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Southeast Asia Strategic Multilateral Biosecurity Dialogue

with participation from Indonesia, Malaysia, the Philippines, Singapore, Thailand, and the United States

Meeting Report from the 2019 Dialogue Session

April 29-May 1, 2019
Phuket, Thailand

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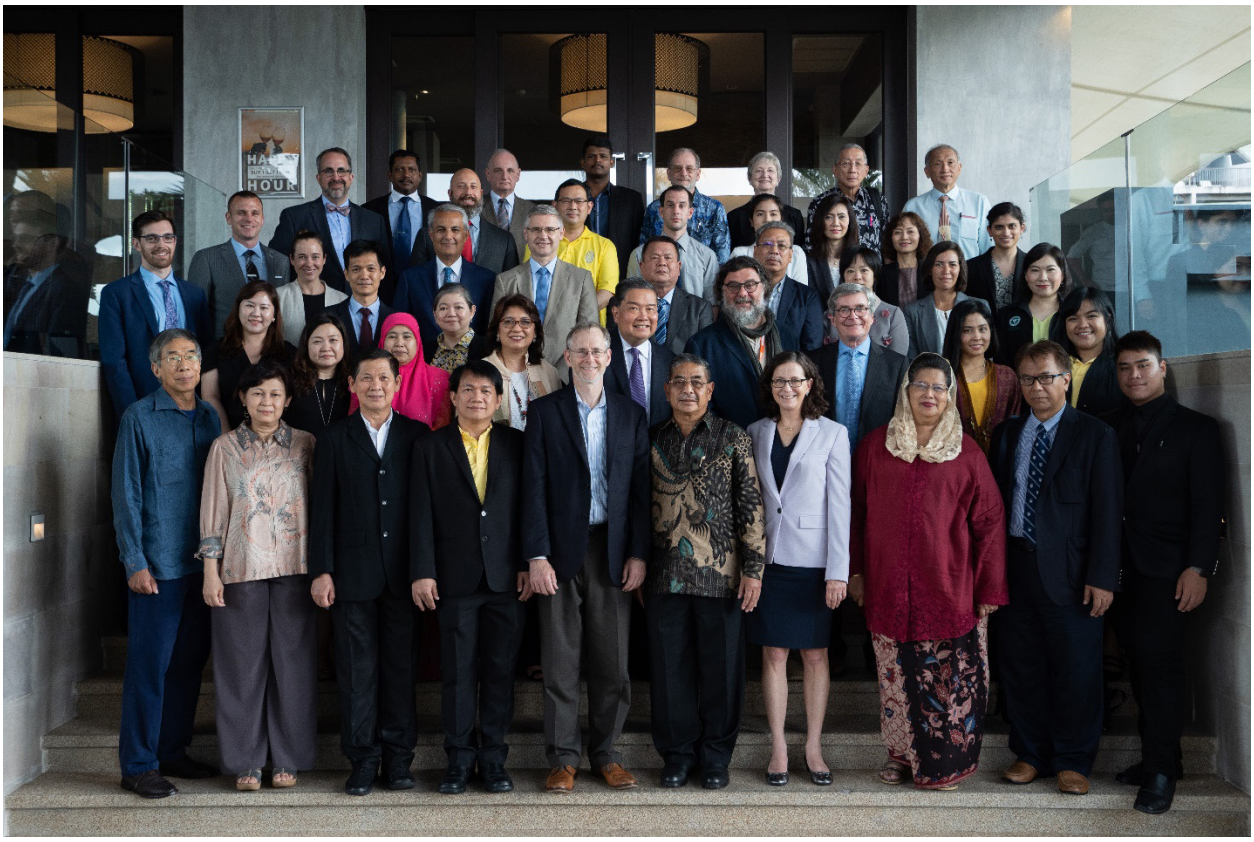
Executive Summary

The Johns Hopkins Center for Health Security and Thailand Ministry of Public Health co-hosted the 2019 Southeast Asia Multilateral Dialogue on Biosecurity from April 29-May 1 in Phuket, Thailand. This year's dialogue meeting was attended by participants from Indonesia, Malaysia, the Philippines, Singapore, Thailand, and the United States. Participants represented a broad scope of sectors relevant to biosecurity, including public health and healthcare; defense, national security, and law enforcement; homeland security and home affairs; plant and animal health; WMD nonproliferation; academia; and the media. The participants discussed ongoing and emerging biosecurity challenges in the Southeast Asia region and shared key challenges and solutions with the aim of bolstering regional biosecurity preparedness and response capabilities. Among these challenges were emerging infectious diseases; deliberate biological threats, including bioterrorism; national, cross-border, and regional biosurveillance; the role of evolving regional and global geopolitics on biosecurity; misinformation around health topics and emergencies; and biological weapons nonproliferation. In addition to the dialogue discussion sessions, invited experts from the World Health Organization, Biological and Toxin Weapons Convention, and US Indo-Pacific Command provided detailed presentations on their programs and engagement, with a focus on the Southeast Asia region. The participants also engaged in a tailored version of the Clade X pandemic tabletop exercise, elucidating a myriad of biosecurity policy dilemmas in the context of an emerging pandemic scenario.

As the participants shared views on complex biosecurity challenges, a number of key themes emerged across the dialogue discussion sessions and presentations. At a high level, participants noted that current geopolitical trends—in particular, a perceived shift away from multilateralism and toward nationalist and isolationist policies—could have a myriad of direct and indirect effects on biosecurity in Southeast Asia and around the world. Participants also discussed in depth the role of the military in biosecurity issues, both at the national level and via international collaboration. Interestingly, participants seemed to place more emphasis on the threat of terrorism and other deliberate biological threats than in previous years. The threat posed by emerging infectious diseases has typically been the priority for many participating countries over the course of this dialogue, but this year's meeting exhibited increased attention to deliberate threats, potentially signaling a change in perceptions of biosecurity risks in the region. Participants continue to place significant value on international and regional collaboration on biosecurity issues, and they discussed a variety of international partnerships, including biosurveillance networks, training and education programs, and preparedness and response coordination.

Advances in biology and biotechnology in Southeast Asia continue at a rapid pace, which both increases the potential for positive benefits in the region—and beyond—and increases the risk of accidental and deliberate biological events. Participants discussed in depth the feasibility of developing and advancing pharmaceutical research and production capacity in the region, both as an economic driver and to ensure self-reliance during future biological events in which medical countermeasures are needed for response activities. Finally, participants from all countries described the growing challenges of misinformation and disinformation, particularly in the context of communicating health information. These challenges exist for routine health communication as well as emergencies, and false or misleading information could have major impacts on public trust, which is critical to maintaining the public's health.
This dialogue began in 2014 as a bilateral effort between Singapore and the United States, and it has grown in the intervening years to include Indonesia, Malaysia, the Philippines, and Thailand. These discussions continue to strengthen professional ties between experts in the participating countries and identify priority challenges and threats across the broad scope of biosecurity. Participants share important lessons and solutions to these challenges and determine areas that merit elevation to the highest levels of government, including formal government-to-government engagement.
This dialogue will continue to tackle important biosecurity threats in the region and internationally as it continues into its seventh year in 2020.

Contents



Introduction

From April 29 to May 1, 2019, the Johns Hopkins Center for Health Security and the Thailand Ministry of Public Health's Department of Disease Control co-hosted a meeting of the Southeast Asia Strategic Multilateral Biosecurity Dialogue in Phuket, Thailand. This dialogue began in 2014 as a bilateral Track II dialogue between Singapore and the United States and expanded the following year to include Indonesia and Malaysia. The Philippines and Thailand were added as observers in 2017, and they became full participants starting with this year's meeting. The purpose of this dialogue is to examine biological risks facing the United States and the Southeast Asia region—including natural, accidental, and deliberate. This dialogue aims to facilitate cross-border and regional engagement and collaboration and identify novel solutions and share best practices in combatting priority threats.

The 2019 dialogue meeting in Phuket brought together participants from each of the 6 countries, including current and former senior government officials from an array of agencies and organizations and subject matter experts from non-governmental organizations, academia, and the media. Participants represented diverse fields, including national security and foreign affairs, public health and healthcare, homeland

defense/home affairs, WMD nonproliferation, animal health and agriculture, and journalism. The dialogue is conducted at an informal Track II level, as opposed to formal government-to-government engagement, which enables the discussions to be frank and open, leading to a stronger understanding of each country's capabilities and limitations.

The 2019 meeting consisted of multiple dialogue sessions focused on group discussions as well as more structured presentations on a broad range of biosecurity topics that built on previous dialogue meetings and provided opportunities to address new programs and capabilities and emerging threats. Each session provided participating countries with an opportunity to present on relevant national-level experience, programs, and priorities, followed by active dialogue involving all participants. Additionally, invited guests representing the World Health Organization (WHO) Health Emergencies Programme, the WHO Health Security Interface Secretariat, the Biological and Toxin Weapons Convention Implementation Support Unit (BWC ISU), the Thailand Ministry of Public Health, and the US Department of Defense Indo-Pacific Command provided detailed briefings on priority biosecurity topics, programs, and perspectives from their offices, with a particular focus on Southeast Asia, to supplement the dialogue discussions. Dialogue topics included national biosecurity priorities, the effects of a changing geopolitical environment on biosecurity, emerging infectious disease (EID) threats, deliberate and high-consequence biological threats, the role of military and defense assets and programs in biosecurity, EID research and vaccine policy, and communication and misinformation challenges during public health emergencies. Additionally, dialogue participants actively engaged in a modified version of the Clade X pandemic tabletop exercise, a simulation developed by the Johns Hopkins Center for Health Security. The final session of the dialogue was dedicated to a roundtable discussion of future steps and priorities for the dialogue itself, with the goal of identifying collaborative activities to disseminate the dialogue findings and influence national and regional policy.

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

Evolving Geopolitical Climate in Southeast Asia

Participants noted that they have observed a global trend in recent years toward nationalism and isolationism and that these policies are impacting realms far beyond politics, including regional and global economies and biosecurity. Nationalist rhetoric

and policy shifts have been observed from the United States to Europe and the United Kingdom to the Philippines as well as in many other countries,[1,2,3] and candidates and governments have exhibited a desire to pivot away from multilateralism to focus on domestic priorities. Participants observed that when countries withdraw from international engagement to prioritize domestic interests, voids can remain in those international arenas that could be filled by new actors, creating new geopolitical dynamics.

Southeast Asian participants discussed a perceived lessening of US government interest in international programs and collaborations around the world, particularly in Southeast Asia, and questioned the implications of those shifts on biosecurity. Whether resulting from a desire to step back and allow other countries to take leading roles or from a push toward more isolationist policies, this trend by the US government has been ongoing for several years, at least as far back as the 2008 global financial crisis, according to one participant.

For example, participants viewed recent examples of the United States withdrawing from various international commitments as potentially foreshadowing an unreliability on the part of the United States in future health emergencies. While the Global Health Security Agenda (GHSA) was initially a US-led effort, there was concern in 2018 about the future of US government-funded programs under the GHSA that was scheduled to end in 2019.[4,5] Despite these concerns, however, the United States did renew funding support for GHSA programs at the Centers for Disease Control and Prevention (CDC) and the US Agency for International Development (USAID).[6] Even with continued US support, one dialogue participant suggested that stronger leadership would benefit the GHSA, and participants generally expressed uncertainties about its future effectiveness and impact.

Several participants noted that decreased engagement by the United States and other Western nations in Southeast Asia has opened the door for other countries to increase their investment and leadership in the region, and the principal question remained: Who will take the lead? Participants discussed several potential options to fill the perceived void left by the withdrawal of Western nations, each with serious implications for the future of biosecurity in Southeast Asia. Participants identified China, Japan, and Australia as the most likely candidates to establish themselves as a regional leader, and ASEAN was also proposed as a potential source of collaboration and support for Southeast Asian nations that desired to play more active leadership roles in the region.

Multiple participants noted China's role in the global nationalist trend, citing both hard and soft power approaches and policies, particularly in the South China Sea. In recent years, China has reinforced its claim to the South China Sea (including areas claimed by countries participating in this dialogue), in spite of certain international law judgements,[7] through increased military operations as well as construction and expansion of artificial islands.[8] Additionally, participants discussed China's focus on economic aspects of health emergencies, which may stem from its experience with SARS in 2003. Soft power initiatives by China—such as the Belt and Road Initiative, which provides Chinese investment and support for infrastructure development across Asia and Europe[9]—are currently focused on economic growth and do not directly incorporate health security, but participants noted that they could see great benefits to partnership with China if the scope of this program were expanded. One participant posited that expanded regional data sharing and collaboration could potentially improve vaccine development and production efforts. Associated improvements in the commercial profitability of the vaccine industry in Southeast Asia could further attract Chinese engagement and investment in the region. Participants broadly viewed China as utilizing a variety of approaches in the region, noting that Chinese leadership on biosecurity issues could provide a range of benefits and potential challenges for countries.

Participants also commented that Australia has an active history in biosecurity engagement, particularly in Southeast Asia, but one participant stated that Australia seems concerned about the US government's level of commitment to the GHSA. Australia hosted a major global health security conference in June 2019 with the goal of issuing a "Sydney Statement" outlining the principles and goals for the future of global health security. This could be an indication that Australia is willing to play a leading role on global health security, regardless of whether the United States recedes. One participant noted that Japan had previously contributed vaccine from national stockpiles in emergencies, and Japan has taken leadership roles on other regional issues. It was unclear, however, whether the Japanese had an interest in leading regional biosecurity efforts.

Ultimately, regional biosecurity leadership could come down to where ASEAN seeks assistance in the next health emergency. Due to its interest and available resources, participants highlighted China as the most likely option, but they also raised concerns about its regulatory and oversight systems, particularly for the biotechnology and pharmaceutical sectors. Regardless of the outcome, participants suggested that the perceived retraction of the United States from international engagement has resulted in considerable uncertainty about the future of biosecurity in Southeast Asia, including the region's ability to prepare for and respond to major health events.

Role of the Military and Security Sectors in Health and Biosecurity

As nations and experts have increasingly recognized and called attention to the security threats associated with health and biology, militaries and national security agencies have played a larger role in biosecurity issues, particularly for deliberate threats. Notably, biological threats directly and indirectly affect both health and security sectors. For example, participants highlighted that while EIDs like malaria and avian influenza remain priority threats for health officials, military units routinely operate in areas that place them at elevated risk for these diseases, and associated illnesses and outbreaks can have substantial effects on military readiness and national security. Additionally, the military and security sector have many assets and capabilities, including logistics expertise, that can be leveraged to support health emergency responses. Many challenges and barriers remain, however, to establishing, maintaining, and strengthening integration between health and security sectors and organizations. This dialogue has repeatedly examined these challenges, from a range of perspectives, and participants—including increasing representation from law enforcement, military, and other security agencies—continue to share their experiences, challenges, and lessons with the goal of identifying and disseminating best practices.

It was evident from meeting discussions that the role of militaries in biosecurity preparedness and response activities varies by country. For example, Indonesia's military plays a more direct role in health emergency issues—including coordinating response activities—operating from the perspective that health emergencies are potential security issues. And while Indonesia has a strong Ministry of Health, the security sector—including the military, State Intelligence Agency, and the National Police—coordinate closely on biosecurity preparedness and response issues. In fact, one participant noted that the WHO Director-General cited Indonesia as the "role model" for civilian-military coordination on health issues. Indonesia's military also collaborates with academic researchers on a variety of priority biosecurity topics. Conversely, Singapore's military is often not the principal first responder to a health crisis; however, is has a wealth of operational experience that can be leveraged for health threats, and it can provide manpower and logistical support to response operations. Singapore's military coordinates closely with partners in the Ministry of Health for training and exercises, and the Ministry of Home Affairs (MHA) provides border security services, including infectious disease screening and laboratory diagnostics at border crossings. Singapore's MHA officials communicate disease data to partners in the Ministry of Health to establish baseline data for diseases imported into the country, particularly influenza, which can be compared against surveillance data from local healthcare systems. Additionally, border surveillance can provide advance notice of diseases (eg,

influenza) crossing into Singapore, which can allow health officials to quickly initiate appropriate response activities. In Malaysia, the Ministry of Defence leads the country's activities at the BWC on the international stage, receiving support from an array of other ministries and agencies in the context of national implementation of BWC obligations. Additionally, Malaysia's Ministries of Health and Defence have established a strong working relationship, including joint training and exercises. In addition to chemical, biological, radiological, and nuclear (CBRN) events, military assets in Malaysia such as ambulances and field hospitals can even be mobilized to support the civilian response to large-scale outbreaks.

Militaries not only play a role in national governments' biosecurity preparedness and response efforts, they also contribute directly to regional-level biosecurity capacity and planning. For example, the ASEAN Centre for Military Medicine in Bangkok, Thailand, facilitates coordination between military/defense agencies in the region, including on biosecurity issues, and the ASEAN Defense Ministers Meeting-Plus (ADMM-Plus) Working Group on Military Medicine hosted in Myanmar in February 2019—attended by a number of dialogue countries (including the United States), other ASEAN member countries, and additional partners in Asia (including China and Russia)—included a field exercise to test and improve functional interoperability for health responses. One participant noted that efforts such as the Asia Pacific Military Health Exchange, jointly hosted by the US Indo-Pacific Command and China in 2018, could provide continued opportunity for collaboration on health and biosecurity issues, even if political and/or military tensions exist between countries.

Despite the engagement by military and security agencies and programs on biosecurity issues, there remain significant barriers to fully integrating health and security preparedness and response efforts in many countries. One participant noted that, militaries' existing and historical capabilities and experience often make them well poised to support operational response during health emergencies, particularly considering their historic active role in natural disaster and humanitarian response in many countries. Dialogue participants from multiple countries, including the United States, also noted, however, that a lack of communication between the health and security sectors during emergencies can pose challenges to conducting effective and cohesive response operations. One participant acknowledged that while there are numerous military conferences and meetings related to health security, there are relatively few conferences or formal venues in which military and civilian health stakeholders can engage collaboratively on these issues. Additionally, a participant noted that it is important to ensure that increased engagement by militaries on health issues does not result in diminished civilian preparedness and response capacity, and another expressed concern that engagement between non-governmental organizations

(including academic institutions) and security agencies could result in a perception of militarization or securitization of those organizations, which could potentially pose barriers to integrating the health and security sectors.

Delineating responsibilities between security and health sectors in order to mitigate duplication of efforts and define a clear chain of command remains a challenge in many countries. In particular, multiple participants expressed a need to deconflict responsibilities and authorities for events that are suspected of potentially being deliberate in nature, especially if that suspicion is raised or the determination is made in the midst of a response. In other words, how do countries transition from a health-led response to one with a security focus without reducing the effectiveness of either aspect of the response? One participant confirmed that his country has no plan in place for the national public health authority to coordinate with the security authorities in the event of a biological weapons attack, whether it occurs within the country or it is imported from another country.

One participant noted that in the United States, the military has substantial assets that can support pandemic response—specifically, logistics, communications, and command and control—but they do not typically participate in domestic health emergency response. These activities are largely conducted by state health agencies with federal support the Department of Health and Human Services, including the CDC and the Assistant Secretary for Preparedness and Response (ASPR). Conversely, the US military has provided support in a number of recent international health emergencies, including natural disasters, but they typically play more of a supporting role for infectious disease events, such as during the 2013-16 West Africa Ebola epidemic. Unlike many other countries, including some dialogue countries, the US military does not typically play a major role in domestic healthcare or public health issues; however, this is changing to a modest degree, as some military health facilities are beginning to engage in community-based health care efforts.

Several participants discussed the potential benefits and hazards resulting from rapid advances in genomics, biotechnology, and other biological specialties, as illustrated during the Clade X tabletop exercise. In addition to traditional security domains—including land, air, sea, undersea, and cybersecurity—the biomolecular domain poses a range of yet unknown capabilities that could be used for nefarious or beneficent purposes. Many participants agreed that it is critical for militaries in the United States and partner countries, including across Southeast Asia, to collaborate on identifying how best to function in this emerging domain, anticipate threats, and leverage new capabilities. There are many parallels between biotechnology and the internet and associated technologies, including rapidly decreasing costs and distributed and

accessible capabilities, and a proactive effort is required to mitigate future risks while also reaping the technical, economic, and health benefits.

US Indo-Pacific Command

Rear Admiral Lou Tripoli, Surgeon General of the US Indo-Pacific Command, presented and discussed the priorities and global health security engagement by the US Department of Defense, particularly in the context of Southeast Asia. Notably, the Indo-Pacific Command area of operations spans 11 time zones (from the West Coast of the United States to the Indian Ocean) and from the Arctic to the Antarctic, including 36 countries. This area encompasses a total population of more than 4 billion people, more than 60% of the global population (and expected to reach 70% by 2050). The size and diversity of environments and populations subject the Indo-Pacific region to a wide variety of existing and emerging biological threats. The Indo-Pacific Command has approached health security as an important mechanism for ensuring global stability and has pursued engagement in a broad scope of health security issues in order to support sustainable capacity development and empower partner nations, including a number of Southeast Asian countries. Diseases can cause instability through a variety of mechanisms—ranging from degrading the health and readiness of military forces to eroding trust in government to downstream political, financial, and economic impacts—and emerging events can rapidly grow into regional and global threats. The Indo-Pacific Command has also supported and participated in a variety of programs with country partners to facilitate engagement and regional capacity building.

Rear Admiral Tripoli explained that the Indo-Pacific Command actively engages with partners in the region on health security, including through the Pacific Partnership, which is the "largest annual, multilateral disaster response preparedness mission in the Indo-Pacific region." Pacific Partnership 2019 included health professionals from militaries in Malaysia, the Philippines, Thailand, and the United States as well as Australia, Canada, Japan, Peru, South Korea, and the United Kingdom. This program conducted more than 60 operations in Malaysia, the Philippines, Thailand, the Marshall Islands, Micronesia, Timor-Leste, and Viet Nam to develop resiliency to a broad scope of biological threats. In addition to direct engagement with countries in the Indo-Pacific region, the US Department of Defense has invested in advanced research and development for number of vaccines and therapeutics for EIDs present in Southeast Asia. US Department of Defense engagement in Southeast Asia also includes more permanent efforts, such as Naval Medical Research Unit Two (NAMRU-2) laboratories throughout Southeast Asia and the Armed Forces Research Institute of Medical Sciences (AFIRMS) in Thailand, a partnership between the US Army and the Royal Thai Army that has combatted biosecurity threats—including HIV/AIDS; malaria, dengue, and other EIDs; and disease vectors—for more than 50 years.

Regional and International Collaboration

Informal and Formal Regional and Cross-Border Surveillance Networks

Participants agreed that there is an increasingly substantial range of formal and informal efforts and organizations aimed at improving regional biosurveillance by fostering cross-border collaboration in Southeast Asia. Informally, health officials in the region have established ad hoc networks using e-mail and web- and cloud-based communications applications (eg, WhatsApp) to notify points of contact in other countries of emerging health security issues, such as an imported case of a priority disease. Countries in Southeast Asia also use formal notification networks, including those mandated under the International Health Regulations (IHRs), to communicate critical information about ongoing and emerging health threats.

Several formal bilateral and regional cross-border surveillance and response programs, both new and well established, have been implemented to improve regional capacity to detect and respond to emerging biosecurity events. Numerous participants noted the Mekong Basin Disease Surveillance (MBDS) consortium, an ongoing effort among 6 countries in the Mekong Basin sub-region of Southeast Asia, as a vital resource and information sharing network. Health officials in Cambodia, China, Lao PDR, Myanmar, Thailand, and Viet Nam as well as nongovernmental partners collaborate on capacity building, biosurveillance data sharing, and outbreak preparedness and response efforts for both endemic and emerging diseases. A Thai participant also described its "twin cities program" with neighboring countries to foster cross-border collaboration, including disease surveillance, information sharing, and training. Thailand has 31 provinces that share borders with Cambodia, Lao PDR, Myanmar, and Malaysia, 24 of which participate in the bilateral twin cities program. Notably, Thailand leverages this program to collaborate with Myanmar in order to strengthen malaria and tuberculosis case referral systems and surveillance. Additional regional and subregional networks and programs in Southeast Asia include the Lower Mekong Initiative, Lancang-Mekong Cooperation, and the ASEAN Regional Capacity on Disaster Health Management (ARCH) Project. These efforts address a broad range of biosecurity threats, issues, and priorities in Southeast Asia, including infectious disease outbreak surveillance and response.

Dialogue participants also discussed the importance of international partnerships to securing national borders. Screening and security at points of entry (PoEs), including for infectious diseases and food safety, leverage bilateral and regional collaboration. Participants specifically addressed the challenge posed by the ongoing African Swine Fever (ASF) epidemic, which has affected multiple countries in Southeast Asia. None of the countries participating in this dialogue had yet reported a case of ASF linked to the

current epidemic, but the volume of the pork trade in the region had many participants concerned about the potential for future introductions of the disease into domestic pig farms or markets. Participants noted that Southeast Asia also faces significant volumes of regional human travel as well, as highly mobile populations compound challenges posed by long and porous borders. Regional air travel has also increased considerably in recent years, owing largely to the advent of low-budget regional airlines. For example, one participant shared that there are 35 flights each day from Jakarta to Singapore and another 12 between Manila and Singapore, highlighting the potential for rapid international spread of disease in the region. Participants discussed the importance of ongoing fever and symptom screening at airports, considering the high frequency of arriving flights from countries across Southeast Asia.

The ASEAN Plus Three (includes China, Japan, and South Korea) Field Epidemiology Training Network (FETN) has played a substantial role in surveillance and epidemiology capacity building among countries throughout the region by facilitating collaboration among the field epidemiology training programs operated by participating countries. The Thailand Ministry of Public Health serves as the principal focal point for the FETN initiative since its inception in 2011. Participants described a recent mission in which a Thai FETN group traveled to Lao PDR to facilitate training. Additionally, FETN co-organized a GHSA meeting focused on Regional Strategic Frameworks in Animal & Human Health (under the Workforce Development action package that Thailand co-leads) and established a technical dialogue to facilitate regional communications. A Thai presenter said that programs like the FETN help to build national- and regional-level biosecurity preparedness and response capacity through sharing experiences and expertise between national training programs and fostering cross-border professional relationships that can be leveraged between and during incident responses.

Unlike previous multilateral dialogue discussions, during which participants raised concerns about best practices for sharing surveillance data, this year's sessions did not focus substantially on the challenges of what type of data to share or who to share it with. Instead, participants showed support for the numerous and diverse formal and informal surveillance networks and viewed them positively as mechanisms to strengthen regional collaboration. Participants did note, however, that other regional programs, such as China's Belt and Road Initiative, are currently optimized for world trade but could potentially be leveraged to improve regional disease surveillance, information sharing, and operational response. The Belt and Road Initiative could provide an opportunity for participating countries to share emerging surveillance data and medical countermeasures, but the value in such a program could be lost if the focus is exclusively on economic development. Additionally, some participants acknowledged

that mapping the locations of existing laboratories highlighted geographical gaps in laboratory capacity across the region, particularly in the case of One Health approaches to laboratory-based surveillance. This is of particular concern, considering the economic threat posed by ASF and other animal and zoonotic diseases in the region. Participants also discussed how ASF and other similar pathogens that pose substantial economic threats could be utilized as a form of bioterrorism, as opposed to pathogens that directly impact human health.

Regional Leadership and Fora

Similar to the growing number and scope of surveillance networks, there are increasing efforts to establish collaborative fora and response networks in the Southeast Asia region. Participants noted several types of bilateral and multilateral workshops and meetings in the region on relevant biosecurity topics, including laboratory biosafety, antimicrobial resistance, and response during a nuclear emergency. These workshops and discussions were occurring not only among participating countries present at this meeting, but also with other neighboring countries that may have historically had less established health security infrastructures in place.

Participants also discussed ways in which ASEAN has assisted in fostering regional leadership and collaboration. The post-2015 ASEAN Health Development Agenda includes a variety of relevant health security focus areas, including food safety, health systems strengthening, access to care, all-hazards response capabilities, and healthy lifestyle practices. One of the most popular initiatives discussed by participants was the ASEAN Coordinating Center for Humanitarian Assistance (AHA), which is an intergovernmental organization that focuses on disaster monitoring, preparedness, and response as well as overall regional capacity building. AHA focuses on providing regional humanitarian assistance for natural disasters, and all ASEAN national focal points are linked directly to the regional emergency operations center (EOC). AHA facilitates surveillance and communication during disasters and provides standard operating procedures for disaster response. Disaster management systems for ASEAN countries are linked through the AHA system, and the national focal point from an affected country can request help through the network, which can trigger automatic activation of national disaster management systems. One of the principal challenges noted by participants is that AHA focuses solely on natural disasters, which limits its impact during outbreaks and other health emergencies.

The multitude of bilateral, subregional, and regional efforts to collaborate and build surveillance and response capacity is a major strength in Southeast Asia and demonstrates the commitment of these countries to improving preparedness and response capacity for a range of biological threats. Despite these national commitments,

however, participants noted that the region still faces a number of challenges in this regard, including the need for organizing international and regional activities and for programs to eliminate siloes and duplication of effort across these many initiatives and activities. Identifying ways to consolidate and streamline coordination and collaboration in the region could help optimize the allocation of limited resources and improve the efficiency of these efforts.

International Collaboration

In addition to improving regional partnerships, dialogue countries are also playing leadership roles on the global level. Under the GHSA, for example, Thailand is currently one of the lead countries for both the Workforce Development and National Laboratory System action packages, Indonesia is a lead country for Zoonotic Disease, and Malaysia is a lead country for Emergency Operations Centers. Additionally, most dialogue countries serve as contributors for a number of other GHSA action packages. The Philippines also chaired the BWC Meeting of Experts #1 in 2018, which addressed international cooperation and assistance under Article X of the BWC. These countries continue to actively engage on a broad range of biosecurity topics in various fora around the world in order to share their expertise and experience with others.

Domestic Research, Development, and Production Capacity for Medical Countermeasures

As a region, Southeast Asia is particularly vulnerable to epidemics arising from novel and emerging pathogens. Participants discussed domestic and regional capacity for developing and producing medical countermeasures, including vaccines and antimicrobials, as a priority area for improvement. Currently, Thailand, Indonesia, and Viet Nam are the countries in the region with the most capacity to produce vaccines on a large scale. Other countries, such as Malaysia, have capacity to develop diagnostics. Some participants discussed the role of government as a stakeholder to incentivize and coordinate investment and collaboration across the pharmaceutical industry. Thailand's National Vaccine Institute (NVI), for example, operates independently from government but collaborates closely with government agencies to support vaccine development. While NVI does not directly conduct vaccine research, it acts as a coordinator for vaccine research nationally to facilitate the development of production capacity for both routine and emergency immunization efforts. NVI has collaborated with other institutes in the region as well, including South Korea's International Vaccine Institute, and supports the ASEAN Vaccine Security and Self-Reliance initiative (AVSSR). AVSSR is a regional initiative, currently under development, that aims to foster acceptable approval rates of vaccines across the region and promote collaboration across ASEAN countries

to ensure vaccine security, development of necessary human resources, and establish appropriate pricing for licensed products.

Participants expressed the need for public-private partnerships to better incentivize the pharmaceutical industry to conduct research and development *and* establish the capacity to scale-up production to support emergency response. Without proper incentives and support, participants noted that companies will move their operations to other countries, taking their expertise, capacity, and research infrastructure with them. Additionally, participants expressed concern that the growing anti-vaccine and vaccine hesitancy movement will negatively affect pharmaceutical research and development activities. As vaccine hesitancy grows in the region, participants noted the increasing importance of ensuring vaccine safety. In addition to the direct health effects, vaccine safety incidents—particularly those involving children—could have severe downstream effects that could impact the operation of vaccine research and production companies in the region, potentially resulting in far-reaching health effects.-

Increasing Focus on Deliberate Threats

Since the beginning of this biosecurity dialogue, deliberate biological threats have been included among discussion topics, but they played a much more central role in this year's dialogue meeting than in previous years. The funder for this dialogue, the Defense Threat Reduction Agency (US Department of Defense) has identified deliberate biological threats as a priority in the region from the beginning of this dialogue; however, participants from Southeast Asia have historically focused more on risks stemming from EIDs. This disparity likely resulted from 2 principal differences between the United States and Southeast Asia. First, biosecurity as a discipline in the United States largely evolved out the anthrax attacks in 2001, whereas biosecurity in Southeast Asia seems to have stemmed primarily from the emergence of SARS in 2003. These events shaped the focus of biosecurity programs at the national and regional levels: deliberate threats in the United States and EIDs in Southeast Asia. Many countries in Southeast Asia have not historically faced the same level of terrorist threats, from foreign and domestic actors, as the United States. Rather, the region has faced a much higher risk from a wide variety of EIDs, including SARS, Nipah, Zika, avian influenza, and even MERS. The differences in these experiences resulted in subsequent differences in priority biosecurity threats, which manifested themselves throughout the early years of this biosecurity dialogue.

During the Phuket meeting, participants noted that their countries continue to prioritize naturally occurring biological threats, including EIDs and natural disasters, but it was clear in the discussions that deliberate threats are a growing concern in the region. It

should be noted Southeast Asian countries have experienced increasing activity by foreign and domestic terrorist groups in recent years. While globally, terrorist activity is on the decline, the collapse of the so-called Islamic State in Syria and Iraq has resulted in increased activity in Southeast Asia, as expatriate combatants return to the region and the extremist groups seek new territory from which to conduct their operations.[10] Several participants discussed the widespread availability of biological agents and equipment via the internet and dark web and rapidly advancing biological and biotechnological capabilities, explicitly noting the associated increased risk of misuse use of these materials and techniques by nefarious actors. Additionally, one participant commented that the emerging ASF epidemic in Southeast Asia could potentially pose a risk for deliberate use for the purpose of causing large-scale economic disruption and threatening food supplies. Contaminated food or animals crossing the border could have major health and economic impacts, even if there was little direct risk of human infections.

This year's meeting included presentations by Alex Lampalzer of the BWC ISU, Maurizio Barbeschi from the WHO's Health Security Interface secretariat, and Sylvie Briand from the WHO's Health Emergencies Programme to provide perspectives from international treaties and organizations that directly address deliberate biological threats. Participants themselves referenced the increased attention on these types of events at the senior levels of their governments, most commonly addressing deliberate biological threats in the context of terrorist activity. The focus on non-state actors is, in part, a testament to the BWC's role in mitigating the risk of biological weapons use by state actors, but likely also a result of increasing terrorist activity in the region. Several participants—particularly those representing law enforcement, national security, and military organizations—discussed ongoing efforts to prevent and prepare for the deliberate use of biological agents, with an emphasis on risk assessment and cross-sector collaboration with health agencies. Participants from Singapore also discussed food and water vulnerabilities as a priority threat since it has no domestic food production capacity. Singapore maintains a multisectoral laboratory network—including human and animal health, agriculture, forensics, and military—that monitors food and water safety, including against deliberate contamination, and coordinates response activities.

Participants cited recent advances in biology and biotechnology as potential risks to facilitating deliberate threats in the region. Similar to deliberate threats as a whole, participants in previous iterations of this dialogue placed less emphasis on the prevalence of advanced biology research and development in the region; however, this year's dialogue featured increased attention to the risks posed by these advances and the associated potential for the misuse of dangerous pathogens. Several participants

noted, in particular, that CRISPR-Cas 9 technologies and other forms of genetic engineering increased the risk that novel bioengineered pathogens and even vectors (eg, mosquitoes) could be used for nefarious purposes. Several participants drew parallels between the rapidly advancing biological and biotechnological capabilities, including genetic editing techniques like CRISPR, and nuclear engineering and the internet. They noted that similarities in the pace of advancement (including associated reductions in cost and increased availability), range of beneficial and deleterious effects, and struggles to mitigate the impact of nefarious use in these fields illustrate the need to proactively identify and address the risks associated with biotechnology.

One of the biggest challenges noted by participants was determining if an event was deliberate as opposed to accidental or natural. This was addressed multiple times in the context of chemical events (eg, chemical spill), but participants noted this challenge applies to biological events as well. This challenge largely seems to stem from decisions regarding how to proceed with response operations and determine the lead agency for directing and coordinating response activities. Many deliberate events may initially appear to be natural or accidental, particularly in the absence of an individual or group claiming credit, so health officials may be the lead agency at the onset of the response. Participants discussed challenges regarding how and when to determine the need to transition response authority to security agencies if an event is later suspected to be deliberate in origin. While many countries have developed plans to facilitate collaboration between health and law enforcement or military partners, the act of transitioning response authority and implementing new standards (eg, evidence chain of custody, personal protective equipment) remains a challenge.

Malaysia has taken a proactive approach to certain aspects of this issue through national-level legislation that provides expanded authority to law enforcement agencies to combat organized crime and terrorism (including biological and chemical incidents), and one participant noted that these efforts have facilitated law enforcement engagement earlier in responses, which could improve transition efforts. Additionally, Malaysia has developed a CBRNE handbook for law enforcement responders to help them determine the appropriate protective measures to ensure their safety during investigations and developed a consolidated national standard operating procedure that covers health, security, and other responders for CBRNE events. Operationalizing the plan, however, remains a challenge. Malaysia is also bolstering domestic capabilities for deliberate events through the implementation of new national-level legislation that provides law enforcement and security agencies with broader authority to prevent terrorist activity and through continued cross-sectoral training and exercises involving health and security agencies.

The University of the Philippines continues to support a broad range of government efforts to combat CBRN threats, including the operation of a mass decontamination facility to support response to CBRN incidents and input to a new national CBRN action plan. In addition to operational capacity, this facility can be utilized to provide training to a variety of organizations, including law enforcement, military, and other security sector agencies. Support from the US Cooperative Biological Engagement Program (CBEP) provided capacity building in the Philippines to help firefighter HAZMAT teams develop response capacity for WMD scenarios. Additionally, the University of the Philippines recently hosted a regional workshop on science and technology and the BWC, with participants from 15 countries as well as relevant non-governmental organizations.

All of the participating countries in this dialogue are States Parties to the BWC, and the Southeast Asia region is beginning to play a larger role in BWC meetings and activities. In previous meetings, some participants discussed the challenge of prioritizing the BWC at the highest levels of government, noting that it was difficult to secure the necessary resources and political will to fully engage in biological weapons nonproliferation issues, but this year, participants noted increased attention by their governments on BWC-related issues and national implementation of BWC obligations. For example, Ambassador Maria Teresa T. Almojuela from the Philippines served as the Chair of Meeting of Experts #1 in 2018, leading the discussion on Strengthening Cooperation and Assistance Under Article X of the BWC, a critically important topic for many countries in Southeast Asia. Additionally, the Philippines has proposed to conduct a biosecurity tabletop exercise at the ASEAN Regional Forum in 2020 that will also support their BWC national implementation efforts.

One participant noted the importance of continued engagement at BWC meetings and emphasized that Southeast Asia needs to maintain a strong voice within the Non-Aligned Movement and Other Countries (NAM) regional group to ensure that the interests and priorities in the region are adequately represented. Additionally, a Philippines participant noted that continued attendance and active participation in BWC meetings has helped raise awareness of these issues among senior government officials and generated sufficient political will for the Philippines to complete its BWC Confidence-Building Measures (CBM) report. Malaysia continues to serve as a regional leader in BWC-related activities, focusing recently on proactively engaging the scientific and research communities on BWC-related issues. From November 2018 to April 2019, Malaysia conducted 15 outreach workshops nationwide, which aimed to promote the responsible conduct of research among scientists and build awareness and support for the BWC and associated nonproliferation norms in order to strengthen national BWC implementation and reduce the risk of misuse of biology. Additionally,

Malaysia is currently developing a scientific code of conduct that aims to reduce the risk of deliberate misuse of science by increasing awareness of and support for existing bioweapons nonproliferation norms and improving risk assessment efforts. Malaysia will also be co-hosting and participating in a variety of regional and international workshops with the EU CBRN Center of Excellence, BWC ISU, UN Office of Counter Terrorism, World Organization for Animal Health (OIE), and other partners to address a broad scope of biosecurity priorities in the context of deliberate biological events.

Misinformation and Risk Communication

Participants discussed the growing challenge, globally and regionally, of combatting the unintentional and deliberate spread of inaccurate information—referred to as misinformation and disinformation, respectively—in the context of biosecurity threats and incident response. They noted that the communication environments surrounding responses to biological events can provide ideal circumstances for misinformation and disinformation, which can pose major challenges for response efforts. The rise of social media use across multiple platforms—including WhatsApp, Facebook, Instagram, and Twitter—has fostered the spread of misinformation in a variety ways, and while social media can be a source of legitimate news—and in fact, is the primary source of news for many people—it is also increasingly a common source of questionable anecdotal evidence and inflammatory rhetoric that can lead to the misrepresentation, misinterpretation, or distortion of factual information as well as deliberate efforts to deceive readers.

Recent examples in Southeast Asia illustrate that health-related misinformation poses a substantial threat to controlling epidemics and health emergencies, and participants discussed misinformation as a serious concern in the region, particularly during outbreaks and other biological incidents. During an outbreak or epidemic, government officials and responders can face epidemics of misinformation, or "infodemics," in the midst of responding to the outbreak itself. These infodemics can include misinformation about the disease source and outbreak scale, medical countermeasures and other control interventions, and even the very existence of the disease or outbreak itself. The spread of inaccurate information can substantially hinder public health response efforts. In fact, one participant noted a recent report that 25% of community members in North Kivu, Democratic Republic of the Congo, did not believe there was actually an ongoing Ebola epidemic.

Participants also noted that the factors contributing to misinformation are diverse, ranging from religious to social to political. Divya Hosangadi, Analyst at the Johns Hopkins Center for Health Security, presented recent analysis of misinformation

characteristics identified in a set of predominantly US-focused tweets that were published over a 1-month period during the 2013-16 West Africa Ebola epidemic. The presentation illustrated the variety of topics referenced in tweets and various characteristics of those containing misinformation. The researchers determined that the vast majority of tweets about Ebola served to elevate the perceived risk, such as messaging about the spread or growth of the epidemic and the fatal nature of Ebola virus disease. Additionally, many tweets, particularly in the US context, focused on political issues, including travel bans or quarantine that were often called for by elected officials and candidates. A substantial portion of the tweets contained misinformation, which was defined as either incorrect content or information that was partially incorrect or misrepresented. Misinformation was positively associated with political content, such that political content was much more prevalent among tweets containing misinformation than in tweets with true information. Additionally, many political tweets were worded in such a way that could promote discord or provoke a response from the reader. The 2 most common rumors were that Ebola was a government conspiracy and that Ebola was an airborne pathogen, reflecting similar themes to the types of infodemics previously discussed. It should be noted, however, that nearly half of the tweets referencing airborne transmission of Ebola were, in fact, refuting that rumor, potentially indicating that public health messaging centered around addressing that common misstatement. This analysis illustrated how health security events, such as the first case of person-to-person transmission of Ebolavirus infection in the United States, can create environments that are conducive to the spread of misinformation. Misinformation not only disseminates incorrect information about these events, but it can also be weaponized for political, social, and other purposes by linking it to hyper-partisan or other polarizing content in order to facilitate its spread through social media networks and/or discredit legitimate information.

A prime example of the impact of misinformation on health security is the ongoing global anti-vaccine movement. Anti-vaccine sentiment and vaccine hesitancy are growing in communities around the world, including the United States and multiple other dialogue countries. Vaccine hesitancy and anti-vaccine sentiment have contributed to a re-emergence of vaccine-preventable diseases such as measles. The United States is currently facing a growing series of measles outbreaks across the country,[11] which threatened the United States' measles official elimination status. Additionally, similar challenges have been reported across Europe,[12] Africa, and Southeast Asia, including Hong Kong and the Philippines.[13] Participants discussed how a surge in anti-vaccine sentiment toward measles vaccination in the Philippines followed a recent Dengue vaccine clinical trial that resulted in the deaths of several children. One participant noted that these deaths exacerbated distrust between the public and the government and public health institutions, which is now manifesting in the form of growing

hesitancy and opposition toward other vaccines, despite a rapidly growing measles epidemic in the country. Vaccines are a critical public health intervention, including for preventing and responding to outbreaks and epidemics, and hesitancy or opposition to their use could significantly hinder response efforts to health emergencies, which could enable these events to grow and spread regionally and globally.

Combating misinformation during health emergencies is challenging, and effective communication mechanisms are difficult to identify and implement, particularly as distrust of government grows. Participants noted the complexities of communicating during a biosecurity event and the importance of being proactive in these situations. It is crucial to establish networks of trustworthy partners in advance of an emergency and to foster evidence-based communication efforts. Additionally, communicating clearly with the media can help avoid or mitigate potential misinterpretation of information or the use of divisive language that could promote discord in a community. Some participants also suggested the need for some type of national government anti-misinformation legislation or a coordinated international mechanism to require social media companies to reduce the amount of circulating misinformation.

Conclusions

Southeast Asia sits at the nexus of emerging infectious disease threats, growing religious extremism and terrorist activity, rapidly advancing biotechnology and pharmacological sectors, evolving geopolitical influences, and mobile populations crossing porous borders. This combination of factors creates a highly dynamic biosecurity environment that drives a diverse set of biological threats—natural, accidental, and deliberate. The Southeast Asia Multilateral Dialogue on Biosecurity continues to serve as a trusted forum for sharing views, discussing difficult challenges, and considering novel mechanisms to enhance regional and international collaboration on emerging and ongoing biosecurity threats. Dialogue participants bring a broad range of expertise to these discussions, and each session further elucidates the complex problems and opportunities for potential collective action on these issues.

During the 2019 meeting, dialogue participants agreed that the recent publication of their jointly authored article in *Emerging Infectious Diseases* demonstrated the ability of this unique multilateral group to reach consensus on positions and inspired them to consider additional joint activities. New potential activities and options will be developed by the Johns Hopkins Center for Health Security for the group's consideration. Participants also agreed that there is great value in candidly sharing and learning from actual case studies that challenged individual countries in order to identify key challenges and lessons for in the context of actual biosecurity and biosafety

incidents. The 2019 meeting was a very useful convening, and the conversations and collaboration will continue in 2020 with the next iteration of the dialogue.

Agenda

MULTILATERAL STRATEGIC DIALOGUE ON BIOSECURITY
DAY 1 - 29 APRIL

7:00 – 9:00 **Breakfast available at the Pool House Restaurant**

9:00 – 9:15 **Welcome and Goals for Meeting**

Preecha PREMPREE
Deputy Director, Department of Disease Control, Thailand
Ministry of Public Health

Tom INGLESBY
Director, Johns Hopkins Center for Health Security

Anita CICERO
Deputy Director, Johns Hopkins Center for Health Security

9:15 – 9:45 **Introductions**

Each participant will introduce herself/himself and briefly describe her/his background and interest in biosecurity issues. For purposes of this dialogue, we define "biosecurity" as the policy, programs, and actions taken to prevent and respond to biological threats, whether they are natural, deliberate, or accidental.

9:45 – 11:00 **Dialogue Session One: National Biosecurity Priorities**

A representative from each country will provide opening remarks on current national biosecurity priorities. Topics addressed will include: What are the most concerning biological threats—natural, accidental, and deliberate? What major efforts are being made to address them? How do biosecurity leaders view the latest international developments in biology and biotechnology? What new emerging infectious disease risks are most concerning? How do the life sciences interact with each country's overall security concerns? What has changed since the last meeting of the dialogue in April 2018?

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Seth CARUS, LEE Fook Kay, Irma MAKALINAO, Ratna SITOMPUL, Zalini YUNUS

11:00 – 11:30 Coffee & Tea Break, Kamala Foyer

11:30 – 12:45 Dialogue Session Two: Geopolitical Developments

Participants will discuss the current and rapidly changing geopolitical situation in the Southeast Asia region and the United States. Topics include elections in Indonesia and Thailand, the resurgence of Islam as an election issue in Indonesia, rumors of North Korea developing bioweapons, disputes over air and maritime boundaries between Malaysia and Singapore, political actions regarding free speech in the Philippines, measles outbreaks in the Philippines and the United States due to "vaccine hesitancy," the political environment in the United States, the changing US stance in Asia, and the United States' and other countries' perspectives and actions on bioeconomy issues. The opening presentations will provide a high-level overview of these developments and their potential implications for biosecurity.

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Endy BAYUNI, Ken BERNARD, KWA Chong Guan, Mely ANTHONY

12:45 – 2:00 Lunch at Pool House Restaurant and Group Photo

2:00 – 2:45 Presentation: Biosecurity Priorities of the Department of Disease Control in the Ministry of Public Health

Preecha PREMPREE
Deputy Director, Department of Disease Control, Thailand
Ministry of Public Health

Q&A and comments from the group

2:45 – 3:15 Coffee & Tea Break, Kamala Foyer

3:15 – 4:30 **Dialogue Session Three: Preparedness for and Response to Emerging Infectious Diseases**

This discussion will explore approaches for effective surveillance, early detection, and response to new outbreaks. Participants will also discuss opportunities to improve regional and international collaboration on these issues and the scientific response to emerging infectious diseases. What has been learned from the responses to SARS, MERS, novel influenza, Ebola, and Zika? What disease containment lessons emerged from these outbreaks? What are priority areas for building national response capacity and building the technical capacity to mount an effective response? What is the perception of progress made and future action needed to adhere to the International Health Regulations and the Global Health Security Agenda? Are these issues receiving sufficient political and financial support at the national level? What should the priorities be going forward?

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Pratiwi SUDARMONO, CHONG Chee Kheong, Noreen HYNES

4:30 **Day 1 Adjourns**

6:30 **Dinner at Sunset Grill Restaurant**

MULTILATERAL STRATEGIC DIALOGUE ON BIOSECURITY
DAY 2 - 30 APRIL

7:00 – 9:00 **Breakfast available at the Pool House Restaurant**

9:00 – 10:15 **Dialogue Session Four: Deliberate and Other Advanced and High-Consequence Biological Threats**

This session will address a broad range of high-consequence biological threats and collaboration between health and security sectors. Topics include deliberate and accidental threats arising from advances in biology and biotechnology, deliberate biological incidents (eg, bioterrorism), and the roles of security and health agencies in preventing, detecting, and responding to these threats. The opening remarks will be followed by a group discussion of these issues in the context of Southeast Asia, including national and regional mechanisms to address these and other emerging threats.

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Hussein OMAR KHAN, May ONG Bee Leng, Ben RIMBA

10:15 – 10:45 **Coffee & Tea Break, Kamala Foyer**

10:45 – 11:30 **Presentation: Regional and International Cooperation to Achieve Biosecurity Goals**

Soawapak HINJOY
Director, Office of International Cooperation, Thailand Ministry of Public Health

Q&A and comments from the group

11:30 – 12:15 **Presentation: WHO's Response to Major Outbreaks, Epidemics, and Pandemics**

Sylvie BRIAND
Director, Infectious Hazard Management, Pandemic and Epidemic Diseases Department, WHO Health Emergency Programme

Q&A and comments from the group

12:15 – 1:15 **Lunch at Pool House Restaurant**

1:15 – 2:00 **Presentation: The Relevance of the Biological & Toxin Weapons Convention to Southeast Asia and Future Priorities**

Hermann LAMPALZER
Deputy Chief and Political Affairs Officer, Implementation Support Unit, Biological & Toxin Weapons Convention

Q&A and comments from the group

2:00 – 2:15 **Coffee & Tea Break, Kamala Foyer**

2:15 – 4:30 **Tabletop Policy Exercise: Clade X Pandemic Scenario**

During this tabletop exercise, created by the Johns Hopkins Center for Health Security, dialogue participants will be presented with a fictional scenario of an infectious disease pandemic that threatens national and global public health as well as economic and political security. In the scenario, all participants will play advisors to senior government leaders and will be called on to give their recommendations on a number of high-stakes issues and engage in discussion on difficult policy dilemmas that are likely to emerge during a novel pandemic.

4:30 – 4:45 **Presentation: WHO's Role in the Public Health Response to Deliberate Biological Events**

Maurizio BARBESCHI
Technical Lead, Health Security Interface Secretariat, World Health Organization

4:45 **Day 2 Adjourns**

6:30 **Beach Dinner at Kamala Bay Lawn**

MULTILATERAL STRATEGIC DIALOGUE ON BIOSECURITY
DAY 3 - 1 MAY

7:00 – 8:45 **Breakfast available at the Pool House Restaurant**

8:45 – 9:30 **Presentation: US Indo-Pacific Command Health Security Priorities**

Rear Admiral Lou TRIPOLI
Command Surgeon, Indo-Pacific Command, US Department of Defense

Q&A and comments from the group

9:30 – 10:30 **Dialogue Session Five: Ministry of Defense Approaches to Biosecurity and Priorities in Southeast Asia**

Ministries of defense are not historically responsible for health issues; yet, public health emergencies can lead to national security threats. Ministries of defense have important roles to play in responding to large-scale outbreaks and other biological events with national security implications. But the security sector's involvement is complicated by the diversity of government agencies that also have some degree of responsibility for issues at the intersection of health and security. Participants will discuss the degree to which their defense ministries are involved in biosecurity and biodefense initiatives. How organized are they to take on these threats? Do national militaries educate and train their forces on biosecurity threats? Do they have dedicated and sufficient funding for this endeavor? How well do ministries of defense coordinate with other relevant government agencies involved in prevention, response, and recovery related to biological events? What is the extent of regional or international cooperation between militaries on these issues? Have defense ministries in the region become more involved in Global Health Security Agenda initiatives and/or the negotiations around the Biological Weapons Convention? Are ministries of defense attuned to advances in the life sciences that could be misused to create weapons that threaten national security?

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Jeremiah CHNG, Daniel TJEN, Zalini YUNUS

10:30 – 11:00 Coffee & Tea Break, Kamala Foyer

11:00 – 12:15 Dialogue Session Six: New Developments in Infectious Disease Research and Vaccine Policy

During this session, participants will discuss their country's work in leveraging science and technology to develop better surveillance tools, diagnostics, vaccines, and therapeutics to combat infectious disease threats. Participants will discuss research being conducted in government and academic sectors in their countries. Potential discussion topics include the challenges of working with pathogens or technologies that have dual-use applications; promising areas of technology that could optimize outbreak response; plans to procure, manufacture, distribute, or dispense vaccines during infectious disease emergencies, including for novel pathogens; regional coordination for medical countermeasure development, production, or use during emergencies; and national preparedness and capacity for mass vaccination during fast-moving outbreaks.

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Sazaly ABUBAKAR, Venugopal BALAKRISHNAN, Nakorn PREMSRI, Amin SOEBANDRIO

12:15 – 1:15 Lunch at Pool House Restaurant

1:15 – 2:15 Dialogue Session Seven: Impact of Misinformation on Public Health Emergencies

During an epidemic, the public's trust of a government's public health communications can be undermined by fragmented, contradictory, or unreliable messaging. The increasing use of social and nontraditional media channels and growing concern about misinformation and disinformation across these platforms pose significant challenges for communicating about a wide range of health and security issues. To what extent has your country experienced misinformation or disinformation challenges, particularly in the context of biosecurity? Has your country made any efforts to proactively or reactively address them? Are there useful case studies or examples of creating or using highly trusted communication networks to distribute accurate and timely information and public health advice to address uncertainty, answer questions, or counter misinformation or disinformation?

Opening remarks (5-7 minutes each) followed by group discussion

Opening Remarks: Tikki PANGESTU, Divya HOSANGADI, Endy BAYUNI

2:15 – 2:30 Coffee & Tea Break, Kamala Foyer

2:30 – 3:15 Roundtable Discussion: Future Priorities for Multilateral Biosecurity Dialogue

This session will investigate next steps and future topics for this biosecurity dialogue. As a result of relationships formed in the dialogue, a number of collaborative initiatives have taken place, including:

- Dialogue participants participated in a side event panel discussion on the importance of Track II biosecurity dialogues at the BWC Meeting of the States Parties in December 2017.
- Dialogue participants attended the Prince Mahidol Award Conference in Thailand in February 2018 and presented on the value of Track II multilateral discussions on biosecurity.
- Singapore, Malaysia, and the Philippines initiated a collaborative "Security Sensitive Materials Awareness Programme" in 2018.
- Dialogue participants collectively authored a manuscript to be published in US CDC's *Emerging Infectious Diseases* journal in May 2019.

Building on these successes, what other activities or engagement should we consider in order to highlight recommendations from the dialogue? Are there certain issues that this group should recommend for "Track I" attention between their governments? Additionally, we would like to solicit your input regarding topics for next year's dialogue discussions to ensure that we are engaging in the most relevant topics for your particular organizations and governments.

Opening Remarks and Moderator: Tikki PANGESTU

3:15 Dialogue Adjourns

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References

1. Demertzis M. European worries about isolationist trends [blog post]. November 7, 2017. http://bruegel.org/2017/11/european-worries-about-isolationalist-trends/. Accessed August 15, 2019.
2. Teehankee JC. Duterte's resurgent nationalism in the Philippines: a discursive institutionalist analysis. Journal of Current Southeast Asian Affairs. 2016;35(3):69-89. https://journals.sagepub.com/doi/pdf/10.1177/186810341603500304. Accessed August 15, 2019.
3. Bieber F. Is nationalism on the rise? Assessing global trends. Ethnopolitics. 2018;17(5):519-540. https://www.tandfonline.com/doi/pdf/10.1080/17449057.2018.1532633. Accessed August 15, 2019.
4. McKay B. CDC to scale back work in dozens of foreign countries amid funding worries. Wall Street Journal. January 19, 2018. https://www.wsj.com/articles/cdc-to-scale-back-work-in-dozens-of-foreign-countries-amid-funding-worries-1516398717. Accessed August 15, 2019.
5. Nuzzo JB, Cicero AJ, Inglesby TV. The importance of continued US investment to sustain momentum toward global health security. JAMA. 2017;318(24):2423-2424. https://jamanetwork.com/journals/jama/fullarticle/2664388. Accessed August 15, 2019.
6. Watson C, Watson M, Gastfriend D, Sell TK. Federal funding for health security in FY2019. Health Secur. 2018;16(5):281-303. https://www.liebertpub.com/doi/full/10.1089/hs.2018.0077. Accessed August 15, 2019.
7. https://pca-cpa.org/en/cases/7/
8. Weiss JC. What China's assertiveness in the South China Sea means – and what comes next. Washington Post. May 30, 2019. https://www.washingtonpost.com/politics/2019/05/30/whats-going-south-china-sea/. Accessed August 15, 2019.
9. Chatsky A, McBride J. China's massive Belt and Road Initiative. Council on Foreign Relations. https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative. Updated May 21, 2019. Accessed August 15, 2019.
10. Global Terrorism Index 2018: Measuring the impact of terrorism. Sydney, Australia: Institute for Economics & Peace; 2018. http://visionofhumanity.org/app/uploads/2018/12/Global-Terrorism-Index-2018-1.pdf. Accessed August 15, 2019.
11. Measles cases in 2019. US Centers for Disease Control and Prevention website. https://www.cdc.gov/measles/cases-outbreaks.html. Updated August 12, 2019. Accessed August 15, 2019.
12. Soucheray S. Measles outbreaks continue to grow in US, Europe. CIDRAP News. May 6, 2019. http://www.cidrap.umn.edu/news-perspective/2019/05/measles-outbreaks-continue-grow-us-europe. Accessed August 15, 2019.
13. Global Measles Outbreaks. US Centers for Disease Control and Prevention website. https://www.cdc.gov/globalhealth/measles/globalmeaslesoutbreaks.htm. Updated February 24, 2019. Accessed August 15, 2019.

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