Feasibility of a Health Security Center in Asia

Findings from a feasibility study on the benefits and challenges of establishing a new health security center in Asia

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Johns Hopkins Bloomberg School of Public Health | Center for Health Security

Johns Hopkins Center for Health Security Project Team

Gigi Kwik Gronvall, PhD
Senior Scholar, Principal Investigator, Johns Hopkins Center for Health Security

Natasha Kaushal, MSPH
Analyst, Johns Hopkins Center for Health Security

Debora Sandiford, MHS
Program Manager, Johns Hopkins Center for Health Security

Anita J. Cicero, JD
Deputy Director, Johns Hopkins Center for Health Security

Project Sponsor

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Executive Summary

This study examined the feasibility of creating a new nongovernmental health security research policy center in Asia, how such a center might benefit the advancement of policies promoting health security, and where such a center might be located. Health security policy encompasses numerous aspects of global health, including emerging infectious diseases, epidemics, medical and public health preparedness and response, deliberate and accidental biological threats, risk management related to advanced life science research and other biosecurity issues, and reduction of global catastrophic biological risks (GCBRs). GCBRs are those events in which biological agents—whether naturally emerging or reemerging, deliberately created and released, or laboratory engineered and escaped—could lead to sudden, extraordinary, widespread disaster beyond the collective capability of national and international governments and the private sector to control.[1] If unchecked, GCBRs could lead to great suffering, loss of life, and sustained damage to national governments, international relationships, economies, societal stability, or global security.

The study was undertaken by the Johns Hopkins Center for Health Security at the Bloomberg School of Public Health, the leading and longest standing health security policy center (or "think tank") in the United States. The sponsor asked the Center for Health Security to conduct the feasibility study to determine whether a health security policy and research center based in Asia would be an important regional asset, able to convene experts, perform research, and advance health security policy in the region, similar in activities and scope to the Center for Health Security. The sponsor recognizes the value the Center has had since its founding, providing public officials and decisionmakers with in-depth, independent analysis and policy and practice recommendations to advance preparedness for large-scale public health emergencies, including GCBR preparedness.

For this study, 16 technical and regional experts were interviewed from ministries of health, infectious disease and biological research institutes, and universities in China, Singapore, Thailand, Malaysia, Indonesia, and the United States (see Appendix A). The project team also asked interviewees to consider where such a center could most successfully be housed, considering such characteristics as ease of travel for meetings, potential institutional homes for a center, and government support (see Appendix B).

Findings

1. **There is a pressing need for an Asian nongovernmental center to advance health security goals.**

All the interviewees strongly believed a nongovernmental, not-for-profit Asian health security center would advance health security research, awareness, and policy in the region. Such a center could convene experts and government officials, develop policy, perform research, and allow for collaboration on regional and international

health security issues. A center could encourage cross-sectoral partnerships and the development of regional-specific health security policies. Currently, there is no existing center with the knowledge, collaborative intent, or operational capacity to fulfill the health security needs of the region. Without such a center, health security and biosecurity could be neglected in terms of attention, financing, and priority-setting regionally.

2. **Leadership and staffing of an Asian health security center should come from the region. Strategic advisory roles and international advisory networks should also be developed to support the center, including to define its scope of work.**

Interviewees strongly recommended that a center be established with experienced leadership from the host country and the region. For a first-of-its-kind center to become productive quickly, additional international advisory roles and networks should be developed to help support the initial establishment and scaleup of a center. The center's leadership should engage expertise and insight from strategic advisors when crafting the scope of work, mission, vision, and goals of the center. Interviewees also advised that strategic direction should include benefits to the host country government, which would help garner support and ensure the center provides long-lasting value.

3. **Singapore was considered a strategically sound location for a new regional health security center. Interviewees also suggested a center located in China would be beneficial.**

Most interviewees recommended that a new regional health security center be located in Singapore due to ease of travel, strong regional partnerships, political neutrality, and several academic options for affiliation. Many also emphasized the best-case scenario of having two health security centers in the region, with another center located in China, given the importance of the nation for global health security progress. This could encourage increased Chinese participation in regional health security policy development, including collaborative work with regional partners. Experts observed that a new Singapore-based regional center might be able to partner with the existing Center for Biosafety Research and Strategy (CBRS) at Tianjin University. University settings for health security centers provide opportunities for interdisciplinary engagement with experts in related fields, as well as opportunities for students to learn about GCBR issues and consider entering the health security field.

Role of an Asian Health Security Center

Defining Need

In the wake of the COVID-19 pandemic, there is an opportunity to enhance and advance health security policies, programs, and practices across Asia to reduce the risk of consequential naturally occurring, accidental, or deliberate GCBR threats. Fundamentally, interviewees agreed there is a need for a nongovernmental, not-for-profit Asia-based health security policy center. Currently, no regional center exists to improve health security policy through independent research, analysis, and strategic outreach and advocacy efforts. While some universities have a range of distinct and modest academic programs that touch on different aspects of health security policy and practice, these efforts are disparate and largely unconnected. Existing health research and policy institutes operate in niche topical or geographic areas, making cross-sectoral and cross-country collaboration a challenge. **Establishing, supporting, and sustaining a nongovernmental regional health security center would benefit the region to address health security concerns in a collaborative manner that spans disciplines and partners.**

The information gathered in interviews of experts for this study aligns with opinions expressed in the Multilateral Biosecurity Dialogue with Singapore, Malaysia, Indonesia, and the United States, a project run by the Johns Hopkins Center for Health Security with funding from the Defense Threat Reduction Agency (DTRA).[2] The threat posed by natural emerging infectious diseases was the priority for the participating countries, but in recent years there has been increased attention and concern about deliberate threats. The dialogue participants discussed the value of international and regional collaboration on biosecurity and health security issues, and they discussed a variety of international partnerships, including biosurveillance networks, training and education programs, and preparedness and response coordination, but a central focal point could help to connect these disparate efforts and advance preparedness for deliberate as well as natural and accidental biological threats. An Asian health security center would help to catalyze this discussion and could help to coordinate efforts.

The COVID-19 pandemic underscores the importance of health security, as the pandemic continues to expose new weaknesses in national, regional, and global preparedness and response systems. Here, a new health security center in Asia could seize this moment and provide value for preparing for the next pandemic. As countries continue to implement pandemic response activities and look to the future, such a center could help to document and share lessons learned, as well as identify, develop, and adapt effective mechanisms to improve preparedness and response capacity and establish sustainable resilience policies and practices.

Staffing and Partnerships

Experts interviewed for this project had recommendations about the characteristics of leadership for a new health security center. For example, prior international leadership experience would be beneficial to encourage collaboration and navigate geographic or political barriers. Additionally, center leadership and staff should have relevant international work experience, an understanding of regional politics, and knowledge of biosecurity and health security stakeholders. To foster expertise, a long-term goal would be to create fellowships, training programs, and career pathways for emerging professionals in the field. Interviewees maintained that the roles and responsibilities of center staff would be shaped by location, partnerships, and levels of support.

Strong partnerships with collaborators would be vital to build trust across the region, disciplines, and stakeholders. Additionally, partnering with nongovernmental organizations (NGOs) that have ground-level perspectives of local challenges and opportunities would help the center develop its program of activities. Interviewees recommended that an informal advisory group be developed to support the center, including representatives from organizations similar in scope and focus, such the Johns Hopkins Center for Health Security. Such a group would help to provide continued support, access to health experts, and international relationships for the new center.

Goals and Activities

Interviewees recommended the creation of a new health security center or centers focused on conducting health security research, advising policymakers, convening power and collaboration, curating expertise, and defining the importance of health security for the region (see Table 1). A center could serve as a convening hub for health security experts to conduct research, host dialogues and conferences, disseminate information, and encourage collaboration and resource sharing with partners in the region and beyond. A center could help to improve regional emergency response systems, advance GCBR technologies and innovations benefiting biosecurity, build capacity for regional health security, and spur pandemic preparedness efforts. By collaborating with stakeholders across the research-to-policy spectrum, a center would foster the visibility and legitimacy of health security concerns in the region and provide a path for career development and networking.

Part of this work would include educating government officials and policymakers about natural, intentional, and accidental GCBRs to elevate and integrate health security concerns into mainstream global health governance activities. International and Asia-specific discussions of a post-COVID world are required, including the development of lessons learned, and could support diplomatic efforts toward sharing information and building trust. One expert mentioned the importance of balancing near-term, smaller projects that show immediate value with grand challenges or far-reaching projects, to ensure continued support. Balancing ambitious, high-yield projects with everyday preparedness and response research would fortify regional and global impact.

Experts mentioned that center activities would facilitate an updated and holistic picture of current regional trends in health security research and policy. They also emphasized the need for collaboration, coordination, and communication with country governments to address health security concerns throughout the region. A center could engage with government officials to promote buy-in and cooperation but act with discretion to protect the continuity of research and programmatic ventures.

Table 1: Potential Goals and Activities of an Asian Health Security Center

Goals	Activities
Convene Power	• Serve as a hub for collaboration, discussion, convention, and partnerships across countries • Establish cross-sectoral networks and partnerships with governmental, regional, local, and international organizations • Facilitate information- and resource-sharing • Develop and advance regional goals and best practices • Disseminate relevant communication and build trust
Curate Expertise and Training	• Serve as a convening location for experts in health security • Offer fellowships and programs to train future health security leaders
Define Health Security and Biosecurity Issues	• Elaborate on health security issues, GCBRs, and research and development related to the region • Educate on health security issues, innovation, and advancement
Conduct Policy Research	• Generate regional research independent of countries' national interests • Be an independent voice of authority on health security issues that garners trust
Advise on Global and Regional Health Governance	• Understand World Health Organization (WHO) guidance and impact on regional health security • Address regional governance challenges and opportunities • Advise policymakers in governmental and nongovernmental roles

Areas of Priority Focus

Health security is a diverse field, and there are many important topics that an Asian center could usefully address. For example, the Johns Hopkins Center for Health Security has programs focused on hospital preparedness, medical countermeasure development, laboratory biosafety, indoor air purification and ventilation, and many other topics. Interviewees were asked what the initial focus of an Asian health security center should be, based upon their perceptions of the region's needs. Some experts suggested the center focus on infectious disease surveillance, lab safety, regional and global health policies, vaccine manufacturing and distribution efforts, and resource management.

Many interviewees stated the need for a center to act as a unifying voice for regional health security concerns, develop practical policy solutions, and serve as a bridge between health security experts and regional policymakers. For GCBRs, it was noted that research and policy drivers are much more common in western countries, and that an Asian center would provide an opportunity to expand awareness and progress in mitigating GCBRs.

Interviewees suggested that an Asian health security center address a range of priority issues, including:

- Health Security: Such a center could work to articulate regional health security and biosecurity concerns, as well as address biocontainment issues and threats to national security such as GCBRs, military threats, bioterrorism, and chemical, biological, radiological, and nuclear (CBRN) threats. One concern threaded throughout various interviews was the need for an improved and relevant working definition of health security versus biosecurity[3] as a tool to help regional actors set realistic goals and take collective action.
- Infectious Disease Outbreaks, Surveillance, and Monitoring: Taking momentum from efforts deployed during the COVID-19 pandemic, a center could advocate for sustained interest and investment in regional outbreaks monitoring, pandemic preparedness for future emergencies, and understanding the origins of emerging infections.
- Laboratory Safety Guidelines: With its cadre of health security experts, a center could improve lab safety guidelines, lab management guidelines, and educate policymakers on intentional and avoidable lab practices.
- Policy and Practice: A center could provide a hub for collaboration between researchers and policymakers to produce risk mitigation measures, innovative solutions, and improved public health messaging on health security topics in the Asian region, including air quality. A center also could develop programs and messaging to address misinformation and disinformation.
- Vaccines and Therapeutics: A center would be well suited to support policy recommendations surrounding vaccine and therapeutic research and

development, manufacturing and distribution, diplomacy, equity, and sharing among Association of Southeast Asian Nations (ASEAN) member states and other regional entities. Interviewees discussed emerging technologies, self-reliance, and development and maintenance of pharmaceutical manufacturing facilities within Asia.

- Regional Concerns and Resource Sharing: A center could enhance the sharing of resources and establish collaborative initiatives to provide pathways for translational health security research in the region, develop post-COVID regional policies, help balance public-private interests, and inform administrative or policy agendas. Due to overlapping governance structures and the global health landscape of the region, this center should partner with existing bodies like ASEAN and regional WHO coordinating centers and pool resources from high-income countries with more capacity.
- GCBR Prevention, Mitigation, and Awareness: GCBRs have the potential to cause severe disruptions in the normal functioning of the world, exact heavy tolls in terms of morbidity and mortality, and lead to major economic losses. Some experts noted that GCBR research historically has been a mostly western concept and will take time to gain traction in Asia. By collaborating with WHO regional coordinating centers, investing in GCBR research may unlock new topic areas in Asia and spur regional interest in health security issues.

Detection of Future Threats

Interviewees were asked what future public health events might concern the Asian region and warrant further attention by a center, including monitoring and surveillance efforts for emerging or uncommon diseases and the prevention, detection, and mitigation of GCBRs. Alongside pandemic preparedness efforts, experts recommended that the center address future threats to health security, such as lab safety practices, coordinated outbreak responses, surveillance and monitoring of spillover events, and regional health communication mechanisms. A center could focus on understanding the impact of WHO guidance on local and regional settings, review actions and information regarding data sharing, and monitor diagnostic, vaccine, and therapeutic distribution. The Pandemic Preparedness Partnership (PPP)[4], a public-private partnership established by the United Kingdom to guide preparedness plans and coordinated responses, was mentioned as a potential roadmap for engaging partners along the vaccine development and distribution pipeline.

While there are or have been institutes in Asia that focus on regional security concerns—including Stanford's China Program[5] and the now-defunct Regional Emerging Diseases Intervention (REDI) Centre[6,7] in Singapore—a center that focuses specifically on GCBR and other health security issues is needed to help detect and prepare for future emergencies. For example, Stanford's China Program conducts research and organizes conferences in Asia focused on political, social, and economic issues but does not address the specific health security needs of the region. Established

around 2003 with support from the government of Singapore and the US Department of Health and Human Services (HHS), the REDI Centre aimed to expand bilateral cooperative efforts in medical sciences and health security threats but was unable to continue operations in the region due to funding and stakeholder engagement challenges. The REDI Centre was established as an intergovernmental organization and last engaged in regional work in 2010, leaving a gap in health security efforts since then. As such, there is no coordinating regional center in Asia currently suited to address future health security concerns, coordinate policies, convene experts, and invest in GCBR threat detection.

Financial Stability

A single funding source can launch a new Asian health security center. However, interviewees stressed that diversified funding streams would better demonstrate the center's value to the region and benefit its long-term viability. Additionally, many stressed that engaged, as well as diverse, donors would make more sustainable investments. As a cautionary lesson, one expert noted the REDI Centre, which failed in part due to a lack of funding.

Most interviewees did not speculate about a specific amount of money required to establish a center but agreed that start-up support from one or more donors is required to establish a presence in the region. As an example, the Johns Hopkins Center for Health Security initially received a grant from the Alfred P. Sloan Foundation and had no other external funder, except for the provision of office space by the Johns Hopkins Bloomberg School of Public Health. Now, the Johns Hopkins Center for Health Security is funded by a variety of organizations and governmental agencies, including philanthropic (via Open Philanthropy[8]) and US government sources.

Funding for a new center could originate from several different types of sources, including:

- Government Funders: Interviewees recommended seeking grants through Asian country health ministries. Depending upon the host country, US government funds may or may not be possible.
- Academic Donors: If the center is hosted under and funded through a university, there also exists the potential for in-kind support, including office space and use of university facilities, as well as proximity to expertise and students. Some noted that using fellowships or grants may allow for affiliated faculty or academic experts to engage with center activities.
- Country or Regional Partners: Some interviewees suggested requesting funds from ASEAN or soliciting annual contributions from ASEAN member states to be used as a pooled resource supporting the center. When considering other countries with funding allocations for health security measures, one expert noted Japan's recent renewed interest in health security[9] and its potential to help diversify funding streams.

Location

Interviewees recommended that a well-resourced, regionally staffed center be established in an easily accessible area to promote convening in the region. **Creating multiple centers would allow opportunities for expansion and help mitigate regional challenges of working across borders, languages, and time zones.**

A center created with host country government support, versus without, would have a greater degree of success. Interviewees expressed concern over past centers or programs established without collaboration or guidance from the host country. Additionally, they recommended that a center collaborate with or be established within an academic institution to potentially maintain a non-biased political agenda, improve access to talent pools, and foster close relationships with policymakers, organizations, and government leadership. To ensure sustained impact on regional policies, a center should have clear goals for and expectations of a host country, host organization, and/or partner nations.

Singapore and **China** emerged as the most recommended locations by experts, as both countries geographically fall between WHO regional offices in Delhi, India, and Manila, Philippines. Some experts recommended Singapore for its neutral reputation and ease of travel. Others recommended a center in China due to its global influence, workforce, and scientific scholarship (see Table 2). In balance, most interviewees **recommended that external funds be used to set up a center in Singapore, and another center in China, established with or without external funds, would provide an excellent opportunity for collaboration on health security in the region.**

Singapore

A health security center in Singapore would benefit from preexisting convening power, ease of travel, multiple research institutions, potential for partnerships with governments, and regional reputation. Singapore already has strong networks of health security partners in government, academia, and NGOs across Asia, and the country also has established itself as a neutral convening partner where emerging health security concerns may be openly discussed and acted upon. Experts expressed that a center established in partnership with a university in Singapore—such as Nanyang Technological University (NTU)[10], S. Rajaratnam School of International Studies (RSIS)[11], National University in Singapore (NUS)[12], or Duke Graduate Medical School in Singapore[13]—may have more flexibility, resources, and independence to address GCBR issues.

China

China is an existing health expertise hub, has the logistical infrastructure to support a center, and maintains a strong network of health security involvement (e.g., Tianjin University[14]). Establishing a center in China presents several challenges, including

difficulty receiving external funding and visa hindrances increasing the complexity of travel to China from other countries in the region.

Table 2: Pros and Cons of Location of an Asian Health Security Center

Country	Pros	Cons
China	• Global expertise and experience in pandemic preparedness and response • High resource and high capability • Critical partner in health security • International and regional leader • Existing network and investment in health security	• Concerns over information-sharing with regional partners • Unclear whether government would overtly support an international center • Travel restrictions (some temporary due to COVID-19) • Possible difficulties in accepting external funding
Malaysia	• Straightforward visa process • Low cost of living compared to China or Singapore • Strong network of partnerships with the government • Government is considering PPP, and would be amenable partner to international preparedness efforts	• Would require investment to build health security workforce capacity • Lacks operational infrastructure for health security research
Singapore	• Ease of travel and visa process • Open and neutral reputation • Convening power • English an official language • Existing academic centers and expertise • Headquarters for other intergovernmental organizations • Well-known policy hub in the region	• Less influential on global stage than China
South Korea	• Potential partner in health security based on interviews with US CDC experts • Existing lab capacity	
Thailand	• Standing presence in ASEAN • Established department of disease control, national referral labs, and bioresource centers • Strong surveillance systems and national response coordination to COVID-19 pandemic	• Would require investment to build health security workforce capacity

Next Steps

The unanimous opinion of the interviewees is that an Asian health security center or centers would be a valuable resource for the development of related policy and recommendations and would serve to heighten attention to the region's health security. The creation of such a center or centers should be a top priority.

This report is the first step in exploring the establishment of a new health security center in Asia, describing a new center's potential goals and activities, topical areas of priority, and location. However, there remain key areas that need to be explored to move forward on establishing a new health security center. The authors recommend a meeting, or series of meetings, of experts, funders, and other stakeholders to develop recommendations and identify specific next steps that will help guide the establishment of a new Asian health security center. Such a meeting would allow decisions to be made regarding center leadership, location, funding, partners, and other critical issues.

Future Discussions

In establishing a center, it is necessary to clearly describe further details on roles and responsibilities, collaborations and partnerships, operational staff and costs, and funding mechanisms. The following list of questions and considerations could help guide future discussions during the next phase of development.

1. **Define roles and responsibilities**
    a. What would be the center's primary roles and responsibilities?
    b. If two centers were established, how would collaboration and support for research projects occur?
        i. **China**
            1. What do Chinese implementing partners think about a proposed collaboration with a new center in Singapore?
            2. Request further conversations with colleagues from China regarding
                a. partnerships with existing health security centers, or
                b. potential of establishing a new center.
        ii. **Singapore**
            1. What does a partnership with a center in China look like?
                a. How would roles, responsibilities, and research endeavors be divided?
                b. How would support and collaboration happen?

2. **Identify and engage partners**
    a. What level of government engagement would be required to establish a center?
    b. What regional or international partners or funders would need to be involved or approached in the creation phase?

c. Would it be feasible to begin with a center in Singapore, and then establish another center or work with an existing center in China?
    i. What are associated challenges from the perspectives of implementing partners?
    ii. What concrete steps can be taken to preempt or overcome constraints that existing organizations face?

3. **Create center staff job descriptions and proposed operating budget**
    a. Create a sample budget for 1-3-5 years in the future with these costs in mind:
        i. How is the center to be staffed?
        ii. What are the salary and other budgetary considerations?
        iii. How many people are initially required? At full effort? At half-effort?
        iv. Will staff be allowed to retain partial effort at previous jobs?
        v. Where will the center be housed?

4. **Establish financing mechanisms**
    a. How should the center balance government, philanthropic, and other nongovernmental sources of funding?
        i. What streams should be prioritized in the short term? In the long term?
    b. Consider the experience of the Johns Hopkins Center for Health Security:
        i. When and how did diversification happen?
        ii. What new sources of funding were explored?
        iii. How can these lessons benefit a future center in Asia?

Limitations

There were several limitations to this study, including researchers' bias, generalizability to other contexts, replicability, and language barriers. Our sample size was intentionally small to collect rich information on the Asian health security context but limited the scope of responses. Our aim was to understand the region's health security needs, and thus the findings may not be replicable or generalizable to other contexts. Finally, language barriers may have precluded experts from communicating their express wishes and our study team from fully understanding their expressed perspectives and experiences.

References

1. Schoch-Spana M, Cicero A, Adalja A, et al. Global Catastrophic Biological Risks: Toward a Working Definition. Health Secur. 2017;15(4):323-328. doi:10.1089/hs.2017.0038
2. Cicero A, Shearer MP, Kaushal N. Southeast Asia Strategic Multilateral Biosecurity Dialogue, with Participation from Indonesia, Malaysia, the Philippines, Singapore, Thailand, and the United States. Meeting Report: December 14 and 16, 2021. Baltimore, MD: Johns Hopkins Center for Health Security; 2022.
3. Castriciones EV, Vijayan V. Biosecurity risk mapping and gap analysis in South East Asia. J Biosaf Biosecur. 2020;2(1):36-43. doi:10.1016/j.jobb.2020.03.001
4. United Kingdom Government. New global partnership launched to fight future pandemics. Published April 20, 2021. Accessed May 2, 2022. https://www.gov.uk/government/news/new-global-partnership-launched-to-fight-future-pandemics
5. Stanford University. China Program at Stanford's Shorenstein Asia-Pacific Research Center. Accessed May 2, 2022. https://aparc.fsi.stanford.edu/china/content/aparcchina-programhome
6. Republic of Singapore Ministry of Health, US Department of Health and Human Services. Agreement between the governments of the United States of America and the Republic of Singapore establishing the regional emerging diseases intervention center. Published October 17, 2003. Accessed April 26, 2022. https://2001-2009.state.gov/documents/organization/94298.pdf
7. US Department of State. Agreement between the United States of America and Singapore. Published November 22, 2005. Accessed April 26, 2022. https://www.state.gov/wp-content/uploads/2019/02/06-407.1-Singapore-Health.EnglishOCR.pdf
8. Sagara Y. Japan needs radical change to achieve health security. The Japan Times. Published January 20, 2022. Accessed May 2, 2022. https://www.japantimes.co.jp/opinion/2022/01/20/commentary/japan-commentary/japan-health-security/
9. Open Philanthropy. Johns Hopkins Center for Health Security — Biosecurity, Global Health Security, and Global Catastrophic Risks (2019). Published September 2019. Accessed May 2, 2022. https://www.openphilanthropy.org/focus/global-catastrophic-risks/biosecurity/center-health-security-biosecurity-health-security-gcrs-2019
10. Nanyang Technological University. Homepage. Accessed April 22, 2022. https://www.ntu.edu.sg/
11. S. Rajaratnam School of International Studies. Homepage. Accessed April 22, 2022. https://www.rsis.edu.sg/
12. National University of Singapore. Homepage. Accessed April 22, 2022. https://www.nus.edu.sg
13. Duke National University of Singapore. Homepage. Accessed April 22, 2022. https://www.duke-nus.edu.sg/
14. Tianjin University. Center for Biosafety Research and Strategy. Accessed April 22, 2022. http://tjusa.tju.edu.cn/english/Home.htm

Appendix A: List of Interviewed Experts

China

- Dr. Weiwen Zhang, Professor, Center for Biosafety Research and Strategy

Singapore

- Tikki Elka Pangestu, Visiting Professor, Lee Kuan Yew School of Public Policy, National University of Singapore
- Dr. Lim Poh Lian, Director of the High-Level Isolation Unit (HILU) at the National Centre for Infectious Diseases, and Senior Consultant in the Ministry of Health
- Dr. Vernon Lee, Deputy Director, Deputy Director for Communicable Diseases in the Singapore Ministry of Health, Head of the Singapore Armed Forces Biodefence Centre, and Adjunct Associate Professor of Public Health at the National University of Singapore
- Dr. Mely Anthony, Director, RSIS Non-Traditional Security Centre

Thailand

- Dr. Soawapak Hinjoy, Director, Office of International Cooperation, Department of Disease Control, Ministry of Public Health
- Dr. Nakorn Premsi, Director, National Vaccine Institute

Indonesia

- Dr. Pratiwi Sudarmono, Professor, Department of Microbiology, Faculty of Medicine, Universitas Indonesia

Malaysia

- Dr. Chee Kheong Chong, Deputy Director General of Health at the Ministry of Health
- Dr. Sazaly AbuBakar, Senior Professor and Director, Tropical Infectious Diseases Research and Education Center (TIDREC) and WHO Collaborating Center for Arbovirus Reference and Research at the University of Malaysia

Philippines

- Dr. Irma Makalinao, Professor and Graduate Program Adviser, Department of Pharmacology and Toxicology, College of Medicine, University of the Philippines

United States

- Dr. Jamie Yassif, Senior Director and Lead Scientist at the Global Biological Policy and Programs at Nuclear Threat Initiative
- Megan Palmer, Executive Director, Bio Policy & Leadership Initiatives, Department of Bioengineering (BioE), Stanford University
- Jeff Alsott, Program Manager, American Council for Technology and Industry
- Dr. Jim LeDuc, Director, Galveston National Laboratory
- Dr. David Franz, Principal, SBD Global; Commander Retired, US Army Medical Research Institute of Infectious Diseases (USAMRIID)

Appendix B: Interview Questions

Guide: Semi-structured Interview Guides
Duration: 30-45 minutes each
Target number of interviews: 15-20 (aim to reach around 30 people)

Sample Introductory Statement:

> Thank you for joining us today and participating in our feasibility study. Through our discussion, we hope to identify opportunities for the creation of a Biosecurity Center in Asia and learn from your experiences and needs on the ground. Our interviews will not be recorded, and any notes taken will be on a not-for-attribution basis. Ultimately, we hope this conversation helps us to identify geographical considerations and priority topics within the biosecurity space that are of importance in the Asia region.

Sample Concluding Statement:

> Thank you for participating in this study. Your insights and experiences today have been invaluable to our process, and we look forward to incorporating your recommendations and suggestions into a report, which we are happy to share with you upon completion. If you have any questions or concerns post-interview, please don't hesitate to reach out to the CHS team! Thank you for your time and we look forward to collaborating with you in the future.

Questions:

1. **Role of the New Center**

Intro: To date, the Center for Health Security has contributed meaningful research and policy advancements to the field of global biosecurity. Our Center has produced reports, manuscripts, and peer-reviewed articles both independently and in collaboration with key stakeholders and partners around the world. It is our hope that a new center may continue to contribute to regional advancements to the field of biosecurity in a similar manner in Asia. In this section, we would like to discuss the role of a new center, its goals, target audience, and regional impact.

Topics to discuss:

- Valuable partnerships to biosecurity in the region
- Regional influence and convening power of a potential center
- Goals and accomplishments of a partner campus in Asia
- Target audience and regional impact of a new center

2. **Current State of Affairs**

Intro: Although biosecurity is of global concern, it is important to focus on regional challenges, unique solutions, and improved definition of regional threats and regional needs. In this section, we would like to discuss the gaps and current needs of the Asia region, as well as what unique challenges affect the field of biosecurity.

Topics to discuss:

- Gaps or current needs of biosecurity in this region
- Regional interests and advancements to biosecurity
- How do they differ from other regions?
- What makes them unique in the challenges they present to the field of health security?
- How might a new center assist in the definition/identification of these challenges and potential solutions?

3. **Financial Implications of a New Center**

Intro: In this section, we hope to discuss the prospective cost of a new center, and whether you have geographic and regional preferences within your country. We would also like to glean what partnerships or funding may already exist, and where opportunities can be foraged.

Topics to discuss:

- Geographic differences in cost
- Pros or cons of certain locations within country
- Funding sources (new and existing) in the region for biosecurity efforts

4. **Regional and Geographic Trends** (Note: steer away from US-China relations)

Intro: Global and regional public health challenges differ from region to region, and country to country. In considering the creation of a center in Asia, our team hopes to assess the regional differences between countries and regions. In this section, we would like to discuss the advantages or disadvantages of establishing a center in your country, what existing or new supportive partnerships would supplement this center, and the sociopolitical context of establishing a center in your country.

Topics to discuss:

- Logistical implications, advantages and disadvantages of a center's location, pragmatic and or practical considerations for this center's location
- Political/Sociopolitical implications, advantages, and disadvantages of a center's location
- Partners included or not included in the creation of this center

5. **Detection of Future Threats**

Intro: Learning from the COVID-19 experience and looking forward, global and regional public health events of concern include emerging diseases and require the detection of biological threats. In this discussion, we hope to understand the specific nature of threats to your region, potential spillover events of concern, and other threats that would require monitoring and detection.

Topics to discuss:

- Emerging or spillover biological threats of concern to monitor in this region
- Monitoring, detection, and diagnostic systems in the region
- National strategies, regulations, and policies to respond to future events

Johns Hopkins
Center for Health Security

621 E. Pratt Street, Suite 210
Baltimore, MD 21202

Tel: 443-573-3304
Fax: 443-573-3305

centerhealthsecurity@jhu.edu
centerforhealthsecurity.org