

Thailand

This document is a compilation of all questions, justifications, and sources used to determine the 2021 Global Health Security Index scores for Thailand. For a category and indicator-level summary, please see the Country Profile for Thailand.

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Category 1: Preventing the emergence or release of pathogens with potential for international concern

1.1 ANTIMICROBIAL RESISTANCE (AMR)

1.1.1 AMR surveillance, detection, and reporting

1.1.1a

Is there a national AMR plan for the surveillance, detection, and reporting of priority AMR pathogens?

Yes, there is evidence of an AMR plan, and it covers surveillance, detection, and reporting = 2, Yes, there is evidence of an AMR plan, but there is insufficient evidence that it covers surveillance, detection, and reporting = 1, No evidence of an AMR plan = 0

Current Year Score: 2

Thailand has a national AMR plan for the surveillance, detection and reporting of priority AMR pathogens. The Joint External Evaluation for Thailand, completed in June 2017, states that the National Strategic Plan on AMR (2017-2021) was developed in collaboration with multiple sectors and aims to increase coordination on AMR across government. [1] It was designed to align with the Global Action Plan on Antimicrobial Resistance (AMR) and consists of six strategies and 22 strategic actions to reduce morbidity caused by AMR, reduce antimicrobial consumption, and increase public knowledge on AMR. Strategy one of the Plan covers AMR surveillance system using a 'One-Health' approach, which ensures that the AMR surveillance system is capable of indicating problems as well as monitoring and reporting the AMR epidemiological situation in both humans and animals. One of the Strategy goals involves detecting new resistant pathogens, preventing them from spreading widely and supporting a timely response. The integrated AMR surveillance system will also lead to the development of alert and coordinating systems across agencies at local and national levels. [2]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Ministry of Public Health. "National Strategic Plan on Antimicrobial Resistance 2017-2021". [<http://kb.hsri.or.th/dspace/handle/11228/4807?show=full>]. Accessed August 2020.

1.1.1b

Is there a national laboratory/laboratory system which tests for priority AMR pathogens?

All 7 + 1 priority pathogens = 2, Yes, but not all 7+1 pathogens = 1, No = 0

Current Year Score: 1

There is some evidence that Thailand's national laboratory system can test for some of WHO 7+1 pathogens, however there is insufficient evidence it tests for all. Data from Jan-Dec 2019 antibiogram published by The National Antimicrobial Resistance Centre (NARST) shows that the Centre is able to test for *E. coli*, *K. pneumoniae*, *S. aureus*, *S. pneumoniae*, *Salmonella* spp., and *Shigella* spp. [1] The Joint External Evaluation for Thailand, completed in June 2017, states that the NARST is a WHO Collaborating Centre on AMR Surveillance and Training. [2] The NARST surveillance network covered more than 97 hospitals/surveillance sites located in all 77 provinces as of December 2019. [3] Additionally, using the data collected between November 2015-December 2018, 'WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) Report: early implementation 2020' shows that Thailand can test for *N. gonorrhoeae*. [4] Tuberculosis tests via the rapid test

kit has been developed by the Department of Medical Sciences and can be carried out at community hospitals nationwide since October 2019. [5] However, the JEE identified "expanding the coverage of microbiology laboratories with the capacity to perform mycobacterial cultures, identify drug-resistant tuberculosis and report to clinicians in a timely manner." as an area that needs strengthening. [2]

[1] National Antimicrobial Resistance Center Thailand's Website. "Percentage of Susceptible Organisms Isolated From All Specimen, 92 hospitals, Jan - Dec 2019". [<http://narst.dmsc.moph.go.th/antibiograms/2019/12/Jan-Dec2019-All.pdf>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] National Antimicrobial Resistance Center Thailand's Website. "Hospitals in the NARST network in 2019, Total 92 out of 97 in the network". [<http://narst.dmsc.moph.go.th/webantibiogram/Default2.aspx>]. Accessed August 2020.

[4] World Health Organization. 2020. "WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) Report: early implementation 2020". [<https://apps.who.int/iris/bitstream/handle/10665/332081/9789240005587-eng.pdf?ua=1>]. Accessed August 2020.

[5] Bangkok Post. Wipatayotin, A.. 10 July 2019. "Rapid TB Tests To Go Nationwide". [<https://www.bangkokpost.com/thailand/general/1709771/rapid-tb-tests-to-go-nationwide>]. Accessed August 2020.

1.1.1c

Does the government conduct environmental detection or surveillance activities (e.g., in soil, waterways) for antimicrobial residues or AMR organisms?

Yes = 1 , No = 0

Current Year Score: 1

There is public evidence that the government is conducting environmental surveillance. The Ministry of Natural Resources and Environment conducts detection for antimicrobial residues. The Joint External Evaluation for Thailand, completed in June 2017, does not refer to any government agency which conducts detection activities for antimicrobial residues or AMR organisms, but there is publicly available evidence that the Department of Environmental Quality Promotion (DEQP) under the Ministry of Natural Resources and Environment conducted water quality testing in 2015-2017 and found antimicrobial residues in 25 waterways. [1, 2] The National Strategic Plan on AMR 2017-2021 stated in the antimicrobial resistance analysis that the inspection of still water ponds in pig farms reveals higher traces of antimicrobial resistant microbes compared to canals and shrimp and fish ponds, citing a study funded by Health Systems Research Institute and Thai Health Promotion Foundation, both are autonomous government agencies. [3,4] National Strategic Plan on AMR 2017-2021 recognized the need to develop surveillance systems to cover antimicrobial use and AMR in humans, animals and environment. [3]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Health Systems Research Institute (HSRI). 2017. "The Era of Drug Resistance Diseases - Harm to Humans, Animals, and Environment. 25 Agencies collaborate to implement the National Strategic Plan on Antimicrobial Resistance 2017-2021. HSRI supports research on AMR". [<https://www.hsri.or.th/researcher/media/news/detail/9077>]. Accessed August 2020.

[3] Ministry of Public Health. 2017. "National Strategic Plan on Antimicrobial Resistance 2017-2021". [<http://kb.hsri.or.th/dspace/handle/11228/4807?show=full>]. Accessed August 2020.

[4] Thai Drug Watch, Faculty of Pharmaceutical Sciences, Chulalongkorn University. August to September 2018. "Thai Drug Watch Newsletter Series 37: Pharmaceutical in the Environment". pp. 2, 7, 10, 37.

[<http://www.thaidrugwatch.org/download/series/series37.pdf>]. Accessed August 2020.

1.1.2 Antimicrobial control

1.1.2a

Is there national legislation or regulation in place requiring prescriptions for antibiotic use for humans?

Yes = 2 , Yes, but there is evidence of gaps in enforcement = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that there is a national legislation or regulation in place requiring prescriptions for antibiotic use for humans in Thailand. The Joint External Evaluation for Thailand, completed in June 2017, does not refer to any legislation requiring antibiotic use for humans. [1] There is evidence that people can buy antibiotics without a prescription. While the Drugs Act B.E.2510 (1967) and Ministry of Public Health Notification on Dangerous Drugs No. 29 (2017) classified most antibiotics as "dangerous drugs", they can be obtained legally without a prescription. The law only classifies a few antibiotics (e.g. beta lactamase inhibitor, carbapenems and Fosfomycin) as special-control drugs which are reserved for hospital use. Otherwise, the government generally places no restrictions on the quantities of antibiotics that could be sold to any individual. [2, 3, 4] Thai Food and Drug Administration is still working on a reclassification of antibiotics in which a larger proportion of the drugs will be categorized as special control/prescription-only - in line with the recommendations made by the World Health Organization in its 20th Model List of Essential Medicines. [2] The National Strategic Plan on Antimicrobial Resistance 2017-2021 included the promulgation of a legislative order on antimicrobial reclassification as well as the control of distribution channels and conditions for these drugs. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Sommanustweechai, A. et al.. 2017. "Antibiotic distribution channels in Thailand: results of key informant interviews, reviews of drug regulations and database searches". Bulletin of the World Health Organization; Type: Research Article ID: BLT.17.199679. [<https://www.who.int/bulletin/volumes/96/2/17-199679/en/>]. Accessed August 2020.

[3] Drugs Act B.E.2510 (1967).

[[http://www.fda.moph.go.th/sites/logistics/TheLaws_Document/Drugs%20Act,%20B.E.%202510%20\(1967\)/DRUGSB.E.2510.pdf](http://www.fda.moph.go.th/sites/logistics/TheLaws_Document/Drugs%20Act,%20B.E.%202510%20(1967)/DRUGSB.E.2510.pdf)]. Accessed August 2020.

[4] Royal Thai Government Gazette No.134. 2017. "Ministry of Public Health Notification on Dangerous Drugs No.29".

[<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Law03-TheMinistryOfHealth/dangerous-drugs-29.PDF>]. Accessed August 2020.

[5] Ministry of Public Health. "National Strategic Plan on Antimicrobial Resistance 2017-2021".

[<http://kb.hsri.or.th/dspace/handle/11228/4807?show=full>]. Accessed August 2020.

1.1.2b

Is there national legislation or regulation in place requiring prescriptions for antibiotic use for animals?

Yes = 2 , Yes, but there is evidence of gaps in enforcement = 1 , No = 0

Current Year Score: 1

There is regulation in place requiring prescriptions for antibiotic use for animals. "Ministry of Agriculture and Cooperatives Notification on the characteristics and conditions of feed mixtures that are prohibited from being produced, imported, sold and used, No.29" requires prescriptions for antibiotic use for animals. The Ministry Notification prohibits the use of

antibiotics in livestock feed unless the antibiotics is prescribed by veterinarians designated for each farm. [1] However, a 2017 study by the World Health Organization indicated that many Thai farmers were - illegally - adding active pharmaceutical ingredients to animal feeds, probably as a cost-saving measure. [2] The reduction of the use of antimicrobials in livestock farming and fisheries is included in Thailand's National Strategic Plan on Antimicrobial Resistance 2017-2021. [3]

[1] Royal Thai Government Gazette No.135. 2018. "Ministry of Agriculture and Cooperatives Notification on the characteristics and conditions of feed mixtures that are prohibited from being produced, imported, sold and used, No.29". [<http://afvc.dld.go.th/images/file-download/AMR/610801-1-1.PDF>]. Accessed August 2020.

[2] Sommanustweechai, A. et al.. 2017. "Antibiotic distribution channels in Thailand: results of key informant interviews, reviews of drug regulations and database searches". Bulletin of the World Health Organization; Type: Research Article ID: BLT.17.199679. [http://www.who.int/bulletin/online_first/BLT.17.199679.pdf]. Accessed August 2020.

[3] Ministry of Public Health. "National Strategic Plan on Antimicrobial Resistance 2017-2021". [<http://kb.hsri.or.th/dspace/handle/11228/4807?show=full>]. Accessed August 2020.

1.2 ZONOTIC DISEASE

1.2.1 National planning for zoonotic diseases/pathogens

1.2.1a

Is there national legislation, plans, or equivalent strategy documents on zoonotic disease?

Yes = 1 , No = 0

Current Year Score: 1

There are several legislations associated with zoonotic disease in Thailand. There is a long-standing collaboration between public health and animal health sectors for zoonoses prevention and control. In Thailand, a national list of notifiable animal diseases is agreed by the Department of Livestock Development based on the World Organisation for Animal Health (OIE) listed diseases and the Animal Epidemics Act 2015. The national list of notifiable animal diseases is regularly reviewed, according to the OIE listed diseases and national concerns. After each revision, the list will be announced in the Ministry proclamation as required by law. [1] Thailand's National Strategic Plan for Emerging Infectious Diseases 2017-2021, including zoonoses, has been adopted by the Thai Cabinet on December 7, 2016, and outlines six strategies to reduce risk of infection, illness, death, and negative impacts from emerging infectious diseases [2, 3]. The Joint External Evaluation for Thailand, completed in June 2017, states that other relevant laws associated with zoonoses include Animal Epidemics Act 2015, Communicable Diseases Act 2015, Rabies Act 1992, and Public Health Act 1992. [4]

[1] The Bureau of Disease Control and Veterinary Services, Department of Livestock Development, Ministry of Agriculture and Cooperatives' Website. [<http://en.dld.go.th/index.php/en/focus-menu/animal-health-menu/over-all-of-animal-health/bureau-of-disease-control-and-veterinary-services-bdcvs>]. Accessed August 2020.

[2] Bureau of Emerging Infectious Diseases. 2017. "National Strategic Plan for Emerging Infectious Diseases 2017-2021". Bureau of Emerging Infectious Diseases, Department of Disease Control, Ministry of Public Health. [<https://www.dropbox.com/s/vxb924zoi5t93gr/National%20Strategic%20Plan%20for%20Emerging%20Infectious%20Disease%202017-2021.pdf?dl=0>]. Accessed August 2020.

[3] Ministry of Public Health. 2018. "Disease Control Journal Vol 44 No.1 Jan - Mar 2018. Development of Thailand National Strategic Plan for Emerging Infectious Diseases 2017-2021". [<https://tci-thaijo.org/index.php/DCJ/article/view/147375>]. Accessed August 2020.

[4] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". pp. 14-16. World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

1.2.1b

Is there national legislation, plans or equivalent strategy document(s) which includes measures for risk identification and reduction for zoonotic disease spillover events from animals to humans?

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence for national legislation, plans or equivalent strategy document(s) which specifically includes measures for risk identification and reduction for zoonotic disease spillover events from animals to humans. The Bureau of Disease Control and Veterinary Services (BDCVS) of the the Department of Livestock Development (DLD) under supervision of the Ministry of Agriculture and Cooperatives, is responsible for disseminating information on animal health, animal diseases, and surveillance activities to veterinarians, farmers, consumers, private sectors, government agencies, and decision makers. In addition, BDCVS collaborates with other national agencies, especially the Department of Disease Control, Ministry of Public Health and empowers local administrative authorities known as "Sub district Administration Organization" in prevention, control, and eradication of animal and zoonotic diseases. Finally, the BDCVS's website provides weekly updates on zoonotic disease transmissions (rabies, foot and mouth disease, African swine fever virus, and more), an nouncement of epidemic zones, and more. [1, 2] There is a long-standing collaboration between public health and animal health sectors for zoonoses prevention and control. In Thailand, a national list of notifiable animal diseases is agreed by the Department of Livestock Development based on the OIE listed diseases and the Animal Epidemics Act 2015. The national list of notifiable animal diseases is regularly reviewed, according to the World Organisation for Animal Health (OIE) listed diseases and national concerns. After each revision, the list will be announced in the Ministry proclamation as required by law. [1] Thailand's National Strategic Plan for Emerging Infectious Diseases 2017-2021, including zoonoses, has been adopted by the Thai Cabinet on December 7, 2016, and outlines six strategies to reduce risk of infection, illness, death, and negative impacts from emerging infectious diseases [3, 4]. The Joint External Evaluation for Thailand, completed in June 2017, states that other relevant laws associated with zoonoses include Animal Epidemics Act 2015, Communicable Diseases Act 2015, Rabies Act 1992, and Public Health Act 1992. [5] Nonetheless, these laws and strategic plans do not explicitly mention risk reduction for zoonotic disease spillover events nor identifies pathways for transmission of zoonotic diseases from animals to humans. Document with those specific examples are also not available. Further research from the websites of Ministry of Public Health, and Ministry of Agriculture and Cooperatives yielded no evidence. [6, 7]

[1] The Bureau of Disease Control and Veterinary Services, Department of Livestock Development, Ministry of Agriculture and Cooperatives Website. [<http://en.dld.go.th/index.php/en/focus-menu/animal-health-menu/over-all-of-animal-health/bureau-of-disease-control-and-veterinary-services-bdcvs>]. Accessed August 2020.

[2] The Bureau of Disease Control and Veterinary Services, Department of Livestock Development, Ministry of Agriculture and Cooperatives's Website. [<http://dcontrol.dld.go.th/webnew/index.php/th/>].

[3] Bureau of Emerging Infectious Diseases. 2017. "National Strategic Plan for Emerging Infectious Diseases 2017-2021".

Bureau of Emerging Infectious Diseases, Department of Disease Control, Ministry of Public Health.

[<https://www.dropbox.com/s/vxb924zoi5t93gr/National%20Strategic%20Plan%20for%20Emerging%20Infectious%20Disease%202017-2021.pdf?dl=0>]. Accessed August 2020.

[4] Ministry of Public Health. 2018. "Disease Control Journal Vol 44 No.1 Jan - Mar 2018. Development of Thailand National Strategic Plan for Emerging Infectious Diseases 2017-2021". [<https://tci-thaijo.org/index.php/DCJ/article/view/147375>]. Accessed August 2020.

[5] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". pp. 14-16. World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[6] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[7] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

1.2.1c

Is there national legislation, plans, or guidelines that account for the surveillance and control of multiple zoonotic pathogens of public health concern?

Yes = 1 , No = 0

Current Year Score: 1

There are several legislations that account for the surveillance and control of zoonotic pathogens of public health concern. The Joint External Evaluation for Thailand, completed in June 2017, states that the five highest priority zoonotic diseases in Thailand, for which the country has surveillance systems in place, are rabies, avian influenza, brucellosis, anthrax, and nipa [1]. The National Strategic Plan for Emerging Infectious Diseases 2017-2021 covers surveillance, prevention, and control of zoonotic diseases in line with One Health Policy [2]. Animal Epidemics Act B.E.2558 (2015) covers the control of all five highest priority zoonotic diseases, plus others that are listed in the Ministerial Regulation on Additional Zoonotic Diseases B.E.2554 (2011). [3,4] Rabies Work Plan B.E. 2560-2564 (2017-2021) by the Department of Disease Control, Ministry of Public Health, and Rabies Act B.E.2535 (1992) cover surveillance and control of rabies. [5,6] In addition, the Bureau of Disease Control and Veterinary Services, Ministry of Agriculture and Cooperatives published a compilation of laws and regulations which inform the surveillance, prevention, and control of avian influenza. [7]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". pp. 14-16. World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Disease Control Journal. 30 March 2018. "Development of Thailand National strategic Plan for Emerging Infectious Disease (2017-2021)". [<https://tci-thaijo.org/index.php/DCJ/article/view/147375>]. Accessed August 2020.

[3] Animal Epidemics Act B.E.2558 (2015). [http://en.dld.go.th/images/Legislation/Animal-Epidemics-Act_Eng.pdf]. Accessed August 2020.

[4] Ministerial Regulation on Additional Zoonotic Diseases B.E.2554 (2011), Book 128, 64 Kor. [http://www.dld.go.th/th/images/stories/law/ministerial_epidemic2554.pdf]. Accessed August 2020.

[5] Rabies Work Plan B.E. 2560-2564 (2017-2021). Department of Disease Control, Ministry of Public Health. [http://plan.ddc.moph.go.th/meeting30_1augsep/meeting30_1/Documents/5.%20CD/3.1%20%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B9%82%E0%B8%A3%E0%B8%84%E0%B8%9E%E0%B8%B4%E0%B8%A9%E0%B8%AA%E0%B8%B8%E0%B8%99%E0%B8%B1%E0%B8%82%E0%B8%9A%E0%B9%89%E0%B8%B2.pdf]. Accessed August 2020.

[6] Rabies Act B.E.2535 (1992). [http://en.dld.go.th/images/Legislation/RABIES_ACT_B.E._2535_1992.pdf]. Accessed August 2020.

[7] Bureau of Disease Control and Veterinary Services. 2016. "Compilation of laws and regulations on surveillance, prevention, and control of Avian influenza". Bureau of Disease Control and Veterinary Services, Ministry of Agriculture and Cooperatives. [<http://dcontrol.dld.go.th/images/stories/document/LawAI.pdf>]. Accessed August 2020.

1.2.1d

Is there a department, agency, or similar unit dedicated to zoonotic disease that functions across ministries?

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that indicates that Thailand has a department, agency, or similar unit dedicated to zoonotic disease that functions across ministries. Thailand has dedicated departmental units for zoonotic diseases, but there is no evidence that they function across ministries. According to the Joint External Evaluation for Thailand, completed in June 2017, the key stakeholders involved in multisectoral collaboration to tackle zoonotic diseases include the Departments of Disease Control; Medical Sciences; Livestock Development; and National Parks, Wildlife and Plant Conservation; as well as the Ministry of Interior, universities, the Thailand One Health University Network and local administrative organizations. [1] The Bureau of Disease Control and Veterinary Services (BDCVS), Ministry of Agriculture and Cooperatives is responsible for planning, coordination and monitoring of control, prevention, and eradication programs and activities of important animal and zoonotic diseases. In addition, BDCVS collaborates with other national agencies, especially the Department of Disease Control, Ministry of Public Health. However, its organizational structure does not indicate the inclusion of staff from other ministries. [2] Within the Ministry of Public Health, the Zoonosis Section, Bureau of General Communicable Diseases, acts as the information center and collaboration unit for the surveillance and control of zoonotic diseases. However, based on the official mandate, there is no evidence that the unit functions across ministries. [3] Further research on the Ministry of Public Health's website and the Ministry of Agriculture and Cooperatives' website yielded no evidence. [4, 5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] The Bureau of Disease Control and Veterinary Services, Department of Livestock Development, Ministry of Agriculture and Cooperatives Website. [<http://en.dld.go.th/index.php/en/focus-menu/animal-health-menu/over-all-of-animal-health/bureau-of-disease-control-and-veterinary-services-bdcvs>]. Accessed August 2020.

[3] The Royal Thai Government Gazette. 20 June 2019, 136/78 A. "Ministerial Regulations on Government Division - Department of Disease Control. Ministry of Public Health 2019". [https://ddc.moph.go.th/uploads/ckeditor2/ethg/file/ministerial_ddc.pdf]. Accessed August 2020.

[4] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[5] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

1.2.2 Surveillance systems for zoonotic diseases/pathogens

1.2.2a

Does the country have a national mechanism (either voluntary or mandatory) for owners of livestock to conduct and report on disease surveillance to a central government agency?

Yes = 1 , No = 0

Current Year Score: 1

There is a mandatory national mechanism for owners of livestock to report on disease surveillance to provincial or central government agencies. Section 11 of the Animal Epidemics Act B.E.2558 (2015) mandates an owner of animals to notify a competent official, inspector or veterinarian within twelve hours from the time of acknowledgement of the sickness or death of the animals. Failure to comply will be punishable by law. [1] Owners of livestock can report directly to the provincial livestock office, district livestock office, or call the Department of Livestock Development's hotline number +6696-301-1946 which is available 24 hours. [2] In one of the reporting mechanisms, citizens can also use 'e-smart surveillance' via the Department of Livestock Development's website to alert the authorities of potential animal disease cases. [3]

[1] Animal Epidemics Act B.E.2558 (2015). [http://en.dld.go.th/images/Legislation/Animal-Epidemics-Act_Eng.pdf]. Accessed August 2020.

[2] Office of the Secretary, Department of Livestock Development Website. 20 February 2018. "Department of Livestock

advises farmers to take care of pets closely and emphasize strict surveillance and disease prevention in poultry (56/2561)". [http://secretary.dld.go.th/webnew/index.php/th/news-menu/livestock-newsflash-menu/3271-20-2-61]. Accessed August 2020.

[3] Bureau of Disease Control and Veterinary Services Website. "E-smart surveillance". [http://esmartur.net/INFORM.aspx]. Accessed August 2020.

1.2.2b

Is there legislation and/or regulations that safeguard the confidentiality of information generated through surveillance activities for animals (for owners)?

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence of legislation and/or regulations that safeguard the confidentiality of information generated through surveillance activities for animals (for owners). The Joint External Evaluation for Thailand, completed in June 2017, does not refer to any laws or guidelines that safeguard the confidentiality of surveillance information. [1] Section 11 of the Animal Epidemics Act B.E.2558 (2015) mandates an owner of animals to notify a competent official, inspector or veterinarian within twelve hours from the time of acknowledgement of the sickness or death of the animals, but does not mention data confidentiality of the reporter. [2] There is some evidence of safeguards for confidentiality of personal health data, but no indication that these cover surveillance activities. In one of the reporting mechanisms, citizens can use 'e-smart surveillance' via the Department of Livestock Development under the Ministry of Agriculture and Cooperatives' website to alert the authorities of potential animal disease cases [3]. According to the user manual for e-smart surveillance developed by the Bureau of Disease Control and Veterinary Services, the information of the citizen reporters are only visible by the officials with log-in accounts and are not shared with the public [4]. Section 24 of the Official Information Act B.E.2540 (1997) prohibits the government from publicly sharing citizens personal information without the citizen's consent but does not explicitly mention information generated through surveillance activities for animals (for owners). [5] The Ministry of Public Health Regulation on the Protection and Management of Health Data, 2018 protects the confidentiality of a person's identifiable health information but does not explicitly mention information generated through surveillance activities for animals (for owners). [6] The revised Data Protection Act 2019 is also ambiguous regarding the protection of information generated through surveillance activities for animals (for owners), as national security matters are exempt [7]. Finally, further research on the Ministry of Public Health's website and the Ministry of Agriculture and Cooperatives' website also yielded no evidence. [8, 9]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[2] Animal Epidemics Act B.E.2558 (2015). [http://en.dld.go.th/images/Legislation/Animal-Epidemics-Act_Eng.pdf]. Accessed August 2020.

[3] Department of Livestock, Bureau of Disease Control and Veterinary Services Website. "E-smart surveillance". [http://esmartur.net/INFORM.aspx]. Accessed August 2020.

[4] Bureau of Disease Control and Veterinary Services, Ministry of Agriculture and Cooperatives. "User Manual - E-smart Surveillance".

[http://esmartur.net/UploadFiles/DOWNLOAD/%E0%B8%84%E0%B8%B9%E0%B9%88%E0%B8%A1%E0%B8%B7%E0%B8%AD%20E-smart%20%E0%B9%83%E0%B8%AB%E0%B8%A1%E0%B9%88.pdf]. Accessed August 2020.

[5] Official Information Act B.E.2540 (1997). [http://www.dft.go.th/th-th/DetailHotNews/ArticleId/3695/-2540-English]. Accessed August 2020.

[6] Ministry of Public Health Regulation on the Protection and Management of Health Data. 2018.

[<http://hospital.moph.go.th/phangnga/News/info/%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%84%E0%B8%B8%E0%B9%89%E0%B8%A1%E0%B8%84%E0%B8%A3%E0%B8%AD%E0%B8%87%E0%B9%81%E0%B8%A5%E0%B8%B0%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%82%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B8%B9%E0%B8%A5%E0%B8%94%E0%B9%89%E0%B8%B2%E0%B8%99%E0%B8%AA%E0%B8%B8%E0%B8%82%E0%B8%A0%E0%B8%B2%E0%B8%9E%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%9A%E0%B8%B8%E0%B8%84%E0%B8%84%E0%B8%A561.pdf>]. Accessed August 2020.

[7] The Electronic Transactions Development Agency (ETDA) ICT Law Center Website. "Data Protection Act 2019".

[<https://ictlawcenter.eta.or.th/laws/detail/DP-Act-2562>]. Accessed August 2020.

[8] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[9] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

1.2.2c

Does the country conduct surveillance of zoonotic disease in wildlife (e.g., wild animals, insects, other disease vectors)?

Yes = 1, No = 0

Current Year Score: 1

There is evidence that Thailand conducts surveillance of zoonotic disease in wildlife. Since 2004, Thailand established the Monitoring and Surveillance Center for Zoonotic Diseases in Wildlife and Exotic Animals (MoZWE), housed under the Faculty of Veterinary Science, Mahidol University. The MoZWE is mandated to, among other things, monitor and collect information on zoonotic disease; identify and forecast zoonotic disease risks; and routinely provide national authorities relevant information such as the Ministry of Health or the Ministry of Agriculture. [1,2] The MoZWE currently serves as the Food and Agriculture Organization (FAO) Reference Centre for zoonotic and wildlife diseases and the World Organisation for Animal Health (OIE) Collaborating Center for Wildlife Health and Zoonotic Diseases in the Asia-Pacific region. The center has recently started the OIE Laboratory Twinning Project in collaboration with the United States Geological Survey (USGS) National Wildlife Health Center (NWHC). [4, 5] The Center also provides related documents on zoonotic surveillance such as methodology and reporting, and its research is part of 'One Health' national strategy. [5, 6] Moreover, the Joint External Evaluation for Thailand, completed in June 2017, confirms there is surveillance for Nipah viruses, rabies, avian influenza, brucellosis, anthrax, for instance. The government has a dedicated rabies elimination programme, which is under the patronage of the king [7] In general, national wildlife disease surveillance programmes in Thailand focused mainly on diseases associated with previous outbreaks in people. The multi-agency cooperation predominantly monitors diseases from bats, rodents, mosquitoes, monkeys, and wild birds, for the following zoonotic diseases: MERS, West Nile Disease, Avian Influenza, rabies, and Nipah Virus. [8, 9]

[1] The Monitoring and Surveillance Center for Zoonotic Diseases in Wildlife and Exotic Animals (MoZWE), Faculty of Veterinary Science, Mahidol University's Website. [<https://vs.mahidol.ac.th/th/mozwe.html>]. Accessed August 2020.

[2] Mahidol Channel. 14 Feb 2017. "Research Impact by Mahidol MoZWE". YouTube.

[<https://www.youtube.com/watch?v=IGksUgxxecE>]. Accessed August 2020.

[3] World Organisation for Animal Health. "USGS National Wildlife Health Center and Mahidol University OIE Twinning Project". [<https://rr-asia.oie.int/en/projects/wildlife-health/oie-twinning-project-between-the-u-s-and-thailand/>]. Accessed August 2020.

[4] Veterinary Practitioner News Magazine. July 2020. VPN Issue 214. "MoZWE - an organization that will do whatever it takes to find a solution to the disease". [<https://www.readvpn.com/Topic/Info/7fb5d4f5-5230-4323-85dd-1d6053abf9f3>]. Accessed August 2020.

[5] Faculty of Veterinary Science, Mahidol University. "Research Spotlight - Human, Animal and Environmental Health (One Health)". [<https://vs.mahidol.ac.th/th/research.html>]. Accessed August 2020.

[6] Health Systems Research Institute (HSRI). "A One Health Approach to Public Health: Thai Experience".

[<https://www.hsri.or.th/sites/default/files/attachment/One%20Health%20approach%20to%20public%20health.pdf>].

Accessed August 2020.

[7] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[8] The Nation TV News. July 2015. "Department of National Park, Wildlife, and Plant Conservation Monitors Five Diseases in Wild Animals." [<http://www.nationtv.tv/main/content/378462480/>]. Accessed October 2020.

[9] Thairath News. July 2014. "Ministry of Public Health Collaborate with Partners to Establish One Health Centre"

[<https://www.thairath.co.th/content/436997>]. Accessed October 2020.

1.2.3 International reporting of animal disease outbreaks

1.2.3a

Has the country submitted a report to OIE on the incidence of human cases of zoonotic disease for the last calendar year?

Yes = 1 , No = 0

Current Year Score: 1

2019

OIE WAHIS database

1.2.4 Animal health workforce

1.2.4a

Number of veterinarians per 100,000 people

Input number

Current Year Score: 13.34

2019

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: 1.87

2019

OIE WAHIS database

1.2.5 Private sector and zoonotic

1.2.5a

Does the national plan on zoonotic disease or other legislation, regulations, or plans include mechanisms for working with the private sector in controlling or responding to zoonoses?

Yes = 1 , No = 0

Current Year Score: 1

The national plan on zoonotic disease includes mechanisms for working with the private sector in controlling or responding to zoonoses. Strategy 5 of Thailand's National Strategic Plan for Emerging Infectious Diseases 2017-2021 includes mechanisms to strengthen the involvement of civil society and private sector to prevent and control emerging infectious diseases, which includes zoonoses. The strategy focuses on building capacity for private sector, specifically slaughterhouses, private hospitals, livestock businesses, to prevent and control emerging infectious diseases through training; knowledge sharing platforms for databases and best practices; and assistance to comply with Wild Animal Reservation and Protection Act B.E.2535, Animal Epidemics Act B.E.2558, and Communicable Disease Act B.E.2558. [1] The Joint External Evaluation for Thailand, completed in June 2017 highlights the need for more effective information sharing mechanisms between sectors for effective disease response. [2]

[1] Bureau of Emerging Infectious Diseases. 2017. "National Strategic Plan for Emerging Infectious Diseases 2017-2021". Bureau of Emerging Infectious Diseases, Department of Disease Control, Ministry of Public Health.

[<https://www.dropbox.com/s/vxb924zoi5t93gr/National%20Strategic%20Plan%20for%20Emerging%20Infectious%20Disease%202017-2021.pdf?dl=0>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

1.3 BIOSECURITY

1.3.1 Whole-of- government biosecurity systems

1.3.1a

Does the country have in place a record, updated within the past five years, of the facilities in which especially dangerous pathogens and toxins are stored or processed, including details on inventories and inventory management systems of those facilities?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has in place a record updated every three months of laboratories with especially dangerous pathogens and toxins. According to the Joint External Evaluation for Thailand, completed in June 2017, "laboratories are required to report to the Department of Medical Sciences at the Ministry of Public Health on biosafety level two and three pathogens and toxins every three months. The National Institute of Health has an up-to-date inventory of pathogens in laboratory repositories, which is monitored by the Department of Medical Sciences." [1] Moreover, the National Institute of Animal Health has an electronic logbook with an inventory of animal health pathogens in laboratory repositories. As part of their mission to monitor, inspect, and control the production, possession, importation, and exportation of pathogens and toxins from animals within the scope of the Pathogens and Animal Toxins Act B.E.2558 (AD 2015), the Bureau of Laboratory Quality Standards, Department of Medical Sciences keep records of laboratories in Thailand in which dangerous pathogens and toxins are stored. [2] From the

VERTIC database, Pathogens and Animal Toxins Act (B.E. 2525 (1982) amended by B.E. 2544 (2001); Hazardous Substance Act (B.E. 2535 of 1992); and Biosafety Guidelines all mention record keeping and permit requirements for dangerous pathogens and toxins [3, 4, 5]. Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [6] Further research on the Ministry of Public Health's website, the Ministry of Defence's website, and the Ministry of Agriculture and Cooperatives' website yielded no further evidence. [7, 8, 9]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Bureau of Laboratory Quality Standards. 2020. "Annual Report of BLQS 2011-2017". Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health. [<http://blqs.dmsc.moph.go.th/en/page-view/101>]. Accessed August 2020.

[3] The Pathogens and Animal Toxins Act B.E.2558 (AD 2015).

[https://www.vertic.org/media/National%20Legislation/Thailand/TH_Pathogen_and_Animal_Toxins_Act_amended.pdf]. Accessed October 2020.

[4] Hazardous Substance Act (B.E. 2535 of 1992).

[https://www.vertic.org/media/National%20Legislation/Thailand/TH_Hazardous_Substance_Act.pdf]. Accessed October 2020.

[5] Thailand Biosafety Guidelines.

[https://www.vertic.org/media/National%20Legislation/Thailand/TH_Biosafety_Guidelines.pdf]. Accessed October 2020.

[6] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

[7] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[8] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

[9] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

1.3.1b

Does the country have in place legislation and/or regulations related to biosecurity which address requirements such as physical containment, operation practices, failure reporting systems, and/or cybersecurity of facilities in which especially dangerous pathogens and toxins are stored or processed?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has in place legislation related to biosecurity. According to the Joint External Evaluation for Thailand, completed in June 2017, Thailand has developed several acts relating to biosecurity, including Pathogen and Animal Toxin Act (last updated in 2015), the Public Health Act (2015) and the Occupational Safety, Health and Environment Act (2011). [1] Facilities are subject to internal audit for biosecurity, and biosecurity measures are widely applied. Through Section 6 of Pathogens and Animal Toxin Act B.E.2558, Ministry Notifications prescribed place of production or possession of pathogens and animal toxins, tools, equipment, accompanying documents, labels, containers or packages for each group of pathogens and animal toxins and quantities or amount of pathogens and animal toxins which can be possessed, as well as security systems and quality systems of production, import, export, sale, transit or possession of pathogens and animal toxins. [2] Occupational Safety, Health and Environment Act addresses protection of employees from harmful and unhygienic working conditions but does not specifically mention biosecurity. [3] Additionally, from the VERTIC database, the Arms Control Act (B.E. 2530 1987) also covers biological substances. [4] The legislation and/or regulations mentioned above address requirements such as physical containment, operation practices, failure reporting systems. However, cybersecurity is not explicitly mentioned. [2,

3, 4] Finally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Pathogens and Animal Toxins Act B.E.2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[3] Occupational Safety, Health and Environment Act B.E. 2554 (2011). [https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---ilo_aids/documents/legaldocument/wcms_174573.pdf]. Accessed August 2020.

[4] The Arms Control Act (B.E. 2530 1987).

[https://www.vertic.org/media/National%20Legislation/Thailand/TH_Arms_Control_Act.pdf]. Accessed October 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.3.1c

Is there an established agency (or agencies) responsible for the enforcement of biosecurity legislation and regulations?

Yes = 1 , No = 0

Current Year Score: 1

There is an established agency responsible for the enforcement of biosecurity legislation and regulations. According to the Joint External Evaluation for Thailand, completed in June 2017, Thailand has developed several acts relating to biosecurity, including Pathogen and Animal Toxin Act (last updated in 2015), the Public Health Act (2015) and the Occupational Safety, Health and Environment Act (2011). [1] The Department of Medical Sciences, Ministry of Public Health is responsible for the enforcement of biosecurity legislation. The Pathogens and Animal Toxins Act B.E.2558 (2015) includes provisions on biosecurity. Through Section 6 of Pathogens and Animal Toxin Act B.E.2558, Ministry Notifications prescribed place of production or possession of pathogens and animal toxins, tools, equipment, accompanying documents, labels, containers or packages for each group of pathogens and animal toxins and quantities or amount of pathogens and animal toxins which can be possessed, as well as security systems and quality systems of production, import, export, sale, transit or possession of pathogens and animal toxins. The Act designated the Minister of Public Health to preside over the charge and control over the execution of this Act which include the management of competent officials, and issuance of Ministerial Regulations or Notifications and prescription of other acts for the execution of this Act to ensure safety protection and prevention of harm to the public. [2, 3] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [4] There is no further relevant evidence/legislation from the VERTIC database. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Pathogens and Animal Toxins Act B.E.2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[3] The National Center for Genetic Engineering and Biotechnology (BIOTEC). N.d. "Biosecurity". [http://www.biotech.or.th/biosafety/images/document/pb-01_biosecurity_rev%203%20_2_.pdf]. Accessed August 2020.

[4] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

[5] The Verification Research, Training and Information Centre. "BWC Legislation Database".

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October 2020.

1.3.1d

Is there public evidence that shows that the country has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities?

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence available that the country has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities. The Joint External Evaluation for Thailand, completed in June 2017, only refers to the existing system of inventory of Thailand's pathogen repository, but there is no reference to Thailand's efforts to consolidate its inventories of especially dangerous pathogens. [1] Research involving moderately dangerous pathogens and toxins is only allowed in research institutes under the control of Institutional Biosafety Committee under the Pathogens and Animal Toxins Act 2015, with the condition that a license is required. [2] Despite no effort for controlling the numbers of inventories, there are still efforts to record and control research using dangerous pathogens and toxins, as certificate of notification is needed for Risk Group 2 (Low risk pathogens and toxins - LRPT) and License is needed for Risk Group 3 (Moderate risk pathogens and toxins - MRPT) [3, 4]. The most up-to-date Notification of the Ministry of Public Health in February 2020 mentions additional safety measures for SARS-CoV-2 (Risk Group 3) but does not mention anything in regard to consolidating the inventories of especially dangerous pathogens and toxins. [5] In 2018, there has been an effort by the National Research Council of Thailand together with Department of Foreign Trade to collaborate under Section 3 of the Draft Trade Control of Weapons of Mass Destruction Act (TCWMD) to ensure that research and trade of dual use items will not lead to the development of WMD, but there is no mention of dangerous pathogens inventory consolidation. [6] From the websites of Ministry of Defence, Ministry of Public Health, Ministry of Agriculture and Cooperatives, and the National Institute of Health of Thailand, there is no publicly available evidence that shows that Thailand has taken actions to consolidate its inventory of dangerous pathogens into a minimum number of facilities. [7, 8, 9, 10] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [11] Finally, there is no further relevant evidence/legislation from the VERTIC database. [12]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Pathogens and Animal Toxins Act B.E.2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[3] Notification of the Ministry of Public Health Book 134 Special Section 74 Ngor - Pathogen Controls. 2017.

[http://www.tm.mahidol.ac.th/research/Biosafety/Act18_Pathogens%20Controls.pdf]. Accessed August 2020.

[4] Notification of the Ministry of Public Health Book 134 Special Section 74 Ngor - Animal Toxins Control. 2017.

[http://www.tm.mahidol.ac.th/research/Biosafety/Act19_Animal%20Toxins%20Controls.pdf]. Accessed August 2020.

[5] Notification of the Ministry of Public Health Book 137 Special Section 48 Ngor - Pathogen Controls. 2020.

[http://www.ratchakitcha.soc.go.th/DATA/PDF/2563/E/048/T_0002.PDF]. Accessed August 2020.

[6] Department of Foreign Trade, Ministry of Commerce Website. 2018. "Department of Foreign Trade collaborate with National Research Council of Thailand to control research with potential for the development of Weapons of Mass Destruction". [<http://www.dft.go.th/th-th/NewsList/News-DFT/Description-News-DFT/ArticleId/11560/-WMD>]. Accessed August 2020.

- [7] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.
- [8] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.
- [9] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/index.html>]. Accessed August 2020.
- [10] National Institute of Health of Thailand (NIH) Website. [<http://nih.dmsc.moph.go.th/indexeng.html>]. Accessed August 2020.
- [11] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.
- [12] The Verification Research, Training and Information Centre. "BWC Legislation Database". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October 2020.

1.3.1e

Is there public evidence of in-country capacity to conduct Polymerase Chain Reaction (PCR)-based diagnostic testing for anthrax and/or Ebola, which would preclude culturing a live pathogen?

Yes = 1, No = 0

Current Year Score: 1

Thailand can conduct Polymerase Chain Reaction-based diagnostic testing for Ebola in both humans and animals, and anthrax in animals. The Faculty of Veterinary Science at Mahidol University has the capacity to conduct Polymerase Chain Reaction (PCR)-based diagnostic for Bacillus anthracis (Anthrax). [1] In the case of anthrax in humans, diagnostic test employs culturing live pathogen and MALDI-TOF Mass Spectrometry technique. [2] For Ebola cases, the Department of Medical Sciences will send samples to the Faculty of Medicine, Chulalongkorn University for testing using Polymerase Chain Reaction (PCR) diagnostic. [3] In the suspected case of Ebola in animals, the National Institute of Animal Health conducts Real Time Polymerase Chain Reaction or ELISA diagnostic for testing. [4]

- [1] Faculty of Veterinary Science, Mahidol University Website. "Service Rates for Laboratory Diagnosis". [<https://vs.mahidol.ac.th/th/assets/files/CVD/Rates/%E0%B8%AB%E0%B8%A5%E0%B8%B1%E0%B8%81%E0%B9%80%E0%B8%81%E0%B8%93%E0%B8%91%E0%B9%8C%E0%B9%81%E0%B8%A5%E0%B8%B0%E0%B8%AD%E0%B8%B1%E0%B8%95%E0%B8%A3%E0%B8%B2%E0%B8%84%E0%B9%88%E0%B8%B2%E0%B8%9A%E0%B8%A3%E0%B8%B4%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A7%E0%B8%B4%E0%B8%99%E0%B8%B4%E0%B8%88%E0%B8%89%E0%B8%B1%E0%B8%A2%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%AB%E0%B9%89%E0%B8%AD%E0%B8%87%E0%B8%9B%E0%B8%8F%E0%B8%B4%E0%B8%9A%E0%B8%B1%E0%B8%95%E0%B8%B4%E0%B8%81%E0%B8%B2%E0%B8%A3%20%E0%B8%9E.%E0%B8%A8.2563%20%E0%B8%A5%E0%B8%87%E0%B8%A7%E0%B8%B1%E0%B8%99%E0%B8%97%E0%B8%B5%E0%B9%88%2028%20%E0%B8%81.%E0%B8%9E.%202563.pdf>]. Accessed August 2020.
- [2] Thai Health Promotion Foundation. 2017. "Thailand is ready to conduct diagnostic tests for Anthrax". [<http://www.thaihealth.or.th/Content/39789-%E0%B9%84%E0%B8%97%E0%B8%A2%E0%B8%9E%E0%B8%A3%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B9%80%E0%B8%8A%E0%B8%B7%E0%B9%89%E0%B8%AD%20%E0%B9%81%E0%B8%AD%E0%B8%99%E0%B9%81%E0%B8%97%E0%B8%A3%E0%B8%81%E0%B8%8B%E0%B9%8C.html>]. Accessed August 2020.
- [3] Bureau of Epidemiology. 2014. "Guidelines For Surveillance, Prevention, And Control of Ebola Disease in Thailand 2014". [http://203.157.41.165/beid_2014/files/news/Guidline_ebola_11May14.pdf]. Accessed August 2020.
- [4] National Institute of Animal Health, Department of Livestock. N.d. "Surveillance of Ebola Virus in Animals". [http://nih.dmsc.moph.go.th/ebola/file/29_9_57_nontapon.pdf]. Accessed August 2020.

1.3.2 Biosecurity training and practices

1.3.2a

Does the country require biosecurity training, using a standardized, required approach, such as through a common curriculum or a train-the-trainer program, for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential?

Yes = 1, No = 0

Current Year Score: 1

Thailand requires biosecurity training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential. The Pathogen and Animal Toxins Act B.E.2558 (2015) requires personnel working with Biosafety Level 2 to 4 to pass biosecurity and biosafety trainings accredited by the Department of Medical Sciences. [1] The Joint External Evaluation for Thailand, completed in June 2017, states that the Biorisk Management Toolkit is developed by the Department of Medical Sciences to train laboratory personnel in hospitals and academic institutes throughout the country; "In 2017, biorisk management training has reached 96.5% of the Ministry of Public Health's laboratory staff (compared to 45% in 2015)". [2] The toolkit incorporates the following topic: concept and importance of biosafety, biosecurity, and biorisk management; and information on biorisk assessment form and biosafety cabinet. One of the Training of the Trainers took place in January 2015. [3] The Biosafety Guidelines on the VERTIC database also mentions required require biosecurity training. [4] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] Government gazette, Notification of the Ministry of Public Health, Book 135 Special Section 43 Ngor. 2018. "Personnels Serving Under the Pathogens and Animal Toxins Act B.E.2558 (2015)".

[<http://www.ratchakittha.soc.go.th/DATA/PDF/2561/E/043/10.PDF>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] National Institute of Health of Thailand, Department of Medical Sciences. 2017. "Biorisk Management: Lab Safety".

[http://nih.dmsc.moph.go.th/data/data/60/20_2_60/12.pdf]. Accessed August 2020.

[4] Biosafety Guidelines [https://www.vertic.org/media/National%20Legislation/Thailand/TH_Biosafety_Guidelines.pdf]. Accessed October 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.3.3 Personnel vetting: regulating access to sensitive locations

1.3.3a

Do regulations or licensing conditions specify that security and other personnel with access to especially dangerous pathogens, toxins, or biological materials with pandemic potential are subject to the following checks: drug testing, background checks, and psychological or mental fitness checks?

Personnel are subject to all three of these checks = 3, Personnel are subject to two of these checks = 2, Personnel are subject to one of these checks = 1, Personnel are not subject to any of these checks = 0

Current Year Score: 2

There is publicly available evidence that personnel with access to medium to high risk pathogens and toxins are subject to background checks and mental fitness checks. The National Vaccine Institute, Department of Medical Sciences, Lab for

People Public and Policy developed the guidelines for bio-medical resources storage, tracking, and access. The guideline states that personnel with access to risk group 2 to 4 pathogen and toxins (especially dangerous pathogens and toxins with pandemic potential included) storage facilities are subject to passing the following checks: educational background checks, criminal records check, bank account checks (counted as background checks) and personality and mental fitness checks (counted as psychological checks). In addition, personnel must pass the competency test at least once a year. Nonetheless, drug testing is not mentioned. [1] There is no further relevant evidence/legislation from the VERTIC database. [2] Further research on the Ministry of Public Health's website, the Ministry of Defence's website, and the Ministry of Agriculture and Cooperatives' website yielded no further evidence. [3, 4, 5]

[1] National Institute of Health of Thailand. 2018. "Guidelines for Biomedical Resources storage, tracking, and access".

[http://nih.dmsc.moph.go.th/login/filedata/bio_medical.pdf]. Accessed August 2020.

[2] The Verification Research, Training and Information Centre. "BWC Legislation Database".

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October 2020.

[3] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[4] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

[5] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

1.3.4 Transportation security

1.3.4a

Does the country have publicly available information on national regulations on the safe and secure transport of infectious substances (specifically including Categories A and B)?

Yes = 1 , No = 0

Current Year Score: 1

There is a national guideline in Thailand on the safe and secure transport of infectious substances. Chapter 9 of the Biosafety Guidelines for Modern Biotechnology - a guideline published by The National Centre for Genetic Engineering and Biotechnology (BIOTEC) - outlines safe and secure transportation of infectious substances. According to the Guideline, the transportation procedure of all microorganisms and genetically modified organisms must adhere to the Guidance on Regulations for the Transport of Infectious Substances 2013-2014 by the World's Health Organization. Category A substances must be transported via air transport only, whereby human pathogens must be transported in accordance with the UN2814 standard (infectious substance affecting humans). Animal pathogens must be transported in accordance with the UN2900 standard (Infectious Substances Affecting Humans and Infectious substances included in Category A in any form unless otherwise indicated). Category B substances must be packaged and labelled in accordance with UN3373 (Biological Substance, Category B). [1] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [2] Finally, there is no further relevant evidence/legislation from the VERTIC database. [3]

[1] The National Center for Genetic Engineering and Biotechnology (BIOTEC). N.d. "Biosecurity".

[http://www.biotec.or.th/biosafety/images/document/pb-01_biosecurity_rev%203%20_2_.pdf]. Accessed August 2020.

[2] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

[3] The Verification Research, Training and Information Centre. "BWC Legislation Database".

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October

2020.

1.3.5 Cross-border transfer and end-user screening

1.3.5a

Is there legislation and/or regulations in place to oversee the cross-border transfer and end-user screening of especially dangerous pathogens, toxins, and pathogens with pandemic potential?

Yes = 1, No = 0

Current Year Score: 0

There is a national legislation in place to oversee cross-border transfer of especially dangerous pathogens, however there is no evidence of regulation covering end-user screening for dangerous pathogens and toxins. Cross borders legislation over control of import, export, sales, transit and possession of pathogens and animal toxins are specified in the Notification of the Ministry of Public Health Book 134 Special Section 245 Ngor, 2017, issued under the Pathogens and Animal Toxins Act B.E. 2525 (1982). [1, 2] Details of the dual use goods, which requires permission to import, are listed in the notification listed under the Export and Import of Goods Act B.E. 2522 (1979). [3, 4]. Even though some exporters of dual use items voluntarily operate Internal Compliance Programme (a programme which includes trade screening of end-user for potential use of products as Weapons of Mass Destruction), there is currently no legislation requiring end-user screening of especially dangerous pathogens, toxins and pathogens with pandemic potential. [5] There is no evidence of such a regulation in the Joint External Evaluation for Thailand, completed in June 2017, or in the VERTIC database. [6, 7] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [8] Further research from the websites of Ministry of Public Health, Ministry of Defence, Ministry of Commerce, and Ministry of Agriculture and Cooperatives yielded no evidence. [9, 10, 11, 12]

[1] Notification of the Ministry of Public Health Book 134 Special Section 245 Ngor. 2017. "The cessation of production, importation, exportation, sales, transit and possession of pathogens and animal toxins".

[<http://www.ratchakitcha.soc.go.th/DATA/PDF/2560/E/245/2.PDF>]. Accessed August 2020.

[2] Pathogens and Animal Toxins Act, B.E. 2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[3] Notification of the Ministry of Commerce Book 134 Special Section 315 Ngor. 2017. "Requirement for exporters of dual use items to seek export permission and prescription of items that must comply with the export measures (No. 2) 2017".

[<http://www.dft.go.th/th-th/Detail-Law/ArticleId/10055/10055>]. Accessed August 2020.

[4] Export and Import of Goods Act B.E. 2522 (1979). [<http://www.dft.go.th/th-th/DFT-Service/Data-Service-Information/ProductMeasure-Import-Export/Detail-ProductMeasure-Import-Export/tagid/28>]. Accessed August 2020.

[5] Department of International Trade. 2018. "Department of International Trade Prepares ICP System For SCG As Pioneer For Thai Exporters". [<https://gnews.apps.go.th/news?news=19003>]. Accessed August 2020.

[6] Verification Research, Training and Information Centre (VERTIC) Website. "BWC Legislation Database".

[<http://www.vertic.org/pages/homepage/programmes/national-implementation-measures/biological-weapons-and-materials/bwc-legislation-database/t.php>]. Accessed August 2020.

[7] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[8] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

[9] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[10] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

[11] Ministry of Commerce Website. [<https://www.moc.go.th/index.php/moc-english.html>]. Accessed. October 2020

[12] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

1.4 BIOSAFETY

1.4.1 Whole-of-government biosafety systems

1.4.1a

Does the country have in place national biosafety legislation and/or regulations?

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that Thailand has in place national biosafety legislation and/or regulations. According to the Joint External Evaluation for Thailand, completed in June 2017, Thailand has developed several acts relating to biosafety, including the Pathogens and Animal Toxins Act (last updated in 2015), the Public Health Act (2015) and the Occupational Safety, Health and Environment Act (2011). [1] The Safety, Occupational Hygiene and Workplace Environment Act B.E. 2554 [2011] mentions several occupational safety guidelines but there is no mention of any specific safety guidelines for facilities and persons handling biological agents. [2]

Furthermore, the VERTIC database for Thailand states that Biosafety Guidelines in Genetic Engineering and Biotechnology for Laboratory Work and for Field Work and Planned Release were developed by the National Biosafety Committee under the National Centre for Genetic Engineering and Biotechnology (BIOTEC) of the National Science and Technology Development Agency (NSTDA). [3]

There are also biosafety guidelines published by the Technical Biosafety Committee (TBC) under Ministry of Science and Technology for the safety of research and development, field testing, and commercialisation. The guidelines covers, for instance, necessary requirements in terms of biosafety under laboratory conditions as well as small-and large-scale field trials. [4]

Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] International Labor Organisation (ILO). "NATLEX Database of national labour, social security and related human rights legislation: Thailand 441". [https://ilo.org/dyn/natlex/natlex4.detail?p_lang=en&p_isn=89337&p_country=THA&p_count=441] Accessed June 15, 2021.

[3] Verification Research, Training and Information Centre (VERTIC). n.d. "Biosafety Guidelines in Genetic Engineering and Biotechnology for Field Work and Planned Release". [http://www.vertic.org/media/National%20Legislation/Thailand/TH_Biosafety_Guidelines.pdf]. Accessed August 2020.

[4] The National Center for Genetic Engineering and Biotechnology (BIOTEC) Website. [<http://www.biotec.or.th/biosafety/index.php/guideline>]. Accessed August 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.4.1b

Is there an established agency responsible for the enforcement of biosafety legislation and regulations?

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that Thailand has established an agency responsible for enforcement of biosafety regulations as there is insufficient evidence of the biosafety regulations. Nonetheless, there is an established agency for the enforcement of biosafety legislations. Thailand's Biosafety Guidelines in Genetic Engineering and Biotechnology for Field Work and Planned Release state that the National Biosafety Committee (NBC) is responsible for implementing the biosafety guidelines with the National Centre for Genetic Engineering and Biotechnology (BIOTEC) as its Secretariat. NBC members are appointed by the Minister for Science, Technology and the Environment. An Institutional Biosafety Committee (IBC) has been established at each research agency to take care of biosafety measures and to coordinate work with NBC. The NBC serves to command and harmonize the direction of genetic manipulation work with the protocols. One of its authorities and functions include "Facilitate all levels of supervision of genetic manipulation work by establishing, and assisting other regulatory bodies in establishing pertinent codes, disciplines and guidelines for the appraisal of biohazards and the management of biosafeguards.", for instance. [1] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [2]

[1] Verification Research, Training and Information Centre (VERTIC). n.d. "Biosafety Guidelines in Genetic Engineering and Biotechnology for Field Work and Planned Release".

[http://www.vertic.org/media/National%20Legislation/Thailand/TH_Biosafety_Guidelines.pdf]. Accessed August 2020.

[2] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.4.2 Biosafety training and practices

1.4.2a

Does the country require biosafety training, using a standardized, required approach, such as through a common curriculum or a train-the-trainer program, for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential?

Yes = 1 , No = 0

Current Year Score: 1

There is publicly available evidence that biosafety training is required for personnel working with especially dangerous pathogens. The Pathogen and Animal Toxins Act B.E.2558 (2015) requires personnel working with Biosafety Level 2 to 4 to pass biosafety and biosecurity trainings accredited by the Department of Medical Sciences. [1] The Joint External Evaluation for Thailand, completed in June 2017, states that the Department of Medical Sciences has developed a Biorisk Management Toolkit for training laboratory personnel in hospitals and academic institutes throughout the country. [2] The toolkit incorporates the following topic: concept and importance of biosafety, biosecurity, and biorisk management; and information on biorisk assessment form and biosafety cabinet. Training of the Trainers took place in January 2015. [3] The Biosafety Guidelines on the VERTIC database also mentions required biosafety training. [4] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] Government gazette, Notification of the Ministry of Public Health, Book 135 Special Section 43 Ngor. 2018. "Personnels Serving Under the Pathogens and Animal Toxins Act B.E.2558 (2015)".

[<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/10.PDF>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] National Institute of Health of Thailand, Department of Medical Sciences. 2017. "Biorisk Management: Lab Safety".

[http://nih.dm.sc.moph.go.th/data/data/60/20_2_60/12.pdf]. Accessed August 2020.

[4] Biosafety Guidelines [https://www.vertic.org/media/National%20Legislation/Thailand/TH_Biosafety_Guidelines.pdf]. Accessed October 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.5 DUAL-USE RESEARCH AND CULTURE OF RESPONSIBLE SCIENCE

1.5.1 Oversight of research with especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research

1.5.1a

Is there publicly available evidence that the country has conducted an assessment to determine whether ongoing research is occurring on especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research?

Yes = 1, No = 0

Current Year Score: 0

There is no publicly available evidence that Thailand has conducted an assessment to determine whether ongoing research is occurring on especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research. According to the Joint External Evaluation for Thailand, completed in June 2017, "laboratories are required to report to the Department of Medical Sciences at the Ministry of Public Health on biosafety level two and three pathogens and toxins every three months. Licenses for handling certain biosafety level pathogens and toxins must be renewed annually." [1] The Institutional Biosafety Committee (IBC) under the Pathogen and Animal Toxins Act B.E.2558 (2015) continually assess the research of pathogens and animal toxins of all risk levels. [2, 3] The IBC assess and examine research projects to determine if there are any safety issues prior to and during execution. It also ensures that the head of each research project adheres to the rules of the IBC by periodically visiting the laboratory to check the safety of the project. Additionally, through the Act, the Public Health Ministry and the Ministry of Science and Technology partake in legislating and overseeing assessment and control of each research's biosafety level. [2] Research on extremely dangerous pathogens (BSL 4) are, however, permitted only for disease control, prevention and treatment under the Notification of the Ministry of Public Health issued in B.E. 2561 (2018). [4] Such approval would be decided by the Department of Medical Sciences and the Pathogens and Animal Toxins Committee, in which in some cases the final decision would be dictated by the Minister of Public Health. [2] All activities relating to the use of especially dangerous pathogens must be reported in the annual report submitted to the Department of Medical Sciences, as required by the Notification of Ministry of Public Health, Book 135, 43 Ngor on 'Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins' issued in 2018. [5] According to the Statement of the Delegation of the Kingdom of Thailand to the United Nations Office in Geneva at the Meeting of States Parties to the Biological Weapons Convention in 2017, the country has established a mechanism for cross-agency coordination and information-sharing, namely the Working Group on Biological Weapons under the Sub-Committee on WMD Issues, headed by the Office of National Security Council. However, an official website of the working group cannot be found online [6] There is no evidence that the country has conducted an assessment to determine whether ongoing research is occurring on especially dangerous pathogens, toxins, pathogens with pandemic

potential and/or other dual-use research. Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992, 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [7] There is no further relevant evidence/legislation from the VERTIC database. [8] Further research from the websites of Ministry of Public Health, Ministry of Defence, and Ministry of Agriculture and Cooperatives yielded no evidence. [9, 10, 11]

- [1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.
- [2] Pathogens and Animal Toxins Act, B.E. 2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.
- [3] The National Center for Genetic Engineering and Biotechnology (BIOTEC) Website. "The roles of Institutional Biosafety Committee". [<http://www.biotec.or.th/ibc/index.php/ibc-10>]. Accessed August 2020.
- [4] Notification of the Ministry of Public Health Book 135 Special Section 43 Ngor. 2018. "Research for disease control, prevention and treatment". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/15.PDF>]. Accessed August 2020.
- [5] Notification of Ministry of Public Health, Book 135, 43 Ngor. 2018. "Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/18.PDF>]. Accessed August 2020.
- [6] Permanent Mission of Thailand to the United Nations and Other International Organizations in Geneva. 4 Dec 2017. "News: Statement of the Delegation of the Kingdom of Thailand by His Excellency Mr. Sek Wannamethee, Ambassador and Permanent Representative of Thailand to the United Nations Office in Geneva at the Meeting of States Parties to the Biological Weapons Convention 2017, Geneva, 4-8 December 2017". [<http://www.thaiembassy.org/permanentmission.geneva/en/news/4749/84371-Statement-of-the-Delegation-of-the-Kingdom-of-Thai.html>]. Accessed August 2020.
- [7] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.
- [8] The Verification Research, Training and Information Centre. "BWC Legislation Database". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October 2020.
- [9] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.
- [10] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.
- [11] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

1.5.1b

Is there legislation and/or regulation requiring oversight of research with especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research?

Yes = 1, No = 0

Current Year Score: 1

There is a legislation requiring oversight of research with especially dangerous pathogens and toxins. Research with Risk Group 4 (High risk pathogens and toxins with pandemic potential) are permitted solely for the purpose of disease control, prevention and treatment under the Notification of the Ministry of Health issued in B.E. 2561 (2018). [1] All activities relating to the use of especially dangerous pathogens must be reported in the annual report submitted to the Department of Medical Sciences, as required by the Notification of Ministry of Public Health, Book 135, 43 Ngor on 'Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins' issued in 2018. [2] Under the Pathogen and Animal Toxins Act B.E.2558 (2015), The Institutional Biosafety Committee (IBC) must continually assess the research of pathogens and animal toxins of all risk levels. The IBC assess and examine research projects

to determine if there are any safety issues prior to and during execution. It also ensures that the head of each research project adheres to the rules of the IBC by periodically visiting the laboratory to check the safety of the project. [3, 4] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] Notification of the Ministry of Public Health Book 135, 43 Ngor. 2018. "Research for disease control, prevention and treatment". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/15.PDF>]. Accessed August 2020.

[2] Notification of Ministry of Public Health, Book 135, 43 Ngor. 2018. "Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/18.PDF>]. Accessed August 2020.

[3] Pathogens and Animal Toxins Act, B.E. 2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[4] The National Center for Genetic Engineering and Biotechnology (BIOTEC) Website. "The roles of Institutional Biosafety Committee". [<http://www.biotec.or.th/ibc/index.php/ibc-10>]. Accessed August 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.5.1c

Is there an agency responsible for oversight of research with especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research?

Yes = 1 , No = 0

Current Year Score: 1

The Department of Medical Sciences, Ministry of Public Health is responsible for oversight of research of especially dangerous pathogens with pandemic potential. All activities, including research related to the use of especially dangerous pathogens must be reported in the annual report submitted to the Department of Medical Sciences, as required by the Notification of Ministry of Public Health, Book 135, 43 Ngor on 'Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins' issued in 2018. [1, 2] The Institutional Biosafety Committee (IBC) under the Pathogen and Animal Toxins Act B.E.2558 (2015) continually assess the research of pathogens and animal toxins of all risk levels. The IBC assess and examine research projects to determine if there are any safety issues prior to and during execution. It also ensures that the head of each research project adheres to the rules of the IBC by periodically visiting the laboratory to check the safety of the project. [3, 4] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [5]

[1] Notification of the Ministry of Public Health Book 135, 43 Ngor. 2018. "Research for disease control, prevention and treatment". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/15.PDF>]. Accessed August 2020.

[2] Notification of Ministry of Public Health, Book 135, 43 Ngor. 2018. "Preparation and submission of annual report on the production, importation, exportation, transition, or possession of pathogens and animal toxins". [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2561/E/043/18.PDF>]. Accessed August 2020.

[3] Pathogens and Animal Toxins Act, B.E. 2558 (2015). [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[4] The National Center for Genetic Engineering and Biotechnology (BIOTEC) Website. "The roles of Institutional Biosafety Committee". [<http://www.biotec.or.th/ibc/index.php/ibc-10>]. Accessed August 2020.

[5] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

1.5.2 Screening guidance for providers of genetic material

1.5.2a

Is there legislation and/or regulation requiring the screening of synthesized DNA (deoxyribonucleic acid) against lists of known pathogens and toxins before it is sold?

Yes = 1, No = 0

Current Year Score: 0

There is no publicly available evidence of a legislation, regulation, policy, or guidance requiring the screening of synthesised DNA before it is sold. There is no public evidence of any relevant legislation in the databases of the Ministry of Transport, Ministry of Public Health, and Ministry of Agriculture and Cooperatives (and its subsets, specifically, the Department of Agriculture, and the Department of Livestock Development) . [1, 2, 3, 4, 5]. There was no information on the topic from the Ministry of Defence's website or the Ministry's subset units such as the Office of the Permanent Secretary for Defence, nor the Defence Technology Institute [6, 7, 8]. Section 22 of the Pathogens and Animal Toxins Act B.E.2558 (2015) requires a license for the sale of especially dangerous pathogens. "Any person who intends to produce, import, export, sell, transit or possess Group 3 Pathogens under section 18 (3) or Group 2 Animal Toxins under section 19 (2) shall file an application for a license with the Director-General, and such person may produce, import, export, sell, transit or possess such pathogens or animal toxins when the Director-General has already issued the license". [8] Further clarifications of the Pathogens and Animal Toxins Acts 2015 in the Department of Medical Sciences' website only mentions that in the case of production of synthetic DNA, RNA, or vector with disease inducing properties, the producer must acquire a certificate of notification for pathogens risk group 2 or permit for pathogens risk group 3. [9, 10] In 2018, the Ministry of Commerce issued a notification requiring dual use items to acquire an export permit under the Export and Import of Goods Act B.E. 2522 (1979) but there is no publicly available evidence of any screening requirement. [11, 12] Additionally, although Thailand has submitted Confidence Building Measures reports for most years (1990, 1992 2008, 2010, 2011, 2012, 2013, 2014, 2016, 2017, 2019, 2020), access to the reports are restricted to the public, and it is unknown if the reports contain relevant information on this matter. [13] Finally, there is no further relevant evidence/legislation from the VERTIC database. [14]

[1] Ministry of Transport Website. [<http://www.mot.go.th/index.html>]. Accessed August 2020.

[2] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[3] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed August 2020.

[4] Department of Agriculture. [<http://www.doa.go.th/th/>]. Accessed August 2020.

[5] Department of Livestock Development. "Livestock Laws". [<http://www.dld.go.th/th/index.php/th/legal-dld-menu>]. Accessed August 2020.

[6] Ministry of Defence Website. [<https://www.mod.go.th/>]. Accessed October 2020.

[7] Office of the Permanent Secretary for Defence Website.

[<http://www.oic.go.th/Ginfo/moreinfo.asp?g=4224232%26i&i=222%22322%22422&p=%E0%B8%81%E0%B8%A3%E0%B8%0%E0%B8%97%E0%B8%A3%E0%B8%A7%E0%B8%87%E0%B8%95%E0%B9%88%E0%B8%B2%E0%B8%87%E0%B9%86&o=%E0%B8%81%E0%B8%A3%E0%B8%B0%E0%B8%97%E0%B8%A3%E0%B8%A7%E0%B8%87%E0%B8%81%E0%B8%A5%E0%B8%B2%E0%B9%82%E0%B8%AB%E0%B8%A1>]. Accessed August 2020.

[8] Defence Technology Institute Website. [<http://www.dti.or.th/index.php>]. Accessed August 2020.

[9] Pathogens and Animal Toxins Act, B.E. 2558 (2015) [<http://blqs.dmsc.moph.go.th/assets/Bpat/ACTforBPAT.pdf>]. Accessed August 2020.

[10] Department of Medical Sciences, Ministry of Public Health Website. "Questions & Answer for the Pathogens and Animal Toxins Act B.E.2558 (2015)". [<http://blqs.dmsc.moph.go.th/assets/Bpat/ReCertificatePAT03.pdf>]. Accessed August 2020.

[11] Notification of the Ministry of Commerce Book 134 Special Section 315 Ngor. 2017. "Products and items with potential dual-use that require permission and products that must comply with the regulations for exporting outside the Kingdom". [<http://www.dft.go.th/th-th/Detail-Law/ArticleId/10055/10055>]. Accessed August 2020.

[12] Export and Import of Goods Act B.E. 2522 (1979). [<http://www.dft.go.th/th-th/DFT-Service/Data-Service-Information/ProductMeasure-Import-Export/Detail-ProductMeasure-Import-Export/tagid/28>]. Accessed August 2020.

[13] Electronic Confidence Building Measures Portal. [<https://bwc-ecbm.unog.ch/state/thailand>]. Accessed August 2020.

[14] The Verification Research, Training and Information Centre. "BWC Legislation Database".

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/t/>]. Accessed October 2020.

1.6 IMMUNIZATION

1.6.1 Vaccination rates

1.6.1a

Immunization rate (measles/MCV2)

Immunization rate (measles/MCV2), 95% or greater = 2, 80-94.9% = 1, Less than 80%, or no data = 0

Current Year Score: 1

2019

World Health Organization

1.6.1b

Are official foot-and-mouth disease (FMD) vaccination figures for livestock publicly available through the OIE database?

Yes = 1, No = 0

Current Year Score: 1

2020

OIE WAHIS database

Category 2: Early detection and reporting for epidemics of potential international concern

2.1 LABORATORY SYSTEMS STRENGTH AND QUALITY

2.1.1 Laboratory testing for detection of priority diseases

2.1.1a

Does the national laboratory system have the capacity to conduct diagnostic tests for at least 5 of the 10 WHO-defined core tests?

Evidence they can conduct 5 of the 10 core tests and these tests are named = 2, Evidence they can conduct 5 of the 10 core tests and the tests are not named = 1, No evidence they can conduct 5 of the 10 core tests = 0

Current Year Score: 2

The national laboratory system has the capacity to conduct diagnostic tests for at least 5 of the 10 WHO-defined core tests. According to the WHO Joint External Evaluation for Thailand, conducted in June 2017, "Thailand's laboratory network has developed good diagnostic capacities for most emerging pathogens in both the human and animal health laboratories, and is able to perform more than the 10 core tests identified by the International Health Regulations (IHR)". [1] Self Assessment Report conducted by the Ministry of Public Health on Thailand Joint External Evaluation in June 2017, states that the Human Health Laboratory has the capacity to test the following: polymerase chain reaction (PCR) for Influenza, virus culture for polio, serology for HIV, microscopy for tuberculosis, rapid test for plasmodium, bacterial culture for Salmonella Typhi & Enteritidis. Besides the six WHO-defined core tests, the national laboratory system can also test for four country-specific tests which are PCR for Ebola, rapid test for Dengue, rapid test for leptospirosis, and rapid test for Melioidosis. [2]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Ministry of Public Health. 2017. "Thailand Joint External Evaluation Detect 1: National Laboratory System. 2017." [http://nih.dmsc.moph.go.th/data/data/60/20_7_60/20_1.pdf]. Accessed August 2020.

2.1.1b

Is there a national plan, strategy or similar document for conducting testing during a public health emergency, which includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing?

Yes, there is evidence of a plan, and it includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing = 2, Yes, there is evidence of a plan, but there is insufficient evidence that it includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing = 1, No evidence of a plan = 0

Current Year Score: 1

There is evidence of a plan, but there is insufficient evidence that it includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing. The Department of Medical Sciences published the Emerging Infectious Diseases (EID) Network Lab Manual in 2015. The national plan aims to expand the network as well as capacity of laboratories in the country to meet the needs of scale-up testing during an outbreak, among other objectives [1]. Over the years, the EID Network expanded to private laboratories, academic laboratories, public health laboratories outside the specialized area, and capacity building effort is continued. [2] In 2020, The Ministry of Public Health mandated the Department of Medical

Sciences to set up the Public Health Emergency Operation Center in order to rapidly license laboratories to supplement existing laboratory testing capacity especially for Covid-19. The result is the "One Province, One laboratory" program where all provinces in Thailand must have at least one laboratory with sufficient testing capacity for the outbreak [3]. The capacity of licensed laboratories will be scaled up so that the results of testing will be known within 3 hours [4]. Additionally, The Department of Medical Sciences also published 'Guidelines for Establishing a COVID-19 Diagnostic Laboratory (COVID-19)' to assist laboratories nationwide to meet laboratory safety standards for testing Covid-19. [5] Nonetheless, both the EID Network and the current "One Province, One laboratory" program focus on known types of diseases (e.g. COVID-19). There is insufficient evidence that the national plan includes considerations for testing for novel pathogens or multiple disease outbreaks. [1, 3, 4].

[1] The Department of Medical Sciences. 2015. "The Emerging Infectious Diseases (EID) Network Lab Manual".

[http://nih.dmsc.moph.go.th/login/filedata/media2559_2.pdf]. Accessed August 2020.

[2] Siam Rath Newspaper. 15 August 2017. "Department of Medical Sciences Organize a Meeting to Develop the Network Capability".

[<https://siamrath.co.th/n/10245#:~:text=%E0%B8%99%E0%B8%B2%E0%B8%A2%E0%B9%81%E0%B8%9E%E0%B8%97%E0%B8%A2%E0%B9%8C%E0%B8%AA%E0%B8%B8%E0%B8%82%E0%B8%B8%E0%B8%A1%20%E0%B8%81%E0%B8%B2%E0%B8%8D%E0%B8%88%E0%B8%99%E0%B8%9E%E0%B8%B4%E0%B8%A1%E0%B8%B2%E0%B8%A2,%E0%B9%82%E0%B8%94%E0%B8%A2%E0%B8%A1%E0%B8%B5%20%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%9A%E0%B8%B1%E0%B8%99%E0%B8%A7%E0%B8%B4%E0%B8%88%E0%B8%B1%E0%B8%A2%E0%B8%A7%E0%B8%B4%E0%B8%97%E0%B8%A2%E0%B8%B2%E0%B8%A8%E0%B8%B2%E0%B8%AA%E0%B8%95%E0%B8%A3%E0%B9%8C%E0%B8%AA%E0%B8%B2%E0%B8%98%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B8%AA%E0%B8%B8%E0%B8%82>]. Accessed August 2020.

[3] The Department of Medical Sciences. 8 May 2020. "Department of Medical Sciences increases the confidence of analysis and testing results of COVID-19 laboratory network". [<https://gnews.apps.go.th/news?news=60650>]. Accessed August 2020.

[4] Workpoint Today. 28 January 2020. "Dept. of Sci developed the Wuhan virus test laboratories where the results can be realized within 3 hours". [<https://workpointtoday.com/corona-virus-4/>]. Accessed August 2020.

[5] Drug and Medical Supply Information Center, Ministry of Public Health. 18 April 2020. "News release: Guidelines for Establishing a COVID-19 Diagnostic Laboratory (COVID-19)". [<http://dmsic.moph.go.th/index/detail/8134>]. Accessed August 2020.

2.1.2 Laboratory quality systems

2.1.2a

Is there a national laboratory that serves as a reference facility which is accredited (e.g., International Organization for Standardization [ISO] 15189:2003, U.S. Clinical Laboratory Improvement Amendments [CLIA])?

Yes = 1 , No = 0

Current Year Score: 1

The Thailand National Institute of Health laboratory is compliant with various medical laboratory ISO standards and accredited by the Bureau of Laboratory Quality Standard (BLQS/Thailand), and other international organizations, including the World Health Organization (WHO). [1] According to the WHO Joint External Evaluation for Thailand, conducted in June 2017, "All national human and animal health laboratories are accredited according to ISO 9001 and ISO 17025 standards. Human health laboratories are also certified according to ISO 15189 and ISO 17043 standards". [2] National and sub-national animal health laboratories are accredited by ISO 17025 and 9001. [3]

[1] The Thailand National Institute of Health Website. 2018. "Quality Policy Statement".

[<http://nih.dmsc.moph.go.th/login/showimgdetil.php?id=361>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] Ministry of Public Health. 2017. "Thailand Joint External Evaluation Detect 1: National Laboratory System". [http://nih.dmsc.moph.go.th/data/data/60/20_7_60/20_1.pdf]. Accessed August 2020.

2.1.2b

Is there a national laboratory that serves as a reference facility which is subject to external quality assurance review?

Yes = 1 , No = 0

Current Year Score: 1

The National Institute of Health of Thailand (NIH) is subject to external quality assurance (EQA) review and inter-laboratory comparison as outlined in the NIH Action Plan for the budget year 2019. [1] The NIH laboratory is accredited with ISO 9001, ISO 15189, ISO/IEC 17025, ISO 15190, ISO/IEC 17043 and AAALAC International, and ISO Guide 34. [2] As part of ISO 15189 certification, the laboratory is required to complete EQA. [3]

[1] National Institute of Health of Thailand (NIH), Department of Medical Sciences, Ministry of Public Health. 2019. Government Action Plan For Budget Year B.E.2562 (2019)". [http://nih.dmsc.moph.go.th/strategic/plan2562_2.pdf]. Accessed August 2020.

[2] National Institute of Health of Thailand (NIH), Department of Medical Sciences, Ministry of Public Health Website. 2018. "Statement of Quality Policy" [<http://nih.dmsc.moph.go.th/login/showimgdetil.php?id=361>]. Accessed August 2020.

[3] World Health Organization (WHO). Content Sheet 10-1: Overview of External Quality Assessment (EQA). [https://www.who.int/ihr/training/laboratory_quality/10_b_eqa_contents.pdf]. Accessed August 2020.

2.2 LABORATORY SUPPLY CHAINS

2.2.1 Specimen referral and transport system

2.2.1a

Is there a nationwide specimen transport system?

Yes = 1 , No = 0

Current Year Score: 1

There is a nationwide system for transporting specimens to the National Institute of Health of Thailand (NIH). Specimens can be transported via direct deposit, post, coach, or train. For the last three approaches, the sender must notify the National Institute of Health of Thailand at least one day before the delivery date. The parcels will then be collected and taken to the NIH laboratory at the drop-off site. [1] 'The Joint External Evaluation for Thailand' and 'Thailand Joint External Evaluation Detect 1: National Laboratory System Self Assessment Report', both completed in June 2017, state that specimens can be shipped within 24 hours from 80% of the country and within 48 hours from all part of the country. Mobile laboratories are available in some cases, and the military can assist with transportation in case of emergency. National laboratories can ship specimens to the international laboratory network for confirmation. [2, 3]

[1] National Institute of Health of Thailand. 2016. "Handbook on Sample Collection and Testing" [http://nih.dmsc.moph.go.th/lab_nih/labnih60.pdf]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the

Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[3] Ministry of Public Health. 2017. "Thailand Joint External Evaluation Detect 1: National Laboratory System Self Assessment Report. June 27, 2017". [http://nih.dmsc.moph.go.th/data/data/60/20_7_60/20_1.pdf]. Accessed August 2020.

2.2.2 Laboratory cooperation and coordination

2.2.2a

Is there a plan in place to rapidly authorize or license laboratories to supplement the capacity of the national public health laboratory system to scale-up testing during an outbreak?

Yes = 2 , Yes, but there is evidence of gaps in implementation = 1 , No = 0

Current Year Score: 2

There is a plan in place to rapidly authorize or license laboratories to supplement the capacity of the national public health laboratory system to scale-up testing during an outbreak. The Department of Medical Sciences published the Emerging Infectious Diseases (EID) Network Lab Manual in 2015. The national plan aimed to expand the network as well as capacity of laboratories in the country to meet the needs of scale-up testing during an outbreak [1]. The EID Network expanded to private laboratories, academic laboratories, public health laboratories outside the specialized area, and capacity building effort was continued. [2] In 2020, The Ministry of Public Health mandated the Department of Medical Sciences to set up the Public Health Emergency Operation Center in order to rapidly license laboratories to supplement existing laboratory testing capacity especially for Covid-19. The result is the "One Province, One laboratory" program where all provinces in Thailand must have at least one laboratory with sufficient testing capacity for the outbreak [3]. The capacity of licensed laboratories will be scaled up so that the results of testing will be known within 3 hours [4]. Additionally, The Department of Medical Sciences also published 'Guidelines for Establishing a COVID-19 Diagnostic Laboratory (COVID-19)' to assist laboratories nationwide to meet laboratory safety standards for testing Covid-19. [5]

[1] The Department of Medical Sciences. 2015. "The Emerging Infectious Diseases (EID) Network Lab Manual". [http://nih.dmsc.moph.go.th/login/filedata/media2559_2.pdf]. Accessed August 2020.

[2] Siam Rath Newspaper. 15 August 2017. "Department of Medical Sciences Organize a Meeting to Develop the Network Capability".

[https://siamrath.co.th/n/10245#:~:text=%E0%B8%99%E0%B8%B2%E0%B8%A2%E0%B9%81%E0%B8%9E%E0%B8%97%E0%B8%A2%E0%B9%8C%E0%B8%AA%E0%B8%B8%E0%B8%82%E0%B8%B8%E0%B8%A1%20%E0%B8%81%E0%B8%B2%E0%B8%8D%E0%B8%88%E0%B8%99%E0%B8%9E%E0%B8%B4%E0%B8%A1%E0%B8%B2%E0%B8%A2,%E0%B9%82%E0%B8%94%E0%B8%A2%E0%B8%A1%E0%B8%B5%20%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%9A%E0%B8%B1%E0%B8%99%E0%B8%A7%E0%B8%B4%E0%B8%88%E0%B8%B1%E0%B8%A2%E0%B8%A7%E0%B8%B4%E0%B8%97%E0%B8%A2%E0%B8%B2%E0%B8%A8%E0%B8%B2%E0%B8%AA%E0%B8%95%E0%B8%A3%E0%B9%8C%E0%B8%AA%E0%B8%B2%E0%B8%98%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B8%AA%E0%B8%B8%E0%B8%82]. Accessed August 2020.

[3] The Department of Medical Sciences. 8 May 2020. "Department of Medical Sciences increases the confidence of analysis and testing results of COVID-19 laboratory network". [https://gnews.apps.go.th/news?news=60650]. (ccessed August 2020).

[4] Workpoint Today. 28 January 2020. "Dept. of Sci developed the Wuhan virus test laboratories where the results can be realized within 3 hours". [https://workpointtoday.com/corona-virus-4/]. Accessed August 2020.

[5] Drug and Medical Supply Information Center, Ministry of Public Health. 18 April 2020. "News release: Guidelines for Establishing a COVID-19 Diagnostic Laboratory (COVID-19)". [http://dmsic.moph.go.th/index/detail/8134]. Accessed August 2020.

2.3 REAL-TIME SURVEILLANCE AND REPORTING

2.3.1 Indicator and event-based surveillance and reporting systems

2.3.1a

Is there evidence that the country is conducting ongoing event-based surveillance and analysis for infectious disease?

Yes, there is evidence of ongoing event-based surveillance and evidence that the data is being analyzed on a daily basis = 2,
Yes, there is evidence of ongoing event-based surveillance, but no evidence that the data are being analyzed on a daily basis
= 1, No = 0

Current Year Score: 2

There is evidence that Thailand conducts ongoing event-based surveillance and analysis for infectious disease. According to the WHO Joint External Evaluation for Thailand, conducted in June 2017, there is an event-based surveillance unit which functions at all levels of the health care systems in Thailand called the Situation Awareness Teams (SAT), which is based within the Emergency Operations Centre, Department of Disease Control, Ministry of Public Health. The SAT operates on a daily basis, including periods with no active outbreaks, and notify the Surveillance and Rapid Response Teams for control of hazard and important communicable diseases. SAT and SRRT function at all administrative levels to respond to potential public health threats. [1, 2, 3] An SAT is composed of a Supervisor, an In Charge, a Data person, and a SAT Manager. SAT collects and summarizes surveillance data of important communicable diseases, verify, conduct situation analysis and risk assessment, and report to a group of Directors via chat application called Line on a daily basis. When a Director Critical Information Requirements (DCIR) is identified from the surveillance data, a report will be sent to the director within 120 minutes. [2, 4]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[2] Development Guidelines for Provincial SAT. [http://www.boe.moph.go.th/files/meeting/sat25-27%20jun%202017/2.pdf]. Accessed August 2020.

[3] Department of Disease Control, Ministry of Public Health. "Standards and Guidelines for Situation Awareness Teams (SAT) and Joint Investigation Team (JIT)". [http://www.pngo.moph.go.th/pngo/images/meeting2/620621/2406-6.pdf]. Accessed August 2020.

[4] The Office of Disease Prevention and Control 6 Chonburi. The Development of SAT and JIT.

[http://envocc.ddc.moph.go.th/uploads/%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%8A%E0%B8%B8%E0%B8%A1/05-08_06_61/05/5.4.1SAT_JIT.pdf]. Accessed August 2020.

2.3.1b

Is there publicly available evidence that the country reported a potential public health emergency of international concern (PHEIC) to the WHO within the last two years?

Yes = 1, No = 0

Current Year Score: 1

There is publicly available evidence that Thailand has reported a potential public health emergency of international concern (PHEIC) to the WHO within the last two years.

Thailand has reported cases of covid-19 to the WHO before 30 January 2020 when the WHO declared the novel coronavirus

outbreak a PHEIC [1]. Thailand is a member state of WHO and due to this, it is following WHO's technical guidance on all key areas in regard to COVID-19. [2, 3]

[1] World Health Organization. "Novel Coronavirus (2019-nCoV) Situation Report - 10" 30 January 2020.

[https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200130-sitrep-10-ncov.pdf?sfvrsn=d0b2e480_2]

[2] World Health Organization. "Alphabetical List of WHO Member States".

[https://www.who.int/choice/demography/by_country/en/]. Accessed August 2020.

[3] World Health Organization. "WHO supports countries to mitigate COVID-19 spread in the Region".

[<https://www.who.int/southeastasia/outbreaks-and-emergencies/novel-coronavirus-2019>]. Accessed August 2020.

2.3.2 Interoperable, interconnected, electronic real-time reporting systems

2.3.2a

Does the government operate an electronic reporting surveillance system at both the national and the sub-national level?

Yes = 1 , No = 0

Current Year Score: 1

The government operates an electronic reporting surveillance system at both the national and sub-national level. Thailand's surveillance system is electronic and covers all government health services, according to the WHO Joint External Evaluation for Thailand, conducted in June 2017. [1] The website of the Bureau of Epidemiology, Ministry of Public Health, publishes weekly and annual surveillance reports gathered from provincial public health offices, public and some private hospitals, and public health centres on its open-access website. [2] Moreover, according to a presentation from the Bureau of Epidemiology in June 2019, Thailand has operated an electronic reporting surveillance system at both the national and the sub-national level since 2003. [3] For reporting of suspected case during event-based surveillance at a sub-national level, Surveillance and Rapid Response Team (SRRT) will report to the central authority via an online system managed by the Bureau of Epidemiology. [4] For Zoonoses, citizens can directly report cases through e-smart surveillance system on Bureau of Disease Control and Veterinary Services, Department of Livestock's Website. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Bureau of Epidemiology, Ministry of Public Health Website. [<https://apps.doe.moph.go.th/boeeng/annual.php>]. Accessed August 2020.

[3] Doung-ngern, P. 2019. Communicable Disease Unit, Bureau of Epidemiology, Department of Disease Control, Ministry of Public Health. "Public Health Surveillance".

[http://www.interfetpthailand.net/file/June2019/pdf/wk1_Dr_Pawinee_18June_principle.pdf]. Accessed August 2020.

[4] Bureau of Epidemiology. 2012. "Operational Guidelines on Event-Based Surveillance for District Level SRRT". Department of Disease Control, Ministry of Public Health. [http://www.boe.moph.go.th/files/report/20130417_49494256.pdf]. Accessed August 2020.

[5] Bureau of Disease Control and Veterinary Services, Department of Livestock's Website.

[<http://esmartsur.net/INFORM.aspx>]. Accessed August 2020.

2.3.2b

Does the electronic reporting surveillance system collect ongoing or real-time laboratory data?

Yes = 1 , No = 0

Current Year Score: 1

The government's electronic reporting surveillance system collects real-time laboratory and epidemiological data. According to the WHO Joint External Evaluation for Thailand, conducted in June 2017, "epidemiological and laboratory data are reported online and in real-time, including for emerging infectious diseases". Online surveillance programmes are able to link epidemiological officers and laboratory officers for certain respiratory diseases. [1] The Bureau of Epidemiology uses the Electronic Integrated Disease Surveillance System (EIDSS) to collect ongoing disease surveillance data of humans and animals from relevant agencies and laboratories. [2]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[2] Bureau of Epidemiology, Ministry of Public Health. "Surveillance Database". [https://apps.doe.moph.go.th/#nav3]. Accessed August 2020.

2.4 SURVEILLANCE DATA ACCESSIBILITY AND TRANSPARENCY

2.4.1 Coverage and use of electronic health records

2.4.1a

Are electronic health records commonly in use?

Electronic health records are commonly in use = 2, Electronic health records are not commonly in use, but there is evidence they are used = 1, No evidence electronic health records are in use = 0

Current Year Score: 1

There is no publicly available evidence that electronic health records are commonly in use, but there is evidence they are used. According to the public data analysis from Statista, Healthcare Information and Management Systems Society (HIMMS), and PricewaterhouseCoopers (PwC) in 2015, electronic health records (EHR) adoption is in the lower medium range, which means it is not commonly in use. [1] Data from 2010 shows that EHR uptake in Thailand is within the range of 26%-50%, whereby the use of EHR was mostly for administration and claims. [2] The data from the Electronic Transactions Development Agency (ETDA) published in 2015 highlighted the rapid growth of EHR from 2010 to 2015. However, the data is limited to a selected group of governmental hospitals. [3] According to the National eHealth Strategy 2017-2026, the Ministry of Health also has plans to develop the Personal health records (PHRs) through coordination with the Ministry of Interior. The strategy calls for national health reform, which covers EHR, in Phase 2 of the eHealth Inclusion targets to incorporate all sectors of Thailand in eHealth operations. [4] A more recent news article in 2019 shows that 7 major hospitals in Bangkok were in the preparation phase to pilot an electronic health data linkage system. [5]

[1] PricewaterhouseCoopers (PwC). 2017. "The Digital Healthcare Leap". [https://www.pwc.com/gx/en/issues/high-growth-markets/assets/the-digital-healthcare-leap.pdf]. Accessed August 2020.

[2] Jantavongso, S..2015. "Ethics, social media and e-health in Thailand". Journal of the Thai Medical Informatics Association, 1, 25-37, 2015. [http://tmi.or.th/jtmi/docs/1-1/

[3] Ethics%20Social%20Media%20and%20E-health%20[1].pdf]. Accessed August 2020.

[3] Electronic Transactions Development Agency Website. 2015. "e-Medical Record". [https://www.eta.or.th/content/e-medical-record.html]. Accessed August 2020.

[4] Ministry of Public Health. 2017. "eHealth Strategy, Ministry of Public Health (2017 - 2026)"

[<https://ehealth.moph.go.th/index.php/resources/draft-ehealth-strategy-ministry-of-public-health-2016-2021?download=7:eng>]. Accessed August 2020.

[5] Manager Online. 1 September 2019. "7 Hospitals in Bangkok that Use an Electronic Patient Referral System Now Prepare to Pilot a Data Linkage Application". [<https://mgronline.com/qol/detail/962000083786>]. Accessed August 2020.

2.4.1b

Does the national public health system have access to electronic health records of individuals in their country?

Yes = 1, No = 0

Current Year Score: 1

The national public health system has access to personal electronic health records of individuals. The Ministry of Public Health (MOPH) began collecting and structuring health care data of individuals in 2016 through its healthcare facilities. These collected data are submitted to the Ministry in the form of reports with the individual's personal details and health record. [1] These data can be utilised by the Ministry not only for strategizing health policies but also for telemedication. In 2017, the MOPH launched the telemedication in the borders of Tak province, allowing patients residing in rural areas to receive treatment. [2] According to the National eHealth Strategy 2017-2026, the Ministry of Health also has plans to develop the Personal health records (PHRs) through coordination with the Ministry of Interior. [3] This indicates that the Ministry has access to patient records, where the Electronic Health Record would be developed by integrating the patient's Electronic Medical Record (EMR) and Personal health records (PHRs). [4]

[1] Voice TV News. September 2018. "MoPH launched H4U Application". [https://www.voicetv.co.th/read/BkPrNm8_m]. Accessed August 2020.

[2] Witoolkollachit, P.. 2018. "Thailand Healthcare Digital Transformation". [https://www.ispor.org/docs/default-source/conference-ap-2018/thai-1st-plenary-for-handouts.pdf?sfvrsn=268f61e4_0]. Accessed August 2020.

[3] Ministry of Public Health. "eHealth Strategy, Ministry of Public Health (2017 - 2026)" [<https://ehealth.moph.go.th/index.php/resources/draft-ehealth-strategy-ministry-of-public-health-2016-2021?download=7:eng>]. Accessed August 2020.

[4] Wattanayingcharoenchai, S.. 2017. Ministry of Public Health. "Development of eHealth Systems 4.0". [http://dental2.anamai.moph.go.th/ewtadmin/ewt/dental/ewt_dl_link.php?nid=2223]. Accessed August 2020.

2.4.1c

Are there data standards to ensure data is comparable (e.g., ISO standards)?

Yes = 1, No = 0

Current Year Score: 1

Thailand has data standards to ensure that electronic health data is comparable. Standards of Health Information System, effective data integration and interoperability are parts of the Ministry of Public Health's strategic priority in eHealth Strategy 2017-2026. [1] According to Thai Health Information Standards Development Centre (THIS), Thailand has been using health data standards such as the citizen ID system, the health provider facility ID system, standard datasets for reporting, and the International Classification of Diseases (ICD). [2] The Thai Medicines Terminology (TMT) and Logical Observation Identifiers Names and Codes (LOINC), a national laboratory coding standard, are also used to facilitate electronic health records interoperability. [3, 4, 5] Furthermore, the eHealth Strategy 2017-2026 plans to "develop health information standards in all dimensions. Includes standard care mechanisms to provide information systems, coordinate in health data exchange, seamless and secure sharing of data." [1]

- [1] Ministry of Public Health. "eHealth Strategy, Ministry of Public Health (2017 - 2026)". [https://ehealth.moph.go.th/index.php/resources/draft-ehealth-strategy-ministry-of-public-health-2016-2021?download=7:eng]. Accessed August 2020.
- [2] Kijsanayotin B. et al. 2016. Thai Health Information Standards Development Center, Health Systems Research Institute. "eHealth in Thailand: Interoperability and Health Information Standards." [https://www.hsri.or.th/en/researcher/media/printed-matter/detail/7040]. Accessed August 2020.
- [3] Thai Health Information Standards Development Center (THIS) Website. "The Development of Thai Medicines Terminology". [http://www.this.or.th/tmt.php]. Accessed August 2020.
- [4] Thai Health Information Standards Development Center (THIS) Website. "Thai Medicines Terminology". [http://www.this.or.th/publication.php]. Accessed August 2020.
- [5] Wanchana Ponthongmak, et al. 2015. "Mapping Local Clinical Chemistry code with LOINC: the preliminary report". Journal of the Thai Medical Informatics Association, 1, 44-50, 2015. [http://tmi.or.th/jtmi/docs/1-1/Mapping%20Thai%20Local%20Laboratory%20[1].pdf]. Accessed August 2020.

2.4.2 Data integration between human, animal, and environmental health sectors

2.4.2a

Is there evidence of established mechanisms at the relevant ministries responsible for animal, human, and wildlife surveillance to share data (e.g., through mosquito surveillance, brucellosis surveillance)?

Yes = 1 , No = 0

Current Year Score: 1

There are mechanisms for an exchange of surveillance data between ministries responsible for animal, human, and wildlife surveillance. The Joint External Evaluation for Thailand, completed in June 2017, states that Surveillance data are integrated and shared between the Ministry of Public Health (MOPH) and Ministry of Agriculture and Cooperatives (MOAC), and for only some diseases via specific surveillance systems (rabies and avian influenza, for example). [1, 2] The Joint External Evaluation for Thailand, completed in June 2017, further states that "In case of zoonotic diseases, there may be a formal meeting between human health and animal health teams to discuss and make a decision on reporting. The Chief Veterinary Officer (also the Director General of the Department of Livestock Development) has authority on reporting of zoonotic diseases." The Ministry of Public Health and the Department of Livestock Development regularly share information regarding zoonotic events. In case of a zoonotic event of public health concern, there will be direct telephone communication between the human and animal health authorities." [1] Finally, the Action Plan for the MoU in Regard to One Health Action for National Health Security, 2017-2021, lays out mechanisms for the seven relevant ministries responsible for animal, human, and wildlife surveillance, and the Thai Red Cross Society to share data. The seven ministries are Ministry of Agriculture and Cooperatives, Ministry of Natural Resources and Environment, Ministry of Social Development and Human Security, Ministry of Interior, Ministry of Labour, Ministry of Education, and Ministry of Public Health. [3]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[2] Bureau of Disease Control and Veterinary Science, Department of Livestock, Ministry of Agriculture and Cooperatives. 2011. "Cooperation between One Health network in Thailand". [http://dcontrol.dld.go.th/index.php/km/one-health-thailand/1030.html]. Accessed August 2020.

[3] Department of Disease Control, Ministry of Public Health. 2016. "Action Plan for the Memorandum of Understanding in Regard to One Health Action for National Health Security, 2017-2021". [http://planning.dld.go.th/th/images/stories/section-

5/2560/strategy10.pdf]. Accessed August 2020.

2.4.3 Transparency of surveillance data

2.4.3a

Does the country make de-identified health surveillance data on infectious diseases publicly available via reports (or other format) on government websites (such as the Ministry of Health, Ministry of Agriculture, or similar)?

Yes = 1 , No = 0

Current Year Score: 1

Thailand publishes de-identified health surveillance data on disease outbreaks via government websites. The Joint External Evaluation for Thailand, completed in June 2017, states "Thailand's surveillance system is fully electronic and the country has demonstrated capabilities in gathering and aggregating indicator-based surveillance data from all levels of the health system, including a weekly feedback mechanism". [1] Bureau of Epidemiology (BOE), Department of Disease Control, Ministry of Public Health publishes National Disease Surveillance (Report 506), which is the de-identified disease surveillance data on its website weekly. The report covers communicable diseases, sexually transmitted diseases, and other diseases; such as tropical ulcer and hepatitis C. National, provincial, and district disaggregated data can be viewed with different filters including age, nationality, gender, and occupation. [2]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Bureau of Epidemiology, Ministry of Health Website. "National Disease Surveillance (Report 506)". [<http://www.boe.moph.go.th/boedb/surdata/index.php>]. Accessed August 2020.

2.4.3b

Does the country make de-identified COVID-19 surveillance data (including details such as daily case count, mortality rate, etc) available via daily reports (or other formats) on government websites (such as the Ministry of Health, or similar)?

Yes = 1 , No = 0

Current Year Score: 1

Thailand makes de-identified COVID-19 surveillance data available via daily reports on government websites. The data includes daily case count; mortality rate; number of people hospitalized; number of people in quarantine; infected person identification map (nationwide and by provinces); nationalities of infected persons; age of infected persons (oldest, youngest, mean); gender ratio of infected persons; number of infection, recovery, and mortality rate over a period of time; and more [1, 2].

[1] Department of Disease Control Website. "Situation in Thailand - COVID-19". [<https://ddc.moph.go.th/viralpneumonia/index.php>]. Accessed August 2020.

[2] Department of Disease Control. "Covid-19 Situation Report". [<https://covid19.ddc.moph.go.th/>]. Accessed August 2020.

2.4.4 Ethical considerations during surveillance

2.4.4a

Is there legislation and/or regulations that safeguard the confidentiality of identifiable health information for individuals, such as that generated through health surveillance activities?

Yes = 1 , No = 0

Current Year Score: 1

There are laws and regulations that safeguard the confidentiality of identifiable health information for individuals, such as that generated through health surveillance activities. Thailand has several laws and regulations in place to safeguard the confidentiality of identifiable health information for individuals; such as Section 27 of The Medical Council Regulations on Medical Ethics Preservation, B.E. 2549 (2006) and Section 323 of the Criminal Code B.E. 2499 (1956). [1, 2] The legislation that specifically protects health information of those who seek medical service from both public and private health facilities is the National Health Act B.E.2550 (2007). Section 7 of the act states that "Personal health information shall be kept confidential. No person shall disclose it in such a manner as to cause damage to him or her, unless it is done according to his or her will, or is required by a specific law to do so...". [3] The newly enforced Personal Data Protection Act also states that "Any collection of Personal Data pertaining to... health data..., is prohibited, without the explicit consent from the data subject except where: it is to prevent or suppress a danger to life, body or health of the Person, where the data subject is incapable of giving consent by whatever reason" [4] The exceptions can be found in cases dealing with public health concerns as laid out in the Child Protection Act B.E.2546 (2003), and Communicable Disease Act B.E.2558 (2015), which might lead to the disclosure of the patient information. [5, 6, 7]

[1] The Medical Council Regulations on Medical Ethics Preservation, B.E. 2549 (2006).

[https://www.tmc.or.th/download/The_Medical_Council_Regulations_on_Medical_Ethic.pdf]. Accessed August 2020.

[2] Criminal Code B.E. 2499 (1956). [<http://un-act.org/publication/view/thailands-criminal-code-1956/>]. Accessed August 2020.

[3] National Health Act B.E.2550 (2007). [http://thailawforum.com/laws/National%20Health%20Act_2007.pdf]. Accessed August 2020.

[4] The Personal Data Protection Act B.E. 2562 (2019).

[https://www.etda.or.th/app/webroot/content_files/13/files/The%20Personal%20Data%20Protection%20Act.pdf]. Accessed August 2020.

[5] Sathirareuangchai, S. 2013. "Patient Confidentiality". Siriraj Medical Bulletin. Vol 6. No. 2: July-December 2013.

[<https://www.tci-thaijo.org/index.php/simedbull/article/download/81709/65001/>]. Accessed August 2020.

[6] Child Protection Act B.E. 2546 (2003). [<https://www.coj.go.th/en/pdf/ChildProtectAct.pdf>]. Accessed August 2020.

[7] Communicable Disease Act B.E.2558 (2015). [http://web.krisdika.go.th/data//document/ext809/809778_0001.pdf]. Accessed August 2020.

2.4.4b

Is there legislation and/or regulations safeguarding the confidentiality of identifiable health information for individuals, such as that generated through health surveillance activities, include mention of protections from cyber attacks (e.g., ransomware)?

Yes = 1 , No = 0

Current Year Score: 0

There is no specific legislation and/or regulations safeguarding the confidentiality of identifiable health information for individuals that mentions protection of identifiable health information for individuals from cyber attacks, even though

Thailand has enacted a legislation to ensure privacy of personally identifiable health data of individuals irrespective of whether it is analog or digitised format. [1, 2, 3] One legislation mentions protection of electronic data from hacking and cyber attack. Computer Crimes Act B.E.2550 (2007) enforces Thailand's law on the internet and safeguard electronic data within Thailand. [4, 5] Section 7 of The Computer Crimes Act prohibits illegal access to computer data that has specific security measures intended to deny access to unauthorised persons. Nevertheless, this Act does not specify personal health information. [5, 6] The amendments to Computer Crimes Act in 2017 also does not touch upon this issue. [7] In addition to the Computer Crimes Act, the Personal Data Protection Act states that "Any collection of Personal Data pertaining to... health data..., is prohibited, without the explicit consent from the data subject except where: it is to prevent or suppress a danger to life, body or health of the Person, where the data subject is incapable of giving consent by whatever reason". Nonetheless, there is no legal requirement for data protections in place for electronically stored information. [8] Further research from the website of the Ministry of Public Health yielded no relevant evidence. [9]

[1] Criminal Code B.E. 2499 (1956). [<http://un-act.org/publication/view/thailands-criminal-code-1956/>]. Accessed August 2020.

[2] National Health Act B.E.2550 (2007). [http://thailawforum.com/laws/National%20Health%20Act_2007.pdf]. Accessed August 2020.

[3] Sathirareuangchai, S. 2013. "Patient Confidentiality". Siriraj Medical Bulletin. Vol 6. No. 2: July-December 2013. [<https://www.tci-thaijo.org/index.php/simedbull/article/download/81709/65001/>]. Accessed August 2020.

[4] Baker McKenzie. 2018. "Revisions to the Thai Cyber Security Bill Revealed".

[<https://www.lexology.com/library/detail.aspx?g=8dbad0ed-5b01-4b38-b3af-72d233e019ba>]. Accessed August 2020.

[5] Jantavongso, S.. 2015. "Ethics, social media and e-health in Thailand". Journal of the Thai Medical Informatics Association, 1, 25-37, 2015. [<http://tmi.or.th/jtmi/docs/1-1/>

[3] [Ethics%20Social%20Media%20and%20E-health%20\[1\].pdf](#)]. Accessed August 2020.

[6] Computer Crime Act B.E. 2550 (2007). [<http://www.law-democracy.org/wp-content/uploads/2010/07/Thai.Computer.Jul07.official.pdf>]. Accessed August 2020.

[7] Computer Crime Act B.E. 2560 (2017). [<http://www.ratchakitcha.soc.go.th/DATA/PDF/2560/A/010/24.PDF>]. Accessed August 2020.

[8] The Personal Data Protection Act B.E. 2562 (2019).

[https://www.etda.or.th/app/webroot/content_files/13/files/The%20Personal%20Data%20Protection%20Act.pdf]. Accessed August 2020.

[9] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

2.4.5 International data sharing

2.4.5a

Has the government made a commitment via public statements, legislation and/or a cooperative agreement to share surveillance data during a public health emergency with other countries in the region?

Yes, commitments have been made to share data for more than one disease, Yes, commitments have been made to share data only for one disease = 1, No = 0

Current Year Score: 2

The government of Thailand has made a commitment via public statements, legislation and/or a cooperative agreement to share surveillance data during a public health emergency with other countries in the region for more than one disease. Thailand is actively involved in regional networks for information exchange and has bilateral agreements with neighbouring countries for communicable disease surveillance. [1] Thailand is a member of the Mekong Basin Disease Surveillance (MBDS) Network. In 2015, Thailand jointly prepared and approved the third Memorandum of Understanding (MOU) on MBDS

Cooperation with China, Cambodia, Laos, Myanmar, and Vietnam. Under this MOU, the signing countries agree to strengthen national and regional capabilities in disease surveillance, and outbreak preparedness and response to priority diseases and to any public health emergencies of international concerns as stated in the International Health Regulation (IHR 2005). [2] In the light of COVID-19, the latest MBDS newsletter shows that MBDS Six Countries Health Ministries are updating and sharing the current COVID-19 pandemic related information [3] Moreover, Thailand signed MOU with Brunei Darussalam in 29 March 2010 for disease surveillance and risk communication in public health emergency. [4] For the sharing of animal health surveillance data, Thailand signed an MOU between Members of the Association of Southeast Asian Nations (ASEAN) and The World Organisation for Animal Health (OIE) in 2011, which allows disease information for nominated priority animal diseases in ASEAN Member States to be shared privately within ASEAN, and for confirmed outbreak reports to be transferred electronically to the World Health Information System (WAHIS). [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[2] Memorandum of Understanding (MOU) Among the Health Ministries of the Six Mekong Basin Countries on The Mekong Basin Disease Surveillance (MBDS) Cooperation. 2015. [http://www.mbdnet.org/mbds-memorandum-of-understanding/]. Accessed August 2020.

[3] The Mekong Basin Disease Surveillance (MBDS). "eNewsletter June 2020".

[http://www.mbdnet.org/enewsletter_june_2020/]. Accessed August 2020.

[4] Department of Disease Control, Ministry of Public Health's Website. "International Relations, Brunei".

[http://icd.ddc.moph.go.th/view/4/9]. Accessed August 2020.

[5] Memorandum of Understanding between Members of the the Association of Southeast Asian Nations (ASEAN) and The World Organisation for Animal Health OIE). 2011.

[https://www.asean.org/storage/images/Memorandum%20of%20Understanding%20Between%20Members%20of%20the%20Association%20of%20Southeast%20Asian%20Nations%20ASEAN%20and%20the%20World%20Organisation%20for%20Animal%20Health%20OIE.pdf]. Accessed August 2020.

2.5 CASE-BASED INVESTIGATION

2.5.1 Case investigation and contact tracing

2.5.1a

Is there a national system in place to provide support at the sub-national level (e.g. training, metrics standardization and/or financial resources) to conduct contact tracing in the event of a public health emergency?

Yes, there is evidence that the national government supports sub-national systems to prepare for future public health emergencies = 2, Yes, there is evidence that the national government supports sub-national systems, but only in response to active public health emergencies = 1, No = 0

Current Year Score: 1

There is some publicly available evidence that there is a national system in place to provide support at the sub-national level to conduct contact tracing in the event of an active public health emergency. Although there is a contract tracing plan for Covid-19 in place, there is no generic plan that highlights expanding contact tracing. The public health workforce plays crucial roles in case identification and contact tracing in Thailand. Staff from the Division of Epidemiology (DOE), Department of Disease Control and Provincial Public Health Offices, in all provinces are dedicated to such tasks. Their teams have been trained in epidemiology and ethics around public health data collection even before the Covid-19 pandemic. During the Covid-19 pandemic, digital technology has also been used in assisting the staff for contact tracing and case identification. The

Department of Disease Control has developed "the DDC Care" application to help monitor and track patients under investigation. [1] Furthermore, the "Thai Chana" and "Mor Chana" web application was also developed by the Ministry of Digital Economy and Society to record population movement data for the benefit of contact tracing among risk groups and bringing them into the disease surveillance and investigation process. To use this application, a client is requested to register/scan in the application before entering and after leaving the service area to limit the number of people in the area and for the case investigation team to more easily follow-up contacts if there was a confirmed case. [1, 2] Further research from the websites of the Ministry of Public Health and the National Institute of Health of Thailand yielded no relevant evidence. [3, 4]

[1] Ministry of Public Health. August 2020. "Thailand's Experience in the Covid-19 Response".

[https://ddc.moph.go.th/viralpneumonia/eng/file/pub_doc/LDoc9.pdf]. Accessed August 2020.

[2] The Digital Government Development Agency. 2 June 2020. "Inviting Thai people to download the app 'Mor Chana' to join together to win COVID-19". [<https://www.dga.or.th/th/content/913/14144/>]. Accessed August 2020.

[3] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[4] National Institute of Health of Thailand Website. [<http://nih.dmsc.moph.go.th/indexeng.html>]. Accessed October 2020.

2.5.1b

Does the country provide wraparound services to enable infected people and their contacts to self-isolate or quarantine as recommended, particularly economic support (paycheck, job security) and medical attention?

Yes, both economic support and medical attention are provided = 2, Yes, but only economic support or medical attention is provided = 1, No = 0

Current Year Score: 1

There is insufficient evidence that Thailand provides wraparound services to enable infected people and their contacts to self-isolate or quarantine as recommended, particularly economic support (paycheck, job security) and medical attention, although there has been some evidence in light of Covid-19.

As for economic support during the quarantine, Thai laws such as the Social Security Act B.E. 2533 (1990) and the recent Ministerial Regulations in 2020 based on Unemployment Benefits due to Force Majeure Caused by the Outbreak of Dangerous Communicable Diseases under the Communicable Diseases Act. B.E. 2558 (2015), the employee is entitled to receive compensation in case of unemployment due to force majeure at the rate of 62 percent of the daily wage but not more than 90 days. The employee can claim the benefit by registering online via the e-form for unemployment benefit. Furthermore, the laws also provide several job security support such as not counting leave day during the quarantine (i.e. the person in quarantine will be fully compensated with his/her normal salary) which applies to both confirmed cases and suspected cases that were recommended to self-isolate; and employees shall receive salary from the employers even if their business is temporarily closed due to an outbreak of dangerous communicable diseases. [1, 2] Generally, there is no protection by law for the informal economy. [3] Further research from the websites of the Ministry of Public Health and the National Institute of Health of Thailand yielded no relevant evidence. [4, 5]

In the light of covid-19, in terms of medical support, all hospitals, both public and private, are required to provide emergency medical care to patients with COVID-19 until they are out of danger, in accordance with the professional standards and capabilities of the healthcare facility. If a patient must be referred to another hospital for treatments, the hospital must arrange this without any conditions or collect any expenses. The hospitals will later be refunded according to the guidelines. Patients with COVID-19 are not required to pay any medical expenses unless the patient (or relative) refuses to accept further referral based on the hospital network that is provided by the government, or wishes to receive treatment at another hospital. In these cases, patients are responsible for their own expenses. [6, 7]. As for economic support during the

quarantine, by Thai laws such as the Social Security Act B.E. 2533 (1990) and the recent Ministerial Regulations in 2020 based on Unemployment Benefits due to Force Majeure Caused by the Outbreak of Dangerous Communicable Diseases under the Communicable Diseases Act. B.E. 2558 (2015), the employee is entitled to receive compensation in case of unemployment due to force majeure at the rate of 62 percent of the daily wage but not more than 90 days. The employee can claim the benefit by registering online via the e-form for unemployment benefit. Furthermore, the laws also provide several job security support such as not counting leave day during the quarantine (i.e. the person in quarantine will be fully compensated with his/her normal salary) which applies to both cases and suspected cases that were recommended to self-isolate, employees shall receive salary from the employers even if their business is temporarily closed due to an outbreak of dangerous communicable diseases. However, for those who have been out of work for more than 6 months and are affected by COVID-19, the government will pay a one time compensation allowance of 5,000 baht per person as this group does not fall under the social security unemployment benefits scheme. This last scheme is only applicable to the Covid-19 pandemic situation. [1, 2, 8] Generally, there is no protection by the law for informal economy. [3] Further research from the websites of the Ministry of Public Health and the National Institute of Health of Thailand yielded no relevant evidence. [4, 5]

[1] Social Security Office Official Facebook Page. 10 April 2020. "FAQs regarding Unemployment due to Force Majeure or Other Emergencies (COVID-19)".

[https://web.facebook.com/ssofanpage/photos/pcb.2879462358799236/2879462122132593/]. Accessed August 2020.

[2] Social Security Act B.E 2533 (1990). [http://www.olo.go.th/fileupload/8339879019.pdf]. Accessed August 2020.

[3] Social Security Office Website. [https://www.sso.go.th/wpr/main]. Accessed October 2020.

[4] Ministry of Public Health Website. [https://www.moph.go.th/]. Accessed October 2020.

[5] National Institute of Health of Thailand Website. [http://nih.dmsc.moph.go.th/indexeng.html]. Accessed October 2020.

[6] Government gazette No. 137 Special Section 80 Ngor. 7 April 2020. "Notification of the Ministry of Public Health: Criteria, methods and conditions for determining the cost of handling emergency patient under the communicable disease law, infectious cases of coronavirus 2019". [http://www.ratchakitcha.soc.go.th/DATA/PDF/2563/E/080/T_0047.PDF]. Accessed August 2020.

[7] Notification of the Secretariat of the Cabinet Nor Ror 0505/Vor 188. 24 April 2020. "Criteria, methods and conditions for determining the cost of emergency patient handling, under the communicable disease law for the cases of COVID-19 (No. 2)". [http://dmsic.moph.go.th/index/detail/8151]. Accessed August 2020.

[8] Government gazette No. 137 Section 29 Gor. 17 April 2020. "Ministerial Regulations: Unemployment Benefits due to Force Majeure Caused by the Outbreak of Dangerous Communicable Diseases under the Communicable Diseases Act. B.E. 2558 (2015)". [http://www.ratchakitcha.soc.go.th/DATA/PDF/2563/A/029/T_0005.PDF]. Accessed August 2020.

2.5.1c

Does the country make de-identified data on contact tracing efforts for COVID-19 (including the percentage of new cases from identified contacts) available via daily reports (or other format) on government websites (such as the Ministry of Health, or similar)?

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Thailand makes de-identified data on contact tracing efforts for COVID-19 (including the percentage of new cases from identified contacts) available via daily reports (or other format) on government websites (such as the Ministry of Health, or similar). Thailand makes de-identified COVID-19 surveillance data (such as daily case count, mortality rate, people in quarantine, etc.) available via daily reports on government websites [1, 2]. The data set can be publicly obtained via the Department of Disease Control website. However, information on contact tracing efforts, i.e. how many of the cases have been traced back to a known source, is not available. [3]. The Thai Government via the Digital Government Development Agency has launched 'Mor Chana' contact tracing app. The app will inform the users of their risk

level based on their general history and exposure history. However, there is no evidence on public information sharing for contact tracing or on community cases which are linked. [4] Further research from the websites of the Ministry of Public Health and the National Institute of Health of Thailand yielded no relevant evidence. [5, 6]

[1] Department of Disease Control Website. "Situation in Thailand - COVID-19".

[<https://ddc.moph.go.th/viralpneumonia/index.php>]. Accessed August 2020.

[2] Department of Disease Control. "Covid-19 Situation Report". [<https://covid19.ddc.moph.go.th/>]. Accessed August 2020.

[3] Department of Disease Control. "Daily Covid-19 Report". [<https://data.go.th/dataset/covid-19-daily>]. Accessed August 2020.

[4] The Digital Government Development Agency. 2 June 2020. "Inviting Thai people to download the app 'Mor Chana' to join together to win COVID-19". [<https://www.dga.or.th/th/content/913/14144/>]. Accessed August 2020.

[5] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[6] National Institute of Health of Thailand Website. [<http://nih.dmsc.moph.go.th/indexeng.html>]. Accessed October 2020.

2.5.2 Point of entry management

2.5.2a

Is there a joint plan or cooperative agreement between the public health system and border control authorities to identify suspected and potential cases in international travelers and trace and quarantine their contacts in the event of a public health emergency?

Yes, plan(s)/agreement(s) are in place to prepare for future public health emergencies = 2, Yes, but plan(s)/agreement(s) are in place only in response to active public health emergencies = 1, No = 0

Current Year Score: 2

There is a joint plan or cooperative agreement between the public health system and border control authorities to identify suspected and potential cases in international travelers and trace and quarantine their contacts for active and future public health emergencies. There is evidence of cooperation via the new infectious disease intelligence, and some existing plans give authorities to border controls. New Infectious Disease Intelligence which is regularly updated by the Ministry of Public Health, as part of their operational plans, mentioned collaborating with border control authorities to identify suspected and potential cases, and trace and quarantine their contacts in case of positive cases, in international travelers for emerging infectious diseases particularly for Ebola Virus Disease (EVD), Covid-19, and MERS. [1] Additionally, in regards to the Covid-19 situation, all Thai citizens returning to Thailand from abroad, as well as foreigners, are required to go through a 14-day quarantine at a state quarantine site, i.e. 'State Quarantine' site, without any charges. Those who wish to choose their own 'Alternative State Quarantine', can do so by choosing from the list of hotels that have passed the audit at <http://www.hsscovid.com>. However, in this case, the person must bear the costs himself/herself. At the local levels, the government provides free of charge 'Local State Quarantine' sites for those who enter the country by land or air, or those with high risks. In some cases, 'Home Quarantine' is allowed for observing the symptoms of a person with a low risk of exposure under the condition that the person has a separate accommodation and does not share with other people. [2, 3]. The government also provides free COVID-19 testing that covers a wide range of conditions, including those that may be asymptomatic but have been exposed to international travelers [4]. Finally, the Communicable Diseases Act B.E. 2558 (2015) gives authority to communicable disease control officers persons to trace and quarantine those who are infected or reasonably suspected of being infected with the dangerous communicable disease, or those who were in contact with the suspected persons. [5] Immigration Act B.E. 2522 (1979) requires the Immigration Bureau to comply with requests regarding diseases from the Ministries. [6]

[1] Division of Communicable Diseases, Ministry of Public Health. 31 May 2020. "New Infectious Disease Intelligence as of May 31, 2020". [<https://ddc.moph.go.th/uploads/files/1329320200612040155.pdf>]. Accessed October 2020.

[2] Royal Thai Embassy, Helsinki, Finland. Updated 21 August 2020. "Announcement: Thai Citizen Return to Thailand from Abroad During the Announcement of Emergency Operations Center for Medical and Public Health".

[<http://www.thaiembassy.org/helsinki/th/bulletin/1914/119394-%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B9%80%E0%B8%94%E0%B8%B4%E0%B8%99%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%81%E0%B8%A5%E0%B8%B1%E0%B8%9A%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B9%80%E0%B8%97%E0%B8%A8%E0%B9%84%E0%B8%97%E0%B8%A2%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%84%E0%B8%99%E0%B9%84%E0%B8%97%E0%B8%A2%E0%B9%83%E0%B8%99%E0%B8%95%E0%B9%88%E0%B8%B2%E0%B8%87%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B9%80%E0%B8%97%E0%B8%A8%E0%B9%83%E0%B8%99%E0%B8%8A%E0%B9%88%E0%B8%A7%E0%B8%87%E0%B8%81.html>]. Accessed August 2020.

[3] Covid Situation Center, Office of the Permanent Secretary of Interior Ministry. 22 May 2020. "Announcement of Emergency Operations Center for Medical and Public Health Regarding the Coronavirus - Rules and guidelines for Quarantine Sites". [<http://www.moicovid.com/wp-content/uploads/2020/05/%E0%B8%A8%E0%B8%9A%E0%B8%84.%E0%B8%A1%E0%B8%97.-%E0%B8%A1%E0%B8%97-0230-%E0%B8%A72929-%E0%B8%A5%E0%B8%A7.-22-%E0%B8%9E.%E0%B8%84.-63-%E0%B9%81%E0%B8%88%E0%B9%89%E0%B8%87-%E0%B8%9C%E0%B8%A7%E0%B8%88.%E0%B8%97%E0%B8%B8%E0%B8%81%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94-%E0%B9%80%E0%B8%A3%E0%B8%B7%E0%B9%88%E0%B8%AD%E0%B8%87-%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%81%E0%B8%B3%E0%B8%AB%E0%B8%99%E0%B8%94%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%99%E0%B8%97%E0%B8%B5%E0%B9%88%E0%B8%81%E0%B8%B1%E0%B8%81%E0%B8%B1%E0%B8%99.pdf>]. Accessed August 2020.

[4] Ministry of Public Health. "Criteria for free COVID-19 testing". [<https://www.moph.go.th/index.php/news/read/1707>]. Accessed August 2020.

[5] Communicable Diseases Act B.E. 2558 (2015).

[https://ddc.moph.go.th/uploads/ckeditor/c74d97b01eae257e44aa9d5bade97baf/files/001_2gcd.pdf]. Accessed October 2020.

[6] Immigration Act B.E. 2522 (1979). [https://www.immigration.go.th/?page_id=2577]. Accessed October 2020.

2.6 EPIDEMIOLOGY WORKFORCE

2.6.1 Applied epidemiology training program, such as the field epidemiology training program, for public health professionals and veterinarians (e.g., Field Epidemiology Training Program [FETP] and Field Epidemiology Training Program for Veterinarians [FETPV])

2.6.1a

Does the country meet one of the following criteria?

- Applied epidemiology training program (such as FETP) is available in country
- Resources are provided by the government to send citizens to another country to participate in applied epidemiology training programs (such as FETP)

Needs to meet at least one of the criteria to be scored a 1 on this measure. , Yes for both = 1 , Yes for one = 1 , No for both = 0

Current Year Score: 1

There is publicly available evidence that an applied epidemiology training program (ie FETP) is available in Thailand, and there is evidence that resources are provided by the government to send citizens to another country to participate in applied

epidemiology training programs. FETP and FETPV are both available in Thailand; and as part of the programme, public health professionals and veterinarians are sent abroad for study visits. [1] According to the WHO Joint External Evaluation in June 2017, Thailand supports three different levels of field epidemiology training (FETP), which are 8 months, 1 year, and 2 years; each targeting a different level of the public health system (national, provincial/regional, and district). The Bureau of Epidemiology in the Ministry of Public Health, is a WHO Collaborating Centre for Field Epidemiology. The Thai FETP supports regional capacity building by training staff from other countries through their International field epidemiology training programmes. [2, 3] Public health professionals and veterinarians in the Thai FETP are given the opportunity to be sent abroad for study visits during the second year of the programme. [1, 4] During the period of enrollment, public health professionals and veterinarians will be considered an employee/government official of the Ministry of Public Health, and will receive, for instance, salary, benefits, and per diem (for travel and accommodation). [4] The same applies for those who enroll in the FETP-Ph. D. program. [5]

[1] Veterinary Epidemiology Development Center Website. "Field Epidemiology Training Program for Veterinarian" [http://164.115.23.67/vetepidem/?ipage=about_fetpv]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint External Evaluation of IHR Core Capacities of the Kingdom of Thailand Mission report: June 26-30, 2017". World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] International Field Epidemiology Training-Thailand Website. "International Field Epidemiology Training Program (IFETP) - Thailand". [http://www.interfetpthailand.net/course_index.php?1c092a1b53a7a471fe7c04735dad699b=training_for_md]. Accessed August 2020.

[4] International Field Epidemiology Training-Thailand Website. "Medical Residency Training". [http://www.interfetpthailand.net/course_index.php?1c092a1b53a7a471fe7c04735dad699b=course_thai_medi]. Accessed August 2020.

[5] International Field Epidemiology Training-Thailand Website. "FETP-Ph.D.". [http://www.interfetpthailand.net/course_index.php?1c092a1b53a7a471fe7c04735dad699b=course_thai_phd]. Accessed October 2020.

2.6.1b

Are the available field epidemiology training programs explicitly inclusive of animal health professionals or is there a specific animal health field epidemiology training program offered (such as FETPV)?

Yes = 1 , No = 0

Current Year Score: 1

There are field epidemiology training programs which are inclusive of animal health professionals and FETPV which is specific to animal health. The International Field Epidemiology Training-Thailand offers FETP programmes for veterinarians. Later in 2008, a more specific programme for veterinarians was developed called FETPV. The program's aim is to produce qualified and experienced veterinary field epidemiologists who can provide the expertise and service including participation in multi-disciplinary rapid response teams (SRRT) in order to address transboundary and emerging infectious diseases that are of increasing concern to the health of animals, humans and the environment. FETPV training centre is located in the Department of Livestock Development in Bangkok. Instructors participating in FETPV include academic instructors from Thailand's major medical and veterinary faculties as well as epidemiologists from Thailand Ministry of Health and Ministry of Agriculture and Cooperatives. FETPV activities have the support of United States Agency for International Development (USAID), Food and Agriculture Organization (FAO), and U.S. Centers for Disease Control and Prevention (CDC). [1, 2, 3, 4]

[1] International Field Epidemiology Training-Thailand Website. "Learning by Doing". [http://www.interfetpthailand.net/cou_index.php]. Accessed August 2020.

[2] Veterinary Epidemiology Development Center, Bureau of Disease Control and Veterinary Services, Department of Livestock, Ministry of Agriculture and Cooperatives Website. "Field Epidemiology Training Program for Veterinarian".

[http://164.115.23.67/vetepidem/?ipage=about_fetpv_en]. Accessed August 2020.

[3] International Field Epidemiology Training-Thailand Website. "International Field Epidemiology Training Program (IFETP) - Thailand". [http://www.interfetpthailand.net/course_index.php?1c092a1b53a7a471fe7c04735dad699b=training_for_md].

Accessed August 2020.

[4] International Field Epidemiology Training-Thailand Website. "Medical Residency Training".

[http://www.interfetpthailand.net/course_index.php?1c092a1b53a7a471fe7c04735dad699b=course_thai_medi]. Accessed August 2020.

2.6.2 Epidemiology workforce capacity

2.6.2a

Is there public evidence that the country has at least 1 trained field epidemiologist per 200,000 people?

Yes = 1 , No = 0

Current Year Score: 1

2020

Completed JEE assessments; Economist Impact analyst qualitative assessment based on official national sources, which vary by country

Category 3: Rapid response to and mitigation of the spread of an epidemic

3.1 EMERGENCY PREPAREDNESS AND RESPONSE PLANNING

3.1.1 National public health emergency preparedness and response plan

3.1.1a

Does the country have an overarching national public health emergency response plan in place which addresses planning for multiple communicable diseases with epidemic or pandemic potential?

Evidence that there is a plan in place, and the plan is publicly available = 2, Evidence that the plan is in place, but the plan is not publicly available OR, Disease-specific plans are in place, but there is no evidence of an overarching plan = 1, No evidence that such a plan or plans are in place = 0

Current Year Score: 2

Thailand has an overarching national public health emergency response plan in place which addresses planning for multiple communicable diseases with epidemic or pandemic potential such as the National Disaster Prevention and Mitigation plan B.E.2558 (2015) and Action Plan for Surveillance, Prevention and Control of Communicable Disease. The latter is updated every three years. [1, 2] The country includes pandemics in their National Disaster Prevention and Mitigation plan B.E.2558 (2015). This plan discusses hazard-specific, including pandemic, government agencies and management system. [1] In case of emergency, Standard Operating Procedures (SOP) is laid out in the guideline for the Public Health Emergency Incident

Command System: (PHEICS). This guideline applies for pandemics as well. [3] In addition, the Department of Disease Control (DDC) has published the "Action Plan for Surveillance, Prevention and Control of Communicable Disease". The overarching strategy in the plan is intended for any types of disease outbreak but the plan also provides disease-specific action plans. This action plan discusses key performance indicators (KPIs) for the surveillance, prevention, and control of prioritized communicable diseases. It also reports the budget allocated to achieve each KPI as can be seen in the Action Plan for 2016-2018. [2, 4] Additionally, according to the Joint External Evaluation for Thailand, completed in June 2017, Thailand is scored 4 (out of 5) for "National multi-hazard public health emergency preparedness and response plan is developed and implemented". The score of 4 implies that Thailand has a long-established multi-hazard emergency response function; strong policy support; systematic preparation of surge capacity and resource mobilization including training for surge staff; extensive training on emergency operations centres and incident command systems for Department of Disease Control staff; financial preparation for emergency responses at the national and sub-national level; and systematic implementation of emergency operations centres and situation awareness teams at the central and regional levels. [5]

[1] Department of Disaster Prevention and Mitigation (DDPM). 2015. National Disaster Prevention and Mitigation plan B.E.2558 (2015). [http://122.155.1.143/upload/download/file_attach/55acacb4f1f7c.pdf]. Accessed August 2020.

[2] Department of Disease Control (DDC). 2016. "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2559-2061 (2016-2018): According to the Communicable Disease Act B.E.2558 (2015)." [https://cabinet.soc.go.th/doc_image/2559/9931952067.pdf]. Accessed August 2020.

[3] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS." [<https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf>]. Accessed August 2020.

[4] Department of Disease Control (DDC). "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2562-2064 (2019-2021): According to the Communicable Disease Act B.E.2558 (2015)." [http://dcd.ddc.moph.go.th/uploads/file/RAW_1/1.pdf]. Accessed October 2020.

[5] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017." World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

3.1.1b

If an overarching plan is in place, has it been updated in the last 3 years?

Yes = 1, No /no plan in place= 0

Current Year Score: 1

Thailand's overarching public health emergency response plan has been updated in the last 3 years. "Action Plan for Surveillance, Prevention and Control of Communicable Disease" has been updated and published with the latest version accounting for the period of 2019-2021. [1] The action plan contributes to the public health emergency preparedness by setting key performance indicators (KPIs) and action plans for each of the involved government agencies, e.g. hospitals, government units within the Ministry of Public Health, the Thai Food and Drug Association, Ministry of Interior, and Ministry of Defence. [1, 2]

[1] Department of Disease Control (DDC). "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2562-2064 (2019-2021): According to the Communicable Disease Act B.E.2558 (2015)." [http://dcd.ddc.moph.go.th/uploads/file/RAW_1/1.pdf]. Accessed October 2020.

[2] Department of Disease Control (DDC). 2016. "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2559-2061 (2016-2018): According to the Communicable Disease Act B.E.2558 (2015)." [https://cabinet.soc.go.th/doc_image/2559/9931952067.pdf]. Accessed August 2020.

3.1.1c

If an overarching plan is in place, does it include considerations for pediatric and/or other vulnerable populations?

Yes = 1 , No /no plan in place= 0

Current Year Score: 1

The overarching plan includes considerations for pediatric and/or other vulnerable populations. For instance, the Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2559-2561 (2016-2018) explicitly mentions considerations for pediatric and/or other vulnerable populations such as elderly, high risk groups (e.g. people with high exposure to patients, population with no legal rights, migrants, prisoners, chronically ill persons, addicts, etc.). [1] The Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2562-2564 (2019-2021) follows a similar framework [2]. In these plans, there are explicit mentions of how pediatric and vulnerable populations are treated within the plan especially for prioritized communicable diseases. For instance, for TB, the top 3 hot spot districts in each provinces in Thailand will be given priorities, particularly the following population: international migrants, population with no legal rights, HIV/AIDS patients, prisoners, elderly, people with chronic diabetes, caretakers and those with high exposure, addicts, and medical staff , whereas appropriate Key Performance Indicators (KPIs) will be applied [1, 2].

[1] Department of Disease Control (DDC). 2016. "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2559-2061 (2016-2018): According to the Communicable Disease Act B.E.2558 (2015)."

[https://cabinet.soc.go.th/doc_image/2559/9931952067.pdf]. Accessed August 2020.

[2] Department of Disease Control (DDC). 2019. "The Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2562-2564 (2019-2021)". [<http://dcd.ddc.moph.go.th/uploads/file/RAW/AW%20Plan%206302-24%20AGD.pdf>]. Accessed August 2020.

3.1.1d

Does the country have a publicly available plan in place specifically for pandemic influenza preparedness that has been updated since 2009?

Yes = 1 , No = 0

Current Year Score: 1

2020

WHO Strategic Partnership for IHR and Health Security (SPH)

3.1.2 Private sector involvement in response planning

3.1.2a

Does the country have a specific mechanism(s) for engaging with the private sector to assist with outbreak emergency preparedness and response?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has specific mechanisms for engaging with the private sector to assist with outbreak emergency preparedness and response. Strategy 5 of Thailand's National Strategic Plan for Emerging Infectious Diseases 2017-2021 includes mechanisms to strengthen the involvement of civil society and the private sector to prevent and control emerging infectious diseases. The strategy focuses on building capacity for private sector, specifically slaughterhouses, private hospitals, livestock businesses,

to prevent and control emerging infectious diseases through training; knowledge sharing platforms for databases and best practices; and assistance to comply with Wild Animal Reservation and Protection Act B.E.2535(1992), Animal Epidemics Act B.E.2558(2015), and Communicable Disease Act B.E.2558(2015).[1] In terms of response, Thailand's Public Health Emergency Incident Command System (PHEICS) assigned private hospitals as one of the actors in the Multi-Agency Coordination (MAC) group. Other institutions in the MAC group include government hospitals not supervised by the Ministry of Public Health, and provincial disaster prevention and mitigation offices. In response to each emergency case, the incident commander (IC) will decide the extent to which each of these MAC group institutions should provide support. In addition, provincial public health offices can request for supports from private hospitals, either in the form of emergency government procurement or donation.[1] This includes requests for health personnel, medicine, and medical equipment.[2]

[1] Bureau of Emerging Infectious Diseases. 2017. "National Strategic Plan for Emerging Infectious Diseases 2017-2021". Bureau of Emerging Infectious Diseases, Department of Disease Control, Ministry of Public Health.

[http://ddcenter.ddc.moph.go.th/infoc/download/201706151497519218_151159_2.pdf]. Accessed August 2020.

[2] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS". [<https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf>]. Accessed August 2020.

3.1.3 Non-pharmaceutical interventions planning

3.1.3a

Does the country have a policy, plan and/or guidelines in place to implement non-pharmaceutical interventions (NPIs) during an epidemic or pandemic?

Yes, a policy, plan and/or guidelines are in place for more than one disease = 2, Yes, but the policy, plan and/or guidelines exist only for one disease = 1, No = 0

Current Year Score: 2

Thailand has a policy, plan and/or guidelines in place to implement non-pharmaceutical interventions (NPIs) during an epidemic or pandemic, with guidelines in place for more than one disease. Thailand's National Strategic Plan for Emerging Infectious Diseases 2017-2021, which has been adopted by the Thai Cabinet on 7 December 2016, outlines six strategies to reduce risk of infection, illness, death and negative impacts from emerging infectious diseases. The document mentions non-pharmaceutical interventions (NPIs) with specific criteria outlined for when NPIs are implemented such as quarantine at the border; transfer of a suspected person with new emerging diseases from-to abroad; contract tracing; and so on. [1, 2] Some provinces in Thailand also implements rehearsal of an Emerging Infectious Diseases response plan at the provincial level which covers non-pharmaceutical interventions in different scenarios. [3] Thailand also has policies in place for non-pharmaceutical interventions specifically for COVID-19. The details are outlined in Section 3: Emergency declaration; and Section 4: Measures in accordance with the Royal Decree of the Administration - Government service in emergency situations 2005 and practices related to Public health. These interventions include, for instance, wearing masks in public spaces, frequent and thorough handwashing, availability of hand sanitizer, etc. [4]

[1] Bureau of Emerging Infectious Diseases. 2017. "National Strategic Plan for Emerging Infectious Diseases 2017-2021". Bureau of Emerging Infectious Diseases, Department of Disease Control, Ministry of Public Health

[<https://www.dropbox.com/s/r36tgnjny9zp6iz/%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%A2%E0%B8%B8%E0%B8%97%E0%B8%98%E0%B8%A8%E0%B8%B2%E0%B8%AA%E0%B8%95%E0%B8%A3%E0%B9%8C%E0%B9%80%E0%B8%95%E0%B8%A3%E0%B8%B5%E0%B8%A2%E0%B8%A1%E0%B8%84%E0%B8%A7%E0%B8%B2%E0%B8%A1%E0%B8%9E%E0%B8%A3%E0%B9%89%E0%B8%AD%E0%B8%A1%20%E0%B8%9B%E0%B9%89%E0%B8%AD%E0%B8%87%E0%B8%81%E0%B8%B1%E0%B8%99%E0%B8%AF.pdf?dl=0>reposerereerdsfsdfsdf]. Accessed August 2020.

[2] Ministry of Public Health. 2018. "Disease Control Journal Vol 44 No.1 Jan - Mar 2018. Development of Thailand National

Strategic Plan for Emerging Infectious Diseases 2017-2021". [<https://tci-thaijo.org/index.php/DCI/article/view/147375>]. Accessed August 2020.

[3] Chiang Mai Provincial Public Health Office, Disease Control Division. "Manual for participants in the practice of the Integrated Response Plan - Middle East Respiratory Disease MERS - CoV. Chiang Mai Province, Year 2015".

[http://www.chiangmaihealth.go.th/cmpho_web/document/160125145370862618.docx]. Accessed August 2020.

[4] Ministry of Public Health. 3 April 2020. "Public health practice to manage the COVID-19 epidemic - with the requirements issued in accordance with the provisions of Section 9 Of the Emergency Decree on Public Administration in an Emergency Situation 2005 (No. 1)". [https://ddc.moph.go.th/viralpneumonia/file/g_other/g_other02.pdf]. Accessed August 2020.

3.2 EXERCISING RESPONSE PLANS

3.2.1 Activating response plans

3.2.1a

Does the country meet one of the following criteria?

- Is there evidence that the country has activated their national emergency response plan for an infectious disease outbreak in the past year?

- Is there evidence that the country has completed a national-level biological threat-focused exercise (either with WHO or separately) in the past year?

Needs to meet at least one of the criteria to be scored a 1 on this measure. , Yes for both = 1 , Yes for one = 1 , No for both = 0

Current Year Score: 1

There is no publicly available evidence that indicates Thailand has completed a national-level biological threat-focused exercise (either with WHO or separately) in the past year, however there is evidence that Thailand has activated their national emergency response plan for an infectious disease outbreak in the past year. The last national-level biological threat-focused exercise with WHO was completed on 29 January 2018. [1] No relevant information can be found on the Ministry of Public Health's website nor the Office of the National Security Council' website. [2, 3] Thailand has activated their national emergency response plan for an infectious disease outbreak particularly for Covid-19. For instance, Announcement of Emergency Operations Center for Medical and Public Health Regarding the Coronavirus - Rules and guidelines for Quarantine Sites. [4] The country also use their existing laws and response plans to guide the response, such as the Communicable Disease Act B.E.2558 (2015) and the Emergency Decree on Public Administration in Emergency Situations B.E. 2548 (2005). [5, 6, 7]

[1] World Health Organization. Updated 2020. "Simulation Exercise". [<https://extranet.who.int/sph/simulation-exercise>]. Accessed August 2020.

[2] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[3] Office of the National Security Council Website. [<http://www.nsc.go.th/>]. Accessed October 2020.

[4] Covid Situation Center, Office of the Permanent Secretary of Interior Ministry. 22 May 2020. "Announcement of Emergency Operations Center for Medical and Public Health Regarding the Coronavirus - Rules and guidelines for Quarantine Sites". [<http://www.moicovid.com/wp-content/uploads/2020/05/%E0%B8%A8%E0%B8%9A%E0%B8%84.%E0%B8%A1%E0%B8%97.%E0%B8%A1%E0%B8%97-0230-%E0%B8%A72929-%E0%B8%A5%E0%B8%A7.-22-%E0%B8%9E.%E0%B8%84.-63-%E0%B9%81%E0%B8%88%E0%B9%89%E0%B8%87-%E0%B8%9C%E0%B8%A7%E0%B8%88.%E0%B8%97%E0%B8%B8%E0%B8%81%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94-%E0%B9%80%E0%B8%A3%E0%B8%B7%E0%B9%88%E0%B8%AD%E0%B8%87->

%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%81%E0%B8%B3%E0%B8%AB%E0%B8%99%E0%B8%94%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%99%E0%B8%97%E0%B8%B5%E0%B9%88%E0%B8%81%E0%B8%B1%E0%B8%81%E0%B8%81%E0%B8%B1%E0%B8%99.pdf]. Accessed August 2020.

[5] Communicable Disease Act B.E.2558 (2015). [http://web.krisdika.go.th/data//document/ext809/809778_0001.pdf]. Accessed August 2020.

[6] Government Gazette No. 122 Section 58 Gor. 16 July 2005. "the Emergency Decree on Public Administration in Emergency Situations B.E. 2548 (2005)". [https://ddc.moph.go.th/viralpneumonia/file/laws/laws_08.pdf]. Accessed August 2020.

[7] Department of Disease Control. Updated 2020. "Covid-19: Related Laws and Regulations". [<https://ddc.moph.go.th/viralpneumonia/laws.php>]. Accessed August 2020.

3.2.1b

Is there evidence that the country in the past year has identified a list of gaps and best practices in response (either through an infectious disease response or a biological-threat focused exercise) and developed a plan to improve response capabilities?

Yes, the country has developed and published a plan to improve response capacity = 2 , Yes, the country has developed a plan to improve response capacity, but has not published the plan = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence to suggest that, within the past year, Thailand has identified a list of gaps and best practices in response (either through an infectious disease response or a biological-threat focused exercise) and developed a plan to improve response capabilities. A review of the WHO IHR webpage did not reveal that Thailand has undergone an IHR after action review. [1] Additional search through other WHO pages, news media, Ministry of Public Health (MOPH) and Ministry of Agriculture and Cooperative (MOAC) did not reveal evidence that Thailand has undergone an exercise to identify gaps and best practices through either a comprehensive after-action-review or a biological threat with the WHO. [2, 3, 4, 5, 6, 7, 8, 9] Available evidence shows that WHO conducted an assessment of Ebola virus disease preparedness in the South-East Asia Region, including Thailand in 2015. [10] The Ministry of Public Health and the World Health Organization also jointly reviewed the response efforts and lessons learned from Influenza A(H1N1)pdm09 pandemic in Thailand in 2009. [11] Based on the WHO Thailand Situation Report on Covid-19 in July 2020, an 'after action review' is being considered to learn lessons and inform guidance for prevention and response of similar events in the future. Nonetheless, there is no publicly available evidence whether the exercise has been conducted, nor whether Thailand has identified a list of gaps and best practices and developed a plan to improve response capabilities [12].

[1] WHO. 2018. "Strategic Partnership for International Health Regulations (2005) and Health Security (SPH): After Action Review." [<https://extranet.who.int/sph/after-action-review>]. Accessed August 2020.

[2] WHO South-East Asia Website. [<https://www.who.int/southeastasia>]. Accessed September 2020.

[3] WHO Thailand Website. [<https://www.who.int/thailand/>]. Accessed September 2020.

[4] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.

[5] Bangkok Post Website. [<https://www.bangkokpost.com/>]. Accessed October 2020.

[6] Associated Press Website. [<https://apnews.com/>]. Accessed October 2020.

[7] Thai Rath Online. [<https://www.thairath.co.th/news>]. Accessed October 2020.

[8] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[9] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

[10] WHO. 22 September 2016. "Assessment of Ebola virus disease preparedness in the WHO South-East Asia Region". [<https://www.who.int/bulletin/volumes/94/12/16-174441/en/>]. Accessed September 2020.

[11] Ungchusak, K. et al. July 2012. "Lessons Learned from Influenza A(H1N1)pdm09 Pandemic Response in Thailand".

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3376790/#__sec1title]. Accessed September 2020.

[12] WHO. 21 July 2020. "Coronavirus disease 2019 (COVID-19). WHO Thailand Situation Report".

[<https://reliefweb.int/sites/reliefweb.int/files/resources/2020-07-21-tha-sitrep-97-covid19-r02.pdf>]. Accessed September 2020.

3.2.2 Private sector engagement in exercises

3.2.2a

Is there evidence that the country in the past year has undergone a national-level biological threat-focused exercise that has included private sector representatives?

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence to suggest that, within the past year, Thailand has undergone a national-level biological threat-focused exercise that has included private sector representatives. A review of WHO IHR portal and other WHO pages as well as press releases and documents from the Ministry of Health and the Ministry of Agriculture and Cooperatives did not reveal that Thailand has undergone such exercise/after action review. [1, 2, 3, 4, 5, 6, 7]

[1] World Health Organization. 2020. "Strategic Partnership for International Health Regulations (2005) and Health Security (SPH): After Action Review." [<https://extranet.who.int/sph/after-action-review>]. Accessed September 2020.

[2] WHO South-East Asia Website. [<https://www.who.int/southeastasia>]. Accessed September 2020.

[3] WHO Thailand Website. [<https://www.who.int/thailand/>]. Accessed September 2020.

[4] World Health Organization. Updated 2020. "Simulation Exercise". [<https://extranet.who.int/sph/simulation-exercise>]. Accessed August 2020.

[5] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed October 2020.

[6] Ministry of Agriculture and Cooperatives Website. [<https://www.moac.go.th/>]. Accessed October 2020.

[7] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.

3.3 EMERGENCY RESPONSE OPERATION

3.3.1 Emergency response operation

3.3.1a

Does the country have in place an Emergency Operations Center (EOC)?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has an Emergency Operations Centre (EOC) operating under the Bureau of Health Emergency Response, Ministry of Public Health. [1] The Joint External Evaluation for Thailand, completed in June 2017, also states that Thailand has an EOC. [2] The EOC acts as a centre of command during emergency situations which include emerging infectious disease, and natural disasters. [3, 4]

[1] Bureau of Health Emergency Response, Ministry of Public Health Website. [<https://pher.moph.go.th/wordpress/>]. Accessed August 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017". World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] Department of Disease Control. 2018. "Annual Report 2017". Department of Disease Control.

[http://plan.ddc.moph.go.th/AnnualReport_DDC/AnnualReport2560.pdf]. Accessed August 2020.

[4] Public Health Emergency Management, Incidence Command System and Emergency Operations Center, Department of Disease Control. (PHEM, ICS & EOC) Presentation. 2016. "EOC Development Policy of the Department of Disease Control".

[http://envoc.ddc.moph.go.th/uploads/meeting-and-training/11Jan_Mida_ICES_EOC/Slide1_%20ICS.pdf]. Accessed August 2020.

3.3.1b

Is the Emergency Operations Center (EOC) required to conduct a drill for a public health emergency scenario at least once per year or is there evidence that they conduct a drill at least once per year?

Yes = 1 , No = 0

Current Year Score: 1

There is publicly available evidence that the Emergency Operations Centre (EOC) is required to conduct a drill at least once per year. According to the Joint External Evaluation for Thailand, completed in June 2017, the EOC in Thailand either conducts drills or has to respond to real events at least once a year. [1] Furthermore, the Thailand Disaster Management Reference Handbook 2018 gives Thailand the score of 4 out of 5 based on the Hyogo Framework for Action (HFA) for 'Disaster preparedness plans and contingency plans are in place at all administrative levels, and regular training drills and rehearsals are held to test and develop disaster response programs' (with 4 equals to Substantial achievement attained but with recognized limitations in key aspects, such as financial resources and/or operational capacities). [2] The Drills are usually epidemic-specific. For example, EOC conducted a drill on Avian Influenza (H7N9) outbreaks in 2018, Avian Influenza (H5N1) outbreaks in 2017, Ebola outbreaks in 2015, MERS-CoV outbreaks in 2013. [3,4,5,6]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017)." World Health Organization. Country office of Thailand.

[<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Center for Excellence in Disaster Management & Humanitarian Assistance. May 2018. "the Thailand Disaster Management Reference Handbook 2018". [<https://reliefweb.int/sites/reliefweb.int/files/resources/disaster-mgmt-ref-hdbk-thailand.pdf>]. Accessed August 2020.

[3] Daily News. 18 Jul 2018. "Suvannabhumi Airport and The Department of Disease Control Conduct an Avian Influenza Emergency Response Operation Drill". [<https://www.dailynews.co.th/economic/655569>]. Accessed August 2020.

[4] Ministry of Public Health (MOPH). 2017. "Emergency situation drill: the case of H5N1."

[http://110.164.192.180/pher/view_topic_popup.php?idview=590]. Accessed August 2020.

[5] Ministry of Public Health (MOPH). 2014. "Emergency situation drill (Ebola Virus Disease: EVD)."

[http://110.164.192.180/pher/fileupload_doc/2014-09-08-14806067.pdf]. Accessed August 2020.

[6] Ministry of Public Health (MOPH). 2014. "Emergency situation drill and Evaluation for Preparedness in Medical Personnel for EVD and MERS-CoV." [http://110.164.192.180/pher/fileupload_doc/2014-09-16-14816088.pdf]. Accessed August 2020.

3.3.1c

Is there public evidence to show that the Emergency Operations Center (EOC) has conducted within the last year a coordinated emergency response or emergency response exercise activated within 120 minutes of the identification of the public health emergency/scenario?

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence to suggest that the EOC can conduct, or has conducted within the last year, a coordinated emergency response or emergency response exercise activated within 120 minutes of the identification of the public health emergency/scenario. The Joint External Evaluation for Thailand, completed in June 2017, states that the EOC was not yet capable of activating a coordinated emergency response or exercise within 120 minutes of the identification of a public health emergency. [1] Although the ability to activate the EOC and prepare a spot report within 120 minutes of the identification of a public health emergency is one of the KPIs in the "Inspection Guideline for the Budget Year 2561 (B.C.2018)" issued by the Ministry of Public Health, there is no public evidence to suggest that the National EOC or the provincial EOCs has achieved such a goal. [2] Such information cannot be found through reviews of news media, the Bureau of Health Response's website, the Ministry of Public Health's website, or Provincial Health Offices' websites. [3,4] In light of COVID-19, the Health Emergency Operations Centre (HEOC) was activated as early as 3 January. An early activation signals a functioning system is already in place prior to an emergency unfolding, thus positioning the response more effectively; and an online reporting system was adopted to collect information in real time, reducing the risk of delays [5]. However, this does not automatically translate into a coordinated emergency response or emergency response exercise activated within 120 minutes of the identification of the public health emergency.

[1] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017." World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Ministry of Public Health (MOPH). 2018. "Inspection Guideline for the Budget Year 2561 [B.C.2018]." Ministry of Public Health.

[[http://203.157.229.18/inspec/2561/inspec1/doc22dec/%E0%B9%80%E0%B8%A5%E0%B9%88%E0%B8%A1%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3%20%E0%B8%9B%E0%B8%B5%202561%20\(%E0%B8%81%E0%B8%AD%E0%B8%87%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3\)/%E0%B9%80%E0%B8%A5%E0%B9%88%E0%B8%A1%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3%20%E0%B8%9B%E0%B8%B5%2061%20\(file%20word/018.%20Inspection%20Guideline%20%E0%B8%A3%E0%B9%89%E0%B8%AD%E0%B8%A2%E0%B8%A5%E0%B8%B0%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94%E0%B8%A1%E0%B8%B5%E0%B8%A8%E0%B8%B9%E0%B8%99%E0%B8%A2%E0%B9%8C%E0%B8%9B%E0%B8%8F%E0%B8%B4%E0%B8%9A%E0%B8%B1%E0%B8%95%E0%B8%B4%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%A0%E0%B8%B2%E0%B8%A7%E0%B8%B0%E0%B8%89%E0%B8%B8%E0%B8%81%E0%B9%80%E0%B8%89%E0%B8%B4%E0%B8%99\(EOC\).doc](http://203.157.229.18/inspec/2561/inspec1/doc22dec/%E0%B9%80%E0%B8%A5%E0%B9%88%E0%B8%A1%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3%20%E0%B8%9B%E0%B8%B5%202561%20(%E0%B8%81%E0%B8%AD%E0%B8%87%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3)/%E0%B9%80%E0%B8%A5%E0%B9%88%E0%B8%A1%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%95%E0%B8%A3%E0%B8%A7%E0%B8%88%E0%B8%A3%E0%B8%B2%E0%B8%8A%E0%B8%81%E0%B8%B2%E0%B8%A3%20%E0%B8%9B%E0%B8%B5%2061%20(file%20word/018.%20Inspection%20Guideline%20%E0%B8%A3%E0%B9%89%E0%B8%AD%E0%B8%A2%E0%B8%A5%E0%B8%B0%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94%E0%B8%A1%E0%B8%B5%E0%B8%A8%E0%B8%B9%E0%B8%99%E0%B8%A2%E0%B9%8C%E0%B8%9B%E0%B8%8F%E0%B8%B4%E0%B8%9A%E0%B8%B1%E0%B8%95%E0%B8%B4%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%A0%E0%B8%B2%E0%B8%A7%E0%B8%B0%E0%B8%89%E0%B8%B8%E0%B8%81%E0%B9%80%E0%B8%89%E0%B8%B4%E0%B8%99(EOC).doc)]. Accessed August 2020.

[3] Bureau of Health Emergency Respond Website. [<http://110.164.192.180/pher/index2.php>]. Accessed August 2020.

[4] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed August 2020.

[5] WHO News Website. 9 March 2020. "Indonesia Ministry of Health Officials visit Thailand on COVID-19 emergency response". [<https://www.who.int/indonesia/news/detail/09-03-2020-indonesia-ministry-of-health-officials-visit-thailand-on-covid-19-emergency-response>]. Accessed August 2020.

3.4 LINKING PUBLIC HEALTH AND SECURITY AUTHORITIES

3.4.1 Public health and security authorities are linked for rapid response during a biological event

3.4.1a

Does the country meet one of the following criteria?

- Is there public evidence that public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event (i.e., bioterrorism attack)?
- Are there publicly available standard operating procedures, guidelines, memorandums of understanding (MOUs), or other agreements between the public health and security authorities to respond to a potential deliberate biological event (i.e., bioterrorism attack)?

Needs to meet at least one of the criteria to be scored a 1 on this measure., Yes for both = 1, Yes for one = 1, No for both = 0

Current Year Score: 1

There is public evidence that public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event (i.e., bioterrorism attack). According to "Summary of the Exercise for the Integrated Plan for Public Health Emergency Response - Case of Biological Threats (2016)", the Department of Disease Control led a tabletop exercise on 12 September 2016. The exercise was a scenario where a letter containing white powder containing anthrax was found. The exercise was participated by Bureau of Health Emergency Respond, Bamrasnaradura Infectious Diseases Institute, Bangkok Medical Service Department, Thailand Post Company Limited, Office of Police Forensic Science, Department of Medical Science, Department of Disease Control, Urban Disease Prevention and Control Institute, and other departments from the Ministry of Public Health. [1]

There are also publicly available standard operating procedures, guidelines, memorandums of understanding (MOUs), or other agreements between the public health and security authorities to respond to a potential deliberate biological event (i.e., bioterrorism attack). The Joint External Evaluation for Thailand (JEE), completed in June 2017, states that "Thailand has multi-sectoral collaboration mechanisms in place for responding to public health events of suspected or confirmed deliberate origin. These mechanisms for collaboration between public health and security authorities are supported by legislation, policies, and memoranda of understanding". Moreover, Thailand has standard operating procedures, guidelines and MOU between the Ministry of Public Health and the National Security Council with regard to respond to a potential biological event.[2] Biological threat is included in the 'National Disaster Prevention and Mitigation plan B.E.2558 (2015)', the 'Royal Police Disaster Risk Management Plan B.E.2559 (2016)'. [3, 4] The 'Public Health Emergency Incident Command System: PHEICS' also describes Standard Operating Procedures (SOP) which applies for biological events as well.[5] The Joint External Evaluation for Thailand, completed in June 2017, also states that the Ministry of Public Health has prepared a guidelines for responding to biological threats, where a table-top exercise has been carried according to this guideline.[1] The guidelines cover aspects of responses to a potential deliberate biological event (e.g. bioterrorism) and new emerging diseases. [6]

[1] Department of Disease Control , Ministry of Public Health. September 2017. "Summary of the Exercise for the Integrated Plan for Public Health Emergency Response - Case of Biological Threats (2016)". [http://e-lib.ddc.moph.go.th/pdf/material_673/material_673.pdf]. Accessed October 2020.

[2] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017)." World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[3] Department of Disaster Prevention and Mitigation (DDPM). 2015. National Disaster Prevention and Mitigation plan B.E.2558 (2015). [http://122.155.1.143/upload/download/file_attach/55acacb4f1f7c.pdf]. Accessed August 2020.

- [4] Royal Thai Police. 2016. "Royal Police Disaster Risk Management Plan 2016." [http://rtpstrategy.police.go.th/web2013/wp-content/uploads/2016/02/dangerplan59.pdf]. Accessed August 2020.
- [5] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS." [https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf]. Accessed August 2020.
- [6] Department of Disease Control, Ministry of Public Health. "Guidelines for public health emergencies from emerging infectious diseases, biological weapons and network". [http://e-lib.ddc.moph.go.th/pdf/material-36/material-36.pdf]. Accessed August 2020.

3.5 RISK COMMUNICATIONS

3.5.1 Public communication

3.5.1b

Does the risk communication plan (or other legislation, regulation or strategy document used to guide national public health response) outline how messages will reach populations and sectors with different communications needs (eg different languages, location within the country, media reach)?

Yes = 1 , No = 0

Current Year Score: 1

Thailand's risk communication strategy outlines how messages will reach populations and sectors with different communications needs. Thailand has a "Guideline on Crisis Risk Communication" which outlines how messages will reach populations and sectors with different communications needs.[1] The guideline was prepared by the Bureau of Risk Communication and Health Behaviour Development (BRCHBD) to promote effective risk communication in Thailand. This refers to better communications with Thai nationals and foreigners living in Thailand about health-related crises, timely and accurate information to key stakeholders.[2] The guideline discusses how risk should be communicated under public health emergencies. This includes 1) type of media utilized, 2) timing, 3) preparation guidelines for press interview, media interview, press conference, press release. The guideline also discusses how messages should reach different population sub-groups, e.g. general population, migrant workers and tourists. Case studies on risk communication under Zika, MERS-CoV, and H5N1 epidemics also included in the guideline. [1] There is evidence of an updated plan going through a review. The new plan also outlines how messages will reach populations and sectors with different communications needs such as elderly population. [3, 4]

[1] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2016. "Guideline on Crisis Risk Communication." Ministry of Public Health. [http://law.disaster.go.th/site2/download-src.php?did=30581]. Accessed August 2020.

[2] Bureau of Risk Communication and Health Behavior Development (BRCHBD). 2019. "About: Vision, Mission, Incumbency and Department." [https://ddc.moph.go.th/brc/mission.php]. Accessed August 2020.

[3] Committee of the Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 4 September 2019. "Meeting Notes on the Master Plan on Risk Communication during a Crisis and Normal Situation". [http://secretary.dms.moph.go.th/dataconference/9-2562/content5.10.pdf]. Accessed August 2020.

[4] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2019. "Draft Master Plan on Risk Communication during a Crisis and Normal Situation". [https://drive.google.com/file/d/1bKMw5fLoEwFks6ld8Ailyj_UTo5O9A74/view]. Accessed August 2020.

3.5.1 Risk communication planning

3.5.1a

Does the country have in place, either in the national public health emergency response plan or in other legislation, regulation, or strategy documents, a section detailing a risk communication plan that is specifically intended for use during a public health emergency?

Yes = 1, No = 0

Current Year Score: 1

Thailand incorporates a risk communication plan that is specifically intended for use during a public health emergency in its national disaster plan. The Joint External Evaluation for Thailand, completed in June 2017, states that risk communication is integrated into plans at all levels including the National Disaster Prevention and Mitigation Plan B.E.2558 (2015). [1,2] In addition, the Bureau of Risk Communication and Health Behaviour Development (BRCHBD) was established in 2012 to promote effective risk communication in Thailand. This refers to better communications with Thai nationals and foreigners living in Thailand about health-related crises, timely and accurate information to key stakeholders. The BRCHBD issues the "Guideline on Crisis Risk Communication" for the use of their officers. This guidelines discusses how risk should be communicated under public health emergencies. It also includes case studies on risk communication under Zika, MERS-CoV, and H5N1 epidemics.[3] There is an evidence of an updated plan going through a review. [4, 5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017." World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Department of Disaster Prevention and Mitigation (DDPM). 2015. National Disaster Prevention and Mitigation plan B.E.2558 (2015). [http://122.155.1.143/upload/download/file_attach/55acacb4f1f7c.pdf]. Accessed August 2020.

[3] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2016. "Guideline on Crisis Risk Communication". Ministry of Public Health. [<http://law.disaster.go.th/site2/download-src.php?did=30581>]. Accessed August 2020.

[4] Committee of the Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 4 September 2019. "Meeting Notes on the Master Plan on Risk Communication during a Crisis and Normal Situation". [<http://secretary.dms.moph.go.th/dataconference/9-2562/content5.10.pdf>]. Accessed August 2020.

[5] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2019. "Draft Master Plan on Risk Communication during a Crisis and Normal Situation". [https://drive.google.com/file/d/1bKMw5fLoEwFks6ld8Ailyj_UTo5O9A74/view]. Accessed August 2020.

3.5.1c

Does the risk communication plan (or other legislation, regulation or strategy document used to guide national public health response) designate a specific position within the government to serve as the primary spokesperson to the public during a public health emergency?

Yes = 1, No = 0

Current Year Score: 1

Thailand's risk communication plan (or other legislation, regulation or strategy document used to guide national public health response) designates a specific position within the government to serve as the primary spokesperson to the public during a public health emergency. Thailand has a "Guideline on Crisis Risk Communication" which outlines how messages will reach populations and sectors with different communications needs. The document designates a specific personnel within the government to serve as the primary spokesperson to the public during a public health emergency based on different

scenarios and the severity of the situation (e.g. from Chief of disease control checkpoint to Director General of a related Ministry). For instance, in the case of national public health emergency from communicable diseases or epidemics, the Department of Disease Control via the Risk Communication Bureau / Academic Offices / Institutes and Sor Kor Sor 1-12, together with the Office of the Permanent Secretary, Ministry of Public Health by the Office of Information, and the Office of the Prime Minister via the Public Relations Department will work together and assign a spokesperson, as well as a media team for press releases and social media activities. In the case of community level emergency, Department of Academic Affairs at the district and/or provincial levels are responsible for designating the primary spokesperson. [1] The guideline was prepared by the Bureau of Risk Communication and Health Behaviour Development (BRCHBD) to promote effective risk communication in Thailand. This refers to better communications with Thai nationals and foreigners living in Thailand about health-related crises, and timely and accurate information to key stakeholders. [2] The guideline also discusses how risk should be communicated under public health emergencies. This includes 1) type of media utilized; 2) timing; and 3) preparation guidelines for press interview, media interview, press conference, press release, for instance. [1]

[1] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2016. "Guideline on Crisis Risk Communication". Ministry of Public Health. [<http://law.disaster.go.th/site2/download-src.php?did=30581>]. Accessed August 2020.

[2] Bureau of Risk Communication and Health Behavior Development (BRCHBD). 2019. "About: Vision, Mission, Incumbency and Department". [<https://ddc.moph.go.th/brc/mission.php>]. Accessed August 2020.

3.5.2 Public communication

3.5.2a

In the past year, is there evidence that the public health system has actively shared messages via online media platforms (e.g. social media, website) to inform the public about ongoing public health concerns and/or dispel rumors, misinformation or disinformation?

Public health system regularly shares information on health concerns = 2, Public health system shares information only during active emergencies, but does not regularly utilize online media platforms = 1, Public health system does not regularly utilize online media platforms, either during emergencies or otherwise = 0

Current Year Score: 2

There is publicly available evidence that the Thai government regularly utilizes online media platforms (social media, website updates, etc.) to inform the public about ongoing public health concerns and/or dispel rumors, misinformation or disinformation. Thailand has a high mobile social media penetration rate. [1] Hence, actively utilizing social media is part of a key strategy for communication. [2] Many government entities utilize social media such as Facebook or Twitter. As examples, the Bureau of Risk Communication and Health Behaviour Development (BRCHBD), the Department of Disease Control (DDC), and the Ministry of Public Health use multiple media platforms to inform the public about public health emergencies, ongoing public health concerns, and address misinformation. All three organizations maintain up-to-date Facebook pages which publish timely notifications about disease outbreaks and other health concerns. [3, 4, 5] The government also runs a Facebook page called 'Anti-Fake News Center Thailand' which consolidates online messages from public and government entities. The page regularly updates Covid-19 related statistics, and dispel rumours, including rumours on general health information. [6] As an example, on October 11, 2020, page dispelled a rumor that claims bergamot can relieve benign paroxysmal positional vertigo (BPPV). [7] Another example on October 9, 2020 shows that the page dispelled a rumor about the claims that bitter melon can help to treat diabetes. [8] Both of the posts mentioned were verified by the Ministry of Public Health. [7, 8]

- [1] Bangkok Post. 6 Feb 2018. "Thailand Tops Internet Usage Charts".
[<https://www.bangkokpost.com/business/news/1408158/thailand-tops-internet-usage-charts>]. Accessed August 2020.
- [2] Bureau of Risk Communication and Health Behavior Development. Ministry of Public Health. 2016. "Guideline on Crisis Risk Communication." Ministry of Public Health. [<http://law.disaster.go.th/site2/download-src.php?did=30581>]. Accessed August 2020.
- [3] Ministry of Public Health Facebook page. [<https://www.facebook.com/fanmoph>]. Accessed August 2020.
- [4] Bureau of Risk Communication and Health Behavior Development (BRCHBD) Facebook page. [<https://www.facebook.com/riskcomddcfanpage>]. Accessed August 2020.
- [5] Department of Disease Control (DDC) Facebook page.
[<https://www.facebook.com/%E0%B8%81%E0%B8%A3%E0%B8%A1%E0%B8%84%E0%B8%A7%E0%B8%9A%E0%B8%84%E0%B8%B8%E0%B8%A1%E0%B9%82%E0%B8%A3%E0%B8%84-%E0%B8%81%E0%B8%A3%E0%B8%B0%E0%B8%97%E0%B8%A3%E0%B8%A7%E0%B8%87%E0%B8%AA%E0%B8%B2%E0%B8%98%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B8%AA%E0%B8%B8%E0%B8%82-470988516420706>]. Accessed August 2020.
- [6] Anti-Fake News Center Thailand Facebook Page. [<https://www.facebook.com/AntiFakeNewsCenter/>]. Accessed October 2020.
- [7] Anti-Fake News Center Thailand Facebook Page. 11 October 2020.
[<https://www.facebook.com/AntiFakeNewsCenter/photos/a.113638500070332/359217262179120/>]. Accessed October 2020.
- [8] Anti-Fake News Center Thailand Facebook Page. 9 October 2020.
[<https://www.facebook.com/AntiFakeNewsCenter/photos/a.113638500070332/357784788989034/>]. Accessed October 2020.

3.5.2b

Is there evidence that senior leaders (president or ministers) have shared misinformation or disinformation on infectious diseases in the past two years?

No = 1, Yes = 0

Current Year Score: 1

There is no evidence that senior leaders (the prime minister or ministers) have shared misinformation or disinformation on infectious diseases in the past two years on main international and national news outlets based on online search results. [1, 2, 3, 4]

- [1] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.
- [2] Bangkok Post Website. [<https://www.bangkokpost.com/>]. Accessed October 2020.
- [3] Associated Press Website. [<https://apnews.com/>]. Accessed October 2020.
- [4] Thai Rath Online. [<https://www.thairath.co.th/news>]. Accessed October 2020.

3.6 ACCESS TO COMMUNICATIONS INFRASTRUCTURE

3.6.1 Internet users

3.6.1a

Percentage of households with Internet

Input number

Current Year Score: 66.65

2019

International Telecommunication Union (ITU)

3.6.2 Mobile subscribers

3.6.2a

Mobile-cellular telephone subscriptions per 100 inhabitants

Input number

Current Year Score: 186.16

2019

International Telecommunication Union (ITU)

3.6.3 Female access to a mobile phone

3.6.3a

Percentage point gap between males and females whose home has access to a mobile phone

Input number

Current Year Score: 3.0

2019

Gallup; Economist Impact calculation

3.6.4 Female access to the Internet

3.6.4a

Percentage point gap between males and females whose home has access to the Internet

Input number

Current Year Score: 8.0

2019

Gallup; Economist Impact calculation

3.7 TRADE AND TRAVEL RESTRICTIONS

3.7.1 Trade restrictions

3.7.1a

In the past year, has the country issued a restriction, without international/bilateral support, on the export/import of medical goods (e.g. medicines, oxygen, medical supplies, PPE) due to an infectious disease outbreak?

Yes = 0, No = 1

Current Year Score: 0

There is evidence that Thailand has issued a restriction, without international/bilateral support, on the export/import of medical goods (e.g. medicines, oxygen, medical supplies, PPE) due to an infectious disease outbreak in the past year. The World Trade Organisation's "COVID-19: Measures affecting trade in goods" list confirms that Thailand issued "Temporary export ban on surgical masks; face-masks for protection against dust, smoke or toxic substances used for safety apparatus and others (HS 6307.90.40; 6307.90.90), due to the COVID-19 pandemic" Effective 5 February 2020, for 1 year, as well as, a more recent "Extension of the temporary export restriction on surgical masks; face-masks for protection against dust, smoke or toxic substances used for safety apparatus and others (HS 6307.90.40; 6307.90.90), due to the COVID-19 pandemic (the export of such products is subject to an approval from the authorized committee)" effective 5 February 2021 to 5 February 2022. [1]

[1] World Trade Organisation. June 4, 2021. "COVID-19: Measures affecting trade in goods".

[https://www.wto.org/english/tratop_e/covid19_e/trade_related_goods_measure_e.htm] Accessed June 24, 2021.

3.7.1b

In the past year, has the country issued a restriction, without international/bilateral support, on the export/import of non-medical goods (e.g. food, textiles, etc) due to an infectious disease outbreak?

Yes = 0, No = 1

Current Year Score: 0

In the past year, Thailand has issued a restriction, without international/bilateral support, on the export/import of non-medical goods due to an infectious disease outbreak. A review of the Royal Thai Government Gazette's website reveals that between October 2019-September 2020, Thailand has imposed more than 50 restrictions on the export/import of non-medical goods due to an infectious disease outbreak. [1] These include, for instance, an import ban of poultry or poultry carcasses from the Republic of South Africa from October 2019 to June 2020 due to an outbreak of highly pathogenic avian influenza (HPAI) A(H5N1); and an import ban of pigs, boars or pig carcasses from the Kingdom of Cambodia from October 2019 to June 2020 due to an outbreak of African Swine Fever, for instance. [2, 3].

[1] Division of Veterinary Inspection and Quarantine, the Department of Livestock Development. "Announcements to postpone the import of livestock products". [<http://aqi.dld.go.th/webnew/index.php/th/service-menu/putoffthailand/129-putoffthai-kingdom>]. Accessed September 2020.

[2] The Royal Thai Government Gazette. No. 137 Special Section 77 Ngor 2. 2 April 2020. "Notification of the Department of Livestock Development, postponing the importation or bringing through the Kingdom of poultry or poultry carcasses from South Africa". [http://www.ratchakitcha.soc.go.th/DATA/PDF/2563/E/077/T_0017.PDF]. Accessed September 2020.

[3] The Royal Thai Government Gazette. No. 137 Special Section 77 Ngor 2. 2 April 2020. "Notification of the Department of Livestock Development, postponing the importation or bringing through the Kingdom of pigs, boars or pig carcasses from the

Kingdom of Cambodia B.E. 2563 (2020)". [http://www.ratchakitcha.soc.go.th/DATA/PDF/2563/E/077/T_0020.PDF]. Accessed September 2020.

3.7.2 Travel restrictions

3.7.2a

In the past year, has the country implemented a ban, without international/bilateral support, on travelers arriving from a specific country or countries due to an infectious disease outbreak?

Yes = 0, No = 1

Current Year Score: 0

In the past year, Thailand has implemented a ban, without international/bilateral support, on travelers arriving from a specific country or countries due to an infectious disease outbreak. Currently, regulations on the ban of non-essential travel to Thailand by foreign nationals are applied during the COVID-19 pandemic until further notice. The ban applies to all nationals although there are certain exceptions. All those who are permitted to enter Thailand must go under a mandatory 14-day quarantine upon arrival. [1, 2] From July 1, 2020, Thailand began allowing the entry of selected international travelers since the country entered a nationwide lockdown in April 2020 to contain the spread of the Covid-19 virus. Foreigners who have Thai spouses, and those with work permits or residency in Thailand, have been permitted to enter the country. Diplomats or officials of international organizations can also apply for the Certificate of Entry at their nearest Thai embassy. Foreigners seeking non-COVID-19 medical treatment are also permitted. [3]

[1] The Royal Thai Embassy, Washington D.C. "VISAS: Thailand Visa and Certificate of Entry (COE)".

[<https://thaiembdc.org/visas/>]. Accessed September 2020.

[2] Manager Online. 3 August 2020. "Civil Aviation Authority of Thailand declared easing regulations for foreigners entering the country but not yet open for tourism". [<https://mgronline.com/business/detail/9630000079081>]. Accessed September 2020.

[3] The Civil Aviation Authority of Thailand. 2 July 2020. "Public Announcement: The Notification on Conditions for Aircraft Permission to Enter Thailand (No.2)". [<https://www.caat.or.th/en/archives/51895>]. Accessed October 2020.

Category 4: Sufficient and robust health sector to treat the sick and protect health workers

4.1 HEALTH CAPACITY IN CLINICS, HOSPITALS, AND COMMUNITY CARE CENTERS

4.1.1 Available human resources for the broader healthcare system

4.1.1a

Doctors per 100,000 people

Input number

Current Year Score: 80.5

2018

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 275.93

2018

WHO; national sources

4.1.1c

Does the country have a health workforce strategy in place (which has been updated in the past five years) to identify fields where there is an insufficient workforce and strategies to address these shortcomings?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has a health workforce strategy in place (which has been updated in the past five years) to identify fields where there is an insufficient workforce and strategies to address these shortcomings. The Ministry of Public Health updates its Health Workforce Strategic Plan every 10 years. [1] Another relevant plan is the 20-year National Strategic Plan on Public Health (2016-2036) which addresses workforce strategy, specifically on workforce needs prediction and manpower planning. [2] Although there is evidence of the drafting of the Health Workforce Strategic Plan 2017-2026, the document cannot be publicly found. [1, 3] In its 2007-2016 version, the Health Workforce Strategic Plan addresses the shortage of health workforce ranging from general practitioner, specialist, nurse, and dentist. It describes that problem lies both in terms of limited production capacity and inappropriate distribution (more concentrated in big cities and private hospitals) of health workers. The plan contains strategies to solve these problems. For example, adopting rural recruitment, local training, and hometown placement strategies to mitigate the disproportionate distribution of doctors among urban and rural hospitals. [4] An updated projection of the health workforce was also done in 2017, in a report commissioned by the Health Systems Research Institute (HSRI). This report, which provides the basis for Health Workforce Strategic Plan 2017-2026, analyses future capacity and strategies for 9 groups of health workforce i.e. doctor, nurse, dentist, pharmacist, medical laboratory technologist, physiotherapist, public health worker, Thai traditional medicine, and veterinarian. [5]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017." [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Ministry of Public Health. May 2016. "The 20-year National Strategic Plan on Public Health". [<http://203.157.171.117/web/file/menu01/%E0%B8%A2%E0%B8%B8%E0%B8%97%E0%B8%98%E0%B8%A8%E0%B8%B2%E0%B8%AA%E0%B8%95%E0%B8%A3%E0%B9%8C%2020%20%E0%B8%9B%E0%B8%B5.pdf>]. Accessed August 2020.

[3] Strategy and Planning Division, Ministry of Public Health. 2017. "Health Workforce Reform Strategic Plan". [http://bps.moph.go.th/new_bps/sites/default/files/1.%20Present%20HM_26%20July%2017%28KS%29.pdf]. Accessed August 2020.

[4] Ampol J., Thinnakorn N., Nonglak P., and Srikanokwilai N.. 2007. The Health Workforce Strategic Plan 2007-2016. Bangkok: Ministry of Public Health. [<https://kb.hsri.or.th/dspace/handle/11228/2798?locale-attribute=th>]. Accessed August 2020.

[5] Noree, Thinakorn et al. 2017. "Research Report: Analyzing policy alternatives for the next decade's Health Workforce Strategic Plan". [<http://kb.hsri.or.th/dspace/handle/11228/4749?locale-attribute=th>]. Accessed August 2020.

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 210

2010

WHO/World Bank; national sources

4.1.2b

Does the country have the capacity to isolate patients with highly communicable diseases in a biocontainment patient care unit and/or patient isolation room/unit located within the country?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has the capacity to isolate patients with highly communicable diseases in a biocontainment patient care unit and/or patient isolation facility located within the country. The Ministry of Public Health runs the Bamrasnaradura Infectious Disease Institute as the isolation units for highly infectious disease, i.e. Airborne Infection Isolation Room (AIIR). The Institute's facilities were constructed according to the American Institute of Architects (AIA) guidelines and the American Society of Heating Refrigerating and Air-Conditioning Engineers' (ASHRAE's) standard. This includes the appropriate positive/negative ventilation; a separate entrance for decontamination; a separate storage of PPE; a separate laboratory for carrying out tests; an air filter system; and appropriate seals to prevent the transmission of infectious disease through the air.[1] The institute is public-owned and accept any patient suspected to have the highly infectious disease. In 2016, a suspected MERS case was treated there.[2] In late December 2019, Thailand discovered the first case of Covid-19 from a 61-year-old Chinese woman and she was admitted to the Bamrasnaradura Institute. [3]

[1] Puthawadee, Aom-aree. n.d. "Isolation Room". Bamrasnaradura Infectious Diseases Institute. [<https://www.slideshare.net/firstmuk/present-ward-muk1-31774582>]. Accessed August 2020.

[2] Thai PBS News. 2016. "A Suspected MERS case found". [<https://www.youtube.com/watch?v=vz1meNYrYRI>]. Accessed August 2020.

[3] Department of Disease Control. 8 May 2020. "Department of Disease Control reveals results of care for patients with COVID-19 at Bamrasnaradura Institute which meets the standards and patients also cooperate well". [<https://ddc.moph.go.th/odpc7/news.php?news=12827&deptcode=odpc7>]. Accessed August 2020.

4.1.2c

Does the country meet one of the following criteria?

- Is there evidence that the country has demonstrated capacity to expand isolation capacity in response to an infectious disease outbreak in the past two years?

- Is there evidence that the country has developed, updated or tested a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years?

Yes = 1, No = 0

Current Year Score: 1

There is evidence that the country has demonstrated capacity to expand isolation capacity in response to an infectious disease outbreak. The New Infectious Disease Intelligence which is regularly updated by the Ministry of Public Health, as part of their operational plans, is collaborating with border control authorities to identify suspected and potential cases, and trace and quarantine their contacts in case of positive cases, in international travelers for emerging infectious diseases particularly for Ebola Virus Disease (EVD), Covid-19, and MERS. [1] In regards to the Covid-19 situation, all Thai citizens returning to Thailand from abroad, as well as foreigners, are required to go through a 14-day quarantine at a state quarantine site, i.e. 'State Quarantine' site, without any charges. At the local levels, the government provides free of charge 'Local State Quarantine' sites for those who enter the country by land or air, or those with high risks. [2, 3]. Moreover, "locally built negative pressure isolation chambers for safe collection of nasal swabs and specimens were installed in almost all hospitals where nasal swabs were collected." [4] There is no evidence that the country has developed, updated or tested a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years according to the Department of Disease Control, the Ministry of Public Health, Office of the National Security Council. [5,6,7]

[1] Division of Communicable Diseases, Ministry of Public Health. 31 May 2020. "New Infectious Disease Intelligence as of May 31, 2020". [https://ddc.moph.go.th/uploads/files/1329320200612040155.pdf]. Accessed October 2020.

[2] Royal Thai Embassy, Helsinki, Finland. Updated 21 August 2020. "Announcement: Thai Citizen Return to Thailand from Abroad During the Announcement of Emergency Operations Center for Medical and Public Health".

[http://www.thaiembassy.org/helsinki/th/bulletin/1914/119394-

%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B9%80%E0%B8%94%E0%B8%B4%E0%B8%99%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%81%E0%B8%A5%E0%B8%B1%E0%B8%9A%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B9%80%E0%B8%97%E0%B8%A8%E0%B9%84%E0%B8%97%E0%B8%A2%E0%B8%82%E0%B8%AD%E0%B8%87%E0%B8%84%E0%B8%99%E0%B9%84%E0%B8%97%E0%B8%A2%E0%B9%83%E0%B8%99%E0%B8%95%E0%B9%88%E0%B8%B2%E0%B8%87%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B9%80%E0%B8%97%E0%B8%A8%E0%B9%83%E0%B8%99%E0%B8%8A%E0%B9%88%E0%B8%A7%E0%B8%87%E0%B8%81.html]. Accessed August 2020.

[3] Covid Situation Center, Office of the Permanent Secretary of Interior Ministry. 22 May 2020. "Announcement of Emergency Operations Center for Medical and Public Health Regarding the Coronavirus - Rules and guidelines for Quarantine Sites". [http://www.moicovid.com/wp-

content/uploads/2020/05/%E0%B8%A8%E0%B8%9A%E0%B8%84.%E0%B8%A1%E0%B8%97.-%E0%B8%A1%E0%B8%97-0230-%E0%B8%A72929-%E0%B8%A5%E0%B8%A7.-22-%E0%B8%9E.%E0%B8%84.-63-%E0%B9%81%E0%B8%88%E0%B9%89%E0%B8%87-

%E0%B8%9C%E0%B8%A7%E0%B8%88.%E0%B8%97%E0%B8%B8%E0%B8%81%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94-%E0%B9%80%E0%B8%A3%E0%B8%B7%E0%B9%88%E0%B8%AD%E0%B8%87-%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%81%E0%B8%B3%E0%B8%AB%E0%B8%99%E0%B8%94%E0%B8%AA%E0%B8%96%E0%B8%B2%E0%B8%99%E0%B8%97%E0%B8%B5%E0%B9%88%E0%B8%81%E0%B8%B1%E0%B8%81%E0%B8%B1%E0%B8%99.pdf]. Accessed August 2020.

[4] Asia Pacific Observatory on Health Systems and Policies. November 2020. "COVID-19 Health System Response Monitor". [https://apps.who.int/iris/rest/bitstreams/1318248/retrieve]. Accessed August 2020.

[5] Department of Disease Control Website. [<https://ddc.moph.go.th/en/>]. Accessed September 2020.

[6] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed September 2020.

[7] Office of the National Security Council Website. [<http://www.nsc.go.th/>]. Accessed October 2020.

4.2 SUPPLY CHAIN FOR HEALTH SYSTEM AND HEALTHCARE WORKERS

4.2.1 Routine health care and laboratory system supply

4.2.1a

Is there a national procurement protocol in place which can be utilized by the Ministries of Health and Agriculture for the acquisition of laboratory supplies (e.g. equipment, reagents and media) and medical supplies (e.g. equipment, PPE) for routine needs?

Yes for both laboratory and medical supply needs = 2, Yes, but only for one = 1, No = 0

Current Year Score: 2

There is publicly available evidence of a national procurement protocol in place which can be utilized by the Ministries of Public Health and Ministry of Agriculture and Cooperatives for the acquisition of laboratory and medical supply needs. There is a national system in place for public procurement that can be utilised by the Ministry of Public Health and Ministry of Agriculture and Cooperatives. As a support for the implementation of the Public Procurement and Supplies Administration Act, B.E.2560 (2017), E-Government Procurement system (e-GP) was established in 2017. E-GP is a public procurement centre for the public sector managed by the Comptroller General's Department, Ministry of Finance. [1, 2] For procurement registration, government agencies must submit and publish the yearly procurement plan on the e-GP portal. [2, 3] The Act itself does not explicitly list items which are permitted for procurement, however, information on the procurement activities can be found in each ministry's website. The Department of Medical Sciences, Ministry of Public Health issued several Notifications and Procurement Plans for e-bidding of laboratory items and scientific equipment. [4] Furthermore, based on the Government Procurement Report: Fiscal Year 2020, medical supplies were also procured by the Ministries. [5]

[1] Comptroller General's Department, Ministry of Finance. 2017. "Public Procurement via e-GP under the Public Procurement and Supplies Administration Act, B.E.2560 (2017)".

[<https://drive.google.com/file/d/0B5pkHfaEEOQib0l6b2RMZEN4UGc/view>]. Accessed August 2020.

[2] Thai Government Procurement Website. [http://www.gprocurement.go.th/new_index.html]. Accessed October 2020.

[3] Comptroller General's Department, Ministry of Finance. n.d.. "Handbook on Creating Public Procurement Plan in e-GP for public agencies". [<http://www.samutsongkhram.go.th/V2013/attachments/manual-egp.pdf>]. Accessed August 2020.

[4] Notification of the Department of Medical Sciences on the tender for 4 scientific equipments via e-bidding. 2018.

[http://dmsc2.dmsc.moph.go.th/webroot/BQSF/File/BUY_NEWS/2561/e-bidding-1.pdf]. Accessed August 2020.

[5] Thai Government Procurement. 2020. "Government Procurement Report: Fiscal Year 2020 (October 2019 - April 2020)". pp. 19-20. [<http://www.gprocurement.go.th/wps/wcm/connect/d97c1eca-39d4-49d1-81ef-0cb382041f57/%E0%B8%A3%E0%B8%B2%E0%B8%A2%E0%B8%87%E0%B8%B2%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%8B%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%88%E0%B9%89%E0%B8%B2%E0%B8%8763.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-d97c1eca-39d4-49d1-81ef-0cb382041f57-ncNrMe9>]. Accessed October 2020.

4.2.2 Stockpiling for emergencies

4.2.2a

Does the country have a stockpile of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE) for national use during a public health emergency?

Yes = 2, Yes, but there is limited evidence about what the stockpile contains = 1, No = 0

Current Year Score: 2

Thailand has a stockpile of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE, therapeutics and diagnostics) for national use during a public health emergency and there is evidence of what it contains. According to the Purchasing Plan from the Department of Disease Control in 2019, the country has purchased medical supplies, which include gloves, gowns, masks used by medical professionals. Based on the categorizations of 'Outputs/Activities/Items', the medical supplies such as 'medical gloves (S/M/L)', 'nose covers', 'PPE gowns' were purchased. These items were tagged for the Outputs/Activities of supporting the monitoring, prevention, and control of emerging infectious disease and regional epidemics [1]. During the Covid-19 health emergency, the Government Pharmaceutical Organization (GPO) also plays a key role in distributing medical supplies (e.g. gloves, gowns, masks) and drugs for national use. [2, 3] Additionally, according to the Purchasing Plan from the Department of Disease Control in 2019, the country has purchased medical countermeasures, which include medicines/drugs, vaccines and or/diagnostics used to identify, prevent and treat suspected and confirmed cases of a potential disease. Based on the categorizations of 'Outputs/Activities/Items', vaccines, medicines based on the Thailand National List of Essential Medicines (NLEM) 2019, medicines that are not included as part of NLEM, and test kits (particularly for Malaria, and TB) were purchased. These items were tagged for the Outputs/Activities of supporting the monitoring, prevention, and control of emerging infectious disease and regional epidemics [1, 4]. In the light of covid-19 health emergency, the Government Pharmaceutical Organization (GPO) also plays a key role in distributing medical supplies (e.g. gloves, gowns, masks) and drugs (e.g. medicine and vaccines) for national use. GPO communicated to the public that the government has enough stockpiles. The emergency kits are stockpiled in Bangkok and 12 health zones across the country [2]. The stockpile of Favipiravir, Chloroquine, Darunavir, Ritonavir, Azithromycin were specifically mentioned by the GPO. [5]

[1] Department of Disease Control, Ministry of Public Health. 2019. "Purchasing Plan: Medicines, Non-Drug Supplies, Vaccines, Medical Supplies, and Laboratory Supplies, Annual Fiscal Year of 2019".

[http://ddccenter.ddc.moph.go.th/infoc/download/201903141552552951_%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%8B%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B8%A2%E0%B8%B2%20%E0%B8%9B%E0%B8%B5%E0%B8%87%E0%B8%9A%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%A1%E0%B8%B2%E0%B8%93%20%E0%B8%9E.%E0%B8%A8.%202562.pdf]. Accessed October 2020.

[2] The Royal Thai Government News. 31 August 2020. "GPO and FDA confirm Thailand reserves PPE masks, N95 drugs - ready for COVID 19 situation". [<https://www.thaigov.go.th/news/contents/details/34696>]. Accessed September 2020.

[3] The Government Pharmaceutical Organization News. 29 March 2020. "The Government Pharmaceutical Organization (GPO) clarifies medical supplies for COVID-19. Hospitals should notify local health administration, the Department of Medicine or the UHOSNET". [<https://www.gpo.or.th/view/169>]. Accessed September 2020.

[4] National Drug Information. "National List of Essential Medicines". [http://ndi.fda.moph.go.th/drug_national]. Accessed October 2020.

[5] The Government Pharmaceutical Organization (GPO) Facebook Page. 22 April 2020.

[<https://www.facebook.com/gpoth.official/posts/1304474386607872/>]. Accessed September 2020.

4.2.2b

Does the country have a stockpile of laboratory supplies (e.g. reagents, media) for national use during a public health emergency?

Yes = 2, Yes, but there is limited evidence about what the stockpile contains = 1, No = 0

Current Year Score: 1

Thailand has a stockpile of laboratory supplies (e.g. reagents, media) for national use during a public health emergency but there is insufficient evidence of what this includes. According to the Purchasing Plan from the Department of Disease Control in 2019, the country has purchased laboratory supplies (e.g. reagents, media). Based on the categorizations of 'Outputs/Activities/Items', some of these laboratory supplies were tagged for the Outputs/Activities of supporting the monitoring, prevention, and control of emerging infectious disease and regional epidemics [1]. In the light of covid-19, the stockpile of laboratory supplies (e.g. reagents) ran low as referred to in the news articles regarding insufficient reserve of the reagents in the national stockpile due to a huge surge in testing demands. [2, 3]. Due to this, the government has recently ramped up efforts in domestic production and secured larger stockpile of laboratory supplies. [4]

[1] Department of Disease Control, Ministry of Public Health. 2019. "Purchasing Plan: Medicines, Non-Drug Supplies, Vaccines, Medical Supplies, and Laboratory Supplies, Annual Fiscal Year of 2019".

[http://ddcenter.ddc.moph.go.th/infor/download/201903141552552951_%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%8B%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B8%A2%E0%B8%B2%20%E0%B8%9B%E0%B8%B5%E0%B8%87%E0%B8%9A%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%A1%E0%B8%B2%E0%B8%93%20%E0%B8%9E.%E0%B8%A8.%202562.pdf]. Accessed October 2020.

[2] Manager Online. 21 March 2020. "Revealing the latest situation. Suggesting lack of equipment and reagents for virus detectors for COVID-19". [<https://mgronline.com/onlinesection/detail/9630000028550>]. Accessed September 2020.

[3] Bangkok Biz News. 21 March 2020. "Department of Medical Sciences confirms there will be enough reagents for COVID-19". [<https://www.bangkokbiznews.com/news/detail/871938>]. Accessed September 2020.

[4] Siam Rath. 9 April 2020. "Department of Medical Sciences confirms that there is sufficient COVID test solutions - meets the standard". [<https://siamrath.co.th/n/145951>]. Accessed September 2020.

4.2.2c

Is there evidence that the country conducts or requires an annual review of the national stockpile to ensure the supply is sufficient for a public health emergency?

Yes = 1, No = 0

Current Year Score: 0

There is no publicly available evidence that Thailand conducts or requires an annual review of the national stockpile to ensure the supply is sufficient for a public health emergency. Additional research on the websites of the Department of Disease Control, the Ministry of Public Health, Office of the National Security Council, Ministry of Defence, Drug and Medical Supply Information Center, the Medical Device Control Division, Food and Drug Administration, Government Pharmaceutical Organization, and the National News Bureau yielded no relevant result. [1, 2, 3, 4, 5, 6, 7, 8, 9]

[1] Department of Disease Control Website. [<https://ddc.moph.go.th/en/>]. Accessed September 2020.

[2] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed September 2020.

[3] Office of the National Security Council Website. [<http://www.nsc.go.th/>]. Accessed October 2020.

[4] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

[5] Drug and Medical Supply Information Center Website. [<http://dmsic.moph.go.th/>]. Accessed October 2020.

[6] Medical Device Control Division Website. [<https://www.fda.moph.go.th/sites/Medical/Pages/Main.aspx>]. Accessed October 2020.

[7] Food and Drug Administration Website. [https://www.fda.moph.go.th/Pages/HomeP_D2.aspx]. Accessed October 2020.

[8] Government Pharmaceutical Organization (GPO). [<https://www.gpo.or.th/>]. Accessed September 2020.

[9] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.

4.2.3 Manufacturing and procurement for emergencies

4.2.3a

Does the country meet one of the following criteria?

- Is there evidence of a plan/agreement to leverage domestic manufacturing capacity to produce medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during a public health emergency?
- Is there evidence of a plan/mechanism to procure medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during a public health emergency?

Needs to meet at least one of the criteria to be scored a 1 on this measure., Yes for both = 1, Yes for one = 1, No for both = 0

Current Year Score: 0

There is no publicly available evidence of a plan/agreement to procure or to leverage domestic manufacturing capacity to produce medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during a public health emergency. In the light of Covid-19 situation, the Thai Government, together with the Thailand Board of Investment, announced measures to support investments in the medical industry such as tax reductions, import tax exemptions, for instance. The plan covers, but not limited to, medical devices, parts of medical equipment, materials including non-woven fabric used as raw materials in manufacturing of masks or personal protective equipment, medical diagnostic tests, drugs, active ingredients in drugs, and laboratory reagents. The plan will also support investments in the medical industry whereas the beneficiaries must sell or donate at least 50% of the products domestically in 2020-2021. [1] Additionally, the Department of Internal Trade, based on the Cabinet approval, is procuring medical supplies by buying all excess productions of the medical supplies and re-selling them at a non-profit price for governmental agencies. [2] The Government Pharmaceutical Organization (GPO) plays a key role in securing and distributing medical supplies (e.g. gloves, gowns, masks) and drugs (e.g. medicine and vaccines) for national use, especially during the Covid-19 health emergency. The stockpiles of Favipiravir, Chloroquine, Darunavir, Ritonavir, Azithromycin were specifically mentioned by the GPO. GPO is also developing recipes Favipiravir for domestic production. [3, 4] The Department of Medical Sciences is working directly with Siam Bioscience Co., Ltd. to produce and secure test kits for domestic usage and exports excess to ASEAN countries. [5, 6] Nonetheless, there is insufficient evidence that such mechanisms will apply even outside of the Covid-19 crisis for any public health emergency. Additional research on the websites of the Department of Disease Control, the Ministry of Public Health, Office of the National Security Council, Ministry of Defence, Drug and Medical Supply Information Center, the Medical Device Control Division, Food and Drug Administration, Government Pharmaceutical Organization, and the National News Bureau yielded no relevant result. [7, 8, 9, 10, 11, 12, 13, 14, 15] As a support for the implementation of the Public Procurement and Supplies Administration Act, B.E.2560 (2017), E-Government Procurement system (e-GP) was established in 2017. Although the e-GP is a national system for public procurement that can be utilised by the Ministries and governmental agencies, government agencies must submit and publish the yearly procurement plan on the e-GP portal. [16, 17] Although there is an emergency procurement guideline specifically for Covid-19, this is not applicable to all public health emergencies. [18]

[1] Board of Investment, Office of the Prime Minister. Press Release No.41/2563. 13 April 2020. "BOI board tapped a large set of measures to help cope/mitigate the effects of COVID-19". [https://www.boi.go.th/upload/content/No.41_2563TH.pdf]. Accessed September 2020.

[2] Royal Thai Government. News on the COVID-19 Situation. 7 July 2020. "Ministry of Commerce revealed that the production of masks increased to 4.2 million pieces per day. Cabinet orders buying all excess sales units". [https://www.thaigov.go.th/news/contents/ministry_details/33175]. Accessed September 2020.

[3] The Royal Thai Government News. 31 August 2020. "GPO and FDA confirm Thailand reserves PPE masks, N95 drugs - ready for COVID 19 situation". [<https://www.thaigov.go.th/news/contents/details/34696>]. Accessed September 2020.

- [4] The Government Pharmaceutical Organization (GPO) Facebook Page. 22 April 2020. [https://www.facebook.com/gpoth.official/posts/1304474386607872/]. Accessed September 2020.
- [5] Siam Rath. 9 April 2020. "Department of Medical Sciences confirms that there are sufficient COVID test solutions - meets the standard". [https://siamrath.co.th/n/145951]. Accessed September 2020.
- [6] Bangkok Biz News. 15 April 2020. "Ministry of Foreign Affairs Confirmation of COVID testing kits - Thailand produces more than 1 million sets, enough to share with ASEAN." [https://www.bangkokbiznews.com/news/detail/876243]. Accessed September 2020.
- [7] Department of Disease Control Website. [https://ddc.moph.go.th/en/]. Accessed September 2020.
- [8] Ministry of Public Health Website. [https://www.moph.go.th/]. Accessed September 2020.
- [9] Office of the National Security Council Website. [http://www.nsc.go.th/]. Accessed October 2020.
- [10] Ministry of Defence Website. [https://www.mod.go.th/home.aspx]. Accessed October 2020.
- [11] Drug and Medical Supply Information Center Website. [http://dmsic.moph.go.th/]. Accessed October 2020.
- [12] Medical Device Control Division Website. [https://www.fda.moph.go.th/sites/Medical/Pages/Main.aspx]. Accessed October 2020.
- [13] Food and Drug Administration Website. [https://www.fda.moph.go.th/Pages/HomeP_D2.aspx]. Accessed October 2020.
- [14] Government Pharmaceutical Organization (GPO). [https://www.gpo.or.th/]. Accessed September 2020.
- [15] National News Bureau of Thailand Website. [https://thainews.prd.go.th/en/home/index]. Accessed October 2020.
- [16] Thai Government Procurement Website. [http://www.gprocurement.go.th/new_index.html]. Accessed October 2020.
- [17] Comptroller General's Department, Ministry of Finance. n.d.. "Handbook on Creating Public Procurement Plan in e-GP for public agencies". [http://www.samutsongkhram.go.th/V2013/attachments/manual-egp.pdf]. Accessed August 2020.
- [18] Comptroller General's Department, Ministry of Finance. October 2020. "Procurement Guideline: for obtaining supplies for prevention, control, or treatment of the infectious disease coronavirus 2019 or COVID-19". [http://www.gprocurement.go.th/wps/wcm/connect/1780de78-5587-4015-8ee0-12ae7ae7b77/%E0%B8%84%E0%B8%B9%E0%B9%88%E0%B8%A1%E0%B8%B7%E0%B8%AD%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%81%E0%B8%B2%E0%B8%A8%E0%B9%80%E0%B8%9C%E0%B8%A2%E0%B9%81%E0%B8%9E%E0%B8%A3%E0%B9%88%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%94%E0%B8%B3%E0%B9%80%E0%B8%99%E0%B8%B4%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%8B%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%88%E0%B9%89%E0%B8%B2%E0%B8%87+%28%E0%B9%82%E0%B8%84%E0%B8%A7%E0%B8%B4%E0%B8%94%29+20-10-63.pdf?MOD=AJPERES&ContentCache=NONE&CACHE=NONE&CACHEID=ROOTWORKSPACE-1780de78-5587-4015-8ee0-12ae7ae7b77-nleEchL]. Accessed October 2020.

4.2.3b

Does the country meet one of the following criteria?

- Is there evidence of a plan/agreement to leverage domestic manufacturing capacity to produce laboratory supplies (e.g. reagents, media) for national use during a public health emergency?
- Is there evidence of a plan/mechanism to procure laboratory supplies (e.g. reagents, media) for national use during a public health emergency?

Needs to meet at least one of the criteria to be scored a 1 on this measure., Yes for both = 1, Yes for one = 1, No for both = 0

Current Year Score: 0

There is no publicly available evidence of a plan/agreement to leverage domestic manufacturing capacity to produce or procure laboratory supplies (e.g. reagents, media) for national use during a public health emergency or a plan/mechanism to procure laboratory supplies (e.g. reagents, media) for national use during a public health emergency. In the light of Covid-19 situation, the Thai Government, together with the Thailand Board of Investment, announced measures to support investments in the medical industry such as tax reductions, import tax exemptions, for instance. The plan covers, but not

limited to, medical devices, parts of medical equipment, materials including non-woven fabric used as raw materials in manufacturing of masks or personal protective equipment, medical diagnostic tests, drugs, active ingredients in drugs, and laboratory reagents. The plan will also support investments in the medical industry whereas the beneficiaries must sell or donate at least 50% of the products domestically in 2020-2021. [1] Additionally, the Department of Medical Sciences is working with Siam Bioscience Co., Ltd. to produce sufficient laboratory supplies for domestic usage. [2] Nonetheless, there is insufficient evidence that such mechanisms will apply outside of the Covid-19 crisis for any public health emergency. Additional research on the websites of the Department of Disease Control, the Ministry of Public Health, Office of the National Security Council, Ministry of Defence, Drug and Medical Supply Information Center, the Medical Device Control Division, Food and Drug Administration, Government Pharmaceutical Organization, and the National News Bureau yielded no relevant result. [3, 4, 5, 6, 7, 8, 9, 10, 11] As a support for the implementation of the Public Procurement and Supplies Administration Act, B.E.2560 (2017), E-Government Procurement system (e-GP) was established in 2017. Although the e-GP is a national system for public procurement that can be utilised by the Ministries and governmental agencies, government agencies must submit and publish the yearly procurement plan on the e-GP portal. [12, 13] Although there is an emergency procurement guideline specifically for Covid-19, this is not applicable to all public health emergencies. [14]

[1] Board of Investment, Office of the Prime Minister. Press Release No.41/2563. 13 April 2020. "BOI board tapped a large set of measures to help cope/mitigate the effects of COVID-19". [https://www.boi.go.th/upload/content/No.41_2563TH.pdf]. Accessed September 2020.

[2] Siam Rath. 9 April 2020. "Department of Medical Sciences confirms that there is sufficient COVID test solutions - meets the standard". [<https://siamrath.co.th/n/145951>]. Accessed September 2020. &meta charset="utf-8" />

[3] Department of Disease Control Website. [<https://ddc.moph.go.th/en/>]. Accessed September 2020.

[4] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed September 2020.

[5] Office of the National Security Council Website. [<http://www.nsc.go.th/>]. Accessed October 2020.

[6] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

[7] Drug and Medical Supply Information Center Website. [<http://dmsic.moph.go.th/>]. Accessed October 2020.

[8] Medical Device Control Division Website. [<https://www.fda.moph.go.th/sites/Medical/Pages/Main.aspx>]. Accessed October 2020.

[9] Food and Drug Administration Website. [https://www.fda.moph.go.th/Pages/HomeP_D2.aspx]. Accessed October 2020.

[10] Government Pharmaceutical Organization (GPO). [<https://www.gpo.or.th/>]. Accessed September 2020.

[11] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.

[12] Thai Government Procurement Website. [http://www.gprocurement.go.th/new_index.html]. Accessed October 2020.

[13] Comptroller General's Department, Ministry of Finance. n.d. "Handbook on Creating Public Procurement Plan in e-GP for public agencies". [<http://www.samutsongkhram.go.th/V2013/attachments/manual-egp.pdf>]. Accessed August 2020.

[14] Comptroller General's Department, Ministry of Finance. October 2020. "Procurement Guideline: for obtaining supplies for prevention, control, or treatment of the infectious disease coronavirus 2019 or COVID-19".

[<http://www.gprocurement.go.th/wps/wcm/connect/1780de78-5587-4015-8ee0-12ae7ae7b77/%E0%B8%84%E0%B8%B9%E0%B9%88%E0%B8%A1%E0%B8%B7%E0%B8%AD%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9B%E0%B8%A3%E0%B8%B0%E0%B8%81%E0%B8%B2%E0%B8%A8%E0%B9%80%E0%B8%9C%E0%B8%A2%E0%B9%81%E0%B8%9E%E0%B8%A3%E0%B9%88%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%94%E0%B8%B3%E0%B9%80%E0%B8%99%E0%B8%B4%E0%B8%99%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%8B%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%88%E0%B9%89%E0%B8%B2%E0%B8%87+%28%E0%B9%82%E0%B8%84%E0%B8%A7%E0%B8%B4%E0%B8%94%29+20-10-63.pdf?MOD=AJPERES&ContentCache=NONE&CACHE=NONE&CACHEID=ROOTWORKSPACE-1780de78-5587-4015-8ee0-12ae7ae7b77-nleEchL>]. Accessed October 2020.

4.3 MEDICAL COUNTERMEASURES AND PERSONNEL DEPLOYMENT

4.3.1 System for dispensing medical countermeasures (MCM) during a public health emergency

4.3.1a

Does the country have a plan, program, or guidelines in place for dispensing medical countermeasures (MCM) for national use during a public health emergency (i.e., antibiotics, vaccines, therapeutics and diagnostics)?

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Thailand has a plan, program, or guidelines in place for dispensing medical countermeasures (MCM) for national use during a public health emergency (i.e., antibiotics, vaccines, therapeutics and diagnostics). National Vaccine Security Policy and Plan 2020-2022 covers a distribution plan and guidelines for dispensing MCM (i.e. in this case, vaccines). The Plan covers routine immunization policy, however, the plan does not specifically mention if it can be applied for national use during a public health emergency. [1] The Guidelines for the management of immunization in the universal health insurance system 2019 from the National Health Security Office also covers a distribution plan and guidelines for dispensing MCM. The Guidelines covers routine immunization policy, however, the plan does not specifically mention if it can be applied for national use during a public health emergency. [2] Additional research on the websites of the Department of Disease Control, the Ministry of Public Health, Office of the National Security Council, Ministry of Defence, Drug and Medical Supply Information Center, the Medical Device Control Division, Food and Drug Administration, and the Government Pharmaceutical Organization yielded no relevant result. [3, 4, 5, 6, 7, 8, 9, 10]

[1] National Vaccine Institute. "National Vaccine Security Policy and Plan 2020-2022".

[<http://nvi.go.th/index.php/files/large/b5966ec4e02d15c>]. Accessed September 2020.

[2] National Health Security Office (NHSO). 2019. "Guidelines for the management of immunization in the universal health insurance system 2019". [<http://www.kkpho.go.th/i/index.php/component/attachments/download/4916>]. Accessed September 2020.

[3] Department of Disease Control Website. [<https://ddc.moph.go.th/en/>]. Accessed September 2020.

[4] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed September 2020.

[5] Office of the National Security Council Website. [<http://www.nsc.go.th/>]. Accessed October 2020.

[6] Ministry of Defence Website. [<https://www.mod.go.th/home.aspx>]. Accessed October 2020.

[7] Drug and Medical Supply Information Center Website. [<http://dmsic.moph.go.th/>]. Accessed October 2020.

[8] Medical Device Control Division Website. [<https://www.fda.moph.go.th/sites/Medical/Pages/Main.aspx>]. Accessed October 2020.

[9] Food and Drug Administration Website. [https://www.fda.moph.go.th/Pages/HomeP_D2.aspx]. Accessed October 2020.

[10] Government Pharmaceutical Organization (GPO). [<https://www.gpo.or.th/>]. Accessed September 2020.

[11] National News Bureau of Thailand Website. [<https://thainews.prd.go.th/en/home/index>]. Accessed October 2020.

4.3.2 System for receiving foreign health personnel during a public health emergency

4.3.2a

Is there a public plan in place to receive health personnel from other countries to respond to a public health emergency?

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence to suggest that Thailand has a public plan in place to receive health personnel from other countries in case of public health emergency. The current 2016 "Public Health Emergency Incident Command System: PHEICS" guideline discusses Standard Operating Procedures (SOP) and addresses the role of different agencies—both government and non-government. However, the guideline does not specify any mechanism to receive health personnel from other countries. [1] Evidence to suggest that Thailand has a public plan in place to receive health personnel from other countries to respond to a public health emergency cannot be found through a review of news media, the Bureau of Health Response's website, or the Ministry of Public Health's website. [2,3] According to the Joint External Evaluation (JEE) for Thailand, conducted in June 2017, Thailand has yet established formal agreements with regard to sending and receiving health personnel in case of health emergency. [4] Although a public plan to receive health personnel from other countries has not been established, it is stated in the JEE report that the country has made a commitment to progress toward more regional and global collaborations. For example, Thailand co-hosted the ASEAN Regional Capacity on Disaster Health Management (ARCH) project with Japan. This project develops tools for "receiving and deployment of Emergency Medical Teams into disaster-affected areas, using WHO and ASEAN frameworks as guidance". [4] Since the beginning of 2017, the countries have conducted at least two drills. One was a drill to respond to a typhoon in Vietnam. Other ASEAN countries sent medical teams (EMT) to disaster-hit areas in Vietnam with air cargo containing medical equipment. [5] Another drill was conducted in the Philippines. [6]

[1] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS". [https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf]. Accessed August 2020.

[2] Bureau of Health Emergency Respond Website. [https://ddc.moph.go.th/ddce/]. Accessed August 2020.

[3] Ministry of Public Health Website. [https://www.moph.go.th/]. Accessed August 2020.

[4] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017)." [http://apps.who.int/iris/handle/10665/272493]. Accessed August 2020.

[5] Viet Nam News. 28 March 2018. "Emergency medical teams test skills at regional disaster drill". [https://vietnamnews.vn/society/425225/emergency-medical-teams-test-skills-at-regional-disaster-drill.html#TUx1DoVtdC6yRy0z.97]. Accessed August 2020.

[6] ASEAN. 2018. "Philippines hosts ASEAN emergency medical team disaster deployment drill". [https://asean.org/philippines-hosts-asean-emergency-medical-team-disaster-deployment-drill/]. Accessed August 2020.

4.4 HEALTHCARE ACCESS

4.4.1 Access to healthcare

4.4.1a

Does the constitution explicitly guarantee citizens' right to medical care?

Guaranteed free = 4, Guaranteed right = 3, Aspirational or subject to progressive realization = 2, Guaranteed for some groups, not universally = 1, No specific provision = 0

Current Year Score: 3

2020

World Policy Analysis Center

4.4.1b

Access to skilled birth attendants (% of population)

Input number

Current Year Score: 99.1

2016

WHO/World Bank/United Nations Children's Fund (UNICEF)

4.4.1c

Out-of-pocket health expenditures per capita, purchasing power parity (PPP; current international \$)

Input number

Current Year Score: 74.78

2017

WHO Global Health Expenditure database

4.4.2 Paid medical leave

4.4.2a

Are workers guaranteed paid sick leave?

Paid sick leave = 2, Unpaid sick leave = 1, No sick leave = 0

Current Year Score: 2

2020

World Policy Analysis Center

4.4.3 Healthcare worker access to healthcare

4.4.3a

Has the government issued legislation, a policy, or a public statement committing to provide prioritized healthcare services to healthcare workers who become sick as a result of responding to a public health emergency?

Yes = 1, No = 0

Current Year Score: 1

The Thai government provides prioritized health care services to healthcare workers (and other officers) who become sick as a result of responding to a public health emergency. [1] The Public Health Emergency Incident Command System (PHEICS) states that the provincial public health offices are responsible for providing emergency health care services specifically to emergency response officers, including healthcare workers and other personnel. The hospitalization of these officers should be prioritized, e.g. allocate one hospital (or health facility) especially for the treatment and hospitalization of officers.[1]

[1] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS." [https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf]. Accessed August 2020.

4.5 COMMUNICATIONS WITH HEALTHCARE WORKERS DURING A PUBLIC HEALTH EMERGENCY

4.5.1 Communication with healthcare workers

4.5.1a

Is there a system in place for public health officials and healthcare workers to communicate during a public health emergency?

Yes = 1 , No = 0

Current Year Score: 1

Thailand has a system in place for public health officials and healthcare workers to communicate during a public health emergency. The Bureau of Health Emergency Response, under the Ministry of Public Health, is operating a National Emergency Operation Centre (EOC).[1] The National-Level EOC acts as a centre of command to regional EOCs, provincial EOCs, and district EOCs during emergency situations (which include emerging infectious disease and natural disasters) through the Public Health Emergency Incident Command System (PHEICS). [1, 2] Healthcare workers at the district level receive commands and report to the District EOC commanders. District EOCs can both act independently and receive commands from provincial EOCs. Provincial EOCs are responsible for the allocation of healthcare workers within their provinces. The Provincial EOCs receive commands and report to the Ministry of Public Health. As of 2018, 100% of all provinces in Thailand has a provincial-level EOC with a Situation Awareness Team (SAT). [3]

[1] Bureau of Health Emergency Respond Website. [https://ddc.moph.go.th/ddce/]. Accessed August 2020.

[2] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS." [https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf]. Accessed August 2020.

[3] Department of Disease Control, Ministry of Public Health. 2018. "Details of indicators according to the official certification of the Department of Disease Control for the fiscal year 2018". [http://www.opdcddc.org/document/public-service-agreement/institute/KPI_Template_2561/1.2_EOC(edit151160).docx]. Accessed October 2020.

4.5.1b

Does the system for public health officials and healthcare workers to communicate during an emergency encompass healthcare workers in both the public and private sector?

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that the system for public health officials and healthcare workers to communicate during an emergency encompasses healthcare workers in both the public and private sector.

Thailand's Public Health Emergency Incident Command System (PHEICS) assigned private hospitals as one of the actors in the Multi-Agency Coordination (MAC) group. Other institutions in the MAC group includes government hospitals not supervised by the Ministry of Public Health, and provincial disaster prevention and mitigation offices. In response to each emergency case, the Incident Commander (IC) will decide the extent to which each of these MAC group institutions should provide support. Depending on the level of the Emergency Operation Centre (EOC), the Incident Commander (IC) of each EOC could

be the regional health office director, provincial health office director, or district health office director. The Incident Commander (IC) communicates with healthcare workers in their areas. In addition, provincial public health offices (and provincial EOCs) can request for supports from private hospitals, either in the form of emergency government procurement or donation. This includes requests for health personnel, medicine, and medical equipment. [1]

Healthcare workers at the district level receive commands and report to the District EOC commanders. District EOCs can both act independently and receive commands from provincial EOCs. Provincial EOCs are responsible for the allocation of healthcare workers within their provinces. The Provincial EOCs receive commands and report to the Ministry of Public Health. As of 2018, 100% of all provinces in Thailand has a provincial-level EOC with a Situation Awareness Team (SAT). [2]

[1] National Institute for Emergency Medicine (NIEM). 2016. "Public Health Emergency Incident Command System: PHEICS." [https://www.rbpho.moph.go.th/eoc2020/file/PHEICS.pdf]. Accessed August 2020.

[2] Department of Disease Control, Ministry of Public Health. 2018. "Details of indicators according to the official certification of the Department of Disease Control for the fiscal year 2018". [http://www.opdcddc.org/document/public-service-agreement/institute/KPI_Template_2561/1.2_EOC(edit151160).docx]. Accessed October 2020.

4.6 INFECTION CONTROL PRACTICES AND AVAILABILITY OF EQUIPMENT

4.6.1 Healthcare associated infection (HCAI) prevention and control programs

4.6.1a

Is there evidence that the national public health system is monitoring for and tracking the number of healthcare associated infections (HCAI) that take place in healthcare facilities?

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that the national public health system monitors for and tracks the number of healthcare associated infections that take place in healthcare facilities. The Planning Division, Department of Disease Control (DDC), Ministry of Public Health, has been monitoring for and tracking the number of healthcare associated infections that take place in healthcare facilities.[1] According to a country-level report published by the Department of Disease Control (DDC) in 2017, the most common HCAI were ventilator associated pneumonia (VAP), catheter associated urinary tract infection (CAUTI), surgical site infection (SSI) and central line associated bloodstream infections (CLABSI).[1] In response, the DDC has issued a plan to improve the data-collection system in order to improve the monitoring standard. It is also mentioned in this report that the Ministry of Public Health has set a target to reduce disease-resistant infection by 50% by 2021.[1] In addition to the country-level monitoring, many health facilities are constantly monitoring and tracking the number of HCAI within their facilities. For example, the Maharaj Nakorn Chiang Mai Hospital, the Queen Sirikit National Institute of Child Health, and the Phra Nakhon Si Ayutthaya Hospital have been making their HCAI reports available online. [2,3,4] This is because the prevalence of health care associated infections is one of the Key Performance Indicators (KPI) monitored by the Ministry of Public Health (MOPH). [6]

[1] Department of Disease Control (DDC). 2017. "The Health Care Associated Infections Plan B.E.2560-2564 (2017-2021)." [http://plan.ddc.moph.go.th/meeting30_1augsep/meeting30_1/Documents/5.%20CD/6.%20E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%87%E0%B8%B2%E0%B8%99%E0%B8%84%E0%B8%A7%E0%B8%9A%E0%B8%84%E0%B8%B8%E0%B8%A1%E0%B9%82%E0%B8%A3%E0%B8%84%E0%B8%95%E0%B8%B4%E0%B8%94%E0%B9%80%E0%B8%8A%E0%B8%B7%E0%B9%89%E0%B8%AD%E0%B9%83%E0%B8%99%E0%B9%82%E0%B8%A3%E0%B8%87%E0%B8%9E%E0%B8%A2%E0%B8%B2%E0

%B8%9A%E0%B8%B2%E0%B8%A5.pdf]. Accessed September 2020.

[2] Maharaj Nakorn Chiang Mai Hospital. 2017. "Prevalence Report of Health Care Associated Infections B.E.2560 (2017)" [http://www.med.cmu.ac.th/etc/icc/2012/index.php/2012-03-12-06-24-28/139---2560]. Accessed September 2020.

[3] Aumprasert, T. 2015. "Prevalence of Hospital Acquired Infections Survey at Queen Sirikit National Institute of Child Health 2015." Department of Medical Services Journal. [http://thaidj.org/index.php/BDMJ/article/view/6870]. Accessed September 2020.

[4] Phra Nakhon Si Ayutthaya Hospital. 2013. "Prevalence Report of Health Care Associated Infections". [http://www.ayhosp.go.th/ayh/index.php/ic-guidelines/336-ic-sp004]. Accessed September 2020.

[5] Indrawattana, N and Vanaporn, M. 2015. "Nosocomial Infection". Journal of Medicine and Health Sciences vol.22 no.1 April 2015. [http://med.swu.ac.th/research/images/Vol22Num1/9.pdf]. Accessed September 2020.

[6] Nursing Division, Ministry of Public Health. 2011. "Quality Assurance in Nursing Services: Nursing Services Quality Assessment for Health Care Associated Infections Prevention and Control." [http://www.nursing.go.th/Book_nurse/QA/Servicesandinfectioncontrol.rar]. Accessed September 2020.

4.7 CAPACITY TO TEST AND APPROVE NEW MEDICAL COUNTERMEASURES

4.7.1 Regulatory process for conducting clinical trials of unregistered interventions

4.7.1a

Is there a national requirement for ethical review (e.g., from an ethics committee or via Institutional Review Board approval) before beginning a clinical trial?

Yes = 1, No = 0

Current Year Score: 1

There is a national requirement for ethical review before beginning a clinical trial in Thailand. Section 9, Article 50 of the Medical Council Regulations and Medical Ethics Preservation, B.E.2549 (2006) requires practitioners who conduct or participate in the research study or experiment on humans to apply for ethics reviews before beginning a clinical trial. [1] In addition, ethical review is required in compliance with many other declarations and laws, i.e. Declaration of Patient's Rights B.E. 2558 (2015), Mental Health Act B.E.2551 (2008), National Health Act B.E.2550 (2007), and Medical Council Regulations and Medical Ethics Preservation: Stem cell implantation for treatment B.E.2552 (2009) [2,3,4,5]. All clinical trials that involve using imported drugs need ethical approval from the Thai Food and Drug Administration (FDA). [6] Many public university and health research centres have set up their own institutional review board. According to a guideline prepared by the National Research Management System (NRMS), eleven institutions were approved by The Strategic Initiative for Developing Capacity of Ethical Review (SIDCER) in 2017. [7,8,9] Ethical reviews in Thailand follow international standards and practices, namely the Belmont Report, the Declaration of Helsinki, the International Ethical Guidelines for Biomedical Research Involving Human Subjects (CIOMS), the International Ethical Guidelines for Epidemiological Studies (CIOMS and WHO) and the ICH GCP Guidelines. [10]

[1] The Medical Council of Thailand (TMC). 2006. "The Medical Council Regulations and Medical Ethics Preservation B.E.2548 (2006)". [https://tmc.or.th/En/assets/files/file_BE2549.pdf]. Accessed August 2020.

[2] The Medical Council of Thailand (TMC). 2015. "Declaration of Patient's Rights B.E. 2558 (2015)". [https://med.mahidol.ac.th/medicalrecord/en/siti_EN]. Accessed August 2020.

[3] Mental Health Act B.E.2551 (2008). [http://www.omhc.dmh.go.th/law/view.asp?id=3]. Accessed August 2020.

[4] National Health Act B.E.2550 (2007). [http://thailawforum.com/database1/National-Health-Act.html]. Accessed August 2020.

2020.

- [5] The Medical Council of Thailand (TMC). 2009. "Medical Council Regulations and Medical Ethics Preservation: Stem cell implantation for treatment B.E.2552 (2009)". [http://www.si.mahidol.ac.th/sirb/files/Policies%20&%20Guidance/Medical_Council_Regulation.pdf]. Accessed August 2020.
- [6] Food and Drug Administration (FDA). 2018. "Notification of the Food and Drug Administration on the Import of Drugs for Clinical Studies". [<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Law04-Notification-ThFDA/FDA-20180917.pdf>]. Accessed August 2020.
- [7] Siriraj Hospital. 2004. "Notification of the Siriraj Hospital, Mahidol University on Ethical Review of Human Research B.E.2557 (2014)". [http://www.si.mahidol.ac.th/sirb/files/Policies%20&%20Guidance/policy_siriraj_thai.pdf]. Accessed August 2020.
- [8] Chulalongkorn University. 2018. "The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University". [<https://www.research.chula.ac.th/ethics-review-committee/>]. Accessed August 2020.
- [9] Food and Drug Administration (FDA). 2018. "List of ethical review boards approved by the FDA". [http://www.fda.moph.go.th/sites/drug/Shared%20Documents/DrugResearchFile/List_EC.pdf]. Accessed August 2020.
- [10] National Research Council of Thailand (NRCT). 2017. "Human research ethics". [<https://www.nrms.go.th/FileUpload/AttatchFile/News/256106141555382459752.pdf>]. Accessed August 2020.

4.7.1b

Is there an expedited process for approving clinical trials for unregistered medical countermeasures (MCM) to treat ongoing epidemics?

Yes = 1 , No = 0

Current Year Score: 1

There is an expedited process for approving clinical trials for unregistered medical countermeasures to treat pandemics in Thailand. The Notification of the Food and Drug Administration on Expedited Application for Clinical Trial Drugs B.E.2561 (2018) states that drugs imported or produced domestically for clinical studies regarding health emergencies can bypass the import permit application, while the researchers can apply for an expedited ethical review process. [1] Although none of the guidelines by ethical review boards clearly states that "clinical trials for unregistered medical countermeasures to treat ongoing pandemics" will be treated as an expedited case, there is an expedited review track where researchers can apply for. [2] Additionally, in May 2020, Thailand's Food and Drug Administration issued guidance to sponsors and investigators regarding the conduct of clinical trials during the COVID-19 outbreak. The guidelines provide examples of flexible approaches to ensure participant safety while still complying with good clinical practices and maintaining data integrity. [3]

[1] Food and Drug Administration (FDA). 2018. Notification of the Food and Drug Administration on Expedited Application for Clinical Trial Drugs B.E.2561 (2018). [<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Law04-Notification-ThFDA/FDA-20180827.pdf>]. Accessed August 2020.

[2] Mahidol University. 2017. "Standard Operating Procedures (SOP): Institutional Review Board, Faculty of Medicine Siriraj Hospital, Mahidol University". [<http://www.si.mahidol.ac.th/sirb/files/%E0%B8%82%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B8%B9%E0%B8%A5%E0%B8%AA%E0%B8%B3%E0%B8%AB%E0%B8%A3%E0%B8%B1%E0%B8%9A%E0%B8%9C%E0%B8%B9%E0%B9%89%E0%B8%A7%E0%B8%B4%E0%B8%88%E0%B8%B1%E0%B8%A2/SOPs.pdf>]. Accessed August 2020.

[3] Food and Drug Administration (FDA). 26 May 2020. "Guidance regarding the conduct of clinical trials during the COVID-19 outbreak". [<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Law04-Notification-ThFDA/FDA-20200526.pdf>]. Accessed August 2020.

4.7.2 Regulatory process for approving medical countermeasures

4.7.2a

Is there a government agency responsible for approving new medical countermeasures (MCM) for humans?

Yes = 1 , No = 0

Current Year Score: 1

There is a government agency responsible for approving new medical countermeasures for humans in Thailand. All drugs, vaccines and medical devices, including medical countermeasures for humans, have to be approved by the Food and Drug Administration (FDA). The Bureau of Drug Control, operating under the FDA is responsible for approving new drugs and vaccines. The Medical Device Control Division, operating under the FDA, is especially responsible for approving medical devices [1, 2, 3]. Medical products such as medicines, vaccines that are of major public health interest or under urgent needs can apply for an expedited approval. [2, 3, 4] In May, 2020, Thailand's Food and Drug Administration issued guidance to sponsors and investigators regarding the conduct of clinical trials during the COVID-19 outbreak. The guidelines provide examples of flexible approaches to ensure participant safety while still complying with good clinical practices and maintaining data integrity. The guidelines cover approval of importing medications or production of medications for human research studies. [5]

[1] Food and Drug Administration (FDA). 2017. "Notification of the Ministry of Public Health on Application Fee for Drug Registration and Approval B.E.2560 (2017)".

[<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/New/DrugCharges.pdf>]. Accessed August 2020.

[2] Food and Drug Administration (FDA). 2008. "Guideline on Procedural Aspects Regarding Marketing Authorization of Vaccines in Thailand"

[http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Vaccine/Procedural_%20GL_Vaccine_final_sep_08.pdf]. Accessed August 2020.

[3] Prompradith, V. and Chimvong, P. 2017. "Drug Regulation in Thailand. Taiwan-ASEAN Drug Regulatory Symposium".

[<https://www.fda.gov.tw/tc/includes/GetFile.ashx?id=f636695447955896008>]. Accessed August 2020.

[4] Food and Drug Administration (FDA). 2017. "Guideline for Drug Registration and Approval".

[<http://www.fda.moph.go.th/sites/oss/Shared%20Documents/%E0%B9%81%E0%B8%99%E0%B8%A7%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9E%E0%B8%B4%E0%B8%88%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B8%B2%E0%B8%97%E0%B8%B0%E0%B9%80%E0%B8%9A%E0%B8%B5%E0%B8%A2%E0%B8%99%E0%B8%95%E0%B8%B3%E0%B8%A3%E0%B8%B1%E0%B8%9A%E0%B8%A2%E0%B8%B2%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%9B%E0%B8%B1%E0%B8%88%E0%B8%88%E0%B8%B8%E0%B8%9A%E0%B8%B1%E0%B8%99.pdf>]. Accessed August 2020.

[5] Food and Drug Administration (FDA). 26 May 2020. "Guidance regarding the conduct of clinical trials during the COVID-19 outbreak". [<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Law04-Notification-ThFDA/FDA-20200526.pdf>]. Accessed August 2020.

4.7.2b

Is there an expedited process for approving medical countermeasures (MCM) for human use during public health emergencies?

Yes = 1 , No = 0

Current Year Score: 1

There is an expedited process for approving medical countermeasures for human use during public health emergencies in Thailand. All drugs and vaccines, including medical countermeasures for humans, require approval from the Bureau of Drug Control, which operates under the Food and Drug Administration (FDA). [1,2,3] There is an expedited process available for

medicines and vaccines that are of major public health interest, or under urgent need to help solve public health problems. [2,3,4] According to the Food and Drug Administration (FDA), 'Priority Review' is a fast track channel for life-threatening medicines and/or medicines in urgent need for public health problems. Some of the conditions are which the drug must be approved by one of the reference agencies (e.g. EMA, MHRA, US FDA, Health Canada), or benchmark, or being sold in specific countries (e.g. EU, UK, Switzerland). [2]

[1] Food and Drug Administration (FDA). 2017. "Notification of the Ministry of Public Health on Application Fee for Drug Registration and Approval B.E.2560 (2017)".

[<http://www.fda.moph.go.th/sites/drug/Shared%20Documents/New/DrugCharges.pdf>]. Accessed August 2020.

[2] Food and Drug Administration (FDA). 2008. "Guideline on Procedural Aspects Regarding Marketing Authorization of Vaccines in Thailand".

[http://www.fda.moph.go.th/sites/drug/Shared%20Documents/Vaccine/Procedural_%20GL_Vaccine_final_sep_08.pdf]. Accessed August 2020.

[3] Prompradith, V. and Chimvong, P. 2017. Drug Regulation in Thailand. Taiwan-ASEAN Drug Regulatory Symposium.

[<https://www.fda.gov.tw/tc/includes/GetFile.ashx?id=f636695447955896008>]. Accessed August 2020.

[4] Food and Drug Administration (FDA). 2017. "Guideline for Drug Registration and Approval".

[<http://www.fda.moph.go.th/sites/oss/Shared%20Documents/%E0%B9%81%E0%B8%99%E0%B8%A7%E0%B8%97%E0%B8%B2%E0%B8%87%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9E%E0%B8%B4%E0%B8%88%E0%B8%B2%E0%B8%A3%E0%B8%93%E0%B8%B2%E0%B8%97%E0%B8%B0%E0%B9%80%E0%B8%9A%E0%B8%B5%E0%B8%A2%E0%B8%99%E0%B8%95%E0%B8%B3%E0%B8%A3%E0%B8%B1%E0%B8%9A%E0%B8%A2%E0%B8%B2%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B8%9B%E0%B8%B1%E0%B8%88%E0%B8%88%E0%B8%B8%E0%B8%9A%E0%B8%B1%E0%B8%99.pdf>]. Accessed August 2020.

Category 5: Commitments to improving national capacity, financing plans to address gaps, and adhering to global norms

5.1 INTERNATIONAL HEALTH REGULATIONS (IHR) REPORTING COMPLIANCE AND DISASTER RISK REDUCTION

5.1.1 Official IHR reporting

5.1.1a

Has the country submitted IHR reports to the WHO for the previous calendar year?

Yes = 1 , No = 0

Current Year Score: 1

2020

World Health Organization

5.1.2 Integration of health into disaster risk reduction

5.1.2a

Are epidemics and pandemics integrated into the national risk reduction strategy or is there a standalone national disaster risk reduction strategy for epidemics and pandemics?

Yes = 1, No = 0

Current Year Score: 1

Risk reduction strategy for pandemics exists both in the national risk reduction strategy and as a standalone agenda. In the National Preparedness Strategy B.E.2560-2564 (2017-2021), risk reduction strategies are discussed for different types of national disasters including natural disasters, pandemics, and national security.[1] Additionally, the Department of Disease Control (DDC), Ministry of Public Health (MOPH), updates their risk reduction strategy for emerging infectious diseases every five years.[2] The current strategy covers the period B.E.2560-2564 (2017-2021). The main strategy for risk reduction is to increase effectiveness in six following dimensions 1) public health emergency response system, 2) surveillance, prevention, and treatment of emerging infectious disease under the "One Health" concept, 3) public relation and risk communication system, 4) international cooperation, 5) civil society participation, and 6) knowledge management and research and development (R&D).[2,3]

[1] The National Security Council (NSC). 2017. "National Preparedness Strategy B.E.2560-2564." Office of the Prime Minister. [http://www.nsc.go.th/wp-content/uploads/2018/10/%E0%B9%81%E0%B8%9C%E0%B8%99%E0%B9%80%E0%B8%95%E0%B8%A3%E0%B8%B5%E0%B8%A2%E0%B8%A1%E0%B8%9E%E0%B8%A3%E0%B9%89%E0%B8%AD%E0%B8%A1%E0%B9%81%E0%B8%AB%E0%B9%88%E0%B8%87%E0%B8%8A%E0%B8%B2%E0%B8%95%E0%B8%B4-%E0%B8%9E.%E0%B8%A8-%E0%B9%92%E0%B9%95%E0%B9%96%E0%B9%90-%E0%B9%92%E0%B9%95%E0%B9%96%E0%B9%94.pdf]. Accessed August 2020.

[2] Department of Disease Control (DDC). 2016. "Strategic Plan for Prevention and Mitigation of Emerging Infectious Diseases." [http://nih.dmsc.moph.go.th/data/data/59/22_6/4.pdf]. Accessed August 2020.

[3] Kaewsomboon et al. 2018. "Development of Thailand National Strategic Plan for Emerging Infectious Disease." Disease Control Journal. 44[1] : 50-62. [https://he01.tci-thaijo.org/index.php/DCJ/article/view/147375]. Accessed August 2020.

5.2 CROSS-BORDER AGREEMENTS ON PUBLIC HEALTH AND ANIMAL HEALTH EMERGENCY RESPONSE

5.2.1 Cross-border agreements

5.2.1a

Does the country have cross-border agreements, protocols, or MOUs with neighboring countries, or as part of a regional group, with regards to public health emergencies?

Yes = 2, Yes, but there is evidence of gaps in implementation = 1, No = 0

Current Year Score: 2

Thailand has cross-border agreements, protocols or MOUs with neighbouring countries with regards to public health emergencies. The Joint External Evaluation for Thailand, completed in June 2017, states that Thailand has various cross-border agreements with neighbouring countries with regards to the control of communicable diseases, and public health emergencies.[1] There exist both bilateral and multilateral agreements. For example, in Article III of the Memorandum of Understanding (MOU) Between The Government of Malaysia and The Government of the Kingdom of Thailand Concerning

Cooperation in Health, it is stated that the countries shall cooperate on "(a) exchange of information in the field of health relating to epidemiology, technical and legislative matters; (b) carrying out of disease surveillance programmes; (c) control of outbreaks in communicable diseases." [2] Similar content is also included in a multilateral agreement between ASEAN and China and bilateral agreements between Thailand and other countries such as Cambodia and China [3,4,5]. The International Cooperation Office at the Department of Disease Control, Ministry of Public Health, showcases many successful collaborations with neighboring countries, countries in the region, and beyond. [6]

[1] World Health Organization. Country Office of Thailand. 2018. "Joint external evaluation of IHR core capacities of the Kingdom of Thailand: mission report: June 26-30, 2017." World Health Organization. Country office of Thailand. [<http://apps.who.int/iris/handle/10665/272493>]. Accessed August 2020.

[2] Ministry of Public Health (MOPH). 1997. Memorandum of Understanding Between The Government of Malaysia and The Government of the Kingdom of Thailand Concerning Cooperation in Health. [<http://www.bihmoph.net/userfiles/file/Thai%20-%20Malaysia.pdf>]. Accessed August 2020.

[3] Ministry of Public Health (MOPH). 2016. Memorandum of Understanding Between The Ministry of Public Health of the Kingdom of Thailand and The Ministry of Health of The Kingdom of Cambodia on Health Cooperation Development. [<http://www.bihmoph.net/userfiles/file/MOU%20Thailand-Cambodia%2017Nov2016.pdf>]. Accessed August 2020.

[4] Ministry of Public Health (MOPH). 2016. Memorandum of Understanding Between The Ministry of Public Health of the Kingdom of Thailand and The Ministry of Health of The People's Republic of China on Cooperation in the Fields of Health, Medicine and Pharmaceuticals. [<http://www.bihmoph.net/userfiles/file/MOU%20-%20China%20%5B29%E0%B8%9E%E0%B8%8440%5D.pdf>]. Accessed August 2020.

[5] Ministry of Public Health (MOPH). 2012. Memorandum of Understanding Between The Governments of The Member States of The Association of Southeast Asian Nations (ASEAN) and The Government of The People's Republic of China on Health Cooperation. [<http://www.bihmoph.net/userfiles/file/MOU%20-%20ASEAN+China%20%5B6%E0%B8%81%E0%B8%842555%5D.pdf>]. Accessed August 2020.

[6] The International Cooperation Office at the Department of Disease Control Website. 2020. "The International Cooperation Office - Main Page". [<https://ddc.moph.go.th/oic/>]. Accessed August 2020.

5.2.1b

Does the country have cross-border agreements, protocols, or MOUs with neighboring countries, or as part of a regional group, with regards to animal health emergencies?

Yes = 2, Yes, but there is evidence of gaps in implementation = 1, No = 0

Current Year Score: 0

There is insufficient evidence that Thailand has MOUs as part of a regional group with regards to animal health emergencies.

Thailand, as party to ASEAN, has signed an MOU with regard to animal health emergencies. The Agreement on the Establishment of the ASEAN Coordinating Centre for Animal Health and Zoonoses (ACCAHZ) was signed among all ASEAN members in 2016. [1] The ACCAHZ provides a platform for cooperation and collaboration among ASEAN members on animal health and zoonoses. For examples 1) prevention, control, and eradication of cross-border animal diseases, zoonoses, and 2) quick response to animal health emergencies.[2] As of May 2020, ACCAHZ has not been yet active as its agreement is pending final ratification by Indonesia. [3]

[1] ASEAN. 2016. "Agreement on the establishment of the ASEAN Coordinating Centre for Animal Health and Zoonoses." [<http://agreement.asean.org/media/download/20161108071810.pdf>]. Accessed August 2020.

[2] Government Public Relations Department. 7 Oct 2016. "ASEAN establishes Coordinating Centre to address trans-boundary animal and zoonotic diseases." [<https://asean.org/asean-establishes-coordinating-centre-to-address-trans-boundary-animal>

and-zoonotic-diseases-2/]. Accessed August 2020.

[3] Yusof Ishak Institute. 18 May 2020. Perspective - ISSUE: 2020 No. 47. "ASEAN's Covid-19 Pandemic Response: Practical Next Steps". [https://www.iseas.edu.sg/wp-content/uploads/2020/03/ISEAS_Perspective_2020_47.pdf]. Accessed August 2020.

5.3 INTERNATIONAL COMMITMENTS

5.3.1 Participation in international agreements

5.3.1a

Does the county have signatory and ratification (or same legal effect) status to the Biological Weapons Convention?

Signed and ratified (or action having the same legal effect) = 2, Signed = 1, Non-compliant or not a member = 0

Current Year Score: 2

2021

Biological Weapons Convention

5.3.1b

Has the country submitted confidence building measures for the Biological Weapons Convention in the past three years?

Yes = 1 , No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1c

Has the state provided the required United Nations Security Council Resolution (UNSCR) 1540 report to the Security Council Committee established pursuant to resolution 1540 (1540 Committee)?

Yes = 1 , No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1d

Extent of United Nations Security Council Resolution (UNSCR) 1540 implementation related to legal frameworks and enforcement for countering biological weapons:

Very good (60+ points) = 4, Good (45–59 points) = 3, Moderate (30–44 points) = 2, Weak (15–29 points) = 1, Very weak (0–14 points) or no matrix exists/country is not party to the BWC = 0

Current Year Score: 3

2021

Biological Weapons Convention

5.3.2 Voluntary memberships

5.3.2a

Does the country meet at least 2 of the following criteria?

- Membership in Global Health Security Agenda (GHSA)
- Membership in the Alliance for Country Assessments for Global Health Security and IHR Implementation (JEE Alliance)
- Membership in the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP)
- Membership in the Australia Group (AG)
- Membership in the Proliferation Security Initiative (PSI)

Needs to meet at least two of the criteria to be scored a 1 on this measure. , Yes for five = 1 , Yes for four = 1 , Yes for three = 1 , Yes for two = 1 , Yes for one = 0 , No for all = 0

Current Year Score: 1

2021

Global Health Security Agenda; JE Alliance; Global Partnership; Australia Group; PSI

5.4 JOINT EXTERNAL EVALUATION (JEE) AND PERFORMANCE OF VETERINARY SERVICES PATHWAY (PVS)

5.4.1 Completion and publication of a Joint External Evaluation (JEE) assessment and gap analysis

5.4.1a

Has the country completed a Joint External Evaluation (JEE) or precursor external evaluation (e.g., GHSA pilot external assessment) and published a full public report in the last five years?

Yes = 1 , No = 0

Current Year Score: 1

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.4.1b

Has the country completed and published, within the last five years, either a National Action Plan for Health Security (NAPHS) to address gaps identified through the Joint External Evaluation (JEE) assessment or a national GHSA roadmap that sets milestones for achieving each of the GHSA targets?

Yes = 1 , No = 0

Current Year Score: 0

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.4.2 Completion and publication of a Performance of Veterinary Services (PVS) assessment and gap analysis

5.4.2a

Has the country completed and published a Performance of Veterinary Services (PVS) assessment in the last five years?

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.4.2b

Has the country completed and published a Performance of Veterinary Services (PVS) gap analysis in the last five years?

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5 FINANCING

5.5.1 National financing for epidemic preparedness

5.5.1a

Is there evidence that the country has allocated national funds to improve capacity to address epidemic threats within the past three years?

Yes = 1, No = 0

Current Year Score: 1

There is evidence that the country has allocated national funds to improve capacity to address epidemic threats within the past three years. Thailand has committed to sharing funds to improve the country's and ASEAN domestic capacity to address epidemic threats. The Joint Statement from Health Ministers of ASEAN and the United States on COVID-19 Cooperation (30 April 2020) states that the Ministers "WELCOMING the announcement of the ASEAN Member States' plan to establish the COVID-19 Response Fund to address COVID-19 and future public health emergencies, and a Regional Reserve of Medical Supplies to enable rapid response to emergency medical supply needs, with the partnership of external partners." The Joint Statement also expressed "collective commitment and cooperation to stop the global pandemic of COVID-19 and associated public health emergencies by enhancing preparedness, prevention, detection and response". [1] A similar statement has

been released by the Prime Minister of Thailand through an official press release prior to the official Joint Statement from Health Ministers of ASEAN and the United States on COVID-19 Cooperation has been released. The Prime Minister reiterated that "no country can fight this threat alone" and that as Thailand is part of ASEAN, he is ready to propose to ASEAN plus three to jointly established "ASEAN Fund to Combat COVID-19". Additionally, the Department of Disease Control has published the "Action Plan for Surveillance, Prevention and Control of Communicable Disease". The overarching strategy in the plan is intended for any types of disease outbreak but the plan also provides disease-specific action plans. This action plan discusses key performance indicators (KPIs) for the surveillance, prevention, and control of prioritized communicable diseases, which includes capacity development activities to address epidemic threats such as human resources development and training, improvement of public laboratory capacity, for instance. The Action Plan reports the budget allocated to achieve each KPI as can be seen in the Action Plan for 2016-2018. [3]

[1] Association of Southeast Asian Nations (ASEAN). 30 April 2020. "Joint Statement Special Video Conference of Health Ministers of ASEAN and the United States in Enhancing Cooperation on Coronavirus Disease 2019 (COVID-19) Response". [https://asean.org/storage/2020/05/Adopted_ASEAN-US-Joint-Statement-on-COVID-19.pdf]. Accessed September 2020.

[2] Royal Thai Government. Government House News. 14 April 2020. "ASEAN Cooperates in Establishing the ASEAN Fund to Combat COVID-19 - Ready to apply lessons learned for new challenges in the future". [<https://www.thaigov.go.th/news/contents/details/28999>]. Accessed September 2020.

[3] Department of Disease Control (DDC). 2016. "Action Plan for Surveillance, Prevention and Control of Communicable Disease B.E.2559-2061 (2016-2018): According to the Communicable Disease Act B.E.2558 (2015)". [https://cabinet.soc.go.th/doc_image/2559/9931952067.pdf]. Accessed August 2020.

5.5.2 Financing under Joint External Evaluation (JEE) and Performance of Veterinary Services (PVS) reports and gap analyses

5.5.2a

Does the Joint External Evaluation (JEE) report, National Action Plan for Health Security (NAPHS), and/or national GHSA roadmap allocate or describe specific funding from the national budget (covering a time-period either in the future or within the past five years) to address the identified gaps?

Yes = 1 , No/country has not conducted a JEE = 0

Current Year Score: 0

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.5.2b

Does the Performance of Veterinary Services (PVS) gap analysis and/or PVS assessment allocate or describe specific funding from the national budget (covering a time-period either in the future or within the past five years) to address the identified gaps?

Yes = 1 , No/country has not conducted a PVS = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5.3 Financing for emergency response

5.5.3a

Is there a publicly identified special emergency public financing mechanism and funds which the country can access in the face of a public health emergency (such as through a dedicated national reserve fund, an established agreement with the World Bank pandemic financing facility/other multilateral emergency funding mechanism, or other pathway identified through a public health or state of emergency act)?

Yes = 1, No = 0

Current Year Score: 1

There is a publicly identified special emergency public financing mechanism and funds which Thailand can access in the face of a public health emergency. Thailand is not an IDA eligible borrowing country.[1] However, being party to the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) also grants Thailand's access to the AADMER Fund.[2,3] In Section 2, Article 10 of the Budget Procedures Act B.E.2502 (1959), Thailand may allocate budget for National Emergency Situations.[4] The Regulation of the Budget Bureau on 'the Management of National Emergency Fund' (B.E.2561) states that this fund can be used for 1) prevention and mitigation of national security threats, 2) mitigation of severe public disasters, 3) top-up the insufficient budget allocation in case of emergency, 4) expenses under the government's commitment or responsibility which has not been allocated through the regular national budget allocation.[5]

[1] IDA, The World Bank's Fund for the Poorest. 2020. "Borrowing Countries," [<http://ida.worldbank.org/about/borrowing-countries>]. Accessed September 2020.

[2] ASEAN. 2005. "ASEAN Agreement on Disaster Management and Emergency Response." [<http://agreement.asean.org/media/download/20190702042042.pdf>]. Accessed September 2020.

[3] ASEAN. AADMER Work Programme Webpage. [<https://asean.org/asean-socio-cultural/asean-agreement-on-disaster-management-and-emergency-response-cop-to-aadmer/aadmer-work-programme/>]. Accessed September 2020.

[4] Office of the Council of State. The Budget Procedures Act B.E.2502. [<http://web.krisdika.go.th/data/law/law2/%c733/%c733-20-9999-update.pdf>]. Accessed September 2020.

[5] Bureau of the Budget. Regulation of the Budget Bureau on the Management of National Emergency Fund B.E.2561. [<http://finance.dld.go.th/th/files/data/budget/bg61/6/290661.PDF>]. Accessed September 2020.

5.5.4 Accountability for commitments made at the international stage for addressing epidemic threats

5.5.4a

Is there evidence that senior leaders (president or ministers), in the past three years, have made a public commitment either to:

- Support other countries to improve capacity to address epidemic threats by providing financing or support?
- Improve the country's domestic capacity to address epidemic threats by expanding financing or requesting support to improve capacity?

Needs to meet at least one of the criteria to be scored a 1 on this measure., Yes for both = 1, Yes for one = 1, No for both = 0

Current Year Score: 1

There is evidence that senior leaders, in the past three years, have made a public commitment to support other countries to improve capacity to address epidemic threats by providing financing or support. The Joint Statement from Health Ministers

of ASEAN and the United States on COVID-19 Cooperation (30 April 2020) addresses funding and capacity development for future disease outbreaks by stating that the Ministers "[welcome] the announcement of the ASEAN Member States' plan to establish the COVID-19 Response Fund to address COVID-19 and future public health emergencies, and a Regional Reserve of Medical Supplies to enable rapid response to emergency medical supply needs, with the partnership of external partners."

[1] A similar statement from the Prime Minister of Thailand through an official press release focuses only on Covid-19. The Prime Minister reiterated that "no country can fight this threat alone" and that as Thailand is part of ASEAN, he is ready to propose to ASEAN plus three to jointly established "ASEAN Fund to Combat COVID-19". [2]

There is no publicly available evidence that demonstrates that senior leaders, in the past three years, made a public commitment to support the country's domestic capacity to address epidemic threats by expanding financing or requesting support to improve capacity. Further research from the Ministry of Health Website, Ministry of Foreign Affairs Website, and internet search from the United Nations and WHO sources yielded no result. [3, 4, 5, 6, 7]

[1] Association of Southeast Asian Nations (ASEAN). 30 April 2020. "Joint Statement Special Video Conference of Health Ministers of ASEAN and the United States in Enhancing Cooperation on Coronavirus Disease 2019 (COVID-19) Response". [https://asean.org/storage/2020/05/Adopted_ASEAN-US-Joint-Statement-on-COVID-19.pdf]. Accessed September 2020.

[2] Royal Thai Government. Government House News. 14 April 2020. "ASEAN Cooperates in Establishing the ASEAN Fund to Combat COVID-19 - Ready to apply lessons learned for new challenges in the future". [<https://www.thaigov.go.th/news/contents/details/28999>]. Accessed September 2020.

[3] Ministry of Public Health Website. [<https://www.moph.go.th/>]. Accessed September 2020.

[4] Ministry of Foreign Affairs Website. [<https://www.mfa.go.th/>]. Accessed September 2020.

[5] United Nations Thailand Website. [<https://thailand.un.org/>]. Accessed September 2020.

[6] WHO South-East Asia Website. [<https://www.who.int/southeastasia>]. Accessed September 2020.

[7] WHO Thailand Website. [<https://www.who.int/thailand/>]. Accessed September 2020.

5.5.4b

Is there evidence that the country has, in the past three years, either:

- Provided other countries with financing or technical support to improve capacity to address epidemic threats?
- Requested financing or technical support from donors to improve the country's domestic capacity to address epidemic threats?

Needs to meet at least one of the criteria to be scored a 1 on this measure., Yes for both = 1, Yes for one = 1, No for both = 0

Current Year Score: 1

There is evidence that the Thai government has spent national budget to 1) provided support to other countries to address epidemic threats and 2) been allocating budget to improve capacity to address epidemic threats. The "Thailand Global Health Strategic Framework 2016-2020", states that Thailand has provided humanitarian aids to countries affected by Ebola outbreaks in Western Africa.[1] In addition, on November 7th, 2017, the Ministry of Public Health transferred additional funding (120,000 THB or about 3,650 USD) to enhance capacity of all 76 provincial communicable disease committees.[2]

This funding was to be used for 1) establishment of provincial infection control centres, 2) assignment of point-of-entry officers, 3) making surveillance, prevention and mitigation plan for deadly infectious diseases and epidemic diseases. Other examples are on the government's budget allocation to prevent and control dengue fever, rabies, and influenza. [3,4,5,6]

There is evidence that Thailand has committed to sharing funds to improve the country's and ASEAN domestic capacity to address epidemic threats. The Joint Statement from Health Ministers of ASEAN and the United States on COVID-19 Cooperation (30 April 2020) states that the Ministers "WELCOMING the announcement of the ASEAN Member States' plan to establish the COVID-19 Response Fund to address COVID-19 and future public health emergencies, and a Regional Reserve of Medical Supplies to enable rapid response to emergency medical supply needs, with the partnership of external partners."

The Joint Statement also expressed "collective commitment and cooperation to stop the global pandemic of COVID-19 and associated public health emergencies by enhancing preparedness, prevention, detection and response". [7]

[1] Ministry of Public Health (MOPH). 2016. "Thailand Global Health Strategic Framework 2016-2020."

[http://www.bihmoph.net/userfiles/file/GHS%20ENG.pdf]. Accessed August 2020.

[2] Office of the Permanent Secretary (OPS), 2017. "The transfer of additional fund for supporting provincial communicable disease committee." Ministry of Public Health (MOPH).

https://phdb.moph.go.th/phdb2017/admin/files/userfiles/files/%E0%B9%81%E0%B8%88%E0%B9%89%E0%B8%87%E0%B8%88%E0%B8%B1%E0%B8%94%E0%B8%AA%E0%B8%A3%E0%B8%A3%E0%B8%87%E0%B8%9B%E0%B8%A1_%E0%B8%84%E0%B8%81%E0%B8%81_%E0%B9%82%E0%B8%A3%E0%B8%84%E0%B8%95%E0%B8%B4%E0%B8%95%E0%B8%94%E0%B9%88%E0%B8%AD%E0%B8%A3%E0%B8%B0%E0%B8%94%E0%B8%B1%E0%B8%9A%E0%B8%88%E0%B8%B1%E0%B8%87%E0%B8%AB%E0%B8%A7%E0%B8%B1%E0%B8%94.pdf]. Accessed August 2020. [in Thai]

[3] Isanews. 2018. "The Department of Livestock Development assures that there will be no shortage of rabies vaccine: 10.2 million dosages are being imported." 13 Mar 2018. [https://www.isranews.org/isranews-news/64255-dog-64255.html]. Accessed August 2020.. [in Thai]

[4] Thai Post. 2018. "Find Measures to Increase Rabies Vaccination Awareness." 21 Mar 2018.

[https://www.thaipost.net/main/detail/4810]. Accessed August 2020. [in Thai]

[5] Naewna. 2018. "The government allocates 373 million THB to achieve "garbage-free" communities." 11 Sep 2018.

[https://www.naewna.com/local/363489]. Accessed August 2020. [in Thai]

[6] Thairath. 2018. "Influenza Vaccine." 27 Jul 2017. [https://www.thairath.co.th/content/1017340]. Accessed August 2020. [in Thai]

[7] Association of Southeast Asian Nations (ASEAN). 30 April 2020. "Joint Statement Special Video Conference of Health Ministers of ASEAN and the United States in Enhancing Cooperation on Coronavirus Disease 2019 (COVID-19) Response". [https://asean.org/storage/2020/05/Adopted_ASEAN-US-Joint-Statement-on-COVID-19.pdf]. Accessed September 2020.

5.5.4c

Is there evidence that the country has fulfilled its full contribution to the WHO within the past two years?

Yes = 1 , No = 0

Current Year Score: 1

2021

Economist Impact analyst qualitative assessment based on official national sources, which vary by country

5.6 COMMITMENT TO SHARING OF GENETIC AND BIOLOGICAL DATA AND SPECIMENS

5.6.1 Commitment to sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) in both emergency and nonemergency research

5.6.1a

Is there a publicly available plan or policy for sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) along with the associated epidemiological data with international organizations and/or other countries that goes beyond influenza?

Yes = 1 , No = 0

Current Year Score: 0

There is evidence of data sharing, however a plan or policy with commitments to data sharing that is specific to certain pathogens with pandemic potential are not available. For instance, Thailand shares epidemiological data on dengue fever through its partnership with UNITEDengue.[1] There is also evidence of regular sharing of clinical specimens and biological materials. The Thailand Network for Culture Collection (TNCC) operates through the coordination of four major/key organizations which house the qualified culture collection. The four key organizations include BIOTEC Culture Collection (BCC), DMST Culture Collection (DMST), DOA Culture Collection (DOAC) and TISTR Culture Collection (TISTR). [2] According to the terms and conditions stated on the Thailand Network for Culture Collection's website, the sharing is likely to be considered on a case-by-case basis.[3] Additionally, according to the Thailand Global Health Strategic Framework 2016-2020, Thailand sent samples of avian influenza viruses for keeping at the laboratory at the WHO Collaborating Centres. [4] Further research on the Ministry of Public Health's website, the Health Technical Office, the Bureau of General Communicable Diseases, and online searches did not provide an evidence of a policy or plan with commitments to data sharing that is specific to certain pathogens. [5, 6, 7]

[1] UNITEDengue. 2018. "Our Partners." [https://www.unitedengue.org/partners2.html]. Accessed September 2020.

[2] Thailand Network for Culture Collection (TNCC). 2018. "Thailand Network for Culture Collection." [http://www1a.biotec.or.th/TNCC/index.asp]. Accessed September 2020.

[3] Thailand Network for Culture Collection (TNCC). 2018. "Distribution of Cultures." [http://www1a.biotec.or.th/TNCC/distribution.asp]. Accessed September 2020.

[4] Ministry of Public Health (MOPH). 2016. "Thailand Global Health Strategic Framework 2016-2020." [http://www.bihmoph.net/userfiles/file/GHS%20ENG.pdf]. Accessed September 2020.

[5] Ministry of Public Health Website. [https://www.moph.go.th/]. Accessed September 2020.

[6] Health Technical Office Website. [https://healthtechnical.go.th/th]. Accessed September 2020.

[7] Bureau of General Communicable Diseases Website. [https://ddc.moph.go.th/dcd/]. Accessed September 2020.

5.6.1b

Is there public evidence that the country has not shared samples in accordance with the Pandemic Influenza Preparedness (PIP) framework in the past two years?

Yes = 0 , No = 1

Current Year Score: 1

There is no public evidence that Thailand has not shared samples in accordance with the PIP framework in the past two years. Reports about Thailand not sharing influenza samples in the past two years cannot be found on the WHO's website.[1, 2] Additionally, in January 2017, Thailand took part in the 140th meeting of the Executive Board (EB) of the World Health Organization (WHO) on the assessment in support of the PIP framework.[3] A review of news media does not give evidence to suggest that Thailand did not share influenza samples in the past two years.

[1] World Health Organisation (WHO). "PIP Framework Advisory Group Reports".

[https://www.who.int/influenza/pip/pip_meetings_consultations/en/]. Accessed September 2020.

[2] World Health Organisation (WHO). 2018. "Virus sharing". [http://www.who.int/influenza/pip/virus_sharing/en/]. Accessed September 2020.

[3] Third World Network (TWN). 7 Feb 2017. "Pandemic Flu Framework a success story with challenges".

[https://www.twn.my/title2/health.info/2017/hi170206.htm]. Accessed September 2020.

5.6.1c

Is there public evidence that the country has not shared pandemic pathogen samples during an outbreak in the past two years?

Yes = 0, No = 1

Current Year Score: 1

There is no public evidence to suggest that Thailand has not shared pandemic pathogen samples during an outbreak in the past two years. Reports about Thailand not sharing samples in the past two years including for Covid-19 cannot be found on the WHO's website. [1, 2] A press release from the Department of Disease Control on 8 October 2020 proves Thailand has been sharing covid-19 samples with Japan via IHR national focal points since August 2020. [3]

[1] WHO. 2020. "WHO Coronavirus Disease (COVID-19) Dashboard". [<https://covid19.who.int/>]. Accessed September 2020.

[2] WHO. 2019. "Virus sharing". [http://www.who.int/influenza/pip/virus_sharing/en/]. Accessed September 2020.

[3] Department of Disease Control, Ministry of Public Health. 8 October 2020. "Department of Disease Control Reveals Results of Thai-Japanese Investigation for Covid-19 from Saliva Samples".

[https://ddc.moph.go.th/brc/news.php?news=15022&deptcode=brc&news_views=1670]. Accessed October 2020.

Category 6: Overall risk environment and vulnerability to biological threats

6.1 POLITICAL AND SECURITY RISK

6.1.1 Government effectiveness

6.1.1a

Policy formation (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1b

Quality of bureaucracy (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1c

Excessive bureaucracy/red tape (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1d

Vested interests/cronyism (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1e

Country score on Corruption Perception Index (0-100, where 100=best)

Input number

Current Year Score: 36

2020

Transparency International

6.1.1f

Accountability of public officials (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1g

Human rights risk (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.2 Orderly transfers of power

6.1.2a

How clear, established, and accepted are constitutional mechanisms for the orderly transfer of power from one government to another?

Very clear, established and accepted = 4, Clear, established and accepted = 3, One of the three criteria (clear, established, accepted) is missing = 2, Two of the three criteria (clear, established, accepted) are missing = 1, Not clear, not established, not accepted = 0

Current Year Score: 2

2021

Economist Intelligence

6.1.3 Risk of social unrest

6.1.3a

What is the risk of disruptive social unrest?

Very low: Social unrest is very unlikely = 4, Low: There is some prospect of social unrest, but disruption would be very limited = 3, Moderate: There is a considerable chance of social unrest, but disruption would be limited = 2, High: Major social unrest is likely, and would cause considerable disruption = 1, Very high: Large-scale social unrest on such a level as to seriously challenge government control of the country is very likely = 0

Current Year Score: 0

2021

Economist Intelligence

6.1.4 Illicit activities by non-state actors

6.1.4a

How likely is it that domestic or foreign terrorists will attack with a frequency or severity that causes substantial disruption?

No threat = 4, Low threat = 3, Moderate threat = 2, High threat = 1, Very high threat = 0

Current Year Score: 3

2021

Economist Intelligence

6.1.4b

What is the level of illicit arms flows within the country?

4 = Very high, 3 = High, 2 = Moderate, 1 = Low, 0 = Very low

Current Year Score: 4

2020

UN Office of Drugs and Crime (UNODC)

6.1.4c

How high is the risk of organized criminal activity to the government or businesses in the country?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.1.5 Armed conflict

6.1.5a

Is this country presently subject to an armed conflict, or is there at least a moderate risk of such conflict in the future?

No armed conflict exists = 4, Yes; sporadic conflict = 3, Yes; incursional conflict = 2, Yes, low-level insurgency = 1, Yes; territorial conflict = 0

Current Year Score: 3

2021

Economist Intelligence

6.1.6 Government territorial control

6.1.6a

Does the government's authority extend over the full territory of the country?

Yes = 1, No = 0

Current Year Score: 0

2021

Economist Intelligence

6.1.7 International tensions

6.1.7a

Is there a threat that international disputes/tensions could have a negative effect?

No threat = 4, Low threat = 3, Moderate threat = 2, High threat = 1, Very high threat = 0

Current Year Score: 2

2021

Economist Intelligence

6.2 SOCIO-ECONOMIC RESILIENCE

6.2.1 Literacy

6.2.1a

Adult literacy rate, population 15+ years, both sexes (%)

Input number

Current Year Score: 93.77

2018

United Nations Development Programme (UNDP); United Nations Educational, Scientific and Cultural Organization (UNESCO);
The Economist Intelligence Unit

6.2.2 Gender equality

6.2.2a

United Nations Development Programme (UNDP) Gender Inequality Index score

Input number

Current Year Score: 0.62

2018

United Nations Development Programme (UNDP); The Economist Intelligence Unit

6.2.3 Social inclusion

6.2.3a

Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)

Input number

Current Year Score: 0

2018

World Bank; Economist Impact

6.2.3b

Share of employment in the informal sector

Greater than 50% = 2, Between 25-50% = 1, Less than 25% = 0

Current Year Score: 2

According to the latest available data from the World Bank, informal employment (% of total non-agricultural employment) in Thailand is 51.42% in 2018. [1]

[1] The World Bank. "Informal employment (% of total non-agricultural employment) - Thailand".

[<https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS?locations=TH&view=chart>]. Accessed August 2020.

6.2.3c

Coverage of social insurance programs (% of population)

Scored in quartiles (0-3, where 3=best)

Current Year Score: 2

2016, or latest available

World Bank; Economist Impact calculations

6.2.4 Public confidence in government

6.2.4a

Level of confidence in public institutions

Input number

Current Year Score: 1

2021

Economist Intelligence Democracy Index

6.2.5 Local media and reporting

6.2.5a

Is media coverage robust? Is there open and free discussion of public issues, with a reasonable diversity of opinions?

Input number

Current Year Score: 1

2021

Economist Intelligence Democracy Index

6.2.6 Inequality

6.2.6a

Gini coefficient

Scored 0-1, where 0=best

Current Year Score: 0.35

Latest available.

World Bank; Economist Impact calculations

6.3 INFRASTRUCTURE ADEQUACY

6.3.1 Adequacy of road network

6.3.1a

What is the risk that the road network will prove inadequate to meet needs?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.3.2 Adequacy of airports

6.3.2a

What is the risk that air transport will prove inadequate to meet needs?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.3.3 Adequacy of power network

6.3.3a

What is the risk that power shortages could be disruptive?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.4 ENVIRONMENTAL RISKS

6.4.1 Urbanization

6.4.1a

Urban population (% of total population)

Input number

Current Year Score: 50.69

2019

World Bank

6.4.2 Land use

6.4.2a

Percentage point change in forest area between 2006–2016

Input number

Current Year Score: 0.17

2008-2018

World Bank; Economist Impact

6.4.3 Natural disaster risk

6.4.3a

What is the risk that the economy will suffer a major disruption owing to a natural disaster?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.5 PUBLIC HEALTH VULNERABILITIES

6.5.1 Access to quality healthcare

6.5.1a

Total life expectancy (years)

Input number

Current Year Score: 76.93

2018

United Nations; World Bank, UNICEF; Institute for Health Metrics and Evaluation (IHME); Central Intelligence Agency (CIA)
World Factbook

6.5.1b

Age-standardized NCD mortality rate (per 100 000 population)

Input number

Current Year Score: 362.6

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 12.41

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 22.8

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 10

2016

WHO

6.5.2 Access to potable water and sanitation

6.5.2a

Percentage of homes with access to at least basic water infrastructure

Input number

Current Year Score: 99

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 98.75

2017

UNICEF; Economist Impact

6.5.3 Public healthcare spending levels per capita

6.5.3a

Domestic general government health expenditure per capita, PPP (current international \$)

Input number

Current Year Score: 551.22

2018

WHO Global Health Expenditure database

6.5.4 Trust in medical and health advice

6.5.4a

Trust medical and health advice from the government

Share of population that trust medical and health advice from the government , More than 80% = 2, Between 60-80%, or no data available = 1, Less than 60% = 0

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018

6.5.4b

Trust medical and health advice from medical workers

Share of population that trust medical and health advice from health professionals , More than 80% = 2, Between 60-80%, or no data available = 1, Less than 60% = 0

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018