towards any eventuality of disaster will be effective action to ensure the security of the people especially when the disaster occurs.

The role of government as one core organization is to ensure the implementation of health is in parallel with the basic objective of to provide health protection to the public. There are a few ministries' and departments responsible to ensure the effectiveness of the policies in managing and handling the possibility of any event leading to affect the health and security.

### STRENGTHENING THE CAPACITY TO IDENTIFY, DETECTION AND SURVEILLANCE SYSTEM

The most important principle in global public health is strengthening the ability of a country to handle and manage the threat of any newly or re-emerging infectious diseases. The role of public health authorities in Malaysia is very crucial. Increase the quality and monitoring system to strengthen the ability to identify and detect any potential of threats. The ability is the best method and rational approach to produce the best protection to the health against any biological threats.

Appropriate approach has to be adopted to ensure the importance of public health and security in parallel with the guarantee to secure health and security is by strengthening the Malaysian public health system from the aspect of control and response to meet the needs and requirements to handle and manage any kind of infectious diseases in the future. As mentioned above, it is difficult to identify the symptom of the infectious diseases from the very beginning of its emergence either it is caused by a biological attack (bioterrorism) or naturally occurring infectious diseases act as normal symptom until certain identification period to detect. It is undeniable based on the history that the origin of the outbreak of infectious disease was doubtful, either due to biological attack or naturally

occurring infectious diseases. Under these circumstances, the strengthening of control and immediate response in terms of public health is important. Implementation of communication, handling, control and prevention should be designed properly to ensure the success of each step in the capture strengthening.

### EARLY NOTIFICATION

Logically, in any event of the emergence of infectious disease, the 'first responder' is a doctor, a pathologist and hospitals' worker involved in health matters. An immediate response from them in identifying the disease could determine the next step. Thus, the first important policy is earlier notification by the first responder to the relevant authority. Prompt response towards any eventuality of disaster will be effective action to ensure the security of the people especially when the disaster occurs.

### SURVEILLANCE SYSTEM

The most fundamental aspect in monitoring, supervising, developing in health planning and promotion, research strategy and enforcement of roles and responsibilities will be successfully implemented through observation. Aspect of observation is supported with surveillance activities to be carried out as a routine surveillance and monitoring under the supervision of MOH. The level of surveillance routine is depending on the type of emerging infectious disease in one particular time.<sup>32</sup> In order to ensure the effectiveness of such supervision to monitor the existence of the agents, viruses or bacteria, laboratory surveillance is established to help in monitoring in case of any emergence of infectious diseases and which can cause infectious disease.

However, the implementation can only be carried out with full basic equipment in public health surveillance such as expertise, laboratories, data collection and system analysis with the support of information sharing system among the relevant parties involve in ensuring the health and security of the country such as MOH, Ministry of Defense, Royal Malaysian Police, Ministry of Foreign Affairs, Ministry of Science and Technology, National Security Council and others. The cooperation to ensure the smoothness of surveillance system will benefit to the public from any unexpected event whenever arise.

### RESEARCH AND STUDIES BY EXPERTISE

The outbreak of infectious diseases ignores geographical boundaries. The importance of research and studies need to be done by the expert such as the scientist, pharmacist and others particularly in identifying or anticipating the appearance of any new form of virus disease or existing infectious disease. The cause and implication with the solution can only resulted from the research. In fact, the

use of these agents derived from the infectious diseases or naturally in existence does not only provide advantages and benefits in the field of medical sciences, it also will cause destruction to human being, plants and animals.

In addition, the researchers are able to generate new diagnostics in addition to antibiotics or antiviral against any infectious diseases. At this stage, the researchers can produce a new vaccine that can be useful in the event of epidemic or pandemic occurs in Malaysia.

#### FULL COOPERATION FROM PUBLIC AND PRIVATE SECTORS

In the event of a threat involving a public health problem that also affects national security; the issue cannot be dealt with and handled by one party only. The role of the public sector not only provides quality services but focuses on security safeguards of the public interest. Thus, there is a need of cooperation from the private sectors and public sectors to mobilize and encourage the support. To ensure the enforcement and implementation, the public sector especially the government need to portray the leadership to be followed by the private sectors to assist the government in achieving the target as planned. The cooperation and collaboration of various parties is required regardless of the government, private sector or individuals and it can be considered as core function of such cooperation for the success. It will demonstrate a prompt response, efficient, and quality produces from the authorities can help to protect the public from any kind of disaster due to infectious diseases leads to bioterrorism event.

#### CONCLUSION

The spread of the infectious diseases will involve microbes and viruses which ignore geographical boundaries and also involves cross border issue. The nature of the disease it caused in human being regardless of whether or not the infection is acquired naturally or being infected as a result of intentional exposure, both are potentially considered as a threat to be used as an agent for bioterrorism.

As a conclusion, there must be a turning point in the consideration of public health issue in linking it with the security issue especially in the event of any possibility of bioterrorism to ensure a world safe and secure from any possibility of bioterrorism in the form of emerging infectious diseases. What we, as in the society collectively do is to assure the conditions in which people can be healthy. The security of the state is dependent on the security of its individual citizens. If they are not secure, the state is not secure and if the individual is not secure, more or less, it will affect the public health security in the state and it will lead to a horrifying state. It is important to find a way forward to ensure the full protection is provided to the public in the event of such disaster.

Furthermore, WHO constitution also stressed that ‘... the health of all peoples is fundamental to the attainment of peace and security.’ Furthermore, the increasing level of threat posed by the emergence of infectious diseases deserve more special attention as it is clearly represents a threat to security as well as public health. The spread will weaken the confidence level of the public due to the ability of the government to respond, handle and manage the threat. Thus, it is hoping to reduce the probability of the risks of emerging infectious diseases by implementing the suggested policies. As mentioned above, prevention is better than cure is far better prepared to detect and respond to any emergence of the diseases instead of doing nothing to overcome such a disaster. As Malaysia has never experience the event, it does not mean that we have to be in the state of ignorance. The likely event to occur is unpredictable. As we are lacking all the experiences on how to handle and manage it, the policies suggested to be applied in the case of necessary to protect the public health and security for the better future of life.

#### NOTES

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