Strategic Multilateral Biosecurity Dialogue among

Singapore, Malaysia, Indonesia, and the United States

with Participating Observers from the Philippines and Thailand

Meeting Report from the 2018 Dialogue Session

April 18-20, 2018

Nusa Dua, Indonesia

JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

Center for
Health Security
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EXECUTIVE SUMMARY

The Johns Hopkins Center for Health Security conducted a Track II multilateral biosecurity dialogue between Singapore, Malaysia, Indonesia, and the United States—with observers from the Philippines and Thailand—in Nusa Dua, Indonesia on April 18-20, 2018. Dialogue topics included national biosecurity priorities as well as ongoing and emerging biosecurity threats facing Southeast Asia countries, ranging from emerging infectious diseases to advances in biotechnology to bioterrorism. Participants discussed national-level biosecurity programs and shared lessons from their experiences, building on trusted relationships established over several years of this dialogue with the aim of improving national capacity and collaboration across the broad scope of biosecurity issues.

In addition to the dialogue sessions, this meeting also included presentations from the US Federal Bureau of Investigation and the Royal Malaysia Police on ongoing security and WMD nonproliferation programs in Southeast Asia. Representatives from Indonesia's Ministries of Health and Defence provided insight into national and regional biosecurity and biodefense capabilities as well as a detailed discussion on lessons from Indonesia's recently completed Joint External Evaluation. These individuals provided frank and honest assessments of the capabilities of their national programs and facilitated discussion about outstanding biosecurity challenges and threats facing their country and the region as a whole. Finally, participants discussed the challenges of communicating about biosecurity threats and advances in the life sciences from the perspective of national government programs, academic researchers, and the media.

Since its inception, this biosecurity dialogue has provided a mechanism to inform national leaders about biosecurity threats facing the region. Dialogue participants routinely brief senior government officials, including the Ministers of Health and Defence and the Office of the President, about lessons drawn from dialogue meetings. These efforts raise awareness among elected and appointed officials about the reality of biosecurity threats and the importance of further investment in and support for national programs. Additionally, the dialogue has sparked numerous bilateral and multilateral collaborations between participating countries. For example, Malaysia, the Philippines, and Singapore held the first meeting in May 2018 for a program to raise awareness about regional biosecurity threats with the goal of establishing an annual series. The dialogue has also been briefed in various international fora. Several dialogue participants served on side event panels at the 2017 Meeting of States Parties (MSP) to the Biological and Toxin Weapons Convention (BWC) in Geneva, Switzerland and the 2018 Prince Mahidol Award Conference in Bangkok, Thailand. These events highlighted the findings from the dialogue and demonstrated the importance of these types of engagement toward building sustainable and collaborative biosecurity capacity at the national and regional levels.

INTRODUCTION

On April 18-20, 2018 the Johns Hopkins Center for Health Security hosted a meeting of the Multilateral Dialogue on Biosecurity in Nusa Dua, Indonesia. This dialogue began in 2014 as a bilateral effort between Singapore and the United States, and it has steadily expanded. Malaysia and Indonesia were added in 2015, and the Philippines and Thailand joined as observers in 2017. Each of these countries bring unique and valuable perspectives on biosecurity to the dialogue, which has allowed for important discussion on how to collaboratively mitigate growing biosecurity risks in the region. This year's dialogue included 28 participants from across the six countries. The dialogue was conducted at the Track II level, which involves subject matter experts and current and former senior-level government officials who work on biosecurity related issues. In contrast to Track I meetings—involving formal ministerial-level interaction—the informal Track II engagements facilitate more frank and honest discussion that leads to a better understanding of existing capabilities and limitations across the participating countries.

As with previous dialogue meetings, participants included individuals from a broad range of sectors, including academia, homeland security/home affairs, foreign affairs and international relations, military and national security, journalism, public policy, public health and health care, WMD non-proliferation, and agriculture. This dialogue included multiple round-table discussions and presentations on a broad range of biosecurity topics, including national biosecurity risks and priorities, outbreak detection and response, public communication about infectious disease threats, security risks of emerging biotechnologies, medical countermeasures, One Health, the Global Health Security Agenda, and the Biological and Toxin Weapons Convention (BWC). Of note, this dialogue also included a presentation on law enforcement and attribution for deliberate events, a topic that had not been covered during previous dialogues but was something that participants in the 2017 dialogue meeting expressed interest in learning more about.

Funding and support for the dialogue was provided through the Project on Advanced Systems and Concepts for Countering WMD (PASCC) at the United States Air Force Academy and the US Defense Threat Reduction Agency (DTRA).

MULTILATERAL BIOSECURITY DIALOGUE
BALI , INDONESIA, APRIL 18 - 20, 2018

DIALOGUE SESSIONS

National Biosecurity Priorities and Challenges

Southeast Asia faces a myriad of health threats, including natural disasters (eg, volcanoes, earthquakes, flooding), and dialogue participants discussed the increasing incidence of these events, particularly in the context of climate change and social and economic trends. A major priority among these threats is communicable diseases, which can arise in the form of novel or emerging diseases. The dynamic human-animal interface in the region—largely driven by land use changes and population movement—creates opportunity for zoonotic transmission of novel and emerging pathogens (eg, Nipah virus, highly pathogenic avian influenza), and increased international travel—including migrant workers—presents the opportunity for importing diseases. Several participants, from the United States and elsewhere, discussed challenges regarding low vaccination coverage—due to a range of factors, including vaccine hesitancy—as a driver of increased incidence of vaccine-preventable diseases and the re-emergence of diseases thought to be eliminated or controlled. In addition to naturally occurring biosecurity risks, the threat of deliberate misuse of pathogens is of concern to dialogue participants, and they see it as a priority that Southeast Asian nations develop and maintain robust and flexible biosecurity programs with the capability to respond to a broad scope of potential threats.

Participants acknowledged that the diversity of biosecurity threats necessitates the involvement of many sectors beyond public health and health care. Participants discussed the need for further collaboration between health, defense, agriculture/livestock, home affairs/homeland security,

education, and other sectors to more comprehensively address current and emerging risks. One of the principal challenges addressed by multiple participants lied in the terminology and scope of biosecurity. Participants noted that the integration of health and security agencies has improved in recent years, but other sectors (eg, academic institutions, agriculture) may not fully appreciate their role in biosecurity. Participants emphasized the importance of proactively addressing biosecurity, particularly in terms of laboratory safety and security and the risks posed by emerging biotechnology, as part of academic curricula at the undergraduate and graduate levels as a mechanism for building an understanding and appreciation for the importance and severity of these types of threats. Additionally, there was increased discussion in this year's dialogue about the need for further engagement with agriculture biosecurity issues, particularly on the security side.

As always, funding for biosecurity programs is a principal challenge for every country. Many participants discussed the importance of bolstering laboratory capacity to facilitate event detection and response activities, and several discussed the variation in laboratory capabilities across their respective countries, often a result of disparities in funding. Some laboratory facilities have solid, reliable capacity, but others, often rural or non-human health laboratories, perform at lower levels. Considering the broad range of threats and the risk of outbreaks crossing borders or traveling from rural to densely populated urban areas, participants viewed investment in laboratory readiness at all levels and geographic areas of their respective countries as a priority to improve resilience to a variety of health threats. Biosecurity funding faces a major challenge in the "cycle of panic and neglect," in which emergency funding is allocated as a response to an acute event and then wanes during periods between emergencies. Participants emphasized the increased benefit, and likely return on investment, of sustained funding, but they also noted that communicating the severity of biosecurity threats to policymakers is a major challenge. Similarly, several participants questioned whether recent chemical weapons use (eg, attacks in Malaysia, Syria, and the United Kingdom) and nuclear weapons issues (eg, Iran, North Korea) have diverted attention and funding away from biological threats. Countries face not only challenges in establishing awareness and appreciation of biosecurity threats as priority targets for national-level funding, there are also growing concerns about the future of support for international programs. The United States has signaled a willingness to shift focus away from international health issues, which, if coupled with corresponding budget changes, could substantially reduce financial support for overseas engagement (eg, through the CDC) or the World Health Organization (WHO) and Global Health Security Agenda (GHSA), on which many Southeast Asian nations rely for setting health and security standards and capacity building.

Biosurveillance, Detection, and Public Health Epidemic Response

Recent infectious disease outbreaks in Southeast Asia have highlighted the biosecurity risks that exist in this region. While outbreak detection and response is a priority for the Southeast Asia dialogue countries, there are a number of challenges that have hindered these critical components of health security. Many of these challenges were noted by dialogue participants to exist across the spectrum of biosecurity preparedness and response, ranging from frontline staff who interface directly with human and animal health (eg, healthcare workers, veterinarians) to national-level public health offices (eg, Ministries of Health).

One of the biggest challenges to early outbreak detection is the lack of field staff that would likely be the first to recognize a potential outbreak, including healthcare workers such as doctors and nurses, veterinarians, epidemiologists, and lab technicians. This is particularly problematic in low-resource and rural settings, where the environment is ripe for the emergence of infectious disease outbreaks due to the proximity of animal farms, poor sanitation and public health infrastructure, and a scarcity of public health workers. To improve outbreak detection, many of the dialogue countries are turning to the public for help. For example, some of the dialogue countries are using community leaders and village volunteers as outbreak surveillance sources. One country trained more than 200,000 villagers to identify and report any local outbreaks or public health events and implemented a system among poultry farmers that allows them to report any abnormal events. Social media was also highlighted as a potential tool to monitor for disease outbreaks.

In addition to having sufficient staff, participants noted the need to better train healthcare providers who interface directly with the public to quickly recognize and report infectious disease cases that could threaten public health. This can be difficult because many diseases that have outbreak potential (eg, Ebola, Nipah, SARS, MERS) occur infrequently and/or in geographic areas removed from the Southeast Asia region. With increased global travel and highly mobile populations, however, the likelihood of disease importation is increasing and so, too, is the need to increase awareness of healthcare providers. Additionally, programs that facilitate cross-training between those working in human and animal health would help ensure that diseases emerging in animal populations do not become a threat to human health.

Outbreak response was also a frequently noted challenge, due in part to decentralized surveillance and healthcare systems that are not connected to the same reporting platforms. Integrated surveillance and reporting systems and better data sharing practices—both within countries and beyond county borders—could help decrease the time it takes to detect and respond to an outbreak. Additionally, siloed sectors at the ministry level (eg, MOH, MOA, MOD) often lead to disjointed and uncoordinated responses. Similar themes have emerged in previous dialogue sessions, and participants have highlighted ways to overcome these challenges, including inviting members outside of traditional public health sectors (eg, MOD) to dialogue sessions or other fora to bridge relationships between these sectors and using academic networks to facilitate data sharing between countries. Technological advancements in reporting mechanisms were also highlighted as being important, but these are insufficient in the absence of the workforce needed to use them.

Biosafety, Biosecurity, and Misuse of Biotechnology

As clinical and public health laboratories in Southeast Asia increasingly confront novel and emerging pathogens (eg, SARS, Nipah virus, highly pathogenic avian influenza) and as research laboratories increasingly incorporate biotechnology tools and techniques in the pursuit of advanced research, biosafety and biosecurity face growing scrutiny in the region. Biotechnology is viewed in many countries, including the United States, as a tool for economic growth, and more laboratories conducting more advanced research with dangerous pathogens inherently increases the risk posed by failures of biosafety and biosecurity programs. Many countries are struggling to adequately develop and implement oversight and regulatory mechanisms that can keep pace with the emerging capabilities of advanced biology and biotechnology. In the laboratory context, biosafety and biosecurity efforts seek to mitigate

the risk of accidental or deliberate misuse of dangerous pathogens; however, these principles also apply more broadly to questions surrounding ethics and responsible conduct of science, particularly in the context of advanced biological research such as synthetic biology and gain-of-function experiments with dangerous pathogens.

One of the principal questions discussed by the dialogue participants was the extent to which biosafety and biosecurity require a top-down or bottom-up approach. National governments have the ability to directly impact the conduct of science through a variety of mechanisms, including allocation of research funding and the implementation of regulatory and oversight programs. This top-down approach has the benefit of promoting consistency and standardization across facilities, organizations, and research programs, particularly those for which governments provide funding support or have oversight authority; however, it is often unable to account for variations in the experience and capabilities of researchers at the local level or the capacity for local programs or agencies to adequately implement these oversight and regulatory mechanisms.

It was suggested that some issues may warrant the development of international standards. Considering the potential that a laboratory release of a dangerous pathogen could spread across borders, it may be beneficial to identify commonly accepted biosafety standards and ensure that they are implemented consistently from country to country. Several participants noted that their respective countries leave decisions regarding appropriate research to local institutional biosafety/biosecurity committees, but this could result in inconsistent implementation of national guidelines across the country. At times, national-level governance may not adequately consider local input, such as a situation described by one participant in which local committees decided to prevent the release of Wolbachia-infected mosquitoes but were overruled by ministry-level officials. Finally, national-level regulations—such as the US policies on dual-use research of concern (DURC) and potential pandemic pathogens (PPP)—often focus on specific areas of research, neglecting broader principles for research ethics and practices and leaving outstanding gaps in oversight.

The discussion about bottom-up approaches largely focused on proactively engaging scientists and students to build a culture of responsibility for biological research. The principal argument is that regulation can only accomplish so much and that, ultimately, the safe and responsible conduct of research comes down to the decisions and practices of researchers. Multiple participants discussed ongoing programs that aimed to integrate biosafety, biosecurity, and responsible conduct of research into educational curricula, and many viewed these efforts as important tools for establishing a cohort of established and emerging scientists for whom safe and responsible research is a priority. Some participants, however, expressed concern about how well these efforts can address emerging challenges posed by advanced biological research (eg, gain-of-function, gene drives). In the United States, for example, it appears as though the responsible research discussion predominantly focuses on ethical issues such as plagiarism and data collection as opposed to risk assessments and determinations regarding whether certain research is appropriate, in and of itself. In some cases, assessment of prospective research focuses more on biocontainment considerations than on the downstream implications of the project. One participant noted that education is a critical step in changing behavior, but it is difficult to determine the extent to which these programs are implemented consistently—between institutions, local jurisdictions, or countries—or to which they result in lasting change.

Medical Countermeasures Research and Development

Medical countermeasures (MCMs) are critical to mitigating an outbreak, but they can be challenging to develop, produce, procure, and distribute. While some countries have the capacity to develop and stockpile their own MCMs, others must obtain them from different countries. For example, during the 2009 H1N1 influenza pandemic, the United States deployed both antivirals and vaccines to the WHO to help with the international response. Dialogue participants spoke of the need to continue building relationships with other countries through international fora such as Connecting Organisations for Regional Disease Surveillance (CORDS) and the Asia Partnership on Emerging Infectious Disease Research (APEIR) to help facilitate access to MCMs should they be needed. However, continued government investment in MCM technologies and public/private partnerships with biotechnology companies is needed to help advance MCM research and development within their borders and help guarantee access to MCMs during a public health emergency should support not be available from other countries.

Dialogue participants also spoke of numerous bottlenecks in the MCM procurement and distribution processes that drastically slow down delivery to those at risk for infection. Novel manufacturing and vaccine administration strategies could help speed up these processes, but they will require major government investments. For example, participants highlighted cell-based and needleless vaccine technologies as options to quicken access to potentially life-saving MCMs. Additionally, in an emergent situation, there are often regulatory issues that delay the delivery of MCMs that are still undergoing clinical trials or may be unlicensed. To help streamline these processes, dialogue participants spoke of the need to develop global standards and protocols for investigational MCMs—including diagnostics, vaccines, and therapeutics—during a public health emergency.

One Health and Biosecurity

Population growth, urbanization, deforestation, and changing livestock/agricultural practices have placed humans and animals closer into proximity with one another, increasing the risk of zoonotic disease transmission. In fact, many recent disease outbreaks that have received global attention were zoonotic in origin, including SARS (China in 2003), Nipah (Malaysia in 1999 and India in 2018), Ebola (West Africa in 2013-16 and DRC in 2018), H1N1 (2009), and MERS (South Korea in 2015). As the threat of zoonotic diseases continues to increase, the One Health approach will become increasingly important in mitigating outbreaks that could have dramatic public health consequences.

Interest in the concept of One Health has steadily increased over the course of several years of dialogue sessions, as the interconnectedness between human, animal, and plant health has become clearer. While many people—including the dialogue participants—believe in the importance of One Health, it has been challenging to translate these beliefs into practice. In particular, competing priorities at Ministries of Health and Ministries of Agriculture have made collaboration challenging, due in part to the potential economic impacts that could ensue if an outbreak is detected in animal populations (eg, leading to large-scale animal culling).

Many of the dialogue countries have recently taken action to integrate One Health into public health practice, including forming “One Health networks” between relevant sectors and creating an interagency committees focused on zoonotic diseases. The Ministry of Health and their animal health

counterparts in one country even recently co-hosted a meeting with various local councils and departments to support information sharing around diseases that threaten both human and animal health. Many countries have also increased communication and collaboration with those who work in animal farming operations, such as poultry workers, as an outbreak in animal populations could signal potential public health consequences. This includes setting up surveillance systems within farming operations and creating mechanisms for farmers to report potential outbreaks without negatively impacting their business. Allowing physicians to conduct fieldwork with their veterinary/agricultural counterparts was also highlighted as one way to bridge the gap between human, animal, and plant health.

Impact of Geopolitical Issues, Intergovernmental Organizations, and Regional Developments on Biosecurity

The dialogue discussion of geopolitical and regional issues focused, in large part, on the roles, capabilities, and functions of intergovernmental and regional organizations. In the wake of the West Africa Ebola epidemic (2013-16), the WHO was forced to take a close look at its purpose and capacity. Multiple dialogue participants noted that there is still considerable uncertainty, both at the WHO and among many nations, about the organization's role, particularly in the context of emergency response. One participant laid out a number of the WHO's strengths, including its ability to establish norms and standards; its convening authority to discuss controversial or emergent issues; its role as a clearinghouse for news, information, and expertise; and its ability to develop legally binding instruments. Conversely, the WHO does not have the resources—personnel or financial—to conduct response operations or provide direct assistance to countries to implement the standards and agreements over which it presides. Similarly, there was considerable discussion about the historic and future roles of regional organizations such as the Association of Southeast Asian Nations (ASEAN). ASEAN's role in biosecurity emerged out of the SARS pandemic (2003), which illustrated the ability of health threats to reach far beyond the borders of their origin. While there have been several regional biosecurity programs funded through ASEAN in recent years, there is still considerable uncertainty regarding its role in responding to emerging health threats. ASEAN facilitates multi-sectoral coordination; however, the member states remain independent, and there is reluctance to cede operational control of national response assets.

Some participants asserted that, as the threat landscape changes—with respect to national security, health, and otherwise—the roles of organizations like the WHO and ASEAN must evolve to ensure they are providing the necessary benefits to their constituent nations. Considering the uncertainty surrounding the roles of these types of organizations, concerted effort across many countries would be required to develop a common understanding of these organizations' intended functions and build support for developing these capacities and focus strategic and policy discussion to the relevant topics. These efforts would require a targeted and honest evaluation of the organizations' assets and capabilities as well as a dynamic assessment of ongoing, emerging, and future threats to ensure that these organizations' respective structures and mandates adequately reflect their purpose. It is likely not possible for intergovernmental organizations to be all things to all parties, and there must be willingness by other groups, including civil society, to fill in the outstanding gaps and implement mechanisms to facilitate their engagement at the regional and global levels.

Moving beyond operational capacity, one of the biggest challenges in addressing health threats at the regional or global level is the ability and willingness to share information (eg, surveillance data, intelligence). Multiple participants discussed the challenge of sharing information, particularly with international partners. The principal concern, they noted, was not a reluctance to share information—in fact, countries are very willing to share—but rather, making a determination regarding *what* information to share. In principle, everyone seems to agree that sharing information is beneficial, but in practice, countries may have concerns that certain information, or types of information, could potentially illustrate or suggest failures or deficiencies in preparedness or response programs or pose security risks. Additionally, identifying mechanisms to share this information is another barrier to transparency. Bilateral agreements with trusted partners may exist in some cases, but sharing information broadly (eg, via the WHO) may be more difficult due to the concerns listed above. Participants also noted that countries, or even agencies within countries, have their own data systems, each with its own formatting and security, that can make it difficult to compile data from across multiple countries. Most participants agreed on the need to recommend policies to improve data sharing at the most senior levels of government, but they acknowledged that there are significant barriers to operationalizing these policies.

Medical Care During Public Health Emergencies

Providing adequate medical care during public health emergencies is a priority, but participants noted that there are numerous practical challenges that diminish response capacities. This is particularly true for remote and under-resourced areas, where individuals must travel long distances just to receive basic medical services. These areas often do not have adequate laboratory capacity to test for many infectious disease agents, meaning that diagnosis can be extremely delayed, leading to a protracted response and poor health outcomes. Additionally, lack of isolation capabilities can enhance—rather than inhibit—disease transmission in healthcare settings, increasing case numbers and decreasing public trust in the healthcare system. These challenges persist even in higher-resource settings, particularly for highly transmissible diseases that require high levels of isolation. Such patients can quickly overwhelm healthcare facilities, decreasing the overall capacity to respond to a serious outbreak.

Many dialogue participants also noted the lack of coordination and harmonization that exists between the Ministry of Health, local provinces, and other government officials/ministries as a barrier to providing adequate medical care during a public health emergency. Using a systems approach for disaster response, which integrates multiple levels of government and the healthcare sector, could help support a more coordinated response. For example, in the United States, healthcare coalitions have helped integrate the many sectors and departments that would be needed during an emergency, including hospitals, public health departments, emergency medical services (EMS), and local government. Additionally, including more components of the healthcare system into the GHSA was also noted as a way to improve country-level response capabilities.

Public Communication About Advances in Life Sciences and Biosecurity Threats

Public communication, particularly in the context of an emerging biosecurity emergency, is a complex task fraught with many pitfalls with the potential to have severe consequences on the public's health and safety. It is a difficult proposition, even under ideal circumstances. The emergence of social media and other competing sources of information and entertainment poses even further challenges. Dialogue

participants discussed the delicate balance between maintaining transparency—and in turn, trust—and mitigating the potential for public panic. Many biosecurity threats, including potentially catastrophic pandemics and bioterrorism, are low-probability but high-consequence threats, and public officials must proactively develop communications plans capable of educating the public on the relevant risks, encourage proper protective action, and control misinformation (both deliberate and unintentional). One participant noted that government agency websites are often not the primary source of information for the public. The public is more likely to seek information from traditional and social media, friends, and family than official government sources, so public officials must engage in these other media to reach the public. The principal challenge is ensuring that the message is properly conveyed through these sources.

Communicating with the public directly is a challenge in and of itself, but channeling these communications through others (eg, journalists, elected officials) is even more complicated. One dialogue participant discussed how journalists are often assigned the health "beat" early in their careers and do not cover this topic long before they are promoted to cover more prestigious subject matter, preventing these individuals from developing expertise in this area. Additionally, press deadlines may not afford journalists sufficient opportunity to conduct the background research required to fully understand the nuances (eg, epidemiology, clinical, legal) of emerging health events. Journalists also face the competing interests of providing accurate, objective information and publishing compelling storylines that will attract readership. Inaccurate coverage, particularly during situations in which there may be stigma against certain people or populations, can hinder response operations and place the public at increased risk.

The onus is on public officials to proactively engage journalists before and during biosecurity events to promote positive and accurate coverage of health topics. One dialogue participant noted that elected officials are often neglected as "mouthpieces" for public communication, but this may not always be the most effective means of communicating with the public. Politicians have additional motivations beyond conveying accurate information, and their communications with the public, at times, may be driven more by political pressures than by a desire for accuracy or by the public interest. For example, during the 2013-16 West Africa Ebola epidemic, some state and local elected officials in the United States made public statements and enacted policies that directly contradicted evidence-based guidance published by federal agencies such as the Centers for Disease Control and Prevention (CDC). There are certainly alternatives to direct communication with the public, but health officials must consider the lenses through which these "mouthpieces" receive and transmit the information.

Perhaps the biggest challenge facing modern public communication is misinformation, particularly deliberate attempts to mislead the public. Dialogue participants discussed the significant challenge posed by articles designed to steal the public's attention through the use of controversy and sensationalism, particularly when they deliberately contradict factual information about policies, programs, operations, and officials. These efforts can take many forms on social media as well as traditional media. One participant suggested that the only way to begin combatting these types of stories is to proactively publish factual information rather than responding to the misleading information directly; however, this is a difficult proposition. Ideally, health officials will engage with the public in advance of emergencies to establish trusted relationships and position themselves as trusted sources of information, but this may not be sufficient to compete with deliberate misinformation campaigns. There may, however, be other means (eg, policy, regulatory) to address this challenge. For

example, Malaysia recently passed a law banning deliberate misinformation efforts and, in fact, secured its first conviction under the new legislation in April 2018.[1]

Biological and Toxin Weapons Convention

All of the participants in this dialogue are from countries which are States Parties to the Biological and Toxin Weapons Convention (BWC), and the treaty and its associated nonproliferation norms received sweeping support from the dialogue participants. Because the BWC is an international treaty that operates on consensus agreement by the States Parties, it is inherently more of a political document than a practical one. For many countries, bioweapons are a considerably lower priority than many more pressing issues—including food security, economic challenges, or more traditional national security or terrorist threats—and as such, it is difficult to develop the political will and budgetary support for national BWC implementation. Several dialogue participants specifically noted their respective countries' difficulties in developing national-level legislation and completing confidence-building measures in support of the BWC.

A significant portion of the discussion addressed alternative approaches for strengthening the BWC, from the financial, normative, and institutional perspectives. Because many States Parties are unable to secure funding that can cover their participation in BWC-related meetings (eg, Meetings of States Parties, Meetings of Experts, Review Conferences) and/or their annual dues, let alone improve national-level implementation, dialogue participants proposed options for supplementing these efforts. One of the principal ideas was expanding the role of civil society (eg, non-governmental organizations, philanthropies, academic institutions) in the BWC. Non-state organizations engage directly with other United Nations (UN) organizations—for example, the Bill and Melinda Gates Foundation provide "technical input, funds and advocacy" to the WHO on a range of global health topics.[2] This kind of engagement is considerably less common for the BWC, however, and dialogue participants debated the prospective merits of more active civil society participation.

The options for increased civil society to further engage with the BWC fell largely into two categories: financial and technical. The BWC has struggled in recent years to secure sufficient funding to support the Implementation Support Unit (ISU) and host necessary meetings. As mentioned above, many States Parties struggle to pay annual dues, and some are in arrears for many years. In fact, the BWC's total outstanding dues as of May 31, 2018 totaled more than 470,000 USD, and operations continue thanks to overpayments by a number of countries.[3] As mentioned above, private funders provide financial support for other UN organizations, including the WHO, but this does not occur for the BWC. Dialogue participants speculated as to whether the ISU or States Parties would consider accepting funding from non-States Parties. This funding could provide much-needed stability for BWC operations, expand the ISU, and ease the burden on States Parties to participate in BWC proceedings. While the funding may be needed, there would likely be questions regarding the influence of funders on BWC proceedings and the potential for conflicts of interest. Civil society could also provide a range of technical support, both for the ISU and States Parties. The 7th BWC Review Conference in 2011 established a database in which States Parties could offer or request assistance under Article X of the BWC, including support for completing confidence-building measures or developing national legislation.[4] This appears to currently be limited to States Parties, but future iterations could potentially enable civil society organizations to offer their services to support States Parties in their efforts to implement the BWC and further

bioweapons nonproliferation norms. There has been recent conflict over the mere presence of non-governmental organizations at BWC proceedings,[5] so it is unclear to what extent these options could ever come to fruition.

CONCLUSION

The 2018 multilateral biosecurity dialogue identified existing biosecurity threats and outstanding gaps in preparedness and response programs while further solidifying important bilateral and regional relationships. Southeast Asia continues to face a broad range of biosecurity challenges, particularly stemming from a highly dynamic human-animal-environmental interface, a growing threat from terrorist groups, and an increased prevalence of advanced biotechnology in commercial and academic settings. This dialogue is a critical tool to building and maintaining a sustainable, collaborative regional approach to combatting biological threats with the potential to impact national, regional, and global security.

AGENDA

18 APRIL 2018

09:00 – 09:15 **Welcome and Goals for Meeting**

Pratiwi Sudarmono, Professor, Faculty of Medicine, Universitas Indonesia

Tom Inglesby, Director, Johns Hopkins Center for Health Security

Anita Cicero, Deputy Director, Johns Hopkins Center for Health Security

09:15 – 09:45 **Introductions**

Each participant will introduce himself/herself and briefly describe their background and interest in biosecurity issues.

09:45 – 11:15 **Dialogue Session One:** National Priorities and Challenges in Biosecurity

Health security concerns and challenges continue to evolve. In this opening session, we will discuss: How does each country currently view the challenges posed by biosecurity threats – natural, accidental, and deliberate? What opportunities exist for strengthening national efforts to respond? Have new developments or concerns emerged over this past year? What are the main elements of our respective national programs to prevent and respond to major biological threats? A representative from each country will provide opening remarks (5 minutes each) on this topic, followed by a discussion among all participants.

Opening Remarks: Ratna Sitompul, Zalini Yunus, Michelle Yap, Rolando Enrique Domingo, Nakorn Premsri, Seth Carus

11:15 – 11:30 **Coffee/Tea Break**

11:30 – 12:45 **Dialogue Session Two: Improving Disease Detection and Public Health Response to Epidemics**

In this session, participants will focus on how their national public health systems detect and respond to new outbreaks of infectious disease. From the earliest cases, when the cause of an epidemic (natural, deliberate, or accidental) may be unclear, through the transition into a concerted public health system response, the differences and commonalities of national approaches will be discussed. Questions will include: What are your key national or regional systems for disease surveillance? What technologies

are most important now, or might be in the future? What are the biggest challenges to early outbreak detection? How quickly would outbreaks of novel diseases be detected? What is the process for communicating with the public during epidemics? Opening remarks (5-7 minutes each) will be followed by a group discussion.

Opening Remarks: Rolando Enrique Domingo, Kitpong Sunchatawirul, Pratiwi Sudarmono, Sumi Parenjape

12:45 – 14:15 **Lunch and Group Photo**

14:15 – 15:00 **Presentation: *Indonesia Ministry of Defence Perspectives on National and Regional Biosecurity and Biodefense***

Major General Bambang Hartawan, Director General, Defence Forces, Ministry of Defence, Republic of Indonesia

Q&A and Comments from the Group

15:00 – 15:15 **Coffee/Tea Break**

15:15 – 16:30 **Dialogue Session Three: Biosafety, Biosecurity, and the Potential Misuse of Biotechnology**

This session will focus on the current state and future trends in biosafety, biosecurity, and advanced life sciences research in Southeast Asia and the United States. In your country, how much high level scientific and government attention is paid to biosafety involving high consequence pathogens? How is your country approaching laboratory biosecurity issues – for example, the personnel reliability of workers in labs with high consequence pathogens, and the physical safety of those labs? Emerging biotechnologies are becoming profoundly important for medicine, health, and for economic development. New technologies provide the opportunity to develop more effective medical countermeasures and public health measures (such as using gene drives to reduce mosquito populations), but they could also increase the potential for the misuse, the creation of new weapons, or highly consequential accidents. How does your country address those issues? Are there life science research efforts or practices happening elsewhere

in the world that are concerning to you from a biosafety/biosecurity perspective? How do you see the future of biotechnology changing the potential risks of misuse, and how to manage these new risks? A representative from each country will provide opening remarks (5-7 minutes) on this topic, followed by a discussion by all participants.

Opening Remarks: Sazaly Abu Baker, Michelle Yap, Jaime Yassif, Irma Makalinao

16:30 **Meeting Adjourns**

19 APRIL 2018

08:45 – 09:45 **Presentation: *Indonesia Ministry of Health Perspectives on the Global Health Security Agenda and Joint External Evaluation***

Presenters: Dr. Siswanto, Head of National Institute for Health R&D, Ministry of Health, Republic of Indonesia *and* Dr. Imran Pambudi, Chief of Multilateral Health Cooperation, Ministry of Health, Republic of Indonesia

Q/A and Comments from the Group

09:45 – 11:00 **Dialogue Session Four: Research and Development for Medical Countermeasures to address Biological Threats**

In order to develop vaccines, therapeutics, and diagnostics for infectious disease threats, there needs to be government investment as well as public/private partnerships with pharmaceutical and biotech companies that can do the necessary advanced development and manufacturing. What are your country's strategies for researching and developing the MCM's seen as highest priority infectious disease threats? How does your country determine which threats are worth spending resources on? In the event of an emergency, do you have relationships with other countries to either acquire or share MCMs? Are there novel manufacturing strategies that could be employed that would allow greater international distribution of MCMS in infectious disease emergencies? Opening remarks (10 minutes each) will be followed by a group discussion.

Opening Remarks: Noreen Hynes, Amin Soebandrio

11:00 – 11:15 **Coffee/Tea Break**

11:15 – 12:30 **Two Perspectives on the Role of Law Enforcement in Biosecurity, followed by Group Discussion**

- Vincent Lucero, WMD Assistant Legal Attaché, US Embassy Singapore
- Dato' Hussein Bin Omar Khan, Chief Assistant Director, DNA Databank Division, Criminal Investigation Department, Royal Malaysian Police

12:30 – 13:45 **Lunch**

13:45 – 15:00 **Dialogue Session Five: Taking Action -- Moving One Health from Science into Policy**

A strategic approach to strengthening biosecurity would include the principles of "One Health," which recognize that the health of people is connected to the health of animals and the environment. While the importance of One Health has been acknowledged for a long time, it has proven challenging to integrate such concerns across governmental departments, funding sources, and expertise. This session will focus on the extent to which One Health approaches are being pursued in the countries involved in the dialogue. What would stronger One Health initiatives look like concretely in practice? What would be the most valuable ways to combine human and animal infectious disease surveillance and response? Are other countries building One Health programs in ways that are worth emulating? Opening remarks (10-15 minutes each) will be followed by a group discussion.

Opening remarks: Rozanah Asmah Abd Samad, Irma Makalinao

15:00 – 15:15 **Coffee/Tea Break**

15:15 – 16:30 **Roundtable Discussion: *Biosecurity from 30,000 Feet – Geopolitical Considerations, Current Approaches by International Organizations, and Regional Developments Affecting Biosecurity***

What geopolitical issues affect national priorities in biosecurity? To what extent does the strength of other countries' preparedness for natural epidemic threats affect safety in our own countries? To what extent are deliberate biological threats perceived to emanate from states vs. groups or individuals? What more might we do collectively to prevent, detect and respond to infectious disease threats? What role can international organizations play in prevention, detection and response, and what are their limitations?

Opening Presentations and Moderation by: Kwa Chong Guan and Tikki Pangestu

16:30 **Meeting Adjourns**

20 April 2018

09:00 – 10:15 **Dialogue Session Six: Medical Care in a Public Health Emergency – How can Countries Improve their Ability to Take Care of Civilians and Military Personnel after a Large Biological Event**

How resilient are our health systems to major biological disasters? In what ways can countries work to meet medical care needs during emergencies of any scale? In the United States, there are programs to create and empower healthcare coalitions to better provide coordination and surge capacity during catastrophic health events. How well are these coalitions functioning now? In what ways can they improve? Do other countries in the dialogue have similar or different strategies for providing medical care during public health emergencies? What approaches for providing medical care and surge capacity are used by countries' militaries? Are there lessons to be learned from the military's approach that would be applicable to medical care of civilian populations following a large biological event? Opening remarks (10-15 minutes each) will be followed by a group discussion.

Opening Remarks: Daniel Tjen, Dan Hanfling

10:15 – 10:30 **Coffee/Tea Break**

10:30 – 11:30 **Two Perspectives on Communicating to the Public about Advances in the Life Sciences and Biosecurity Threats, followed by Group Discussion**

- Endy Bayuni, Senior Editor, The Jakarta Post
- Nazalan bin Mohd Najimudin, Professor of Molecular Genetics, Universiti Sains Malaysia

11:30 – 12:45 **Dialogue Session Seven: Current Developments and Future Directions for the Biological Weapons Convention**

In December 2017, during the Meeting of the States Parties in Geneva, the States Parties successfully reached consensus on an intersessional program of work between 2018-2020. Matthew Shearer, from the Center for Health Security, will give participants an update about the outcome of this meeting. Participants will discuss: How do countries in this dialogue view the BWC? What challenges are faced by countries attempting to implement the treaty? Do countries have incentive to implement it? Does the BWC adequately address new developments in biotechnology? Opening remarks (7-10 minutes each) will be followed by a group discussion.

Opening Remarks: Zalini Yunus, Irma Makalinao, Seth Carus

12:45 – 13:45 **Lunch**

13:45 – 14:45 **Case study and Group Discussion: De Novo Synthesis of Horsepox and its Implications**

Moderated by Tom Inglesby

14:45 – 15:00 **Coffee/Tea Break**

15:00 – 15:30 **Discussion of Next Steps and Future Topics for the Multilateral Biosecurity Dialogue**

Participants will suggest topics of interest for future dialogues, possible topics for Track 1 engagement & next steps on the policy paper.

15:30 **Dialogue Adjourns**

Meeting Participants

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REFERENCES

[1] Deahl D. First person convicted under Malaysia's fake new law gets month in jail. *The Verge*. April 30, 2018. https://www.theverge.com/2018/4/30/17302954/malaysia-anti-fake-news-act-youtube. Accessed June 15, 2018.

[2] World Health Organization Executive Board. Engagement with non-State actors: non-State actors in official relations with WHO. http://apps.who.int/gb/ebwha/pdf_files/EB140/B140_42-en.pdf. Document EB140/42. Published January 13, 2017. Accessed June 19, 2018.

[3] United Nations Secretariat. Status of Contributions of BWC, CCW, CCM, OTW as at 31 May 2018. https://www.unog.ch/80256EDD006B8954/(httpAssets)/2213680B1746A158C12582A2003FC925/$file/27480938.pdf. Published May 31, 2018. Accessed June 19, 2018.

[4] Assistance and cooperation database. United Nations Office at Geneva website. https://www.unog.ch/bwc/database. Accessed June 19, 2018.

[5] Guthrie R. First cross-cutting plenary: Article X and science & technology. BioWeapons Prevention Project. http://www.cbw-events.org.uk/RC16-07.pdf. RevCon report 7. Published November 15, 2016. Accessed June 19, 2018.