Malaysia

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

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

Malaysia has a national AMR plan for the surveillance, detection and reporting of priority AMR pathogens. This plan, called "Malaysia Action Plan on Antimicrobial Resistance 2017-2021" (MyAP AMR), is published by the Ministry of Health and Ministry of Agriculture and Agro-based Industry. It adopts a multi-sector, One Health approach, and addresses surveillance and reporting of priority AMR pathogens by human and animal health authorities. [1] MyAP AMR has four priority areas: public awareness and education, surveillance and research, infection prevention and control (IPC), and appropriate use of antimicrobials. The surveillance and research area includes five specific strategies for surveillance, detection, and reporting. First, Strengthen the national surveillance system that consist of a core set of organisms and antimicrobial medicines from both health care facilities and the community.". Second, Strengthen the national surveillance system for AMR by harmonizing surveillance system in both human and animal health using standardized tests for identification of resistant microorganisms. Third, Develop antimicrobial surveillance system in animal health. Fourth, establish a comprehensive One Health Surveillance System for AMR that promotes participation in regional and global networks and sharing of information. Fifth, "Develop an alert mechanism for AMR detection and reporting of newly emerged resistance that may constitute a public health emergency of international concern (PHEIC). To facilitate and coordinate activities within MyAP AMR, a National Antimicrobial Resistance Committee (NARC) was formed in March 2017 and is co-chaired by the Director General of Health and Director General of Department of Veterinary Services. Malaysia is also a participant of WHO's Global Antimicrobial Resistance Surveillance System (GLASS). [2]

Prior to MyAP AMR, Malaysia already had a functioning AMR surveillance system. In the human health sector, the Institute for Medical Research (IMR) under the National Surveillance of Antibiotic Resistance (NSAR) program published National Antibiotic Resistance Surveillance report annually with latest update on 2019. [3] Malaysia also developed National Antimicrobial Guideline (recent update in 2019) and Protocol on Antimicrobial Stewardship Program in Healthcare Facilities (first launched in 2014). [4][5] For AMR in livestock, Malaysia currently has two jurisdictions: Department of Veterinary Services (DVS) for veterinary biologics and vaccines and National Pharmaceutical Regulatory Agency (NPRA) for veterinary drugs [6] in which the MyAP AMR suggests harmonizing them as part of its strategy.

The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, affirmed that Malaysia has working surveillance systems for both human and animal health. JEE awarded Malaysia a score of 4 for Surveillance of AMR, meaning that Malaysia has "demonstrated capacity", with "centrally coordinated national AMR sentinel surveillance system that produces regular reports on AMR resistance level" and "sentinel laboratories supporting AMR surveillance that follow quality assurance processes and demonstrate good performance-testing." [7]_

[1] Ministry of Health and Ministry of Agriculture & Agro-based Industry of Malaysia. 2017. "Malaysian Action Plan of Antimicrobial Resistance (MYAP-AMR) 2017-2021."
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/National_Action_Plan_-_FINAL_29_june.pdf]. Accessed January 15, 2021.
[2] World Health organization (WHO). "Global Antimicrobial Resistance Surveillance System (GLASS)."
[https://www.who.int/glass/country-participation/en/] Accessed January 15, 2021.
[3] Antibiotic Resistance Surveillance Reference Laboratory, Bacteriology Unit, Infectious Diseases Research Centre, Institute for Medical Research, Malaysia. "National Antibiotic Resistance Surveillance Report 2019."
[https://www.imr.gov.my/images/uploads/NSAR/2019/NSAR_report_2019_03092020.pdf]. Reports from other years are archived available at https://www.imr.gov.my/MyOHAR/index.php/site/archive_rpt. Accessed January 15, 2021.
[4] Ministry of Health Malaysia. September 26, 2019. "National Antimicrobial Guideline 2019."
[https://hsbas.moh.gov.my/images/panduan/nag.pdf]. Accessed January 15, 2021.
[5] Ministry of Health Malaysia. 2014. Protocol on Antimicrobial Stewardship Program in Healthcare Facilities.
[https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485 9584a70637942515957356b645746754c306468636d6c7a49464268626d5231595734675657313162536 84c533030704c31427962335276593239735832397558304675644476c7461574e7962324a7059577866 5533526c643246795a484e6f615841756347526d]. Accessed January 15, 2021.
[6] Hassali M.A., Ho R.Y., Verma A.K, Hussain R., Sivaraman S. 2018. "Antibiotic Use in Food Animals: Malaysia Overview." p. 10. [https://www.reactgroup.org/wp-content/uploads/2018/11/Antibiotic_Use_in_Food_Animals_Malaysia_Overview_2018web.pdf]. Accessed January 16, 2021.
[7] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia."
[https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 15, 2019._

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: 2

Malaysia has a national AMR system with government and university hospital laboratories nationwide checking for six of the 7+1 priority AMR pathogens, and has the capacity to test for the remaining two. Annually, National Antibiotic Resistance Surveillance Report is published by the Infectious Disease Research Centre within the Institute for Medical Research, under the Ministry of Health, documenting antibiotic susceptibility testing of selected pathogens. [1] According to the latest annual report, for 2019, the following 6 priority AMR pathogens were tested for: E. coli, K. pneumonia, S. aureus, S. pneumoniae, Salmonella spp., and N. gonorrhoeae. Data was obtained from 41 hospital microbiology laboratories nationwide, of which 39 were government hospitals and two were university hospitals. Data was collected using WHONET software. The National Public Health Laboratory can test for shigella and mycobacterium tuberculosis, and tuberculosis is a notifiable disease, but these are part of the country's disease surveillance program – guided by Infectious Disease Prevention and Control Act 1988, rather than its AMR program. [2, 3] There are designated sentinel sites for some AMR pathogens. [3]"

The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, also documents that the national laboratory system can conduct core tests for all 10 priority diseases as well as more specialized tests. These diseases include influenza virus, MERS-CoV, human immunodeficiency virus, dengue , Leptospira species, tuberculosis , Plasmodium species, Corynebacterium Diphtheria, Salmonella enteritidis serotype Typhi, and polio. On top of that, The National Public Health and Reference Laboratories can perform tests for emerging infectious diseases with well-equipped laboratories. Given this capacity, the JEE awarded Malaysia with a score of 5 for its laboratory testing for detection of priority diseases, meaning that

Malaysia has sustainable capacity, supported by systems for quality assurance and results that are disseminated regularly. [4]

[1] Antibiotic Resistance Surveillance Reference Laboratory, Bacteriology Unit, Infectious Diseases Research Centre, Institute for Medical Research, Malaysia. "National Antibiotic Resistance Surveillance Report 2019." [https://www.imr.gov.my/images/uploads/NSAR/2019/NSAR_report_2019_03092020.pdf]. Reports from other years are archived available at https://www.imr.gov.my/MyOHAR/index.php/site/archive_rpt. Accessed January, 2021.
[2] National Public Health Laboratory. 2018. "The National Public Health Laboratory Test Handbook 2018." [https://mkak.moh.gov.my/en/muat-turun-orange/penerbitan/mkak-test-handbook-2018.html]. Accessed January, 2021.
[3] Ministry of Health. 2017. "Case Definitions for Infectious Diseases in Malaysia." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/Case_Definition_Of_Infectious_Disease_3rd_Edition_2017.pdf]. Accessed January, 2021.
[4] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January, 2021.

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: 0

There is insufficient evidence that Malaysia's government conducts environmental detection or surveillance activities in (e.g., in soil, waterways) for antimicrobial residues or AMR organisms. The Ministry of Natural Resources and Environment (NRE) monitors river basins, groundwater, and marine water according to a Water Quality Index, but this does not address AMR. [1-4] According to the Department of Fisheries, no monitoring of fisheries or aquaculture covers AMR at present, though some isolated studies have been carried out, and current AMR surveillance does not cover soil either. [5] Malaysia recently published a national action plan on AMR 2017-21, which adopts a One Health approach. It calls for AMR in fisheries and aquaculture to be equally attended to along with human and animal health and includes action points aimed at ensuring fisheries officers receive AMR training. The action plan was targeting 2018 for the implementation of broad surveillance systems, but there is no evidence of completion. [6] There is no additional information from websites of relevant agencies, including the Ministry of Health, Department of Fisheries, and Department of Agriculture. [7-9] There are AMR tests done in aquaculture and water bodies by public universities and staff of government research arm, but they are isolated activities and not part of government's regular AMR detection or surveillance activities. Some examples of such research are You et al. (2012), Hua and Apun (2013) and Leong et al. (2019). [10-12] The 2019 Joint External Evaluation (JEE) for Malaysia doesn't document any environmental detection or surveillance activities for antimicrobial residues or AMR organism, both for human and animal health. [13]_

[1] Ministry of Natural Resources and Environment. 2018. "River water quality monitoring (Pengawasan Kualiti Air Sungai)." [https://www.doe.gov.my/portalv1/wp-content/uploads/2018/09/Pengawasan-Kualiti-Air-Sungai.pdf]. Accessed January 2021.
[2] Ministry of Natural Resources and Environment. 2016. "National water quality standards for Malaysia." [https://environment.com.my/wp-content/uploads/2016/05/River.pdf]. Accessed January 2021.
[3] Ministry of Energy, Science Technology, Environment & Climate Change. 2019. "Malaysian Marine Water Quality Standards and Index." [https://www.doe.gov.my/portalv1/wp-content/uploads/2019/04/BOOKLET-BI.pdf]. Accessed January 2021
[4] Naubi, Irena, et al. 2015. "Effectiveness of Water Quality Index for monitoring Malaysian river water quality." Polish

Journal of Environmental Studies, 25[1] , 2016. [https://www.researchgate.net/publication/288672929_Effectiveness_of_Water_Quality_Index_for_Monitoring_Malaysian_River_Water_Quality]. Accessed January 2021.
[5] Noordin, Wan, and Gerald N. Misol Jr. 2017. "Country report on antimicrobial resistance in fisheries: Malaysia." Aquatic AMR workshop 1: Apr 2017. [http://www.fao.org/fi/static-media/MeetingDocuments/WorkshopAMR/presentations/13_Milson_Norhana.pdf]. Accessed January 2021.
[6] Ministry of Health and Ministry of Agriculture & Agrobased Industry of Malaysia. 2017. "Malaysian Action Plan of Antimicrobial Resistance (MYAP-AMR) 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/National_Action_Plan_-_FINAL_29_june.pdf]. Accessed January 15, 2021.
[7] Ministry of Health. [https://www.moh.gov.my/]. Accessed January2021.
[8] Department of Fisheries. https://www.dof.gov.my]. Accessed January 2021.
[9] Department of Agriculture. [http://www.doa.gov.my]. Accessed January 2021.
[10] You, K. & Bong, C. & Lee, C. (2016). "Antibiotic resistance and plasmid profiling of Vibrio spp. in tropical waters of Peninsular Malaysia." Environmental Monitoring and Assessment. 188. 10.1007/s10661-016-5163-0. Available online at https://www.researchgate.net/publication/244993301_Antimicrobial_resistance_in_bacteria_isolated_from_tropical_coastal_waters_of_Peninsular_Malaysia. Accessed January 2021.
[11] Hua, L. M. and Apun, K. 2013. "Antimicrobial Susceptibilities of Vibrio parahaemolyticus Isolates from Tiger Shrimps (Penaeus monodon) Aquaculture in Kuching, Sarawak." Research Journal of Microbiology, 8: 55-62. Available online at https://scialert.net/fulltext/?doi=jm.2013.55.62. Accessed January 2021.
[12] Leong, S. S. and Lihan, S. and Chia, H. C. and Kueh, R. J. H. and Kwan, Y. M. 2019. "Biorisk assessment of antibiotic-resistant pathogenic bacteria isolated from swiftlet houses in Sarawak." Pertanika Journal of Tropical Agricultural Science, 42 [1]. pp. 285-303. ISSN 1511-3701; ESSN: 2231-8542. Available online at http://psasir.upm.edu.my/id/eprint/67337/. Accessed January 2021."
[13] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 15, 2019._

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: 1

Malaysia has a law requiring prescriptions for antibiotic use for humans, but there is evidence of gaps in enforcement. The Poisons Act 1952 restricts the dispensing of medicines according to published schedules of poisons. Antibiotics for human use fall mostly under Part I, Group B except for topical/external applications, which are Part I, Group C. Group B poisons can only be supplied as dispensed medicines with written prescriptions by a registered medical practitioner. Group C are dispensed medicines but do not always require prescription. [1, 2, 3, 4] The Ministry of Health has also published guidelines for health practitioners with a view to ensuring appropriate prescription of antibiotics. In 2014, it published a "Protocol on antimicrobial stewardship program in healthcare facilities" and a "National antibiotic guideline" - the latter of which has been revised in 2019. [5, 6] The "Malaysia action plan on antimicrobial resistance (MyAP AMR) 2017-2021" includes a chapter on optimizing antimicrobial use, which includes measures aimed at tightening enforcement of regulations on antibiotic use and calls for the "National antibiotic guideline" to be revised every 3-5 years. [7] There are information from newsmedia that

despite enaction of these regulations, it is still possible to purchase antibiotics in pharmacies without prescription. [8, 9]

[1] Government of Malaysia. 2009. "Poisons Act 1952 (revised 1989)." Last amended in 2009. [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/poisons-act-1952-act-366.pdf]. Accessed January 2021.
[2] Ministry of Health. 2017. "First schedule - Poisons list." [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/poisons-list-1.9.2020_0.pdf]. Accessed January 2021.
[3] Ministry of Health. 2016. "Guide to good dispensing practice." [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/gdsp-2016-final.pdf]. Accessed January 2021.
[4] Ministry of Health. 2017. "The Purchase and Supply of Controlled Medicine." [http://www.myhealth.gov.my/en/purchase-supply-controlled-medicine/]. Accessed January 2021.
[5] Ministry of Health Malaysia. 2014. "Protocol on Antimicrobial Stewardship Program in Healthcare Facilities." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c306468636d6c7a49464268626d5231595734675657313162536 84c533030704c3142796233527659323973583239755830467564476c7461574e7962324a70595778665533526c643246795a484e6f615841756347526d]. Accessed January 15, 2021.
[6] Ministry of Health Malaysia. September 26, 2019. "National Antimicrobial Guideline 2019." [https://hsbas.moh.gov.my/images/panduan/nag.pdf]. Accessed January 15, 2021.
[7] Ministry of Health and Ministry of Agriculture & Agrobased Industry of Malaysia. 2017. "Malaysian Action Plan of Antimicrobial Resistance (MYAP-AMR) 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/National_Action_Plan_-_FINAL_29_june.pdf]. Accessed January 15, 2021.
[8] Amuthaganesh Mathialagan. Jan 2nd 2020. "Frequent use of over-the-counter medicines can be harmful to health." The Star. [https://www.thestar.com.my/lifestyle/health/2020/01/02/use-otc-medicines-cautiously]. Accessed January 2020.
[9] A. Ruban, May Robertson. July 11th 2018. "No rescription, no problem: buying medicines is as easy as buying candy really." Malay Mail. [https://www.malaymail.com/news/malaysia/2018/07/11/no-prescription-no-problem-buying-medicines-is-as-easy-as-buying-candy-real/1650964]. Accessed January 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

Malaysia has national legislation requiring prescriptions for antibiotic use for animals, except where they are compounded in feed, but there is evidence of gaps in enforcement. The supply of antibiotics is covered by the Poisons Act 1952, which refers to official schedules of poisons. Antibiotics utilization for disease treatment and metaphylaxis are regulated by the National Pharmaceutical Regulatory Agency (NPRA), while antibiotics for disease prevention and growth promotion (including mixing antibiotics with feed) are regulated by Department of Veterinary Services (DVS). [1] Antibiotics in veterinary preparations intended for inclusion in animal feeds are in Part I, Group B, which require prescription. When antibiotics are compounded with animal feeds, they fall into Part II, meaning they do not require prescription. [2,3] The Feed Act 2009 also addresses the supply of antibiotics through animal feed. Antibiotics can only be added to feed or otherwise administered to animals in a manner and at a level that is in accordance with regulations. [4] The Department for Veterinary Services (DVS) under the Ministry of Agriculture and Agro-based Industry publishes lists of allowed antibiotics and how they can be used. [5] Some antibiotics that are banned are erythromycin, enrofloxacin, ceftiofur, tetracycline, Tylosin, Fosfomycin, and Colistin. [6] The "Malaysia action plan on antimicrobial resistance (MyAP AMR) 2017-2021" includes an action for the DVS in 2018 to develop a national guideline on antimicrobial drugs use in the veterinary sector, and for it to propose an additional regulation on

prescription of antimicrobials in animal feed, under Section 19 of the Feed Act 2009. [7] No more recent information on the availability of antimicrobial guideline in the veterinary sector is found at websites of Ministry of Health nor Department of Veterinary Service. [8, 9] Gaps in enforcement of the aforementioned legislation exist. Research has shown high concentration of antibiotics in soil samples from various locations in Malaysia. [10] There is evidence of continued imprudent use of antibiotics, poor monitoring and lack of enforcement of regulations.[11] This statement is aligned with the findings from sectoral studies such as the lack of reliable, nationwide surveillance and monitoring system to monitor antimicrobial usage in food-producing farms. [12]_

[1] Hassali M.A., Ho R.Y., Verma A.K, Hussain R., Sivaraman S. 2018. "Antibiotic Use in Food Animals: Malaysia Overview." p. 10. [https://www.reactgroup.org/wp-content/uploads/2018/11/Antibiotic_Use_in_Food_Animals_Malaysia_Overview_2018web.pdf]. Accessed January 16, 2021.
[2] Government of Malaysia. 2009. "Poisons Act 1952 (revised 1989)." Last amended in 2009. [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/poisons-act-1952-act-366.pdf]. Accessed January 2021.
[3] Ministry of Health. 2017. "First schedule - Poisons list." [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/poisons-list-1.9.2020_0.pdf]. Accessed January 2021.
[4] Government of Malaysia. 2014. "Feed Act 2009." [http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act%20698%20-%20Feed%20Act%202009.pdf]. Accessed January 2018.
[5] National Pharmaceutical Regulatory Agency. 2017. "Registration Guideline of Veterinary Products (REGOVP).". https://www.npra.gov.my/images/Guidelines_Central/Guidelines_on_Veterinary/2017/REGOVP_JULY2014_13041713.pdf]. Accessed January 2021.
[6] Department of Veterinary Service. "AMR Surveillance Program and Data Analysis 2018-2019 (Program Survelan AMR dan Data Analisis 2018-1019). [http://www.dvs.gov.my/dvs/resources/user_1/2020/KAV/AMR/Survelen_AMR_2018-2019.pdf]. Accessed January 2021/
[7] Ministry of Health and Ministry of Agriculture & Agrobased Industry of Malaysia. 2017. "Malaysian Action Plan of Antimicrobial Resistance (MYAP-AMR) 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/National_Action_Plan_-_FINAL_29_june.pdf]. Accessed January 15, 2021.
[8] Ministry of Health. 2021. [www.moh.gov.my]. Accessed January 2021.
[9] Department of Veterinary Service. [www.dvs.gov.my]. Accessed January 2021.
[10] Yu Ho, Mohamad P. Zakaria, Puziah A. Latif, Nazamid Saari. 2014. ""Occurrence of veterinary antibiotics and progesterone in broiler manure and agricultural soil in Malaysia."" Science of The Total Environment, Volumes 488-489, Pages 261-267. [https://www.sciencedirect.com/science/article/pii/S0048969714006342]. Accessed January 2021."
[11] Enli Loo, Kok Song Lai and Rozaihan Mansor, 2019. "Antimicrobial Usage and Resistance in Dairy Cattle Production." Veterinary Medicine and Pharmaceuticals, [https://www.intechopen.com/books/veterinary-medicine-and-pharmaceuticals/antimicrobial-usage-and-resistance-in-dairy-cattle-production]. Accessed February 2021."
[12] Chia Wanq Tan, et.all, 2020. "Prevalence and antibiotic resistance patterns of Vibrio Parahaemolyticus isolated from different types of seafood in Selangor, Malaysia." "Saudi Journal of Biological Sciences, Volume 27, Issue 6,Pages 1602-1608. [https://www.sciencedirect.com/science/article/pii/S1319562X20300036]. Accessed February 2021._

1.2 ZOONOTIC 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

Malaysia has a national manual specifically addressing zoonotic diseases, which has been endorsed by the relevant government authorities. The Malaysia One Health University Network published a "One Health manual for handling zoonotic disease outbreaks in Malaysia" in 2017, endorsed by the directors general of the Ministry of Health and of the Department of Veterinary Services, though its implementation is not mandated by law. The manual divides zoonotic diseases into three categories: Group A (including anthrax and Ebola), Group B (including brucellosis) and Group C (including MERS-CoV). [1] Other laws and policies relevant to zoonosis include the Animals Act 1953 (amended in 2006), which addresses measures to control animal diseases, but does not mention zoonoses specifically; and the "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015". [2] The latter plan contains a section on zoonoses, which is not detailed enough to constitute a strategy. [3] The Ministry of Health published an updated plan, Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED II Workplan 2017-2021), which addresses zoonoses. MySED II is a direct effort by Malaysian government under the Ministry of Health (MOH) to expand the involvement of multiple governmental and non-governmental agencies for tackling zoonoses. In MYSED II the scope of activities is improved and widened under various strategies. The current MySED II Workplan is in line with the Asia Pacific Strategy for Emerging Diseases (APSED III) which covers the all-hazards approach. It also mentions that a National Strategic Plan for Zoonoses will be developed. [4]

[1] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[2] Government of Malaysia. 2006. "Animals Act 1953". Amended 2006; also includes the Declaration of Animal and Bird Disease, P.U. (B) 44/2009 and 317/2009. [http://extwprlegs1.fao.org/docs/texts/mal72832.doc]. Accessed January 2021.
[3] Ministry of Health. 2012. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942 77655774706443394e57564e465246395862334a7263477868626c38794d4445794c5449774d5455756347526d]. Accessed January 2021.
[4] Ministry of Health. 2017. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed February 2021.

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 insufficient evidence of 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. The Ministry of Health (MOH) Malaysia has an Interim Guideline for Human Rabies Prevention and Control, developed by its Disease Control Division but it contains no specific risk reduction plan. It mostly discusses types of exposure and actions to be taken according to each type, whilst discussion regarding pathways of transmission of zoonotic diseases from animals to humans in specific environment is not elaborated sufficiently. The document mentions that Negeri Pelis, Kedah, Pulau Pinang, and Perak as rabies-infected states but does not explain the reasons why rabies infection is more prevalent in those states. The document does mention the role of Health District Office (Pejabat Kasihatan Daerah-PKD) in handling rabies cases, for example, for the purpose of investigation and further action, all suspected, probable, and confirmed cases (including dog bite cases - human exposed to suspected rabid dog/animal) must be notified to the nearest Health District Office (PKD) within 24 hours of the date of diagnosis by respective hospital/clinic. PKD must notify the nearest District Veterinary Office immediately by phone followed by submission form through fax. The District Health Office is expected to take further actions. [1] MOH also has strengthened its surveillance for monkey Malaria in human since 2009, based on MOH's Press Statement "Zoonotic Malaria and the Prevention Program in Malaysia". To manage and reduce Malaria epidemic risk, Malaysia makes molecular diagnosis for Malaria available in all Public Health Laboratories including the National Public Health Laboratory in Sungai Buluh, regional Public Health Laboratories in Johor, Perak, Kelantan and Sabah. The molecular diagnosis is also made available at the referral hospitals since 2014. Where else Institute for Medical Research (IMR) has established the molecular diagnosis test for malaria much earlier as the research center of Malaria for Ministry of Health. [2] The Joint external evaluation of IHR core capacities of Malaysia conducted in 2019 states that mechanisms for responding to infectious and potential zoonotic diseases are established and functional. It further states that there are contingency plans for rabies and highly pathogenic avian influenza that have been tested and updated after outbreaks and simulation exercises. [3] Despite this affirmation, JEE did not particularly discuss measures that are directly targeted at reducing risk of infectious disease spillover events.

[1] Disease Control Division. Ministry of Health. 2019. "Interim Guideline for Prevention and Control of Human Rabies in Malaysia".
[https://www2.moh.gov.my/moh/resources/Penerbitan/Interim_Guideline_for_Prevention_and_Control_of_Human_Rabies_in_Malaysia.pdf]. Accessed February 2021.
[2] Ministry of Health. 2018. "Kenyataan Akhbar Ketua Pengarah Kasihatan Malaysia".
[https://www.moh.gov.my/index.php/database_stores/attach_download/337/1087]. Accessed February 2021.
[3] World Health Organization. (2020). Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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

Malaysia has national plans that account for the surveillance and control of zoonotic pathogens of public health concern. The Malaysia One Health University Network published a "One Health manual for handling zoonotic disease outbreaks in Malaysia" in 2017, endorsed by the directors general of the Ministry of Health and the Department of Veterinary Services, though its implementation is not mandated by law. It states the need for a national surveillance mechanism for zoonoses, outlines what this should involve, and addresses control measures [1] The Ministry of Health's strategic workplan for emerging diseases (MySED workplan) 2012-2015 identifies surveillance, risk assessment and response as a focus area. It outlines the key components of an effective surveillance and response framework that already in place and under

development. It also addresses zoonoses and the need to strengthen surveillance information-sharing between human health, veterinary and wildlife professionals. [2] The MOH updated the workplan via MySED II Workplan for the year of 2017-2021 (or MySED II) to "accommodate differences in national planning cycles and international initiatives." MySED II prioritizes surveillance in their series of strategic actions, which include sharing of surveillance information between MOH/DVS and related agencies and link public health laboratories with surveillance and risk assessment. At the national level, the Department of Veterinary Services (DVS) is developing the Malaysia Animal Disease Information Centre (ADIC) for animal health surveillance data. [3] The Joint External Evaluation (JEE) of Malaysia conducted in 2019 states that surveillance activities and information sharing between MOH and DVS is conducted for 14 priority diseases. A permanent veterinary officer is located within the MOH in the zoonotic sector. Data and information are shared during meetings of the Technical Committee on Control of Zoonotic Disease every six months. For zoonotic outbreaks reported from outside the country, risk assessments were conducted, and control measures executed accordingly to prevent the spread into Malaysia. Surveillance and response activities for public health events are regularly evaluated at the national level through Epidemiology Technical Meetings and Inter-Ministerial Technical Meetings, both of which are held at least twice annually at the state level during Monthly Epidemiology Review Meetings and at the district level at weekly Epidemiology Review Meetings. The ADIC is responsible for collecting and collating animal disease information for Peninsular Malaysia through the web- based laboratory system eMakvet. A more advanced system is being developed to further enable users from various levels of the organization access the data to inform effective veterinary practice and management. In Sabah, a system called DAVETSA is used, while Sarawak uses a system similar to the one used on the peninsula. Data collected on 14 priority zoonotic diseases is shared between DVS-MOH staff in biannual meetings. [4]_

[1] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[2] Ministry of Health. 2012. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942 77655774706443394e57564e465246395862334a7263477868626c38794d4445794c5449774d5455756347526d]. Accessed January 2021.
[3] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[4] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021._

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 evidence that Malaysia has set up a department, agency or similar unit dedicated to zoonotic diseases that functions across ministries. The Malaysia One Health University Network published a “One Health manual for handling zoonotic disease outbreaks in Malaysia” in 2017, endorsed by the directors general of the Ministry of Health and the Department of Veterinary Services, though its implementation is not mandated by law. This manual mentions the need for a cross-functional unit in Malaysia and suggests several possible structures; but there is no evidence that any of these have been created. [1] However, Malaysia has a dedicated national, cross-ministerial committee for zoonotic diseases. The Inter-

Ministerial Committee on the Control of Zoonotic Diseases was established in 1999 following a Nipah outbreak. [2] The Committee includes representatives of the Ministry of Health, Department of Disease Control, Department of Veterinary Services, Department of Wildlife and Department of Education. It is co-chaired by the directors-general of the Ministry of Health and Department of Veterinary Services. Meetings are held every six months and during outbreaks, and documents and meeting minutes are shared between all members. [3] It is not clear if this Committee is temporary or permanent. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 included existence of "formal mechanisms for multisectoral collaboration on zoonotic diseases surveillance and response", affirmed that Malaysia published National Security Council Directive No. 20 to command, control, and coordinate health emergency preparedness and response – including to anticipate zoonotic diseases, but did not identify a singular agency responsible for zoonotic diseases that functions across ministries. The mechanism is facilitated by the Inter-Ministerial Committee for Control of Zoonotic Disease, National Disaster Management Agency (NADMA) and the National Environmental Health Action Plan Technical Committee. Malaysia collaborates with other countries through WHO and other platforms, such as the Association of Southeast Asian Nations (ASEAN). MOH and DVS have jointly drafted the National Strategic Plan for Zoonotic Diseases and the Manual on Joint Response to Zoonotic Diseases which provide the multisectoral and multi-stakeholder approach for managing zoonosis events using a coordinated response between the two agencies. Lessons learned from past zoonosis outbreaks (e.g. Nipah, highly pathogenic avian influenza and rabies) and from routine simulation exercises (e.g. for highly pathogenic avian influenza and rabies) have been used to develop these and other contingency plans, manuals and SOPs. The National Strategic Plan for Zoonosis 2019 draft, which is based on MySED II (2017-2021) includes the strengthening of capacities and capabilities for zoonotic diseases prevention and control, as well as partnerships and networking with other governmental agencies, such as the district authorities, the Malaysia One Health University Network and private stakeholders, e.g. the Federation Livestock Farmers' Association Malaysia. [4]_

[1] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[2] Ministry of Health. 2012. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694 2 7765577 4706443394e57564e465246395862334a7263477868626c38794d4445794c5449774d5455756347526d]. Accessed January 2021.
[3] World Health Organization. 2013. "Asia-Pacific workshop on multisectoral collaboration for the prevention and control of zoonoses." Report of the meeting 27-29 Nov 2013, Kathmandu, Nepal. [http://apps.searo.who.int/PDS_DOCS/B5110.pdf]. Accessed January 2021.
[4] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021._

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

Malaysia has a national mechanism for owners of livestock to report diseases on a set list to the Department of Veterinary Services, a central government agency. The Animals Act 1953 requires any owner or person in charge of an animal to report cases of disease or suspected disease infection, referring to a specific list of animal diseases last updated in 2009, to a veterinary authority or police station, and if the police receive such a report they must report it immediately to the nearest veterinary authority. [1] The Department for Veterinary Services (DVS) is responsible for animal and zoonotic disease surveillance and reporting. Any abnormal animal diseases/mortalities are reported by veterinary authorities to the DVS' Animal Disease Information Centre (ADIC), which oversees investigation, verification and coordination with other agencies, as well as reporting to the Crisis Management Centre if necessary. The latter then reports to the relevant state director(s) as well as the minister of agriculture. [2,3] The DVS also reports zoonoses on an agreed list to the Ministry of Health's Surveillance Section. [4] The DVS publishes protocols for active and passive surveillance of key livestock diseases on its website. JEE 2019 reports that reports from abattoirs and farmer awareness and motivation to notify disease suspicion need to be encouraged because reporting from abattoirs was insufficient. Farmers' lack of motivation to notify disease suspicions is due to the absence of a compensation scheme for animals culled for disease control and eradication purposes. [6]

[1] Government of Malaysia. 2006. "Animals Act 1953". Amended 2006; also includes the Declaration of Animal and Bird Disease, P.U. (B) 44/2009 and 317/2009. [http://www.mvc.gov.my/doc_downloads/AnimalsAct1953.pdf]. Accessed January 2021.
[2] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[3] Samad, Rozanah. 2015. "Department of Veterinary Services (DVS) Malaysia (services, roles and responsibility)." Presentation by representative of the Disease control and eradication section, Biosecurity and SPS Management Division, DVS. [https://onehealthukm.files.wordpress.com/2015/10/drrozanahasmah.pdf]. Accessed January 2021.
[4] Ministry of Health (Communicable Disease Surveillance Section, Disease Control Division). 2004. "Standard operating procedure for potential infectious disease." [http://www.moh.gov.my/penerbitan/SOP%20-%20Potential%20Infectious%20Disease.pdf]. Accessed January 2021.
[5] Department of Veterinary Services. 2018. "List of Malaysian veterinary protocol." [http://www.dvs.gov.my/index.php/pages/view/1397]. Accessed January 2021.
[6] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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

The Animals Act 1953 does not make any reference to the confidentiality of information generated through animal disease surveillance activities. [1] The Department of Veterinary Services (DVS) publishes protocols for active and passive surveillance of key livestock diseases on its website, and these do not mention confidentiality of the owner's information. [2] The DVS has published a number of documents on handling animal disease surveillance, reporting and response. [3] Confidentiality of livestock owners' information does not appear to be covered in these. It does not feature in the document on "Case management", which contains a section on "veterinary record management ethics"; nor in the document on "Disease investigation and epidemiological studies", which lays out the process for reporting cases. [4, 5]

[1] Government of Malaysia. 2006. “Animals Act 1953”. Amended 2006; also includes the Declaration of Animal and Bird Disease, P.U. (B) 44/2009 and 317/2009. [http://www.mvc.gov.my/doc_downloads/AnimalsAct1953.pdf]. Accessed January 2021.
[2] Department of Veterinary Services. 2018. “List of Malaysian veterinary protocol.” [http://www.dvs.gov.my/index.php/pages/view/1397]. Accessed January 2021.
[3] Department of Veterinary Services. 2018. “List of Malaysian veterinary standard operating procedure (APTVM).” [http://www.dvs.gov.my/index.php/pages/view/1408]. Accessed January 2021.
[4] Department of Veterinary Services. 2011. “Case management (Pengurasan fail kes).” [http://www.dvs.gov.my/dvs/resources/auto%20download%20images/560caec5b039d.pdf]. Accessed January 2021.
[5] Department of Veterinary Services. 2011. “Disease investigation and epidemiological studies.” [http://www.dvs.gov.my/dvs/resources/auto%20download%20images/560caea0733f2.pdf]. Accessed January 2021.

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

Malaysia conducts disease surveillance in wildlife. Non-profit organization EcoHealth Alliance started collaborating with the Government of Malaysia on wildlife surveillance in 2001, originally to investigate the origins of the 1998 Nipah virus outbreak. Since 2006 it has been working with the Ministry of Health (MoH) and the Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) to study the risk of disease transmission from wildlife to indigenous populations in Malaysia. This collaboration was further supported by USAID funding in 2009 as part of the Emerging Pandemic Threat's PREDICT project. [1] The PREDICT initiative led to the creation in 2012 of a cross-sectoral Zoonosis Technical Working Committee, involving PERHILITAN as well as the Ministry of Health, the Department of Veterinary Services, and the Department of Wildlife and National Parks. By 2014, PREDICT had helped PERHILITAN to establish a dedicated surveillance team to conduct routine wildlife surveillance and respond to outbreaks. Animals sampled include bats, rodents and non-human primates. [2] PERHILITAN operates the National Wildlife Forensic Laboratory to test samples. [3] One Health Manual states that the country needs to harness the power and the rapid growth and sophistication of new technologies, including Geographic Information Systems (GIS) which enables activities such as herd mobilization mapping, and research related to mixing of wildlife and livestock. The manual also suggests that the way forward is to secure funding, invest in frameworks, policies and processes to better understand the human-animal ecosystems interfaces including wildlife and animal disease surveillance. [4] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, found that "formal mechanisms for multisectoral collaboration on zoonotic diseases surveillance and response at the national and state level are in-place". Other than MoH, Department of Veterinary Services (at Federal and State Level - especially for Sabah and Sarawak), and Department of Wildlife Protection and National Park Peninsular are identified in the JEE as the main government services in the surveillance of zoonotic disease. These mechanisms comprise surveillance under coordination of Department of Wildlife Protection and National Park Peninsular and Department of Veterinary Services (DVS)s. [5]_

[1] University of Malaysia, Development and Health Research Unit. 2018. "About us." [http://www.ums.edu.my/dhru/index.php/en/about-us]. Accessed January 2021.
[2] USAID PREDICT. 2014. "Malaysia," Chapter of PREDICT report, "Reducing pandemic risk, promoting global health." One Health Institute (OHI), University of California, Davis. [https://www2.vetmed.ucdavis.edu/ohi/local_resources/pdfs/chapters/26_predict_malaysia.pdf]. Accessed January 2021.
[3] EcoHealth Alliance. 2017. "Animal sampling in Kuala Kangsar: field notes." FutureEarth.org, 16 Nov 2017. [http://www.futureearth.org/onehealth/animal-sampling-kuala-kangsar-field-notes]. Accessed January 2021.
[4] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."

[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021. "
[5] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021._

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: 0

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: 7.86

2017

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: 1.63

2017

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: 0

There is insufficient evidence that Malaysia has mechanisms for working with the private sector in controlling or responding to zoonoses. Malaysia's plans for dealing with zoonotic diseases include mechanisms to include private laboratories in surveillance and response, but these mechanisms are not yet in place. The Malaysia One Health University Network published a "One Health manual for handling zoonotic disease outbreaks in Malaysia" in 2017, endorsed by the directors general of the Ministry of Health and the Department of Veterinary Services. In the section on preparing for an outbreak investigation, it calls for an inventory of all available resources, including in private laboratories. There are no other mentions of working with the private sector. [1] The Ministry of Health's strategic workplan for emerging diseases (MySED workplan) 2012-2015 (soon to be replaced with an updated plan) called for the creation of a national Laboratory Technical Advisory Committee (LTAC) for Infectious Diseases, including animal and human health, as well as public and private laboratories. It also called for improvements to existing information-sharing mechanisms between public and private laboratories and public health surveillance. [2] There is no additional publicly available evidence from the Ministry of Agriculture and Agro-based Industry or the Ministry of Health. [3,4] Private sectors are engaged in some campaign efforts. For example, a presentation Malaysian Action Plan on AMR 2017-2021 states that there is an on-going campaign targeting the health professionals and the public since 2015, e.g. The World Antimicrobial Awareness Week (WAAW) campaign with public involvement as well as private sectors, NGOs and consumer societies. [5]_

[1] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."
[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[2] Ministry of Health. 2012. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015."
[https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394e57564e465246395862334a7263477868626c38794d4445794c5449774d5455756347526d]. Accessed January 2021.
[3] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my/]. Accessed January 2021.
[4] Ministry of Health. [http://www.moh.gov.my/english.php]. Accessed January 2021.
[5] Presentation by Dr Marzuki, Dr Norita, Dr Rohani, Dr Rozanah, Dr Suraya, Dr Norazah, and Ms. Hazimah on AMR Progress and Zoonoses. [https://rr-asia.oie.int/wp-content/uploads/2020/01/malaysia-1.pdf]. Accessed February 2021._

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: 0

There is no evidence that Malaysia has a record of all facilities in which especially dangerous pathogens and toxins are stored or processed. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC). [1] A draft Biological and Toxin Weapons Bill

(BTWC Bill) was under review in 2015, which would have required licensing and registration of people and facilities handling controlled/regulated biological agents, as listed in a schedule associated with the bill. [2, 3] However, the bill has still not been passed—there is no mention of it in the public domain, not even parliament's dedicated Bills webpage—so it is assumed that such a system has not been introduced. [4,5] In January 2017, the senior director of the Biological & Toxin Weapons Convention Nucleus within STRIDE was quoted in the media as saying that "the authorities have a database in place of pathogens that research institutions are working on, and the research is monitored closely. This is especially true with research involving genetically modified organisms." [6,7] No further information can be found on this database, and there is no evidence that it covers all facilities handling dangerous pathogens and toxins, including those which are not associated with research institutions, or that it was updated in the past 5 years. A draft code of conduct on biosecurity produced by STRIDE in 2015 did not mention a record of facilities handling dangerous biological agents; [8] nor did the Ministry of Health's non-mandatory "Malaysia laboratory biosafety and biosecurity policy and guideline" published in 2015. [9] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subjectAlthough Malaysia has submitted Confidence Building Measures annually since 2010, under the Biological Weapons Convention, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [10] Among Malaysia's legislations documented in Vertic Biological Weapons Convention (BWC) legislation database, Biosafety Act 2007 is the only law with mandate to establishment of National Biosafety board, whose function includes establishment of mechanisms to facilitate the collection, storage and dissemination of data relating to living modified organisms (LMO) and products of such organisms. [11] However, Biosafety Act 2007 does not discuss storage, processing and inventory of dangerous pathogens and toxin beyond LMO. There is no publicly available information related to facilities handling dangerous pathogens and toxins in the website of Department of Biosafety, the Secretariate of the National Biosafety Board. [12]_

[1] Rastam, Z. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Z. 2013. "Biosecurity initiatives: Malaysia's obligations to the Biological Weapons Convention." BWC sub-regional workshop, Kuala Lumpur, 3-4 Sep 2013. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/5FC82E2A00305E75C1257CEE003E1CB2/$file/PPT+for+BWC+Sub-Regional+Workshop+as+per+2+September+2013.pdf]. Accessed January 2021.
[3] Yunus, Z. 2016. "Theme 3: Strengthening national implementation." Regional workshop for South and South-east Asia, Preparing for the eighth review conference of the Biological Weapons Convention. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E57439A25C46B691C125802900372A31/$file/Delhi+presentation+20160829+Yunus.pdf]. Accessed January 2021.
[4] The official portal of parliament of Malaysia. ""House of Representatives - Bills"". [https://www.parlimen.gov.my/bills-dewan-rakyat.html?&uweb=dr&arkib=yes&lang=en]. Accessed January 2021.
[5] Yunus, Z. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[6] Firdaws, N. 2017. "Bioterrorism threat: No worries for now." Free Malaysia Today, 31 Jan 2017. [http://www.freemalaysiatoday.com/category/nation/2017/01/31/bioterrorism-threat-no-worries-for-now/]. Accessed January 2021.
[7] Yunus, Z. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021.

[8] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[9] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[10] The United Nations Office at Geneva. 2020. "AvalableAvailable Confidence Building Measure Reports: Malaysia." [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed February 2021.
[11] The Parliament of Malaysia. Act No. 678, 2007. "Biosafety Act 2007". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Biosafety_Act.pdf]. Accessed February 2021.
[12] Department of Biosafety. [http://www.biosafety.gov.my/]. Accessed February 2021._

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: 0

Malaysia has a policy and guidelines document on biosecurity from the Ministry of Health, and a draft code of conduct from the Ministry of Defense but does not have mandatory legislation/regulations on biosecurity. Malaysia's defense, health, veterinary and other relevant agencies have been collaborating on the development of a framework to govern biosecurity since 2012 and consulted over a draft Biological and Toxin Weapons Bill (BTWC Bill) in 2015. However, the bill has not been passed—there is no mention of it in the public domain, not even parliament's dedicated Bills webpage. [1,2,3] Both the Ministry of Health and the Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, have produced non-mandatory documents addressing aspects of biosecurity including physical containment, operation practices, failure reporting systems and cybersecurity. The Ministry of Health's "Malaysia laboratory biosafety and biosecurity policy and guideline" is final (although it is stated in the forewoard that it is "not intended as a regulatory document") and is referred to in the 2017 One Health Manual (endorsed by the directors general of the Ministry of Health and the Department of Veterinary Services); STRIDE's national code of conduct for biosecurity is still in a draft form. [4,5,6] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject.Although Malaysia has been submitting annual Confidence Building Measures Reports under the Biological Weapons Convention (BWC), updated most recently in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [7] The VERTIC BWC legislation database listed no legislation and/or regulation with specific provision on biosecurity other than Biosafety Act 2007 and its technical guidelines, whose focus are limited to living modified organism, not dangerous pathogens and toxins in general. [8] Although the Joint External Evaluation (JEE) for Malaysia conducted in October 2019 concluded that "biosafety and biosecurity practices in Malaysia are supported by legislation, regulations, policies and guidelines aligned to international best practices", it identified no additional legislations and/or regulations beyond the aforemetionedaforementioned non-mandatory documents. [4,9]_

[1] Yunus, Z. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[2] Rastam, Z. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the

United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[3] The official portal of parliament of Malaysia. ""House of Representatives - Bills"". [https://www.parlimen.gov.my/bills-dewan-rakyat.html?&uweb=dr&arkib=yes&lang=en]. Accessed January 2021.
[4] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[5] Science and technology research institute for defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[6] Khan, A. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[7] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[15] [8[Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021.
[9] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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: 0

Malaysia does not have a domestic biosecurity legislation and therefore does not have an agency which can enforce legislation. However, Malaysia does have an established agency responsible for enforcing Malaysia's biosecurity commitments under international law. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC), to which Malaysia is party. [1] It has a team called the "Biological & Toxin Weapons Convention Nucleus", which is leading a multi-sectoral approach to raising awareness and capacity in the area of biosecurity. [2,3] A draft Biological and Toxin Weapons Bill (BTWC Bill) developed under STRIDE'S leadership was under review in 2015. [1,3] However, the bill has still not been passed—there is no mention of it in the public domain, not even parliament's dedicated Bills webpage. [3,4] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subjectAlthough Malaysia has submitted Confidence Building Measures annually since 2010, under the Biological Weapons Convention, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [5] Enforcement of biosecurity regulations depends on individual facility's IBC. Any organization, which undertakes modern biotechnology research and development, shall establish an Institutional Biosafety Committee (IBC) to ensure that any living modified organism/recombinant DNA module research, conducted at or sponsored by the organization, irrespective of the source of funding, shall comply with the Malaysian Biosafety Act 2007, any other related regulations and Malaysian laws relating to import and export, human, plant and animal health, environment and biological diversity. The IBC consist of experts and shall be registered to the National Biosafety Board (NBB) via Department of Biosafety

under the Ministry of Environment and Water that acts as the Board's secretariate. Non-compliance on the biosafety regulation as prescribed by the act and its derivates regulation and guidelines may result in: Suspension, limitation or termination of the noncompliant research project along with other enforcement orders on the organization. [6, 7] Vertic BWC Legislation database doesn't other biosecurity legislation and regulation beyond what has been mentioned earlier. [8]_

[1] Rastam, Z. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Z. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021.
[3] Yunus, Z. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[4] The official portal of parliament of Malaysia. ""House of Representatives - Bills"". [https://www.parlimen.gov.my/bills-dewan-rakyat.html?&uweb=dr&arkib=yes&lang=en]. Accessed January 2021.
[5] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[6] Department of Biosafety. Ministry of Environment and Water: Services. http://www.biosafety.gov.my/en-my/services/Pages/default.aspx. Accessed February 2021.
[7] Department of Biosafety. Ministry of Natural Resources and Environment Malaysia. "Guidelines for Institutional Biosafety Committees (IBC): Use of Living Modified Organisms and Related Materials". [http://www.vertic.org/media/National%20Legislation/Malaysia/MY_ibc%20guidelines.pdf]. Accessed February 2021
[8] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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 evidence that Malaysia has taken action to consolidate its inventories of especially dangerous pathogens and toxins. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC). [1] A draft Biological and Toxin Weapons Bill (BTWC Bill) was under review in 2015, which would have required licensing and registration of people and facilities handling controlled/regulated biological agents, as listed in a schedule associated with the bill. [2,3,4] However, the bill has not been passed—there is no mention of it in the public domain, not even parliament's dedicated Bills webpage—so it is assumed that without a national registration system, inventories do not exist. [5] In January 2017, the senior director of the Biological & Toxin Weapons Convention Nucleus within STRIDE was quoted in the media as saying that "the authorities have a database in place of pathogens that research institutions are working on, and the research is monitored closely." [6,7] No further information can be found on this database, and there is no evidence that any effort has been made to consolidate inventories covered under it. A draft code of conduct on biosecurity produced by STRIDE in 2015 did not mention consolidating inventories of dangerous biological agents; nor did the Ministry of Health's "Malaysia laboratory biosafety and biosecurity policy and guideline" published in 2015. [8,9]. The aforementioned publications are, as of 2018, the latest

government positions on this issue. There is no additional publicly available evidence from the Ministry of Health or the Ministry of Defense. [10, 11] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subjectAlthough Malaysia has submitted Confidence Building Measures annually since 2010, under the Biological Weapons Convention, access to the reports is restricted, and there is no indication on whether they contain information on this subject.. [12No database or publication with regards to the number of facilities permitted to hold pathogens nor steps taken to consolidate the inventories in country is found at The Department of Biosafety website – the agency who has the mandate to monitor all activities relating to living modified organisms (LMO) and it's products and establish mechanisms to facilitate the collection, storage and dissemination of data related to biosafety in its capacity as the secretariate for for the National Biosafety Board (NBB) under the Biosafety Act. [13] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, states that "the inventory of dangerous pathogens and toxins stored at each facility is monitored and updated routinely" however it doesn't provide additional information to verify this assessment. [14] Vertic Biological Weapons Convention legislation (BWC) legislation database has no additional information about Malaysia's regulatory framework regarding inventory management of dangerous pathogens and toxins. [15]_

[1] Rastam, Zahid. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Zalini. 2013. "Biosecurity initiatives: Malaysia's obligations to the Biological Weapons Convention." BWC sub-regional workshop, Kuala Lumpur, 3-4 Sep 2013. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/5FC82E2A00305E75C1257CEE003E1CB2/$file/PPT+for+BWC+Sub-Regional+Workshop+as+per+2+September+2013.pdf]. Accessed January 2021.
[3] Yunus, Zalini. 2016. "Theme 3: Strengthening national implementation." Regional workshop for South and South-east Asia, Preparing for the eighth review conference of the Biological Weapons Convention. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E57439A25C46B691C125802900372A31/$file/Delhi+presentation+20160829+Yunus.pdf]. Accessed January 2021.
[4] Yunus, Zalini. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[5] The official portal of parliament of Malaysia. ""House of Representatives - Bills"". [https://www.parlimen.gov.my/bills-dewan-rakyat.html?&uweb=dr&arkib=yes&lang=en]. Accessed January 2021.
[6] Firdaws, Nawar. 2017. "Bioterrorism threat: No worries for now." Free Malaysia Today, 31 Jan 2017. [http://www.freemalaysiatoday.com/category/nation/2017/01/31/bioterrorism-threat-no-worries-for-now/]. Accessed January 2021.
[7] Yunus, Zalini. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021.
[8] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[9] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[10] Ministry of Health. [http://www.moh.gov.my/english.php]. Accessed January 2021.
[11] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.

[12] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[13] Department of Biosafety. Ministry of Environment and Water. [http://www.biosafety.gov.my/en-my/Pages/default.aspx]. Accessed February 2021.
[14] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[15] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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

There is public evidence of in-country capacity to conduct Polymerase Chain Reaction (PCR)-based diagnostic testing for Ebola in Malaysia. A 2014 article published in The Malaysian Journal of Medical Sciences, titled "Responding to the Potential of Ebola Virus Disease (EVD) Importation into Malaysia", states that the Institute for Medical Research, a biosafety level (BSL) 3 laboratory, is capable of using PCR to test for Ebola. [1] The article indicates other laboratories were also trained in testing for diagnosis of Ebola in preparation for a possible surge. To ensure fundamental laboratories' functions, MySED II recommends enhancing laboratory testing capacity for detection of priority human diseases. One of the strategies is to have bacterial culture for Bacillus Anthracis (for designated reference laboratories). [2]

[1] Wan Mohamed Noor, Wan Noraini et al. "Responding to the Potential of Ebola Virus Disease (EVD) Importation into Malaysia." The Malaysian Journal of Medical Sciences: MJMS 21.6 (2014): 3–8. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4391448/]. Accessed January 2021.
[2] Ministry of Health. 2017. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed February 2021.

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 trainthe-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: 0

There is insufficient that Malaysia requires 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. Although biosecurity training is required by a national guideline, but there is no common curriculum nor standardized approach. Individual organizations are free to decide the curriculum and approach they will use in their biosecurity training. The Ministry of Health (MOH)'s "Malaysia laboratory biosafety and biosecurity policy and guideline" requires all personnel handling potentially infectious agents to receive

appropriate and ongoing training but leaves it to organization-level Institutional Biosafety and Biosecurity Committees (IBBC) to determine the content and duration of training. [1] The Malaysian standard on safety in laboratories produced by the Department of Standards similarly states that training in biosecurity measures is required but makes this facility specific. It is a legal requirement in that employers may be flouting the Occupational Health and Safety Act 1994 if training is not provided. [2,3] The Malaysian Biosafety and Biosecurity Association, a voluntary non-profit organization, organizes training in biosecurity and bio risk management, some of which is free and includes "train-the-trainer" workshops. [4] The National Public Health Laboratory does not appear to offer training specifically in biosecurity. [5] The aforementioned publications are, as of 2018, the latest government positions on this issue. There is no additional publicly available evidence from the Ministry of Health, the Ministry of Defense, the Ministry of Agriculture and Agro-based Industry, nor the National Institutes of Health (including the Institute for Medical Research and Institute of Public Health). [6,7,8,9] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subjectAlthough Malaysia has submitted Confidence Building Measures annually since 2010, under the Biological Weapons Convention, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [10] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, awarded a score of 3 for "Biosafety and biosecurity training and practices in all relevant sectors" meaning that Malaysia has a "developed capacity" where Malaysia have been providing training on biosafety and biosecurity "to staff at some, but not all, facilities that maintain or work with dangerous pathogens and toxins." Despite affirming existence of various forms of biosafety and biosecurity training, JEE did not mention any type of standardization in the delivery of the training. [11] There is no evidence of a standardized biosecurity training requirement on the VERTIC Biological Weapons Convention (BWC) legislation database. [12]

[1] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[2] Department of Standards Malaysia. 2014. "Draft Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [http://www.sirim.my/srmc/documents/Aug-Sept-2014/08W004R1_PC.pdf]. Accessed January 2021.
[3] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiC75Kj-7fZAhUMB8AKHXx9CtgQFggpMAA&url=https%3A%2F%2Fwww.msonline.gov.my%2Fdownload_file.php%3Ffile%3D33249%26source%3Dproduction&usg=AOvVaw2W6m_PwKyLml_DbmTSMScw] Preview only: costs RM 170 to download. Accessed January 2021.
[4] Malaysian Biosafety and Biosecurity Association. 2018. "About" [http://www.mbba.org.my/webv/], "News and events" [http://www.mbba.org.my/webv/news-and-events/], and "MBBA biorisk management workshop series" [http://www.mbba.org.my/webv/2017/06/mbba-biorisk-management-workshop-series/]. Accessed January 2021.
[5] National Public Health Laboratory (MKAK). 2016. "MKAK service handbook 2016." (See "Training" section.) [http://mkak.moh.gov.my/download/LainLainMikrobiologi/MKAKServiceHandbook2016.pdf]. Accessed January 2021.
[6] Ministry of Health. [http://www.moh.gov.my/ alaysi.php]. Accessed January 2021.
[7] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.
[8] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my]. Accessed January 2021.
[9] National Institute of Health. [http://nih.gov.my/web/]. Accessed January 2021.
[10] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/ alaysia]. Accessed January 2021
[11] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." p22.[https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[12] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-

materials/bwc-legislation-database/m/]. Accessed February 2021.

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: 0

Malaysia does not have regulations or licensing conditions specifying that personnel with access to biological materials with epidemic potential are subject to vetting. A draft Biological and Toxin Weapons (BTWC) Bill was under review in 2015, which would have required licensing and registration of people and facilities handling controlled/regulated biological agents, as listed in a schedule associated with the bill. However, the bill has still not been passed, so it is assumed that such a system has not been introduced. [1,2,3] The Ministry of Health's "Malaysia laboratory biosafety and biosecurity policy and guideline" lists personnel background checks among recommended biosecurity measures but leaves it to organization-level Institutional Biosafety and Biosecurity Committees (IBBC) to determine how to implement this—and the policy and guideline document is not mandatory. [4] The Department of Standards Malaysia operates a national unified laboratory accreditation scheme based on ISO/IEC 17025, known as Skim Akreditasi Makmal Malaysia (SAMM). [5] There are no SAMM accreditation documents specifically related to biosecurity or specifically for BSL-3 laboratories or above. [6] The accreditation documents for microbiology laboratories have sections on personnel competency, but do not address security checks. [7,8] The standard most relevant to biosecurity appears to be the "Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)", published in 2015. It addresses certification for BSL3 and BSL4 facilities, but again any references to personnel focus on competency and do not mention background checks. [9,10] The work-in-progress code of conduct on biosecurity drafted in 2015 by the Science and Technology Research Institute for Defense (STRIDE), under the Ministry of Defense, did not mention personnel vetting, though the report from a 2015 workshop on the code noted feedback that this measure should be included. [11] Although annually Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subjectAlthough Malaysia has submitted annual Confidence Building Measures reports under the Biological Weapons Convention (BWC), access to the reports is restricted, and there is no indication on whether they contain information on this subject. [12] Two 3-day workshops on April and July 2018 were organized over the course of four months in which Malaysia collaborated with The Netherlands. This bilateral engagement aimed to integrate biosecurity practices in their national biorisk management programs and resulted into a comprehensive biosecurity checklist for laboratory assessment and monitoring. To improve laboratories' personnel reliability, the checklist includes questions such as "Are background checks conducted on existing personnel on a periodical basis?" and_x000B_"Were mental health assessments or psychological assessments conducted prior to employment or in interval time of employment?". The checklist is not legal-bound, and it is not certain whether facilities have used this checklist. [13] There are also no related information regarding vetting of personnel in biosafety and biosecurity within the VERTIC BWC legislation database and the Joint External Evaluation (JEE) conducted in October 2019 for Malaysia. [14, 15]._

[1] Saraswathy, T. 2013. "National efforts in biorisk management: Malaysian perspectives." Regional workshop on national implementation of BWC for South and South-east Asia, 3-4 Sep 2013. Ministry of Health presentation. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E5C696F1FF0BE829C1257CEE003E5DAF/$file/Saraswathy+Regional

+workshop+BWC.pdf]. Accessed January 2021.
[2] Yunus, Z. 2016. "Theme 3: Strengthening national implementation." Regional workshop for South and South-east Asia, Preparing for the eighth review conference of the Biological Weapons Convention. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E57439A25C46B691C125802900372A31/$file/Delhi+presentation+20160829+Yunus.pdf]. Accessed January 2021.
[3] Yunus, Z. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[4] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[5] Department of Standards Malaysia. 2018. "Accreditation." [http://www.jsm.gov.my/skim-akreditasi-makmal-malaysia-samm-#.Wo3g2-fLhPY]. Accessed January 2021.
[6] Department of Standards Malaysia. 2018. "SAMM publication" [http://www.jsm.gov.my/samm-publication#.Wo3iVOfLhPY]. Accessed January 2021.
[7] Department of Standards Malaysia. 2011. "Specific criteria 1.3: Specific criteria for accreditation in the field of microbiology." [http://www.jsm.gov.my/documents/10180/253373/SC+1.3+Microbiology+28June2011.pdf/3fea1e9e-2cb1-40f8-888b-016e17a438d0]. Accessed January 2021.
[8] Department of Standards Malaysia. 2017. "Specific technical requirements for accreditation of medical microbiology laboratories." [http://www.jsm.gov.my/documents/10180/329611/STR+2.5%2C%20Issue+5%2C%2026+April+2017.pdf/1e7fe225-e7f4-4492-94df-7550d658a696]. Accessed January 2021.
[9] Department of Standards Malaysia. 2014. "Draft Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [http://www.sirim.my/srmc/documents/Aug-Sept-2014/08W004R1_PC.pdf]. Accessed January 2021.
[10] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiC75Kj-7fZAhUMB8AKHXx9CtgQFggpMAA&url=https%3A%2F%2Fwww.msonline.gov.my%2Fdownload_file.php%3Ffile%3D33249%26source%3Dproduction&usg=AOvVaw2W6m_PwKyLml_DbmTSMScw]. Accessed January 2021.
[11] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[12] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021.
[13] Brizee S, Passel MWJ van, Berg LM van den, et al. 2019. "Development of a Biosecurity Checklist for Laboratory Assessment and Monitoring. Applied Biosafety". [https://journals.sagepub.com/doi/full/10.1177/1535676019838077#articleCitationDownloadContainer]. Accessed February 2021.
[14] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[15] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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

Malaysia has up-to-date national regulations and standards in place to ensure the safe and secure transport of infectious substances (Categories A and B). The Department of Standards Malaysia issued a national code of practice on "Biosafety and biocontainment in microbiology laboratories" (MS 1042-3) in 2015, which addresses transportation of infectious substances. It states that Malaysian regulations are based on the UN model regulations on the transport of dangerous goods and instructs readers to check latest versions of the UN model regulations as well as the IATA and ICAO standards for air transport. The most relevant domestic regulation is the Prevention and Control of Infectious Diseases (Importation and Exportation of Human Remains, Human Tissues and Pathogenic Organisms and Substances) Regulations 2006 (P.U.(A) 182/2006). The code of conduct makes it clear that the sender is responsible for ensuring compliance with these international and domestic regulations. [1,2,3] The Ministry of Health has also published a standard operating procedure (SOP) for transport of biological specimens, aimed at medical laboratories. It uses UN classifications of infectious substances (Category A + B), refers to IATA rules for air and overland transport, and also refers to MS 1042-3. [4] The National Health Public Health Laboratory also has a document on transporting diagnostic specimens which refers to UN and IATA rules. [5] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted the availability of 63 trained personnel and 10 'train the trainers' for International Air Transport Association shipping in Malaysia. Funding for transportation is through the existing government budget and contracts for private laboratories. [6]

[1] Department of Standards Malaysia. 2014. "Draft Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [http://www.sirim.my/srmc/documents/Aug-Sept-2014/08W004R1_PC.pdf]. Accessed January 2021.
[2] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories – code of practice – Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiC75Kj-7fZAhUMB8AKHXx9CtgQFggpMAA&url=https%3A%2F%2Fwww.msonline.gov.my%2Fdownload_file.php%3Ffile%3D33249%26source%3Dproduction&usg=AOvVaw2W6m_PwKyLml_DbmTSMScw]. Accessed January 2021.
[3] Government of Malaysia. 2006. "Prevention and Control of Infectious Diseases (Importation and Exportation of Human Remains, Human Tissues and Pathogenic Organisms and Substances) Regulations 2006 (P.U.(A) 182/2006)." [http://www.bloomcomm.com/sites/ISAKOS-2017/supportLetters/SD.AP.2.pdf]. Accessed January 2021.
[4] Ministry of Health. 2012. "Standard operating procedure for transport of biological specimens in Malaysia." [http://www.imr.gov.my/en/component/content/article/77-english-content/services/1472-idrc-sop-for-transportation-of-biological-specimens.html]. Accessed January 2021.
[5] National Public Health Laboratory. N.d. "Packaging and transportation of infectious substances and diagnostic specimens." [http://mkak.moh.gov.my/ms/muat-turun/borang-dokumen-bahagian-penyakit/lain-lain-dokumen.html?download=35:packaging-transporting-diagnostic-specimens&usg=AOvVaw2VHtqq8eDOuzQtmC_4aKf7]. Accessed January 2021.
[6] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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: 1

Malaysia has national legislation and regulations overseeing cross-border transfer and end-user screening of dangerous pathogens and toxins. The Strategic Trade Act 2010 restricts the import, export and transshipment (including brokering) of strategic items on a list, requiring permits based on end-use. [1] The list of items includes viruses and bacteria with pandemic potential, among others, and the biosafety containment equipment which might be used to transport them. [2] Four government agencies can issue permits, including the Pharmaceutical Services Division of the Ministry of Health. Companies engaging in strategic trade requiring bulk or multiple-use permits must put in place an internal compliance program (ICP) so that a thorough investigation of buyer and end-user can be undertaken prior to shipment. The ICP must include transparent reporting and decision-making responsibilities for exports; knowledge of clients and end-users; early warning and screening of all enquiries and orders; and documentation of all transactions involving strategic items to be kept for at least 6 years. [3,4] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [5] Based on Customs (Prohibition of Export) Order 1998 Schedule 3, Malaysia bans the export of pathogenic wastes, clinical wastes or quarantined materials. [6] Customs (Prohibition of Export) Order 1998 and Schedule 3 and 4 Part 1 specifically are listed in Vertic Biological Weapons Convention (BWC) legislation database._

[1] Government of Malaysia. 2015. "Strategic Trade Act 2010 (as of 1 May 2015)". [http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act%20708%2028_4_2015.pdf]. Accessed January 2021.
[2] Government of Malaysia. 30 March 2017. "Strategic Trade (Strategic Items) (Amendment) Order 2017". [http://www.federalgazette.agc.gov.my/outputp/pua_20170331_P.U.(A)90.pdf]. Accessed January 2021.
[3] Yussof, B. N.d. "Overview of the Malaysian Strategic Trade Act 2010 and its significance to the import and export sectors in Malaysia." Parliament of Malaysia. [http://www.parlimen.gov.my/images/webuser/artikel/ro/bad/STRATEGIC_TRADE_ACT_2010__WMD%20(revised).pdf]. Accessed January 2021.
[4] Ministry of International Trade and Industry. N.d. "Internal compliance program - a guide." [http://www.miti.gov.my/miti/resources/STA%20Folder/PDF%20file/INTERNAL_COMPLIANCE_PROGRAM_guide.pdf]. Accessed January 2021.
[5] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021.
[6] Customs (Prohibition of Export) order. 2018. [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Customs_Prohibition_Exports_Order_Schedule3.pdf]. Accessed February 2021._

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 Malaysia has national legislation and regulations addressing biosafety. The Biosafety Act 2007 (Act 678) and its relevant technical guidelines specifically include Living Modified Organisms (Genetically Modified Organisms/GMO). [1, 2, 3, 4, 5] The Department of Standards Malaysia issued a national code of practice on "Biosafety and biocontainment in microbiology laboratories" (MS 1042-3) in 2015, but there is no evidence that this code carries the force of law. [6] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [7] Although the Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted that "biosafety and biosecurity practices are supported by legislation, regulations, policies and guidelines aligned to international best practices," it does not provide references to legislation which carry the force of law. [8] The guideline listed by JEE, Malaysia Laboratory Biosafety and Biosecurity Policy and Guidelines, is also "not intended as a regulatory document."[9]. No evidence was also found via the VERTIC BWC legislation database. [10]

[1] The Parliament of Malaysia. Act No. 678, 2007. "Biosafety Act 2007". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Biosafety_Act.pdf]. Accessed February 2021.
[2] Ministry of Natural Resources and Environment Malaysia. N.d. "User's guide to the Biosafety Act and regulations." http://www.biosafety.gov.my/ms-my/pustaka-media/Documents/Biosafety%20User%20Guide.pdf]. Accessed January 2021.
[3] Ministry of Natural Resources and Environment of Malaysia. "Biosafety (Approval and Notification) Regulations 2010". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Biosafety_Regulations.pdf]. Accessed February 2021.
[4] Department of Biosafety, Ministry of Natural Resources and Environment of Malaysia. "Guidelines for Institutional Biosafety Committees: Use of Living Modified Organism and Related Materials." [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_ibc%20guidelines.pdf]. Accessed February 2021.
[5] Department of Biosafety, Ministry of Natural Resources and Environment of Malaysia. "Biosafety Guidelines for Contained Use Activity of Living Modified Organism". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_containment%20guidelines.pdf]. Accessed February 2021.
[6] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories - code of practice - Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.scribd.com/document/438010653/MS-1042-3-2015-Preview#download]. Accessed February 2021.
[7] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[8] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[9] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[10] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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 no evidence of an agency responsible for the enforcement of biosafety legislation and regulations because currently there is insufficient evidence of biosafety legislation and regulation. The Biosafety Act 2007 (Act 678) and its relevant technical guidelines specifically include Living Modified Organisms (Genetically Modified Organisms/GMO). [1, 2, 3, 4, 5] The Department of Standards Malaysia issued a national code of practice on "Biosafety and biocontainment in microbiology laboratories" (MS 1042-3) in 2015, but there is no evidence that this code carries the force of law. [6] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [7] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, noted that "there is a comprehensive biosafety and biosecurity management system at the institutional level including designated personnel for biosafety and biosecurity implementation."[6] However, JEE did not provide additional reference regarding biosafety regulation and agency that are not GMO-focused. [8] No evidence was also found via the VERTIC BWC legislation database. [9]

[1] The Parliament of Malaysia. Act No. 678, 2007. "Biosafety Act 2007". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Biosafety_Act.pdf]. Accessed February 2021.
[2] Ministry of Natural Resources and Environment Malaysia. N.d. "User's guide to the Biosafety Act and regulations." http://www.biosafety.gov.my/ms-my/pustaka-media/Documents/Biosafety%20User%20Guide.pdf]. Accessed January 2021.
[3] Ministry of Natural Resources and Environment of Malaysia. "Biosafety (Approval and Notification) Regulations 2010". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_Biosafety_Regulations.pdf]. Accessed February 2021.
[4] Department of Biosafety, Ministry of Natural Resources and Environment of Malaysia. "Guidelines for Institutional Biosafety Committees: Use of Living Modified Organism and Related Materials." [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_ibc%20guidelines.pdf]. Accessed February 2021.
[5] Department of Biosafety, Ministry of Natural Resources and Environment of Malaysia. "Biosafety Guidelines for Contained Use Activity of Living Modified Organism". [https://www.vertic.org/media/National%20Legislation/Malaysia/MY_containment%20guidelines.pdf]. Accessed February 2021.
[6] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories - code of practice - Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.scribd.com/document/438010653/MS-1042-3-2015-Preview#download]. Accessed February 2021.
[7] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021.
[8] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[9] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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 trainthe-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: 0

Malaysia's national regulation and guidelines on biosafety require trainings, however not all of them are conducted in a standardized approach. The Ministry of Health's "Malaysia laboratory biosafety and biosecurity policy and guideline" requires all personnel handling potentially infectious agents to receive appropriate and ongoing training but leaves it to organization-level Institutional Biosafety and Biosecurity Committees (IBBC) to determine the content and duration of training. [1] The Malaysian standard on safety in laboratories produced by the Department of Standards similarly states that training in biosafety measures is required but makes this facility specific. It is a legal requirement in that employers may be flouting the Occupational Health and Safety Act 1994 if training is not provided. [2] The Malaysian Biosafety and Biosecurity Association, a voluntary non-profit organization, organizes training in biosafety, some of which is free and includes "train-the-trainer" workshops. [3] The National Public Health Laboratory does not appear to offer training specifically in biosafety. [4] Although annually Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) since Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject.[5] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, stated that "training for biosafety and biosecurity is embedded at the national, institutional and academic level in Malaysia with 43 people certified as Registered Biosafety Professionals." [6] Despite affirming existence of various forms of biosafety and biosafety training, JEE did not mention any type of standardization in the delivery of the training. [11] Vertic Biological Weapons Convention (BWC) legislation database provides no additional resources about this matter. [7]_

[1] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[2] Department of Standards Malaysia. 2015. "Malaysian standard: Safety in laboratories - code of practice - Part 3: Biosafety and biocontainment in microbiology laboratories (first revision)." [https://www.scribd.com/document/438010653/MS-1042-3-2015-Preview#download]. Accessed February 2021.
[3] Malaysian Biosafety and Biosecurity Association. 2018. "About" [http://www.mbba.org.my/webv/], "News and events" [http://www.mbba.org.my/webv/news-and-events/], and "MBBA biorisk management workshop series" [http://www.mbba.org.my/webv/2017/06/mbba-biorisk-management-workshop-series/]. Accessed January 2021.
[4] National Public Health Laboratory (MKAK). 2016. "MKAK service handbook 2016." (See "Training" section.) [http://mkak.moh.gov.my/en/download-green/penerbitan.html?download=38:mkak-service-handbook-2016]. Accessed January 2021.
[5] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/ Malaysia]. Accessed January 2021.
[6] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.
[7] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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 evidence that Malaysia has conducted an assessment to determine whether ongoing research is occurring on especially dangerous pathogen, toxins, or other dual use research. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC). [1] A draft Biological and Toxin Weapons Bill (BTWC Bill) was under review in 2015, which would have required licensing and registration of people and facilities handling controlled/regulated biological agents, as listed in a schedule associated with the bill. [1,2,3] However, the bill has still not been passed, so it is assumed that such a system has not been introduced. [4] In January 2017, the senior director of the Biological & Toxin Weapons Convention Nucleus within STRIDE was quoted in the media as saying that "the authorities have a database in place of pathogens that research institutions are working on, and the research is monitored closely. This is especially true with research involving genetically modified organisms." [5,6] No further information can be found on this database, and there is no evidence that it covers all researchers handling dangerous pathogens and toxins, including those under other sectors such as the Ministry of Health. A draft code of conduct on biosecurity produced by STRIDE in 2015 did not mention any assessment or record of research projects involving dangerous biological agents; nor did the Ministry of Health's non-mandatory "Malaysia laboratory biosafety and biosecurity policy and guideline" published in 2015. [7,8]. There is no additional publicly available evidence from the Ministry of Agriculture and Agro-based Industry; the Ministry of Health; the National Institutes of Health; or the Ministry of Defense. [9,10,11,12] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [13] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 identified routine information sharing and increasing awareness on the danger of potential dual use research as areas still need to be strengthened. [14] Vertic Biological Weapons Convention (BWC) legislation database provides no additional resources about this matter. [15]_

[1] Rastam, Zahid. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Zalini. 2013. "Biosecurity initiatives: Malaysia's obligations to the Biological Weapons Convention." BWC sub-regional workshop, Kuala Lumpur, 3-4 Sep 2013. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/5FC82E2A00305E75C1257CEE003E1CB2/$file/PPT+for+BWC+Sub-Regional+Workshop+as+per+2+September+2013.pdf]. Accessed January 2021.
[3] Yunus, Zalini. 2016. "Theme 3: Strengthening national implementation." Regional workshop for South and South-east Asia, Preparing for the eighth review conference of the Biological Weapons Convention. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E57439A25C46B691C125802900372A31/$file/Delhi+presentation+20160829+Yunus.pdf]. Accessed January 2021.
[4] Yunus, Zalini. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]
[5] Firdaws, Nawar. 2017. "Bioterrorism threat: No worries for now." Free Malaysia Today, 31 Jan 2017. [http://www.freemalaysiatoday.com/category/nation/2017/01/31/bioterrorism-threat-no-worries-for-now/]. Accessed January 2021.
[6] Yunus, Zalini. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021.
[7] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention."

[https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[8] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[9] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my/]. Accessed January 2021.
[10] Ministry of Health. [http://www.moh.gov.my/english.php]. Accessed January 2021.
[11] The National Institutes of Health. [http://nih.gov.my/web/]. Accessed January 2021.
[12] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.
[13] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021.
[14] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.
[15] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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: 0

There is no public evidence that Malaysia has a national policy requiring oversight of dual use research. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC). [1] A draft Biological and Toxin Weapons Bill (BTWC Bill) was under review in 2015, which would have required licensing and registration of people and facilities handling controlled/regulated biological agents, as listed in a schedule associated with the bill. [1,2,3] However, the bill has still not been passed, so it is assumed that such a system has not been introduced. [4] A report on a draft code of conduct on biosecurity produced by STRIDE in 2015 confirmed that there was not yet adequate oversight of dual use research. The draft code of conduct included the requirement for dual use aspects to be considered in all applications for research projects, but the final code has yet to be published so this is not yet in effect. [5] Oversight of dual-use research is not addressed in the Ministry of Health's non-mandatory "Malaysia laboratory biosafety and biosecurity policy and guideline" published in 2015. [6] There is no additional publicly available evidence from the Ministry of Agriculture and Agro-based Industry; the Ministry of Health; the National Institutes of Health; or the Ministry of Defense. [7,8,9,10] Although annually Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [11] There is a coordination in place between law enforcement and public health and medical officials to tackle public health emergencies, which may pose special challenges for law enforcement, whether the threat is manmade or naturally occurring. Multisectoral exercises have been regularly conducted on various CBRNe scenarios including deliberate attacks. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 identified routine information sharing and increasing awareness on the danger of potential dual use research as areas to be strengthened. [12] Vertic Biological Weapons Convention (BWC) legislation database provides no additional resources about this matter. [13]_

[1] Rastam, Zahid. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-

Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Zalini. 2013. "Biosecurity initiatives: Malaysia's obligations to the Biological Weapons Convention." BWC sub-regional workshop, Kuala Lumpur, 3-4 Sep 2013. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/5FC82E2A00305E75C1257CEE003E1CB2/$file/PPT+for+BWC+Sub-Regional+Workshop+as+per+2+September+2013.pdf]. Accessed January 2021.
[3] Yunus, Zalini. 2016. "Theme 3: Strengthening national implementation." Regional workshop for South and South-east Asia, Preparing for the eighth review conference of the Biological Weapons Convention. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/E57439A25C46B691C125802900372A31/$file/Delhi+presentation+20160829+Yunus.pdf]. Accessed January 2021.
[4] Yunus, Zalini. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[5] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[6] Ministry of Health. 2015. "Malaysia laboratory biosafety and biosecurity policy and guideline." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=11:biosafety-policy-and-guideline-2015]. Accessed January 2021.
[7] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my/]. Accessed January 2021.
[8] Ministry of Health. [http://www.moh.gov.my/english.php]. Accessed January 2021.
[9] The National Institutes of Health. [http://nih.gov.my/web/]. Accessed January 2021.
[10] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.
[11] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021.
[12] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.
[13] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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: 0

Malaysia has an established agency poised to take responsibility for oversight of dual use research, but the country has yet to fully develop the legislative framework which would enable it to oversee research in all sectors. The Science and Technology Research Institute for Defense (STRIDE), an agency under the Ministry of Defense, coordinates the implementation of the Biological Weapons Convention (BWC), to which Malaysia is party. [1] It has a team called the "Biological & Toxin Weapons Convention Nucleus", which is leading a multi-sectoral approach to raising awareness and capacity in the area of biosecurity, including dual use considerations. [2,3,4] A draft Biological and Toxin Weapons Bill (BTWC Bill) developed under the leadership of STRIDE was under review in 2015. [1] The BTWC Bill would have allowed for greater oversight of facilities conducting research with potential dual use aspects. However, the bill has still not been passed. [3] There is no additional publicly available evidence from the Ministry of Agriculture and Agro-based Industry; the Ministry of Health; the National Institutes of Health; or the Ministry of Defense. [5,6,7,8] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the

reports is restricted, and there is no indication on whether they contain information on this subject. [9] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 also highlighted centralized oversight as and area that need strengthening. [10] Vertic Biological Weapons Convention (BWC) legislation database has been consulted and no additional information was found. [11]_

[1] Rastam, Zahid. 2015. "Statement by Zahid Rastam, Deputy Permanent Representative, Permanent mission of Malaysia to the United Nations in Geneva on Agenda Item 7: Strengthening national implementation at the 2015 meeting of experts of state parties to the Biological Weapons Convention." Geneva, 10 August 2015. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/466B21EB7836583DC1257EA00059557D/$file/Statement-Malaysia-BWC+MXP-National+Implementation.pdf]. Accessed January 2021.
[2] Yunus, Zalini. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021.
[3] Yunus, Zalini. 2017. "Enacting changes in Malaysia." USDA ARS 4th International Biosafety & Biocontainment Symposium, Baltimore, 7 Feb 2017. [https://arssymposium.absa.org/wp-content/uploads/2017/02/2017ARS_S1_0930Yunus.pdf]. Accessed January 2021.
[4] Science and Technology Research Institute for Defense (STRIDE). 2015. "Workshop on the development of a national code of conduct for biosecurity, in the framework of biological and toxin weapons convention." [https://issuu.com/asmpub/docs/code_of_conduct_for_biosecurity_wor]. Accessed January 2021.
[5] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my/]. Accessed January 2021.
[6] Ministry of Health. [http://www.moh.gov.my/english.php]. Accessed January 2021.
[7] The National Institutes of Health. [http://nih.gov.my/web/]. Accessed January 2021.
[8] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.
[9] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[10] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[11] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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

Malaysia has a national legislative framework requiring the screening of synthesized DNA before it is sold, however it is unclear if it includes screening of synthesized DNA against lists of known pathogens and toxins before it is sold. Under the Biosafety Act 2007 and its associated regulations, set processes must be followed and permission obtained when obtaining, using, transferring, storing or destroying living modified organisms (LMO) or recombinant DNA materials. [1,2] LMOs are defined in Malaysia's regulations as follows: "Living modified organisms (LMO) are created using recombinant DNA technology and involve the transfer of genetic material between unrelated organisms and species." [1] Among other things, the regulations under the Biosafety Act cover work involving the genetic modification of all microorganisms, including bacteria, fungi, protists, cell-lines and viruses, which are human and animal pathogens. There is a regulation specifically

addressing risk assessment of genetically modified microorganisms, which covers hazards posed by inserted sequences; routine cloning work with Escherichia coli; bacterial gene-delivery systems; work with cell cultures; adeno-associated viruses; adenoviruses; baculoviruses; herpesviruses; poxviruses; retroviruses; and viral reverse genetics. It also covers work with most types of cloned DNA, including prions, proviral DNA, oncogenes, growth factors, cytokines, non-coding elements, antisense constructs, siRNA and host range/virulence factors that are carried or vectored by a microorganism. [3] The National Biosafety Board screens any requests to release, export or import living modified organisms. It reviews items for agent characteristics, including virulence and pathogenicity. [4] Although Malaysia has submitted Confidence Building Measures Reports under Biological Weapons Convention (BWC) annually since 2010, with latest submission in 2020, access to the reports is restricted, and there is no indication on whether they contain information on this subject. [5] There is no additional evidence via the Ministry of Health, or Defense. [7] Malaysia's 2019 submissions of information, online discussions and report of the AHTEG on Synthetic Biology also demonstrate that a broad range of views exist on each of the NEI criteria, from these being satisfied by "synthetic biology" as a general concept (e.g., the 2019 NEI proposal by Norway, and the 2019 submissions of information by Finland and Malaysia). Malaysia's Ministry of Land, Water, and Mineral Resources submitted their information on synthetic biology to the Secretariat of the Convention on Biological Diversity on February 18th, 2019. In the letter, Malaysia states that "synthetic biology is considered a new and emerging issue in Malaysia, therefore more comprehensive information is needed as well as capacity building to enhance the regulatory body's competency in monitoring this issue". From the same letter, it is described that no new technological developments in synthetic biology since the last meeting of the Ad Hoc Technical Expert Group in December 2017, no current state of knowledge of positive and negative impact of synthetic biology application, and no living organisms developed thus far through new developments in synthetic biology. Malaysia's nominations for CBD include people from Department of Biosafety of the Ministry of Water, Land and Natural Resources, from Institute of Biological Sciences (University of Malaya, Malaysia), and Faculty of Applied Sciences Pharmaceutical and Life Sciences (University Teknologi MARA, Malaysia). [8,9] Vertic Biological Weapons Convention (BWC) legislation database has been consulted and no additional information was found. [10]_

[1] Department of Biosafety, Ministry of Natural Resources and Environment (NRE). 2018. "Law, regulation and guideline." (Biosafety Act 2007). [http://www.biosafety.nre.gov.my/law_regulation.shtml]. Accessed January 2021.
[2] Ministry of Natural Resources and Environment. N.d. "User's guide to the Biosafety Act and regulations." [http://www.ppsk.usm.my:86/rd/k-odatabase.nsf/vkoall/63F94527CF01C6BB4825812100126E64/$FILE/2010+User+Guide+Biosafety+Act+Regulation.pdf]. Accessed January 2021.
[3] Department of Biosafety, Ministry of Natural Resources and Environment. 2012. "Biosafety guidelines: Risk assessment of genetically modified microorganisms." [http://www.rmc.upm.edu.my/dokumen/92272_Risk_Assessment_of_GM_Microorganisms.pdf]. Accessed May 2019.
[4] Universiti Teknologi Malaysia. 2014. "Introduction to Malaysian Biosafety Act 2007 and Institution Biosafety Committee UTM." [http://fbme.utm.my/wp-content/uploads/2014/01/Std_slaid_Biosafety_IBC_7_3_11.pdf]. Accessed January 2021.
[5] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/malaysia]. Accessed January 2021
[7] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed May 2019.
[8] https://bch.cbd.int/synbio/submissions/. Accessed February 2021
[9] Keiper, Felicity. And Ana Atanassova. 2020. "Regulation of Synthetic Biology: Developments Under the Convention on Biological Diversity and Its Protocols". [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7160928/]. Accessed February 2021.
[10] Vertic. "BWC Legislation Database for Malaysia". [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/]. Accessed February 2021._

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 Public Health Laboratory (MKAK) has the capacity to conduct 6 of the 10 WHO-defined core tests. MKAK offers the following tests: PCR testing for influenza virus; virus culture for poliovirus; serology for HIV; microscopy for mycobacterium tuberculosis; microscopy testing for plasmodium spp which takes 1 hour (assumed to equal rapid diagnostic testing); bacterial culture for Salmonella enteritidis serotype Typhi. [1] MKAK does not explicitly provide information on the

four country-defined tests, though it does offer a large number of tests for infectious diseases in addition to those listed above, including diseases of local public health concern such as hand, foot and mouth disease, and Japanese encephalitis. [2, 3] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 confirmed Malaysia's national laboratory system ability to "conduct core tests for all 10 priority diseases as well as more specialized tests. [4]_

[1] National Public Health Laboratory. 20186. "Service handbook 20186." [https://mkak.moh.gov.my/en/download-green/penerbitan.html?download=99:test-handbook-pdf-formathttp://mkak.moh.gov.my/en/download-green/penerbitan.html?download=38:mkak-service-handbook-2016]. Accessed January February 2021.
[2] National Public Health Laboratory. 2018. "Our services" [http://mkak.moh.gov.my/en/information-orange/perkhidmatan-mkak.html]. Accessed January 2021.
[3] National Public Health Laboratory. 2018. "Publication" [http://mkak.moh.gov.my/en/download-orange/penerbitan.html]. Accessed January 2021.
[4] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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 national plan, strategy or similar document for conducting testing during a public health emergency, but there is insufficient evidence that it includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing.

Since 2002, Malaysia has started a process to establish protocols for investigations of public health emergencies due to novel pathogens or possible infectious disease beyond communicable diseases identified in mandatory notification list. [1] Such investigation uses syndromic approach and laboratory testing complementary to other specific disease notification. There are six categories within this syndromic approach: neurological, respiratory, dermatological, haemorrhagic, jaundice and diarrheal - each with its own algorithm. Notification will be made to Ministry of Health when definition of any of the six aforementioned syndromes are found by health practitioners. Case investigations will be conducted initially by district health office, and can be escalated based on needs assessment. The protocol also provides guidance regarding the appropriate specimens to be taken to establish the aetiological agent causing the syndrome. Further testing is led by the Institute for Medical Research (IMR), the reference laboratory for Specialized diagnostics and infectious disease management. [2] If occurrence of public health emergency is confirmed, Crisis Preparedness and Response Centre (CPRC) will be activated. Depending on the scale of the emergency, CPRC can be activated at different levels: nationwide, state and district. Activation of CPRC in public health emergency will put it on active mode (response mode) and also carries with it access to necessary resources needed to scale up testing and other relevant activities to deal with the public emergencies. [3]

A recent example of recorded surge capacity occurred in February 2021, in which Malaysia ramped up its testing capacity by 86% through involvement of laboratory in public hospitals, public health laboratories, university laboratories, laboratories within the armed forces, Malaysian Genome institute, private laboratories and IMR. [4, 5] CPRC led coordination with relevant entities will harmonize of various activities during the emergency, including whether tests are to be carried out for

all individual cases or samples. CPRC had been the command, control and coordination centres in various public health emergencies such as H1N1 pandemic in 2009, Avian Influenzas in 2014, MERS-CoV case in 2014, Zika infection in 2016 and the current Covid-19 pandemic. [6, 7]

The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted CPRC's role as coordinator to response to public health incidents, including "all diseases of unknown origin and other public health emergencies" using all-hazard approach. According to JEE, CPRC has demonstrated its capacity both in real emergencies as well as in exercises/simulations. [8] In fact, the JEE notes that Malaysia has an " Effective national diagnostic network" with "Advanced molecular and serological testing for referred samples and for diagnostic confirmation are available and standardized at the national and reference laboratories". Malaysia also has separate pandemic plan for Influenza. [9]

[1] Ministry of Health. 2004. "Syndromic Notification and Laboratory Investigation Manual (2nd Edition)." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694 2 776557747064433945595 84a70494556754c6c7068615735315a476c7549454a4c5543387a636d517655336c755a484a7662 576c6a5830357664476c6d61574e6864476c76626e4d756347526d]. Accessed January 2021.
[2] T.S. Saraswathy Subramaniam, Ravindran Thayan, Mohd Apandi Yusof, Jeyanthi Suppiah, Tengku Rogayah Tg Abd Rashid, Zarina Mohd Zawawi, Nor Aziyah Mat Rahim, Fauziah Kassim, Rozainanee Mohd Zain, Zainah Saat. ""Sharing experiences from a reference laboratory in the public health response for Ebola viral disease, MERS-CoV and H7N9 influenza virus investigations"". Asian Pacific Journal of Tropical Medicine. Volume 9, Issue 2, 2016, Pages 201-203, ISSN 1995-7645.[http://www.sciencedirect.com/science/article/pii/S1995764516000171]. Accessed January 2021.
[3] Ministry of Health. 2017. "Crisis Preparedness and Response Centre (Pusat Kesiapsiagaan dan Tindak Cepat Krisis)." [http://www.myhealth.gov.my/pusat-kesiapsiagaan-dan-tindak-cepat-krisis/]. Accessed January 2021.
[4] World Health Organization (WHO). 2020. "Malaysia: Strong preparedness and leadership for a successful COVID-19 response." [https://www.who.int/publications/m/item/malaysia-strong-preparedness-and-leadership-for-a-successful-covid-19-response]. Accessed January 2021.
[5] Director General of Health, Malaysia. 2020. "The Malaysian Response to COVID-19: Building Preparedness for 'Surge Capacity', Testing Efficiency, and Containment." [https://kpkesihatan.com/2020/06/16/the-malaysian-response-to-covid-19-building-preparedness-for-surge-capacity-testing-efficiency-and-containment/]. Accessed January 2021.
[6] Disease Control Division, Ministry of Health. 2016. "National Crisis Preparedness and Response Centre (CPRC), Ministry of Health Malaysia." ASEAN EOC Newsletter. Volume 1, Issue 1. [https://asean.org/storage/2016/12/ASEAN-EOC-Newsletter1.pdf]. Accessed January 2021.
[7] World Health Organization. 2020. "Malaysia: Strong Preparedness and Leadership for a Successful Covid-19 Response." [https://www.who.int/docs/default-source/coronaviruse/country-case-studies/malaysia-c19-case-study-20-august.pdf?sfvrsn=a0f79358_2&download=true]. Accessed January 2021.
[8] World Health OrganisationOrganization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[9] Ministry of Health. 2006. "National Influenza Pandemic Preparedness Plan." [http://nktm-health.net/sites/default/files/docs/01012016/NIPPP_PoA_Msia.pdf]. Accessed January 2021.

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 National Public Health Laboratory (MKAK), which consists of one central laboratory supported by four regional labs, has received ISO accreditation. MKAK, which serves as the national reference facility, "has been certified by Standards Malaysia MS ISO 9001:2008 (General), accredited by MS ISO 15189:2014 (Disease Division) and MS ISO 17025: 2005 (Food Division and Tar and Nicotine Unit) and also assessed by World Health Organization (WHO)."

[1] The Institute of Medical Research (IMR), one of whose activities is "establishing center of excellence and national reference laboratories for biochemical, immunological, viral, microbiological and molecular diagnostics", also obtained ISO 15189:2003 accreditation "for 10 laboratories in 2006". It is not clear which 10 these are. It appears as if the IMR may have organizational control of MKAK though this is not made clear.
[2] [1] National Public Health Laboratory. 2016. "Service handbook 2016." [http://mkak.moh.gov.my/en/download-green/penerbitan.html?download=38:mkak-service-handbook-2016]. Accessed January 2021.
[2] Institute for Medical Research (IMR), Ministry of Health. 2013. "Background." [http://www.imr.gov.my/index.php/en/corporate-info/background?profile=red]. Accessed January 2021.

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 Public Health Laboratory (MKAK) and Institute for Medical Research (IMR) are subject to external quality assurance review. MKAK has been assessed by Standards Malaysia and by the World Health Organization (WHO). [1] The IMR has been assessed by Standards Malaysia and its Virology Unit has "participated in the External Quality Assurance Programs (EQAP) organized by WHO, the Royal College of Pathologists of Australasia (Australia) and the National Serology Reference Laboratory (Australia) for various serological, viral isolation and molecular tests." [2] Its Molecular Pathology Unit has "participated in the Molecular Analysis of EBV Module (EBV ISH) conducted by the Royal College of Pathologists of Australasia Quality Assurance Program and received the certificate of participation." [3]

[1] National Public Health Laboratory. 2016. "Service handbook 2016." [http://mkak.moh.gov.my/download/LainLainMikrobiologi/MKAKServiceHandbook2016.pdf]. Accessed January 2021.
[2] Institute for Medical Research (IMR), Ministry of Health. 2012. "Introduction to Virology Unit." [http://www.imr.gov.my/index.php/en/idrc/43-english-content/centre/about-idrc/virology-unit/135-introduction-to-virology-unit]. Accessed January 2021.
[3] Institute for Medical Research (IMR), Ministry of Health. 2012. "Diagnostic services." [http://www.imr.gov.my/images/Other_Publication/Annual_Report/Diagnostic.pdf]]. Accessed January 2021.

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 specimen transport system in Malaysia. The system is guided by the standard operating procedures and covers transportation by air and surface. [1] The guideline does not have specific provision regarding selection of couriers, but it provides clear guidelines regarding labelling, arrangement with referral laboratories, cargo handling, refrigerants, packaging instruction and other aspects of specimen transport. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted that Malaysia has a "standardized and organized" system to transport specimen "via hospital transport, national postal service and courier to the reference or national laboratory with appropriate triple packaging and labelling." The country scores a 4 on D.1.2 Specimen referral and transport system, which indicates at least 80% coverage. [2] The Ministry of Health's strategic workplan for emerging diseases II 2017-2021 (MySED II) identifies specimen referral and transportation system as one of the key activities, aiming to lower "rejection rate for improper specimen transportation" to be less than 1%. [3]

[1] Ministry of Health. 2012. "Standard Operating Procedure for Transport of Biological Specimens in Malaysia." [http://www.patologi.gov.my/assets/policy/SOP_for_transportation_of_Biological_specimens.pdf]. Accessed February 2021.
[2] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.
[3] Ministry of Health. 2017. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed February 2021._

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

Malaysia has a plan in place to rapidly authorize laboratories to supplement the capacity of national public health laboratory system to scale-up testing during influenza pandemic, and a system to scale up testing during other types of outbreak. Malaysia's National Influenza Pandemic Plan has a specific provision on increasing laboratory capacity during an influenza pandemic, specifying how many entities should be engaged at different stages, including laboratories at state hospital, university hospital, as well as private general practitioners. [1] For other types of outbreak, Malaysia has established Crisis Preparedness and Response Centre (CPRC) to lead resource/capacity management during public health emergencies including outbreak. [2] In regards to laboratory capacity, CPRC has a specific function to enhance collaboration and coordination with private sector including pharmaceutical companies and laboratories. [3] One example of this function was during the Ebola Outbreak in West African countries. After the outbreak was declared by the World Health Organization (WHO) as Public Health Emergency of International Concern (PHEIC), CPRC coordinate enhancement of Malaysia's laboratory capacity to diagnose Ebola virus disease by training and enhancing capacity of sub-national level laboratories and one laboratory from the armed forces. [3] In a more recent example, CPRC was operationalised at both national and state level, and with the support from Institute of Medical Research (IMR), ramped up Malaysia's Covid-19 related diagnostic laboratory capacity by 86%, involving both public and private laboratories. [4]

[1] Ministry of Health. 2006. “National Influenza Pandemic Preparedness Plan.” [http://nktm-health.net/sites/default/files/docs/01012016/NIPPP_PoA_Msia.pdf]. Accessed January 2021.
[2] Ministry of Health. 2017. “Crisis Preparedness and Response Centre (Pusat Kesiapsiagaan dan Tindak Cepat Krisis).” [http://www.myhealth.gov.my/pusat-kesiapsiagaan-dan-tindak-cepat-krisis/]. Accessed January 2021.
[3] Wan Mohamed Noor, W. N., Sandhu, S. S., Ahmad Mahir, H. M., Kurup, D., Rusli, N., Saat, Z., Chong, C. K., Sulaiman, L. H., & Abdullah, N. H. (2014). Responding to the Potential of Ebola Virus Disease (EVD) Importation into Malaysia. The Malaysian journal of medical sciences : MJMS, 21
[6] , 3–8.
[4] World Health Organization. 2020. “Malaysia: Strong Preparedness and Leadership for a Successful Covid-19 Response.” [https://www.who.int/docs/default-source/coronaviruse/country-case-studies/malaysia-c19-case-study-20-august.pdf?sfvrsn=a0f79358_2&download=true]. Accessed January 2021.

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

Malaysia is conducting ongoing event-based surveillance and analysis for infectious disease. The protocol for event-based surveillance and analysis, involving both offline coordination under the Crisis Preparedness and Response Centre (CPRC) and online system called eWabak, is outlined within a protocol from the Ministry of Health. [1] Daily update and analysis of cases and epidemic curve is mandated within this protocol. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 idenfified Malaysia's event-based surveillance, along with their indicator-based, syndromic and laboratory-based surveillance as Malaysia's strength in the area of surveillance. [2] The JEE also notes that Malaysia has a 'Rumour surveillance system', which "involves the monitoring of multiple sources of information that are received through various communication channels, such as the eWabak system, phone calls, text messages and emails. Information received is assessed and reported daily at the national level. Rumour surveillance occurs across all sectors and the Disease Control Division shares the information with their counterpart in other sectors. " [2]

[1] Ministry of Health. 2018. "Event-Based Surveillance Protocol." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/Buku_Event-Based_Surveillance.pdf]. Accessed February 2021.
[2] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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 evidence that Malaysia reported a potential public health emergency of international concern (PHEIC) to the WHO within the last two years. Malaysia reported its first case of COVID-19 on on January 25, 2020, before the WHO declared the novel coronavirus outbreak (2019-nCoV) a PHEIC on January 30, 2020. [1, 2] There is no evidence that Malaysia reported a disease outbreak or potential PHEIC to the WHO in 2019 and 2020. [3, 4]

[1] Garda World. January 25, 2020. "Malaysia: First cases of 2019-nCoV confirmed January 25". [https://www.garda.com/crisis24/news-alerts/308496/malaysia-first-cases-of-2019-ncov-confirmed-january-25] Accessed May 21, 2021.
[2] World Health Organization. 27 April 2020. "Archived: WHO Timeline - COVID-19". [https://www.who.int/news/item/27-04-2020-who-timeline---covid-19] Accessed May 21, 2021.
[3] World Health Organization. 2019. "Emergencies preparedness, response: 2019". [https://www.who.int/csr/don/archive/year/2019/en/]. Accessed May 21, 2021.
[4] World Health Organization. 2020. "Emergencies preparedness, response: 2020". [https://www.who.int/csr/don/archive/year/2020/en/]. Accessed May 21, 2021.

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

Malaysia's National Public Health Laboratory (MKAK) under the Ministry of Health (MOH) operates an electronic reporting surveillance system at both the national and sub-national level. MKAK is supported by four regional public health laboratories. Notifiable diseases are reported to the Disease Control Division in the Communicable Diseases Surveillance Section of the MOH. [1,2] Prior to 2008 email or fax was used to submit reports, but in 2007 the MOH approved the development of an electronic reporting system based on WHO-Net programming for national surveillance. The project was handed to MKAK for implementation. In 2008 the web-based reporting system was launched at http://elbis.moh.gov.my/login.php, allowing for real-time reporting of surveillance information by public health laboratories around the country. [3,4] The MOH also has two other electronic reporting systems, one for vector-borne disease control, "Vekpro", and one for epidemiology and surveillance, "e-Wabak". [5] The Ministry of Health's "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015" noted the need to integrate and harmonize the various e-reporting systems. [6] Within the MOH there are multiple surveillance systems. The eNotifikasi system is an electronic web-based system in which notifications of communicable diseases can be entered at clinic or district level, verified and then reported through the system to state and national levels. Program staff at district, state and national levels have restricted access to this system based on their level and location. There are separate systems for selected priority diseases – e-Dengue for dengue, SM2 for measles, MyTB for tuberculosis, MyKusta for leprosy and the National AIDS Registry for HIV/AIDS – that are linked to eNotifikasi. Preliminary data entry from eNotifikasi are transferred to these systems for further management. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted that eNotifikasi and eWabak are available at all levels of government with are additional electronic systems for priority diseases that automatically receive notifications from eNotifikasi, at the national level, the DVS is developing the Malaysia Animal Disease Information Centre for animal health surveillance data, electronic tools are used for laboratory test results for both human and animal health. However, three points need strengthening: developing linkages between the indicator-based and event-based surveillance systems within MOH (eNotifikasi and eWabak), reporting laboratory results electronically to MOH systems directly, rather than having the

laboratory system accessible to MOH staff, and further developing electronic tools in the animal health sector and integrating all systems in the Malaysia Animal Disease Information Centre. [5]

[1] Ministry of Health. 2005. “National lab-based surveillance system for infectious diseases in Malaysia: Field guidelines for laboratory-based surveillance.”
[https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiMqqnM97vZAhWHIcAKHUdbAMsQFggpMAA&url=http%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595 84a70494556754c6c7068615735315a476c7549454a4c5543387a636d5176546d463061573975595778665447466945c554a686332566b58314e31636e5a6c6157787359 57356a5a56396d62334a66535552664d6a41774e6935775a47593d&usg=AOvVaw17zMDkk2sZeo1D6ME0p6kb]. Accessed January 2021.
[2] National Public Health Laboratory. 2018. “About us: What is MKAK?” [http://mkak.moh.gov.my/en/mengenai-kami-orange/what-is-mkak.html]. Accessed January 2021.
[3] Pacific Rim Innovation and Management. 2008. “Regional: Strengthening epidemiological surveillance and response for communicable diseases in INO, MAL, PHI.” Prepared for ADB, Nov 2008. [https://www.adb.org/sites/default/files/project-document/67651/39068-reg-tacr.pdf]. Accessed January 2021.
[4] Ministry of Health. 2018. “ELBIS”. [http://elbis.moh.gov.my/login.php]. Accessed January 2021.
[5] Ministry of Health. 2018. “Sistem Laporan Penyakit Bawaan Vektor dan Wabak Penyakit.” [http://vekpro.moh.gov.my/]. Accessed January 2021.
[6] Ministry of Health. 2012. “Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015.”
[https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595 84a70494556754c6c7068615735315a476c7549454a4c5543387a636d5176546d463061573975595778665447466945c554a686332566b58314e31636e5a6c6157787359 57356a5a56396d62334a66535552664d6a41774e6935775a47593d&usg=AOvVaw17zMDkk2sZeo1D6ME0p6kb]. Accessed January 2021.
[5] World Health Organization. (?2020)?. Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019. World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

2.3.2b

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

Yes = 1 , No = 0

Current Year Score: 1

Malaysia's National Public Health Laboratory (MKAK) under the Ministry of Health (MOH) operates a real-time electronic reporting surveillance system at both the national and sub-national level. In 2008 a web-based reporting system was launched at http://elbis.moh.gov.my/login.php, allowing for real-time reporting of surveillance information by hospital and other public health laboratories around the country. Notifiable diseases are reported to the Disease Control Division in the Communicable Diseases Surveillance Section of the MOH. [1,2,3] The MOH also has two other electronic reporting systems, one for vector-borne disease control, "Vekpro", and one for epidemiology and surveillance, "e-Wabak". [4] The Ministry of Health's "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015" noted the need to integrate and harmonize the various e-reporting systems. [5]_

[1] Ministry of Health. 2005. "National lab-based surveillance system for infectious diseases in Malaysia: Field guidelines for laboratory-based surveillance."
[https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595

7356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595584a70494556754c6c7068615735315a476c7549454a4c5543387a636d5176546d46306157397559577866544746694c554a686332566b58314e31636e5a6c615778735957356a5a56396d62334a66535552664d6a41774e6935775a47593dhttps://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiMqqnM97vZAhWHIcAKHUdbAMsQFggpMAA&url=http%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595584a70494556754c6c7068615735315a476c7549454a4c5543387a636d5176546d463061573975595778665744746694c554a686332566b58314e31636e5a6c615778735957356a5a56396d62334a66535552664d6a41774e6935775a47593d&usg=AOvVaw17zMDkk2sZeo1D6ME0p6kb]. Accessed January February 2021.

[2] Pacific Rim Innovation and Management. 2008. "Regional: Strengthening epidemiological surveillance and response for communicable diseases in INO, MAL, PHI." Prepared for ADB, Nov 2008. [https://www.adb.org/sites/default/files/project-document/67651/39068-reg-tacr.pdf]. Accessed January 2021.
[3] Ministry of Health. 2018. "ELBIS". [http://elbis.moh.gov.my/login.php]. Accessed January 2021.
[4] Ministry of Health. 2018. "Sistem Laporan Penyakit Bawaan Vektor dan Wabak Penyakit." [http://vekpro.moh.gov.my/]. Accessed January 2021.
[5] Ministry of Health. 2012. "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595584a70494556754c6c7068615735315a476c7549454a4c5543387a636d5176546d463061573975595778665744746694c554a686332566b58314e31636e5a6c615778735957356a5a56396d62334a66535552664d6a41774e6935775a47593d&usg=AOvVaw17zMDkk2sZeo1D6ME0p6kb]. Accessed January 2021._

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

Electronic health records are commonly in use in public hospitals in Malaysia but not in all healthcare facilities. The Sistem Pengurusan Pesakit (SPP), or Patient Management System, has been rolled out progressively since 2007 as the basis of the development of a Hospital Information System (HIS) for public hospitals, enabling electronic health record management. It covers 9 public hospitals. [1] Looking at the wider health system, the Ministry of Health (MOH)'s action plan for 2016-2020 included a target of rolling out ICT to 60% of healthcare facilities by 2018, indicating that around 40% facilities do not yet have the capacity to implement electronic records. [2] There is a project underway to bring all public and private healthcare facilities into a single electronic data management system, the Malaysian Health Data Warehouse (MyHDW). The MOH has said that this will be available by 2022. [3-5]_

[1] Health Online Unit, Ministry of Health. 2017. "Patient management system (SPP)." [http://www.myhealth.gov.my/en/patient-management-system-spp/]. Accessed January 2021.
[2] Ministry of Health, Planning Division. 2016. "Ministry of Health Malaysia: Plan of action 2016-2020." [http://www.moh.gov.my/penerbitan/Pelan%20Tindakan%20KKM.pdf]. Accessed January 2021.
[3] Health Informatics Centre, Ministry of Health. 2015. "Malaysian Health Data Warehouse (MyHDW): 2015-2016 start up:

initiation." https://myhdw.moh.gov.my/public/documents/20186/169489/MyHDW+2015-2016/86b7603a-eab4-40c0-aa94-35ded673838d?version=1.0]. Accessed January 2021.
[4] Lau, Brenda. 2017. "Malaysia's MOH launches central health database aimed at cutting wastage." MIMS Today, 20 Apr 2017. [https://today.mims.com/malaysia-s-moh-launches-central-health-database-aimed-at-cutting-wastage]. Accessed January 2021.
[5] Lau, Brenda. 2017. "MOH: Integrated health database of Malaysians will be available in five years." MIMS Today, 3 Mar 2017. [https://today.mims.com/moh--integrated-health-database-of-malaysians-will-be-available-in-five-years?channel=GN-Policies-Public-Health]. Accessed January 2021._[1] Health Online Unit, Ministry of Health. 2017. "Patient management system (SPP)." [http://www.myhealth.gov.my/en/patient-management-system-spp/]. Accessed January 2021.
[2] Ministry of Health, Planning Division. 2016. "Ministry of Health Malaysia: Plan of action 2016-2020." [http://www.moh.gov.my/penerbitan/Pelan%20Tindakan%20KKM.pdf]. Accessed January 2021.
[3] Health Informatics Centre, Ministry of Health. 2015. "Malaysian Health Data Warehouse (MyHDW): 2015-2016 start up: initiation." https://myhdw.moh.gov.my/public/documents/20186/169489/MyHDW+2015-2016/86b7603a-eab4-40c0-aa94-35ded673838d?version=1.0]. Accessed January 2021.
[4] Lau, Brenda. 2017. "Malaysia's MOH launches central health database aimed at cutting wastage." MIMS Today, 20 Apr 2017. [https://today.mims.com/malaysia-s-moh-launches-central-health-database-aimed-at-cutting-wastage]. Accessed January 2021.
[5] Lau, Brenda. 2017. "MOH: Integrated health database of Malaysians will be available in five years." MIMS Today, 3 Mar 2017. [https://today.mims.com/moh--integrated-health-database-of-malaysians-will-be-available-in-five-years?channel=GN-Policies-Public-Health]. Accessed January 2021._

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 a limited number of electronic health records of individuals in the country. The national public health system, which serves around 65% of the population (the rest is served by private providers), currently only has access to electronic health records of individuals using public health facilities, not all of which used electronic health records. However, a system is being rolled out to enable sharing of records between public and private sectors. The public health system currently has access to electronic records through a unified system covering 9 public hospitals. [1] Looking at the wider health system, the Ministry of Health (MOH)'s action plan for 2016-2020 included a target of rolling out ICT to 60% of healthcare facilities by 2018, indicating that around 40% facilities do not yet have the capacity to implement electronic records. [2] There is a project underway to bring all public and private healthcare facilities into a single electronic data management system, the Malaysian Health Data Warehouse (MyHDW). This will eventually give the public health system access to all public- and private-sector health records. The MOH has said that this will be available by 2022. [3,4,5]

[1] Health Online Unit, Ministry of Health. 2017. "Patient management system (SPP)." [http://www.myhealth.gov.my/en/patient-management-system-spp/]. Accessed January 2021.
[2] Ministry of Health, Planning Division. 2016. "Ministry of Health Malaysia: Plan of action 2016-2020." [http://www.moh.gov.my/penerbitan/Pelan%20Tindakan%20KKM.pdf]. Accessed January 2021.
[3] Health Informatics Centre, Ministry of Health. 2015. "Malaysian Health Data Warehouse (MyHDW): 2015-2016 start up: initiation." https://myhdw.moh.gov.my/public/documents/20186/169489/MyHDW+2015-2016/86b7603a-eab4-40c0-aa94-35ded673838d?version=1.0]. Accessed January 2021.
[4] Lau, Brenda. 2017. "Malaysia's MOH launches central health database aimed at cutting wastage." MIMS Today, 20 Apr

2017. [https://today.mims.com/malaysia-s-moh-launches-central-health-database-aimed-at-cutting-wastage]. Accessed January 2021.
[5] Lau, Brenda. 2017. “MOH: Integrated health database of Malaysians will be available in five years.” MIMS Today, 3 Mar 2017. [https://today.mims.com/moh--integrated-health-database-of-malaysians-will-be-available-in-five-years?channel=GN-Policies-Public-Health]. Accessed January 2021.

2.4.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Malaysia has data standards to ensure data is comparable. However, the Ministry of Health (MOH) is has been developing standards for electronic health data that were due to be ratified in 2019. This standard, called The MOH's action plan for 2016-2020 includes an action of creating The National Health Data Dictionary, which aims to provide data standards for health informatics to promote integration and interoprability. [1] No further information about the progress is found at websites of MOH or from a wider search in the internet. [2] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 also identified development of "data dictionaries for each surveillance system to ensure consistency of data collection" as areas that need strengthening.[3]_

[1] Ministry of Health, Planning Division. 2016. "Ministry of Health Malaysia: Plan of action 2016-2020." [https://www.moh.gov.my/moh/resources/Penerbitan/Pelan%20Strategik%20/2016-2020/Pelan_Tindakan_KKM.pdfhttp://www.moh.gov.my/penerbitan/Pelan%20Tindakan%20KKM.pdf]. Accessed January February 2021.
[2] Ministry of Health. [www.moh.gov.my]. Accessed January 2021.
[3] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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

Malaysia has a mechanism to allow surveillance information sharing among animal, human and wildlife authorities. Under One Health framework, an The Inter-Ministerial Committee on the Control of Zoonotic Diseases is established to "coordinate the links between the human, domestic animal, and wildlife health sectors." [1] The Committee is co-chaired by the Ministry of Health (MOH) and Department of Veterinary Service (DVS). Relevant ministries and institutions are invited to coordinate in the committee, including the Malaysian One Health University Network. includes representatives of the MOH, Department of Disease Control, DVS, Department of Wildlife and Department of Education. The USAID-supported PREDICT initiative, implemented from 2009-2020, aimed to elevate the implementation of the concept of One Health in Malaysia and highlight the significance of multi-agency zoonotic disease surveillance. [2] According to the Joint External Evaluation report for

Malaysia conducted in October 2019, "surveillance activities and information sharing between MOH and DVS is conducted for 14 priority diseases - Nipah, highly pathogenic avian influenza, rabies, Japanese encephalitis, brucellosis, tuberculosis, leptospirosis, bovine spongiform encephalopathy/variant Creutzfeldt-Jakob disease, anthrax, salmonellosis (S. enteritidis, S. typhimurium), Rift Valley fever, Q fever, hantavirus and other zoonotic diseases of human importance (e.g. filariasis and zoonotic malaria)." It further notes that "a permanent veterinary officer is located within the MOH in the zoonotic sector. Data and information are shared during meetings of the Technical Committee on Control of Zoonotic Disease every six months." [3]

[1] Abdul Latip, Norsham. 2020. "Statement at Convention on Biological Diversity Special Virtual Session SBSTTA 24 and SBI 2 on Biodiversity, One Health and Covid 19." [https://www.cbd.int/doc/c/4310/942c/ec93f22181944621791fe5d3/malaysia-15-12-en.pdf]. Accessed February 2021.
[2] USAID PREDICT. 2020. "Country Reports." [https://p2.predict.global/country-reports]. Accessed January 2021.
[3] World Health Organization. (2020). "Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019." World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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: 0

Malaysia does not make de-identified health surveillance data on infectious disease that are updated at least weekly available via reports or other formats. No evidence was found via the websites of the Ministry of Health, Ministry of Agriculture and Food Industry, Institute for Medical Research, and National Public Health Laboratory. [1, 2, 3, 4] The Ministry of Health's "Health Indicators 2020" report has the most recent and comprehensive surveillance data on infectious disease, but it only has information from 2019 that are not updated on a weekly basis. [5]

[1] Ministry of Health. [www.moh.gov.my]. Accessed January 2021.
[2] Ministry of Agriculture and Food Industry. [www.mafi.gov.my]. Accessed January 2021.
[3] Institute of Medical Research. [www.imr.gov.my]. Accessed January 2021.
[4] National Public Health Laboratory. [https://mkak.moh.gov.my/en]. Accessed January 2021.
[5] Ministry of Health. 2020. "Health Indicators 2020." [https://www.moh.gov.my/moh/resources/Penerbitan/Penerbitan%20Utama/HEALTH%20INDICATOR/FlipBook%20Petunjuk%20Kesihatan/Petunjuk%20Kesihatan%202020.html#p=76]. Accessed January 2021.

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

Malaysia makes de-identified COVID-19 surveillance data available via daily report on a dedicated Ministry of Health website, which includes among others: number of total confirmed cases, number of active cases, number of active cases in ICU, number of active cases with respirator, number of recovered patients, and number of deaths. [1]

[1] Ministry of Health. 2020. "Covid-19 Malaysia." [http://covid-19.moh.gov.my]. Accessed January 2021.

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

Malaysia has laws safeguarding the confidentiality of identifiable health information for individuals. According to guidelines for handling and managing patient medical records issued by the Director-General of Health in 2010, medical records containing private personal information are categorized as classified official documents with a "confidential" status, and their management has to comply with procedures for classified documents under the Security Order (Arahan Keselamatan). This means that only those who have made a declaration under the Official Secrets Act 1972 (Act 88) are authorized to manage and access these medical records. [1, 2] The Malaysian Medical Council also issued guidance on patient information confidentiality in 2011, which are to be used for reference in disciplinary cases. These state that "patients have the right to expect that there will be no disclosure of any personal information… unless they give consent," and advises that for secondary uses of data such as public health surveillance, anonymized data will often be sufficient. Section 40 of the Personal Data Protection Act 2010 regulates that sensitive personal data, such as health information of an individual, can be processed for medical purposes and is undertaken by "a person who in the circumstances owes a duty of confidentiality which is equivalent to that which would arise if that person were a healthcare professional". [3]

[1] Health Online Unit, Ministry of Health. 22 March 2016. "Confidentiality of medical records information: Who's responsibility?" [http://www.myhealth.gov.my/en/confidentiality-of-medical-records-information-whos-responsibility/]. Accessed January 2021.
[2] Ministry of Health. 2010. "Director-General of Health Circular - Guidelines for Handling and Management of Patient Medical Record for Hospitals and Medical Institutions." Circular No. 17/2010. [www.moh.gov.my › database_stores › attach_download]. Accessed January 2021.
[3] Government of Malaysia. 2010. "Act 709 Personal Data Protection Act 2010." [https://www.kkmm.gov.my/pdf/Personal%20Data%20Protection%20Act%202010.pdf]. Accessed January 2021.

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: 1

Malaysia's laws safeguarding the confidentiality of identifiable health information for individuals include mention of protections from cyber attacks (e.g., ransomware). According to Personal Data Protection Act, health information constitutes

as sensitive personal data, and its processing should adhere to the requirements under Section 40 of the aforementioned law. [1] According to guidelines for handling and managing patient medical records issued by the Director-General of Health in 2010, medical records containing private personal information are categorized as classified official documents with a "confidential" status, and their management has to comply with procedures for classified documents under the Security Order (Arahan Keselamatan). This means that only those who have made a declaration under the Official Secrets Act 1972 (Act 88) are authorized to manage and access these medical records. Those in charge of records have the responsibility to consider information security and prevent abuse, according to the Ministry of Health. [2] The Malaysian Medical Council also issued guidance on patient information confidentiality in 2011, which are to be used for reference in disciplinary cases. These outline cyber security measures for electronic records, including virus protection and encryption measures. [3]

[1] Government of Malaysia. 2010. "Act 709 Personal Data Protection Act 2010." [https://www.kkmm.gov.my/pdf/Personal%20Data%20Protection%20Act%202010.pdf]. Accessed January 2021.
[2] Health Online Unit, Ministry of Health. 22 March 2016. "Confidentiality of medical records information: Who's responsibility?" [http://www.myhealth.gov.my/en/confidentiality-of-medical-records-information-whos-responsibility/]. Accessed January 2021.
[2] Ministry of Health. 2010. "Director-General of Health Circular - Guidelines for Handling and Management of Patient Medical Record for Hospitals and Medical Institutions." Circular No. 17/2010. [www.moh.gov.my › database_stores › attach_download]. Accessed January 2021.
[3] Malaysian Medical Council. 2006. "Medical Records and Medical Reports." [https://mmc.gov.my/wp-content/uploads/2019/11/Medical-RecordsMedical-Reports.pdf]. Accessed January 2021.

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 = 2, Yes, commitments have been made to share data only for one disease = 1, No = 0

Current Year Score: 1

There is evidence that the government of Malaysia 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 one disease only (covid-19).

Malaysia's government has made commitments to share surveillance data during a public health emergency with other ASEAN member states. Malaysia is a lead country in 2016-2020 for ASEAN's program of work aimed at strengthening regional disease surveillance networks. It is in charge of establishing a network of ASEAN member states emergency operation centers (EOCs), which will enable timely sharing of public health emergency information (within 1-2 weeks). [1] For example, it has a program to discuss Antimicrobial Resistance surveillance data, as well as strengthening capacity in big data analytics and visualization. In a December 2016 newsletter, the director of disease control at the Malaysian Ministry of Health publicly committed to establishing a formal EOC network to ensure that ASEAN's EOCs were in constant communication to share information and ensure early warning of regional spread of diseases. [2] The foreign minister of Malaysia made a joint statement with ASEAN and the People's Republic of China on February 20, 2020 to increase cooperation during the COVID-19 pandemic to share information in a timely manner which includes "exchanging available epidemiological information, technical guidelines and solution for epidemic prevention and control, diagnosis, treatment and surveillance." [3]

[1] ASEAN. 2017. “ASEAN Health Cluster 2 Work Programme for 2016 to 2020.” [http://asean.org/storage/2017/11/ASEAN-Health-Cluster-2-Work-Programme_FINAL-ENDORSED.pdf]. Accessed February 2021.
[2] Kheong, Chong Chee. December 2016. “ASEAN EOC Newsletter"". [http://asean.org/storage/2016/12/ASEAN-EOC-Newsletter1.pdf]. Accessed February 2021.
[3] Association for Southeast Asian Nations (ASEAN). "Statement of the Special ASEAN-China Foreign Ministers' Meeting on the Coronavirus Disease 2019 (COVID-19)". [https://asean.org/statement-special-asean-china-foreign-ministers-meeting-coronavirus-disease-2019-covid-19/]. Accessed 8 September 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: 0

There is no evidence that Malaysia has a national system in place to provide support at the sub-national level to specifically conduct contact tracing in the event of an active or future public health emergency.

Malaysia Strategy for Emerging Diseases and Public Health Emergency (MySED) II Workplan (2017-2021) has a plan to "strengthen capacity at the subnational level, including documenting response to outbreak investigation", but no further elaboration on whether capacity to conduct contact tracing in the event of a public health emergency is an inherent feature of this plan. [1] Absence of indication regarding contact tracing support notwithstanding, it should be noted that the central government has established Crisis Preparedness and Response Centre (CPRC) who can both secure additional funding during public health emergency and allocate additional resource to activities at national and subnational level. [2]

The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 also noted CPRC's role in coordinating response to public health incidents using all hazard approach, but did not discuss availability of contact tracing support for subnational level governments. [3]

The recent "COVID-19 Management Guidelines in Malaysia No.5 /2020" (updated on January 27, 2021) does not specify how contact tracing is being support through trainings or funding at the sub-national level. [4] The Federal Government's online contract-tracing application called MySejahtera is currently being used to complement nationwide tracing. [5] Critics have pointed out that the current number of physical contact tracers are insufficient and that more transparency is needed regarding how information is processed by MySejahtera. [6, 7] There is no further information on available on the Ministry of Health's COVID-19 website. [8]

[1] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[2] Ministry of Health. 2017. "Crisis Preparedness and Response Centre (Pusat Kesiapsiagaan dan Tindak Cepat Krisis)." [http://www.myhealth.gov.my/pusat-kesiapsiagaan-dan-tindak-cepat-krisis/]. Accessed January 2021.

[3] World Health Organisation (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January, 2021.
[4] Ministry of Health. 2021. "COVID-19 Management Guidelines in Malaysia no.5/2020." [http://covid-19.moh.gov.my/garis-panduan/garis-panduan-kkm]. Accessed January 2021.
[5] The Federal Government of Malaysia. "MySejahtera." [https://mysejahtera.malaysia.gov.my/intro_en/]. Accessed January 2021.
[6] Tashny Sukumaran. 25 January, 2021. "A year after its first coronavirus case, Malaysia's contact tracing efforts are falling dangerously short." South China Morning Post. [https://www.scmp.com/week-asia/health-environment/article/3119162/year-after-its-first-coronavirus-case-malaysias]. Accessed January 2021.
[7] "Contact Tracing: More transparency wanted." 1 November, 2020. The Star. [https://www.thestar.com.my/news/focus/2020/11/01/more-transparency-and-details-wanted]. Accessed January 2021.
[8] Ministry of Health Malaysia. COVID-19 Malaysia. "Home". [http://covid-19.moh.gov.my/] Accessed May 21, 2021.

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 publicly available evidence that Malaysia provides wraparound services to enable infected people and their contacts to self-isolate or quarantine as recommended, particularly economic support (paycheck, job security), but just for an ongoing disease outbreak.

The most recent inclusion of public health emergency in a national strategy was within The Ministry of Health's strategic workplan for emerging diseases (MySED) II 2017-2021 or MySED II, but it provides no information about wraparound services. [1] Malaysia does have wraparound services but is currently limited to enable cases and suspected cases of COVID-19 to self isolate, which include economic support and is provided to eligible recipients in all parts of the country. [2, 3] The economic support part of the wraparound services was initiated on an ad hoc basis, from March to December 2020 in the form of RM 100 or around US$ 24 per day allowance during self-isolation or treatment at health facilities. On the other hand, the medical attention to cases and suspected cases is part of Covid-19 management guideline used in both national and subnational level, especially Annex 2a & 2b. [4]

Beyond this allowance for individual cases and suspected cases, Malaysia also provide various forms of economic supports and incentives under a RM 250 billion (around US$ 60 billion) stimulus package called Prihatin Rakyat, available to both individuals and enterprises. [5] There is no information on whether equivalent wraparound services covering both economic and medical support has been implemented in previous outbreaks in Malaysia, such as SARS in 2002 and Nipah in 1998. [6, 7] Malaysia's primary regulation on infectious disease prevention and control, the Prevention and Control of Infectious Diseases Act 1988 has no specific provision on wraparound services to support self-isolation of cases and suspected cases. [8]. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 has no discussion about wraparound services. [9] No further information about wraparound services is found at the website of Ministry of Health and Ministry of Finance. [10, 11]

[1] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.

[2] National Disaster Management Agency. 2020. "Special Covid-19 Assistance (Bantuan Khas Covid-19)." [http://www.nadma.gov.my/ms/info/bantuan-khas-covid-19]. Accessed January 2021.
[3] The Straits Times. "Malaysia launches special fund to help those affected in coronavirus outbreak." Mar 12, 2020. [https://www.straitstimes.com/asia/se-asia/malaysia-launched-special-fund-to-help-those-affected-in-coronavirus-outbreak]. Accessed January 2021.
[4] Ministry of Health. 2021. "COVID-19 Management Guidelines in Malaysia no.5/2020." [http://covid-19.moh.gov.my/garis-panduan/garis-panduan-kkm]. Accessed January 2021.
[5] Ministry of Finance. 2020. "Prihatin Rakyat Economic Stimulus Package 2020." [https://pre2020.treasury.gov.my/pdf/PRIHATIN-Touchpoints-EN.pdf]. Accessed January 2021.
[6] Ministry of Health. 2003. "Infectious Diseases Outbreak Rapid Response Manual." [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiwqYmussvuAhXz73MBHb6cD58QFjAAegQIBBAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864746754943596761324633595778686269427765577470644339455958 4a70494556754c6c7068615735315a476c7549454a4c5543394a626d5a6c593352706233567a583052706332566863325666543356306596e4a6c59577466556c4a4e4c6e426b5a673d3d&usg=AOvVaw25iwY301fChZZL-lSLdfwl]. Accessed January 2021.
[7] Looi LM, Chua KB. 2007. Malays J Pathol. 2007 Dec;29
[2] :63-7. PMID: 19108397. "Lessons from the Nipah virus outbreak in Malaysia." [http://www.mjpath.org.my/2007.2/02Nipah_Virus_lessons.pdf]. Accessed January 2021.
[8] The Federal Government of Malaysia. Act 342 of September 1988, incorporating latest amendment in Act 374 of 2006. "Prevention and Control of Infectious Diseases Act 1988." [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj8_urPs8vuAhVOWX0KHXCaD4IQFjAAegQIARAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Fdatabase_stores%2Fattach_download%2F317%2F19&usg=AOvVaw2oQqsDJXzk5QC6EM7MIJoM]. Accessed January 2021.
[9] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[10] Ministry of Health. [www.moh.gov.my]. Accessed February 2021.
[11] Ministry of Finance. [www.mof.gov.my]. Accessed February 2021.

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

Malaysia does not make de-identified data on contact tracing efforts for COVID-19 available via daily reports. In its main portal for Covid-19 data, key data shown are number of total confirmed cases, number of active cases, number of active cases in ICU, number of active cases with respirator, number of recovered patients, and number of deaths. [1] Malaysia has a mobile app to assist government with contact tracing efforts, but it also does not provide de-identified contact tracing data available. [2] Sufficiency and transparency of MySejahtera and contact tracing data in general have been subject of criticism by national media. [3, 4]

[1] Ministry of Health. 2020. "Covid-19 Malaysia." [http://covid-19.moh.gov.my]. Accessed January 2021.
[2] Federal Government of Malaysia. "Infographic (Galeri Foto)." [https://mysejahtera.malaysia.gov.my/intro/]. Accessed

January 2021.
[3] Tashny Sukumaran. 25 January, 2021. "A year after its first coronavirus case, Malaysia's contact tracing efforts are falling dangerously short." South China Morning Post. [https://www.scmp.com/week-asia/health-environment/article/3119162/year-after-its-first-coronavirus-case-malaysias]. Accessed January 2021.
[4] "Contact Tracing: More transparency wanted." 1 November, 2020. The Star. [https://www.thestar.com.my/news/focus/2020/11/01/more-transparency-and-details-wanted]. Accessed January 2021.

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: 1

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, but only in response to active public health emergencies (COVID-19).

There is no publicly available evidence that plan(s)/agreement(s) are made for a wider context beyond COVID-19, i.e. for all future public health emergencies. The most recent inclusion of public health emergency in a national strategy was within The Ministry of Health's strategic workplan for emerging diseases (MySED) II 2017-2021 or MySED II, but it provides no detailed information about cooperative agreement between health and border control authorities. [1] MySED II has listed a strategy to "Strengthen regional and international partnership and collaboration on managing public health emergencies at POE," but provides no elaboration about how such partnership is implemented but it is limited for COVID-19.

For the current active public health emergency, COVID-19, Malaysia does have a collaboration between health and border control authorities. There is a collaboration between Ministry of Health, the Immigration Department, Airport/Port/Ground Crossing authorities, Airlines, Shipping Companies to screen potential cases in international travelers and trace and quarantine their contact during current COVID-19 pandemic, utilizing both physical system and online mobile app application called MySejahtera. [2] No other information is found from the Joint External Evaluation (JEE) for Malaysia conducted in October 2019, Ministry of Health's website, Ministry of Foreign Affairs' website, or wider internet search. [3, 4, 5]

[1] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021. "
[2] Ministry of Health. "Annex 9: Management of Covid-19 at Point of Entry – Covid 19 Management Guidelines Inin Malaysia No. 5/2020." [http://covid-19.moh.gov.my/garis-panduan/garis-panduan-kkm]. Accessed January 2021.
[3] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia. [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[4] Ministry of Health. [www.moh.gov.my]. Accessed February 2021.
[5] Ministry of Foreign Affairs. [www.kln.gov.my]. Accessed March 2021.

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

Malaysia has run a field epidemiology training program for health professionals since 2002, called the Epidemic Intelligence Programme (EIP), which has produced 41 graduates until January 2021. [1, 2] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, highlight Malaysian FETP as one of its best practices. FETP in Malaysia is a three-tiered program of basic, intermediate and advance, and funded by the Ministry of Health. Training program for public health physician also includes a component in field epidemiology.[3] A report given by the Malaysian health authorities at a World Health Organization meeting in 2016 stated that since 2014, some graduates of the program had been sent overseas for further training, for example joining the WHO Western Pacific Region (WPRO) surveillance team and attending a training of trainers program in Thailand. [2]

[1] ASEAN+3. 2012. "ASEAN+3 field epidemiology training programs." [http://www.aseanplus3fetn.net/read_more_pdf/FETNP21-30.pdf]. Accessed January 2021.
[2] Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET). 2021. "Malaysia Epidemic Intelligence Program." [https://www.tephinet.org/training-programs/malaysia-epidemic-intelligence-program]. Accessed January 2021.
[3] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[4] WHO Western Pacific Region. 2016. "Sixth workshop on field epidemiology training programs." RS/2016/GE/67(KHM). [http://iris.wpro.who.int/bitstream/handle/10665.1/13687/RS-2016-GE-67-KHM-eng.pdf?ua=1]. Accessed January 2021.

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

Malaysia's field epidemiology training program includes animal health professionals. Malaysia has run a field epidemiology training program for health professionals since 2002, called the Epidemic Intelligence Programme (EIP). [1] A report given by the Malaysian health authorities at a World Health Organization meeting in 2016 stated that some graduates of the program go into the animal health sector. [2] Malaysia sent one participant to Thailand to participate in the Regional Field

Epidemiology Training Program for Veterinarians (R-FETPV) in Southeast Asia. [3]

[1] Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET). 2021. “Malaysia Epidemic Intelligence Program.” [https://www.tephinet.org/training-programs/malaysia-epidemic-intelligence-program]. Accessed January 2021.
[2] WHO Western Pacific Region. 2016. “Sixth workshop on field epidemiology training programs.” RS/2016/GE/67(KHM). [http://iris.wpro.who.int/bitstream/handle/10665.1/13687/RS-2016-GE-67-KHM-eng.pdf?ua=1]. Accessed January 2021.
[3] TEPHINET. "Regional Field Epidemiology Training Program for Veterinarians (Southeast Asia)". [https://www.tephinet.org/training-programs/regional-field-epidemiology-training-program-for-veterinarians-southeast-asia] and [https://www.rfetpv.com/]. Accessed January 2021.

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: 0

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

Malaysia has a national public health emergency response plan, the “Infectious diseases outbreak rapid response manual” (RRM) of 2003, as well as “National Influenza Pandemic Preparedness Plan” and more recent disease-specific plans and a “One Health manual on handling zoonotic disease outbreaks” (One Health manual) published in 2017. The Ministry of Health published the RRM in 2003, addressing national and regional planning for outbreak response. It includes, for example, a specific section on criteria to determine if an infectious disease outbreak should qualify as a ""national disaster"", citing

disease such as Marburg, Lassa, Yellow Fever and Ebola, providing guidance on the requisite reporting. [1] In 2006, responding to a growing concern regarding influenza pandemic, Malaysia published its "National Influenza Pandemic Preparedness Plan" (NIPPP), which covered essential preparatory actions such as public health response, medical & laboratory response, and risk communications. [2]

The Ministry of Health has also published several disease-specific plans. [3] Awareness of the need for multi-sectoral planning and response has grown in recent years, and in 2017 the Malaysia One Health University Network published the One Health manual, endorsed by the directors-general of the Ministry of Health and the Department of Veterinary Services. This covers preparations and procedures for outbreak investigations, implementation of control measures (including surveillance and notification systems), and communication during an emergency. It draws on the RRM, disease-specific plans published by the human and animal health authorities, and international best practice. [4] All of the aforementioned regulation are currently enforced and valid as of 2021. Note: the RRM is referred formally within The Ministry of Health's strategic workplan for emerging diseases (MySED) II 2017-2021, and NIPP is referred by academics and officials as one of the useful starting points to develop a strategy to tackle the current pandemic. [5, 6, 7]

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual."" [https://www.moh.gov.my › file_manager › dl_itemhttps://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[2] Ministry of Health. 2006. "National Influenza Pandemic Preparedness Plan." [http://nktm-health.net/sites/default/files/docs/01012016/NIPPP_PoA_Msia.pdf]. Accessed January 2021.
[3] Ministry of Health. 2021. "Publications" [https://www.moh.gov.my/index.php/pages/view/205?mid=51]. Accessed January 2021.
[4] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021."
[5] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)". [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[6] Kit, Lam Sai. March 2020. "Covid-19: Malaysia's pandemic action plan activated for the coronavirus." The Star. [https://www.thestar.com.my/lifestyle/health/2020/03/16/covid-19-malaysia039s-pandemic-action-plan-activated-for-the-coronavirus]. Accessed February 2021. [7] Fong, Loh Foon. February 2020. "Pandemic plan to tackle Covid-19." The Star. [https://www.thestar.com.my/news/nation/2020/02/29/pandemic-plan-to-tackle-covid-19]. Accessed February 2021. _

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: 0

There is no evidence that Malaysia has updated its overarching emergency preparedness plan in the last three years. Malaysia has not updated its overall national public health emergency response plan since 2003, though some elements were updated in a "One Health manual on handling zoonotic disease outbreaks" (One Health manual) published in 2017 and

complemented with the national strategy for emerging diseases and public health emergency (MySED II) workplan (2017-2021). The Ministry of Health published the "Infectious diseases outbreak rapid response manual" (RRM) in 2003, addressing national and regional planning for outbreak response. [1, 2] Awareness of the need for multi-sectoral planning and response has grown since then, and in 2017 the Malaysia One Health University Network published the One Health manual, endorsed by the directors-general of the Ministry of Health and the Department of Veterinary Services. Focused on zoonotic disease outbreaks, this covers preparations and procedures for outbreak investigations, implementation of control measures (including surveillance and notification systems), and communication during an emergency. It draws on the RRM, disease-specific plans published by the human and animal health authorities, and international best practice. [3] No information regarding update to national public health emergency response is found in the websites of Ministry of Health and National Disaster Management Agency. [4, 5]

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." [https://www.moh.gov.my › file_manager › dl_item]. Accessed January 2021.
[2] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)".
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[3] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."
[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia]. Accessed January 2021.
[4] Ministry of Health. [www.moh.gov.my]. Accessed January 2021.
[5] National Disaster Management Agency. [www.nadma.gov.my]. Accessed January 2021.

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: 0

There is insufficient evidence that Malaysia's national public health emergency response plan includes considerations for vulnerable populations. According to the "Infectious diseases outbreak rapid response manual" published by the Ministry of Health (MOH) in 2003, when health authorities are evaluating the severity of an outbreak, they should consider the involvement of vulnerable and other high-risk groups. State-level rapid response teams (RRT) must include the state pediatrician, and the national RRT must include the MOH's chief pediatrician. Hospitals identified as specialized infectious disease (ID) hospitals should have adult and pediatric ID physicians. [1] The "One Health manual on handling zoonotic disease outbreaks", published by the Malaysia One Health University Network in 2017 and endorsed by the directors-general of the Ministry of Health and the Department of Veterinary Services, continues to refer to the role of RRTs. It also says that when gathering information on an outbreak, investigators should consider which groups are particularly vulnerable or high-risk. It contains a case study on hypothesis generation, which mentions the need to consider demographic profiles and who is at risk. [2] However all these statements simply highlight the need to consider vulnerable and at-risk populations. There is no specific mention about how exactly they are to be treated.

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." [https://www.moh.gov.my › file_manager › dl_item]. Accessed January 2021.
[2] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."
[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store:

[https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.

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: 0

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: 0

There is insufficient evidence that Malaysia has mechanisms in place for engaging the private sector to assist with outbreak emergency preparedness and response. The MySED II Workplan 2017-2021 listed the private sector as an additional key implementer of MySED II and should be engaged in simulation & exercise, surveillance, reporting, communication, and coordination. [1] The "Infectious diseases outbreak rapid response manual" published by the Ministry of Health in 2003 states that a national operations room coordinating disease outbreak response should have a directory of all available public and private healthcare facilities and laboratories. [2] The "One Health manual for handling zoonotic disease outbreaks in Malaysia" published in 2017, instructs those preparing for an outbreak to conduct an inventory of all available resources, including in private laboratories. There are no other mentions of working with the private sector with a focus on actual mechanisms. [3] There is no further evidence as per the Joint external evaluation of IHR core capacities of Malaysia: mission report. [4]

[1] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)".
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[2] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual."" [https://www.moh.gov.my › file_manager › dl_itemhttps://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[3] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."
[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store:
[https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ].

Accessed January 2021.
[4] World Health Organization. (2020). "Joint external evaluation of IHR core capacities of Malaysia: mission report, 21-25 October 2019." World Health Organization. [https://apps.who.int/iris/handle/10665/336716]. License: CC BY-NC-SA 3.0 IGO. Accessed February 2021.

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

Malaysia has policy in place to implement non-pharmaceutical intervention (NPI) during an epidemic or pandemic for more than one disease. Although, Malaysian policies do not use the term non-pharmaceutical intervention (NPIs), elements of NPIs such as cleaning of infected areas, additional sanitary standards for public premises and transportation, movement control and isolation are parts of regulatory tools stipulated within Prevention and Control of Infectious Diseases Act 1988 (especially Section 12, 14, 18 and 31), and National Influenza Pandemic Plan (especially Appendix 2) of 2006. [1, 2] During the COVID-19 outbreak, the Prime Minister of Malaysia enforced a "Movement Control Order", which "refers to the Prevention and Control of Infectious Diseases (Declaration of Infected Local Areas) Order 2020 (PCID Order)" on March 16, 2020. [3] The MCO listed numerous NPIs such as closure of businesses and non-essential services, control movements and gatherings, requirement of a health exam on those returning to the country, and penalties for noncompliance. [3] The PCID order or the MCO has been enforced several times since March 16, 2020 in the country. [3]

[1] The Federal Government of Malaysia. Act 342 of September 1988, incorporating latest amendment in Act 374 of 2006. "Prevention and Control of Infectious Diseases Act 1988." [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj8_urPs8vuAhVOWX0KHXCaD4IQFjAAegQIARAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Fdatabase_stores%2Fattach_download%2F317%2F19&usg=AOvVaw2oQqsDJXzk5QC6EM7MIJoM]. Accessed January 2021.
[2] Ministry of Health. 2006. "National Influenza Pandemic Preparedness Plan." [http://nktm-health.net/sites/default/files/docs/01012016/NIPPP_PoA_Msia.pdf]. Accessed January 2021.
[3] Mondaq. 23 July 2020. "Malaysia: FAQs On The Movement Control Order (MCO) And What Happens If You Breach It". [https://www.mondaq.com/operational-impacts-and-strategy/968656/faqs-on-the-movement-control-order-mco-and-what-happens-if-you-breach-it-#:~:text=The Movement Control Order refers,Sri Muhyiddin Yassin on 16.3.] Accessed May 21, 2021.

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 evidence that Malaysia has activated its national emergency response plan for an infectious disease outbreak in the past year and that the country has completed a national-level biological threat-focused exercise with WHO in the past year.

As stipulated in Malaysia's national emergency response plan, namely the Infectious diseases outbreak rapid response manual (RRM) published by the Ministry of Health (MOH) in 2003, once outbreak information is ascertained at the state level, rapid response team (RRT) is then activated. [3] Until 2005, there was no publicly available information about which entity/entities represent the role assigned by RRM to RRT. Then, in 2005, as part of the development of "overall strategies in preparedness of effective management of disasters, outbreaks, crises and emergencies (DOCE) related to health," Malaysia established an entity whose role includes RRT-related function as mandated within RRM: the Crisis Preparedness and Response Centre (CPRC). Formalised in article 20.49 of the 9th Malaysia Plan on "Crisis and Disaster Management Response (Pengurusan Krisis dan Bencana)", CPRC is designed to "harmonize all activities related to health...ensuring there is rapid response...before, during and after emergencies through intersectoral coordination." [4] CPRC is established as a command, control, and coordination centre for DOCE both at National level (CPRC HQ at Ministry of Health) and Sub-national level (CPRC branches at State and District health offices). [5, 6] It has two operation modes: passive surveillance (with limited coordination and reporting) and active surveillance (with broader coordination and reporting). [7] Once activated, CPRC will shift from passive to active surveillance mode, then initiate a dedicated operation room to coordinate the response plan for national emergencies, (this was done for the Covid-19 outbreak), with interagency support, including from the National Security Council. [1, 4] Malaysia had been implementing the 'Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED)' for the polio outbreak and the coronavirus outbreak in the country since December 2019, as part of which, the CRPC had been actively working to respond to the outbreaks. [8] According to the WHO, "The CPRC coordinated the National Plan for COVID-19, receiving strong support on the implementation of the non-pharmaceutical interventions from the National Security Council (NSC)". [8]

There is evidence that Malaysia completed a biological threat exercise with the WHO which was designed to test Malaysia's ability to deal with a biological-threat scenario. As the Ministry of Health notes, "the scenario of Exercise Crystal focused on potential adverse events following immunization (AEFI) with a fictitious pandemic vaccine for a novel respiratory virus that has caused a global pandemic. [2]

[1] World Health Organization (WHO). 2020. "Malaysia: Strong preparedness and leadership for a successful COVID-19 response." [https://www.who.int/publications/m/item/malaysia-strong-preparedness-and-leadership-for-a-successful-covid-19-response]. Accessed January 2021.
[2] Ministry of Health. 2020. "MOH Participated in the International Health Regulation (IHR) Exercise Crystal 2020." [http://covid-19.moh.gov.my/semasa-kkm/122020/moh-participated-in-ihr-exercise-crystal-2020]. Accessed February 2021.
[3] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual."" [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694 2 7765577470644339455958 4a70494556754c6c7068615735315]. Accessed January 2021
[4] Economic Planning Unit, Prime Minister's Department. 2006. "Article 20.49 of the 9th Malaysia Plan." [https://www.epu.gov.my/sites/default/files/2020-03/RMK9.pdf]. Accessed March 2021.
[5] Ministry of Health. 2014. "What is Crisis Preparedness and Response Centre (CPRC)?." [https://kpkesihatan.com/2014/08/04/crisis-preparedness-and-response-centre-cprc/]. Accessed January 2021.

[6] Ministry of Health. "Government Services to Fight Covid-19." [https://www.malaysia.gov.my/portal/content/30953]. Accessed March 2021.
[7] Disease Control Division, MoH. 2016. "National Crisis Preparedness and Response Centre, Ministry of Health Malaysia." ASEAN EOC Newsletter. [https://asean.org/storage/2016/12/ASEAN-EOC-Newsletter1.pdf]. Accessed March 2021.
[8] World Health Organisation. August 2020. "Malaysia: Strong Preparedness and Leadership for a successful COVID-19 Response". [https://www.who.int/docs/default-source/coronaviruse/country-case-studies/malaysia-c19-case-study-20-august.pdf?sfvrsn=a0f79358_2&download=true] Accessed May 21, 2021.

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: 2

There is evidence that Malaysia in the past year has identified gaps and best practices in infectious disease and biological threat response. In the past year, Malaysia has carried out several infectious disease or biological-threat focused exercises including two after action reviews (AAR) which it independently conducted in March and October 2020, and another one with support from the World Health Organization (WHO): the International Health Regulation exercise Crystal 2020 In December 2020 involving member states areas and territories of the WHO Western Pacific Region. [1, 2] In the independent after action review (AAR) involving relevant stakeholders held in March and October 2020, plans and actions in the context of Covid-19 pandemic were "revisited, relooked, and retooled, best practices demonstrated and challenges...identified and documented with the aim to ensure the healthcare facilities on the front line emerge from the crisis not only intact but strengthened with better preparedness and response capacity for the future." [1] The overall gaps and best practices to improve response capabilities has been published in a report titled "The Fight Against Uncertainty - Hospital Services Journey in Combating COVID-19", particularly in its penultimate chapter: "Service Continuity: Business Not As Usual."[3] As explained by the Secretary General to Ministry of Health in his foreword, the "Fight Against Uncertainty" is meant to be documentation for future reference, rather than a comprehensive plan to improve response capacity. [4] In December 2020, Ministry of Health took part in the International Health Regulation (IHR) exercise Crystal 2020, along with member states, areas and territories of the WHO Western Pacific Region. The scenario deployed in the exercise was "on potential adverse events following immunization with a fictitious pandemic vaccine for a novel respiratory virus that has caused a global pandemic." Regarding the exercise carried out with WHO, Ministry of Health noted that this particular exercise has helped to identify strengths and areas needing improvement on the management of "pandemic vaccine safety events." [2] Further search at Ministry of Health's website as well as a wider search in the internet found no additional information regarding specific policies made in response to the aforementioned exercises. [5]_ _

[1] Ministry of Health. 2020. "Growing Through the Pandemic - After Action Review The Fight Against Uncertainty." [https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=114https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=1]. Accessed February 2021.
[2] Ministry Of Health. 2020. "MoH Participated in the International Health Regulation Exercise Crystal 2020." [http://covid-19.moh.gov.my/semasa-kkm/122020/moh-participated-in-ihr-exercise-crystal-2020]. Accessed February 2021.
[3] Ministry of Health. 2020. "The Fight Against Uncertainty - Hospital Services Journey in Combating COVID-19." [https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=1]. Accessed February 2021.
[4] Ministry of Health. 2020. "Foreword by The Secretary General to The Ministry of Health Malaysia."

[https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=9]. Accessed March 2021.
[5] Ministry of Health. [www.moh.gov.my]. Accessed February 2021._ "
https://eiu.quickbase.com/db/bpmup88zy?a=API_EditRecord&rid=187572&_fid_19=Submitted to Reviewer&apptoken=bx3fmg9gsdyednn4hnqb6zn58h&rdr=https%3A%2F%2Feiu.quickbase.com%2F%2Fdb%2Fbpms6ftuq%3Fa%3Ddr%26rid%3D2159_ _

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 that in the past year, Malaysia has conducted a national-level biological threat-focused exercise with participation from the private sector representatives. In the past year, Malaysia has carried out several infectious disease or biological-threat focused exercise in the past year, including two which they independently conducted on March and October 2020, and one with support from the World Health Organization (WHO), the International Health Regulation exercise Crystal 2020 In December 2020 involving member states areas and territories of the WHO Western Pacific Region. [1, 2] However, there is no elaboration regarding private sector participation in the aforementioned events. No further information is found on websites of Ministry of Health, WHO extranet, and wider internet search.[3, 4, 5]_

[1] Ministry of Health. 2020. "Growing Through The Pandemic - After Action Review." [https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=114]. Accessed February 2021. Ministry of Health. 2020. "The Fight Against Uncertainty." [https://www.moh.gov.my/moh/resources/The%20Fight%20Final%20Artwork/mobile/index.html#p=1]. Accessed February 2021.
[2] Ministry Of Health. 2020. "MoH Participated in the International Health Regulation Exercise Crystal 2020." [http://covid-19.moh.gov.my/semasa-kkm/122020/moh-participated-in-ihr-exercise-crystal-2020]. Accessed February 2021. Ministry Of Health. 2020. "Regulation [sic] Exercise Crystal 2020." [http://covid-19.moh.gov.my/semasa-kkm/122020/moh-participated-in-ihr-exercise-crystal-2020]. Accessed February 2021. [32] Ministry of Health. [www.moh.gov.my]. Accessed February 2020. [43] The World Health Organization. "After Action Review." [https://extranet.who.int/sph/after-action-review]. Accessed February 2021."
[5] The World Health Organization. "Simulation Exercise." [https://extranet.who.int/sph/simulation-exercise?region=205&country=344]. Accessed February 2021._

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

There is publicly available evidence that Malaysia has an emergency operations center (EOC) in place. Malaysia has an emergency operations center in the Ministry of Health (MOH), called the Crisis Preparedness and Response Centre (CPRC). The CPRC is part of the MOH multi-hazard plan with main function as a coordinating body for health sector responses in the event of disaster or outbreak. The CPRC was established under the 9th Malaysia Plan (2005-2010) and sits in the Surveillance Section of the Disease Control Division, MOH. It operates daily in passive surveillance mode, but in the event of an outbreak, an operation room opens in the CPRC and the center shifts to active surveillance mode. [1, 2] The CPRC is referred to in the 2017 One Health Manual (endorsed by the directors general of the Ministry of Health and the Department of Veterinary Services). Both animal and human health authorities report to the Centre in the case of an outbreak.[2] In 2020, Malaysia activated the CPRC to response to Covid-19 pandemic. [4]

[1] Director-General of Health. 2014. "What is Crisis Preparedness and Response Centre (CPRC)?" Blog of the Director-General of Health Malaysia, 4 Aug 2014. [https://kpkesihatan.com/2014/08/04/crisis-preparedness-and-response-centre-cprc/]. Accessed January 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[3] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.
[4] Ministry of Health. 05 May 2020. Covid-19 Malaysia. [http://covid-19.moh.gov.my/]. Accessed January 2021.

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 evidence that the Emergency Operations Center (EOC) is 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. The Ministry of Health (MOH)'s Surveillance Section, which includes the Crisis Preparedness and Response Centre (CPRC), has to conduct a national full-scale drill at least once a year according to the workplan for 2017-2021. [1] The "Infectious diseases outbreak rapid response manual" (RRM) published by the MOH in 2003 calls for regular training, including simulations, for people at national and sub-national levels involved in outbreak response. [2] There is evidence that regular simulations take place. At a World Health Organization workshop in 2016, the deputy director-general of health reported that the MOH held simulation exercises for rapid response to public health emergencies. [3] At the regional level, a project for strengthening the ASEAN regional capacity on disaster health management (ARCH) conducted regular regional collaboration drills annually between 2017-2019. [4] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted Malaysia's active participation in ASEAN disaster health management, which include regular collaborative drills with other ASEAN countries. [5]

[1] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)". [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[2] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." Accessed via Ministry of Health. 2021.

"Health management and disease control." [https://www.moh.gov.my › file_manager › dl_itemhttps://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[3] WHO Western Pacific Region. 2016. "Sixth workshop on field epidemiology training programs." RS/2016/GE/67(KHM). [http://iris.wpro.who.int/bitstream/handle/10665.1/13687/RS-2016-GE-67-KHM-eng.pdf?ua=1]. Accessed January 2021.
[4] Japan International Cooperation Agency (JICA). July 2019. "Project for Strengthening the ASEAN Regional Capacity on Disaster Health Management Final Report." [https://openjicareport.jica.go.jp/pdf/12340543_01.pdf]. Accessed January 2021.
[5] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.

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 evidence that Malaysia's EOC, the Crisis Preparedness and Response Centre (CPRC), can conduct, or has conducted within the last year, a coordinated emergency response exercise activated within 120 minutes of the identification of the public health emergency/scenario. The Joint External Evaluation for Malaysia, conducted in October 2019, notes, "CPRC activation in Malaysia usually occurs within 120 minutes from notification, in accordance to the criteria stated in the CPRC SOP, and is managed according to the MOH Disaster Management Plan 2015." [1]

[1] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.

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

Although there is insufficient evidence of a joint standard operating procedure or MOU between the public health and security authorities for the coordination of a joint response to public health and other emergencies, there is evidence that Malaysia has conducted exercise on various chemical, biological, radiological, nuclear and explosives (CBRNE) scenarios, including deliberate biological event. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, noted that "multisectoral exercises have been regularly conducted on various CBRNe scenarios. [1] One of such recent exercise was the CBRNE Capability and Readiness exercise (CarEx), held from July 18 to 23, 2019 in Sungai Ara camp. [2] The Federal Government has a research center for counter-terrorism, Southeast Asia Regional Centre for Counter-Terrorism/SEARCCT, whose function includes promoting strategic partnership at local and international level, which includes CBRNE. SEARCCT has regularly held trainings to strengthen joint response involving public health and security authorities, such as the CBRNE first responder training held in June 2019 involving Royal Malaysian Police, Selayang Hospital, University Malaya Medical Centre, and Malaysia Chemistry Department. [4] There is evidence that public health and national security authorities have engaged in dialogue and workshops, but there no further information is available on exercises to respond to a potential deliberate biological event. [5] The basic policy on disaster management is outlined in the National Security Council (NSC)'s "Directive No. 20: Policy and mechanism of national disaster management and relief" (1997), which predates the creation of a rapid response mechanism and Crisis Preparedness and Response Centre (CPRC) in the MOH. The Directive does not provide much detail on coordination between security and health authorities but does state that national and local disaster management and relief committees should include representatives from the MOH. [6] Since 2003, the MOH has been developing a response system for public health emergencies. A 2010 presentation by the Disease Control Department, which houses the Crisis Preparedness and Response Centre (CPRC), showed lines of communication from the national, state and district-level branches of the MOH to their NSC counterparts, to issue public health alerts. It also showed an action chart involving health and public security authorities for the case of a CBRN-related biosecurity emergency, such as anthrax exposure. [7] In 2015 a new National Disaster Management Agency (NADMA) was established, which is in the process of updating policies and guidelines. [8] A 2017 presentation by the deputy director general, operation coordination division, NADMA, showed a chart of roles and responsibilities in a disaster, with a role for health authorities in managing public health. While the NSC has published several standard operating procedures (SOP) under Directive No. 20, none has been published on public health emergencies. [9] Another avenue for exercise is a three-year EU project launched in December 2019, titled BIOSEC Enhanced Biosecurity in South East Asia (Project 81). The project aims to generate a set of recommendations for improving biosecurity management systems in Southeast Asia and to provide effective tools to enhance capabilities to respond to biosecurity incidents of common concern. [10]_

[1] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[2] M. Daim. July 2019. "Angkatan Tentera Malaysia Uji Kesiagaan Hadapi Ancaman Senjata Kimia Biologi dan Nuklear (Malaysian Armed Forces Conducted CBRNE Capacity Readiness Exercise)." Air Times. [https://www.airtimes.my/2019/07/22/angkatan-tentera-malaysia-uji-kesiagaan-hadapi-ancaman-senjata-kimia-biologi-dan-nuklear/]. Accessed February 2021. "
[3]
[4] Southeast Asia Regional Centre for Counter-Terrorism/SEARCCT. June 2019. "CBRNE First Responder for Royal Malaysian Police." [https://www.searcct.gov.my/ms/cbrne-first-responder-for-royal-malaysia-police-2/]. Accessed February 2021, [1] Yunus, Zalini. 2017. "Inter-ministerial cooperation including the role of the military in preparedness and biological threat reduction." Presentation at 2nd OIE global conference on biological threat reduction, Ottawa, 31 Oct - 2 Nov 2017. [http://www.oie.int/eng/BIOTHREAT2017/Presentations/7.3_YUNUS-presentation.pdf]. Accessed January 2021. [52] Cooperative Biological Engagement Program (CBEP). ""FY15 Annual Accomplishments"". [http://www.dtra.mil/Portals/61/Documents/Missions/CBEP%20FY15%20Annual%20Accomplishments.pdf?ver=2016-09-16-150152-690]. Accessed January 2021. [63] Government of Malaysia. 1997. "National Security Council Directive No. 20: Policy and mechanism of national disaster management and relief."

[http://www.adrc.asia/management/MYS/Directives_National_Security_Council.html?Fr]. Accessed January 2021. [74] Kurup, Devan. 2010. “Public health crisis management: The Malaysian scenario.” Presentation by Disease Control Division, Ministry of Health, 17 Jun 2010. [https://www.unog.ch/80256EDD006B8954/(httpAssets)/3371722B82F6A4D5C125775E0053A360/$file/Devan+Kurup.+Public+Health+Crisis+Management-Malaysian+Scenario.pdf]. Accessed January 2021. [85] CenterCentre for Excellence in Disaster Management and Humanitarian Assistance, US Department of Defense. 07 August 2019. “Malaysia: Disaster management reference handbook.” [https://reliefweb.int/report/malaysia/malaysia-disaster-management-reference-handbook-june-2019]. Accessed January 2021. [96] Seman, Zainal. 2017. “Disaster management in Malaysia: National Disaster Management Agency.” Presentation by deputy director general, operation coordination division, NADMA. [http://www.adrc.asia/acdr/2017/documents/7%20Malaysia%20National%20Disaster%20Management%20Agency%20(NADMA)%20and%20its%20philosophy,%20Mr.%20Zainal%20Azman%20Bin%20Abu%20Seman,%20Deputy%20Director%20General,%20NADMA.pdf]. Accessed January 2021. [108] Project 81. 2019. “BIOSEC Enhanced Biosecurity in South East Asia.” [https://www.cbrn-project81.com/]. Accessed January 2021._

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: 0

There is insufficient evidence that Malaysia's strategy outlines how messages will reach populations and sectors with different communications needs (e.g. different languages, location within country, media reach, etc. Malaysia's most recent national public health emergency response plan, the "One Health manual on handling zoonotic disease outbreaks" (One Health manual), contains advice on reaching populations with different communication needs. The One Health manual has a section on communication. It states that it is "important to note the demographics of those affected by the outbreak. Although issuing a press statement that is prepared for print media is standard practice, the crisis management team should also consider making radio (community radio stations) and local television channel announcements to reach rural residents." [1] However, an elaborate plan for how to reach different population groups with different needs is not clear. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 notes, "Messages are released according to target audiences with information provided in local languages as required". However, the plan for achieving this is not fully outlined in the report.

[1] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/profile/Abdul_Khan165/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia/links/590422eeaca272116d2fccf8/One-Health-Manual-On-Handling-Zoonotic-Disease-Outbreaks-in-Malaysia.pdf] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed

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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

Malaysia has a risk communication plan that is specifically intended for use during a public health emergency as part of the national public health emergency response plan. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, assessed that Malaysia incorporate risk communication in many of its national strategies and response plans, including the National Security Council Directive No. 18, 20 and 21, MySED II, the MOH Crisis Communication Plan, MOH National Disaster Plan and the National Influenza Pandemic Preparedness Plan. Malaysia has well developed and implementable SOPs for communication. These SOPs are regularly tested through training and simulation exercises. [1] Risk Communication is one in eight Focus Areas in Malaysia Strategy to address public health emergency. [2] Another national public health emergency response plan, the "One Health manual on handling zoonotic disease outbreaks" (One Health manual), published in 2017, also has a section detailing risk communication during a public health emergency, with a focus on transparency and building trust. It has tables providing a detailed chronology of risk communication, before, during and after an outbreak. It specifies specific actors involved in the communication plan, including "local leaders, outbreak team, Ministry of Health, Ministry of Primary Industries, Emerging disease surveillance and response team (ESR), other Public Health Services (PHSs), the public, the media".[3]

[1] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[2] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)".
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[3] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia."
[https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store:
[https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.

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: 0

Malaysia's risk communication plan used to guide national public health response does not designate a specific position within the government as primary spokesperson to the public during a public health emergency. One of the expected outcomes of the Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021) is establishment of risk communication "with the capacity to manage the process of risk communication for all phases of public health emergencies," but it has no provision on special designation for primary spokesperson. [1] Another national document on pandemic preparation, National Influenza Pandemic Preparedness Plan, has designation for risk communication positions - depending on severity of the situation, but there are no primary spokesperson. [2] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 also indicates several entities responsible for coordination of interagency communication. But it also does not have information on designation of primary spokesperson beyond noting that there is a pool of trained spokespersons within the Ministry of Health. The JEE also notes however that there are a roster of trained communication officers ready to be mobilized as surge capacity. [3]

[1] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[2] Ministry of Health. 2006. "National Influenza Pandemic Preparedness Plan." [http://nktm-health.net/sites/default/files/docs/01012016/NIPPP_PoA_Msia.pdf]. Accessed January 2021.
[3] World Health Organisation (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January, 2021.

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

In the past year, the Government of Malaysia has actively shared messages via online platforms to inform the public about ongoing public health concerns and to dispel rumoursrumors, misinformation or disinformation. The primary fact-checking channel used by Malaysia's government is Malaysian Communication and Multimedia Commission (MCMC) founded n's sebenarnya.my website, a "one-stop centrecenter for Malaysians to fact-check before sharing unverified news received online through social media, instant messaging services, blogs, websites and more." [1] The portal's earliest archive is from August 2001, and Covid-19 related contents with its own separate tab has been available from January 2020. Other than directly via its website, sebenarnya.my can be accessed in its other channels, including twitter, facebook page, instagram and mobile application for both iOS and Android devices. [2, 3, 4, 5, 6] An example of covid related information message is a message posted in twitter to address a misinformation on vaccine approval forms. [7] The aforementioned social media have also been used to communicate routine public health information to the public. Two of such examples are information regarding an increased health risk in particular area and clarification regarding widely shared claim about food supplement for babies. [8, 9] All of the aforementioned social media channels are maintained with regular updates regarding health emergencies, routine health announcement and other fact-checks provided by various government agencies via MCMC. [2,

3, 4, 5, 6]_

[1] Malaysian] Malaysian Communication and Multimedia Commission. 2021. "About Us: sebenarnya.my - Uncertain, Don't Share (Tentang Kami: sebenarnya.my, Tidak Pasti, Jangan Kongsi)." [https://sebenarnya.my/tentang-kami/]. Accessed February 2021.
[2] [] [https://twitter.com/sebenarnyamy?lang=en]. Accessed February 2021.
[3] [] [https://www.facebook.com/sebenarnya.myofficial/]. Accessed February 2021.
[4] [] [https://www.instagram.com/sebenarnya.myofficial/?hl=en]. Accessed February 2021.
[5] [] [https://play.google.com/store/apps/details?id=com.gov.mcmc.sebenarnyamy]. Accessed February 2021.
[6] [] [https://itunes.apple.com/us/app/sebenarnya-my/id1358556098?ls=1&mt=8]. Accessed February 2021."
[7] Sebenarnya.my. February 2021. [https://twitter.com/sebenarnyaMY/status/1362262535991255044?s=20]. Accessed February 2021.
[8] Sebenarnya.my. July 2018. "Waspada Peningkatan HFMD in Pulau Pinang (Beware of increased Hand-Foot-Mouth Disease in Pinang Island)." [https://www.instagram.com/p/BlUzZTGBBQ_/?utm_source=ig_web_copy_link]. Accessed February 2021.
[9] Sebenarnya.my. February 2018. "Food Supplements for Baby?."
[https://www.facebook.com/sebenarnya.myofficial/posts/2055567944736111]. Accessed February 2021._

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 insufficient evidence to suggest that senior leaders have shared misinformation on infectious diseases in the past two years (2019 and 2020). There are no news articles from national news sources that indicate the spread of misinformation on infectious diseases by senior leaders in 2019 and 2020. [1-5]. An MP and former Deputy Minister was charged in April 2020 with spreading fake news on impact of Covid-19 related movement restriction order, but the news in question was not directly related to information about Covid-19 as an infectious disease. [6]

[1] The Star. [www.thestar.com.my]. Accessed February 2021.
[2] New Straits Times. [www.nst.com.my]. Accessed February 2021.
[3] The Sun. [www.thesundaily.my]. Accessed February 2021.
[4] Berita Harian. [www.bharian.com.my]. Accessed February 2021.
[5] Utusan Malaysia. [www.utusan.com.my]. Accessed February 2021.
[6] T.N. Alagesh. April 28th 2020. “Fake news: Former deputy minister faces two charges over Facebook post.” New Straits Times. [https://www.nst.com.my/news/crime-courts/2020/04/588203/fake-news-former-deputy-minister-faces-two-charges-over-facebook]. Accessed February 2021.

3.6 ACCESS TO COMMUNICATIONS INFRASTRUCTURE

3.6.1 Internet users

3.6.1a

Percentage of households with Internet

Input number

Current Year Score: 84.21

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: 139.6

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: 5.0

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: 5.0

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

In the past year, Malaysia has issued a unilateral restriction on the export of medical goods due to an infectious disease outbreak. In March 2020, a restriction was issued on export of face masks. From then on, medical/surgical face masks can only be exported with a letter of approval from the Controller of Supplies, Ministry of Domestic Trade and Consumer Affairs under the Control of Supplies Act, 1961. [1, 2] The order was not announced as temporary and has been applicable since March 2020. Beyond the restriction made on March 2020, there is no information on this topic on the websites of the Ministry of Health, Royal Malaysian Customs Department, Ministry of Foreign Affairs and Malaysia External Trade Development Corporation. [1, 2, 3, 4]

[1] Global Trade Alert. 2020. "Malaysia: Export Restriction imposed on face masks in response to the Covid-19 pandemic." [https://www.globaltradealert.org/state-act/43784/malaysia-export-restriction-imposed-on-face-masks-in-response-to-the-covid-19-pandemic]. Accessed February 2020.
[2] "Export ban, new price to meet mask demand." Mar 21th21st 2021. The Star. [https://www.thestar.com.my/news/nation/2020/03/21/export-ban-new-price-to-meet-mask-demand]. Accessed February 2021.
[3] Ministry Ofof Health. [www.moh.gov.my]. Accessed January 20201.
[4] Royal Malaysian Customs. [www.customs.gov.my]. Accessed January 20201.
[5] Ministry Ofof Foreign Affairs. [www.kln.gov.my]. Accessed January 2021.
[6] Malaysia External Trade Development Corporation. [https://www.matrade.gov.my/en/about-matrade/media/news-clippings/5056-mihas-postponed-due-to-covid-19-outbreak]. Accessed January 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: 1

There is no evidence to suggest that Malaysia has issued a unilateral restriction on the export/import of non-medical goods due to an infectious disease outbreak. There is no further information on this topic on the websites of the Ministry of Health, Royal Malaysian Customs Department, or Ministry of Foreign Affairs and Ministry of Agriculture and Food Industries. [1, 2, 3, 4]

"[1] Ministry Ofof Health. [www.moh.gov.my]. Accessed January 20201.
[2] Royal Malaysian Customs. [www.customs.gov.my]. Accessed January 20201.
[3] Ministry Ofof Foreign Affairs. [www.kln.gov.my]. Accessed January 20201."

[4] Ministry of Agriculture and Food Industries. [www.mafi.gov.my]. Accessed February 2021._

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, Malaysia has implemented a unilateral ban for all international visitors from entering the country. One of such bans is the restriction of movement order enacted by the office of the Prime Minister to stop the spread of Covid-19, applicable from March 18-31, 2020. [1] This cordon sanitaire has been extended multiple times in various forms, including Conditional Movement Control Order (CMCO) and Recovery Movement Control Order (RMCO). Updates regarding which cordon sanitaire is active in different sector and places can be found on Prime Minister Office website. [2]_

[1] Prime Minister of Malaysia. 2020. "Restriction of Movement Order." [https://www.pmo.gov.my/2020/03/movement-control-order/]. Accessed January 2021.
[2] Prime Minister of Malaysia. 2020. "Tag: Movement Control Order." [https://www.pmo.gov.my/2020/03/movement-control-order/]. Accessed February 2021._

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: 153.58

2015

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 346.76

2017

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: 0

Malaysia does not 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 shortomings. Malaysia's Ministry of Health (MOH) published a Human Resources for Health (HRH) country profile in 2016, identifying workforce shortages; and briefly outlined strategies to address shortages in a 2016-2020 plan of action for the health sector. The MOH's Planning Division worked with the World Health Organization (WHO) to publish HRH country profile reports in 2014 and 2016. These identify human resources needs, and provide the basis for a human resources strategy. The 2016 report states that "plans for the immediate future are being set out in the 11th Malaysia Plan 2016-2020." [1-3,2] However, the 11th Malaysia Plan did not discuss tangible strategy regarding health workforce other than reaffirming government commitment that "...the Government will accelerate efforts to achieve universal access to quality healthcare by targeting underserved areas and increasing capacity of both facilities and healthcare personnel.". In 2016, the MOH published a plan of action for the health sector in 2016-2020. It briefly outlines initiatives and targets aimed at addressing healthcare personnel shortages, including numerical targets for healthcare professionals and the aim to develop retention packages for specialists. It also states the aim of developing and implementing an HRH Masterplan 2016-2020. [3] However, there is no evidence that the HRH Masterplan 2016-2020 exists. It has not been published with other human resources and planning documents on the MOH website; [4] nor on the website of the MOH Planning Department; [5] nor on the relevant Malaysia pages of the WHO Western Pacific Region website and information-sharing repository. [6,7] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, reported that HRH is part of the national development plan of Malaysia under the coordination of the Economic Planning Unit of the Prime Minister office. The 12th Malaysia Plan 2021-2025 has not been published due to significant challenges caused by the Covid-19 pandemic. [8, 9] Wider online search found no other information regarding workforce strategy._

[1] Planning Division, Ministry of Health. 2016. "Human Resources for Health (HRH) country profiles 2015: Malaysia". [http://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a69615852686269394d59584276636d46754c306831625746755831a6c63323931636d4e6c633138794d4445314c6e426b5a673d3d]. Accessed October 2018Accessed February 2021.
[2] World Health Organization. 2014. "Human resources for health country profiles: Malaysia." [http://iris.wpro.who.int/bitstream/handle/10665.1/10530/9789290616375_eng.pdf]. Accessed October 2018Accessed February 2021.
[3] Economic Planning Unit. 2019. "11th Malaysia Plan." [https://policy.asiapacificenergy.org/sites/default/files/11th%20Malaysia%20plan.pdf]. Accessed February 2021."
[3] Ministry of Health, Planning Division. 2016. "Ministry of Health Malaysia: Plan of action 2016-2020."

[https://www.moh.gov.my/moh/resources/Penerbitan/Pelan%20Strategik%20/2016-2020/Pelan_Tindakan_KKM.pdf]. Accessed October 2018Accessed February 2021.
[4] Ministry of Health. 2018. "Main MOH publications." [http://www.moh.gov.my/english.php/pages/view/56]. Accessed October 2018Accessed February 2021.
[5] Planning Division, Ministry of Health. 2018. Official website. [http://perancangan.moh.gov.my/index.php/ms/]. Accessed October 2018Accessed February 2021.
[6] WHO Western Pacific Region. 2018. "Human resources for health country profiles: Malaysia." [http://iris.wpro.who.int/handle/10665.1/10530]. Accessed October 2018Accessed February 2021.
[7] WHO Western Pacific Region. 2018. "Human resources for health country profiles: Malaysia." [http://www.wpro.who.int/hrh/documents/publications/wpr_hrh_country_profiles_malaysia/en/]. Accessed October 2018Accessed February 2021.
[8] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[9] Economic Planning Unit. 2019. "Twelfth Malaysia Plan." [https://rmke12.epu.gov.my/]. Accessed January 2021._

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 188

2017

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: 0

There is insufficient evidence whether Malaysia has the capacity to isolate patients with highly communicable diseases within the country. Malaysia's response to the Covid-19 pandemic included provision of isolation room in hospitals. [1] During the Ebola outbreak in Africa in 2014-15, Malaysia's Ministry of Health (MOH) designated 21 hospitals with isolation facilities to manage suspected Ebola cases, and 3 identified laboratories to perform laboratory confirmation of EVD. [3, 4] However, no additional information on the details of the isolation rooms, both for Covid-19 and Ebola is found from The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 and wider search in the internet. [4]_

[1] Director-General of Health. 16 June 2020. "The Malaysian Response to COVID-19: Building Preparedness for 'Surge Capacity', Testing Efficiency, and Containment. [https://kpkesihatan.com/2020/06/16/the-malaysian-response-to-covid-19-building-preparedness-for-surge-capacity-testing-efficiency-and-containment/]. Accessed January 2021
[2] Director-General of Health. 17 October 2014. "Minister of Health: National preparedness and response in an event of an outbreak of Ebola." [https://kpkesihatan.com/2014/10/17/minister-of-health-national-preparedness-and-response-in-an-

event-of-an-outbreak-of-ebola/]. Accessed January 2021.
[3] Ministry of Health. 2015. "Flow Chart: Management of Person Under Investigation for Ebola Viral Disease." [https://www.moh.gov.my/moh/resources/Info%20kesihatan/EBOLA/garis%20panduan%20pengurusan%20EVD/Annex_5_Flow_Chart_Management_Of_Person_Under_Investigation_(PUI)_For_EVD.pdf]. Accessed February 2021.
[4] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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: 0

There is insufficient evidence that Malaysia has demonstrated capacity to expand isolation capacity in response to an infectious disease outbreak, or that Malaysia has developed, updated or tested a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years. Malaysia's response to the Covid-19 pandemic included provision of isolation room in hospitals but there are no specifications of isolation wards or biocontainment units as such. [1] Further, in its early updates on the COVID-19 situation in the country, it notes that the 'the Quarantine and Low-Risk COVID-19 Treatment Centre at the Malaysia Agro Exposition Park Serdang (MAEPS)' has been operational since 21 April 2020 to treat "low-risk or symptom-free COVID-19 patients" and free up capacity for elective surgeries at the big multi-speciality hospitals. [2] During the Ebola outbreak in Africa in 2014-15, Malaysia's Ministry of Health (MOH) designated 21 hospitals with isolation facilities to manage suspected Ebola cases, and 3 identified laboratories to perform laboratory confirmation of EVD. [3, 4] However, no additional information on the details of the isolation rooms, both for COVID-19 and Ebola is found from The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 and wider search in the internet. [5]

[1] Director-General of Health. 16 June 2020. "The Malaysian Response to COVID-19: Building Preparedness for 'Surge Capacity', Testing Efficiency, and Containment. [https://kpkesihatan.com/2020/06/16/the-malaysian-response-to-covid-19-building-preparedness-for-surge-capacity-testing-efficiency-and-containment/]. Accessed January 2021
[2] Malaysia Ministry of Health. COVID-19 Malaysia. 6 May 2020. "Updates on the Coronavirus disease 2019 (COVID-19) Situation in Malaysia". [http://covid-19.moh.gov.my/terkini/052020/situasi-terkini-06-mei-2020/106%20Kenyataan%20Akhbar%20KPK%20COVID-19%20(6%20Mei%202020)%20-%20EN.pdf] Accessed May 21, 2021.
[3] Director-General of Health. 17 October 2014. "Minister of Health: National preparedness and response in an event of an outbreak of Ebola." [https://kpkesihatan.com/2014/10/17/minister-of-health-national-preparedness-and-response-in-an-event-of-an-outbreak-of-ebola/]. Accessed January 2021.
[4] Ministry of Health. 2015. "Flow Chart: Management of Person Under Investigation for Ebola Viral Disease." [https://www.moh.gov.my/moh/resources/Info%20kesihatan/EBOLA/garis%20panduan%20pengurusan%20EVD/Annex_5_Flow_Chart_Management_Of_Person_Under_Investigation_(PUI)_For_EVD.pdf]. Accessed February 2021.
[5] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.

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

Malaysian Government has online eProcurement system which has been operational as the de facto procurement system for the federal government since 1999. [1] The Ministry of Health (MoH) and Ministry of Agriculture and Food Industries c(MAFI) can use the eProcurement portal for the acquisition of laboratory and medical supplies. Using the search feature, procurement process for lab supplies, like reagents, and medical supplies, like medical equipment and PPEs, as well as agriculture related procurements can be seen in the list of active procurement process and also listed in the eCatalogue. [2, 3] As indicated by recent circular from the Ministry of Finance (MoF) regarding Industry Collaboration Program in the context of eprocurement, both MoH and MAFI is considered by MoF as the users of the eprocurement system. [4]

[1] Ministry of Finance. 2018. "Message from the Undersecretary of Government Procurement Division." [https://www.eperolehan.gov.my/secretary-message]. Accessed January 2021.
[2] Ministry of Finance. 2021. "Quotation/Tender Notice." [https://www.eperolehan.gov.my/quotation-tender-notice#]. Accessed January 2021.
[3] Ministry of Finance. 2021. "Catalogue Listing." [https://www.eperolehan.gov.my/e-catalogue]. Accessed January 2021.
[4] Ministry of Finance. September 2020. "Garis Panduan Bagi Pelaksanaan Program Kolaborasi Industri dalam Perolehan Kerajaan Melalui Sistem ePerolehan (Guideline for Industrial Collaboration Program in Government Procurement Using eProcurement)." [https://www.eperolehan.gov.my/documents/10182/17038/Garis+Panduan+ICP.pdf/b2cbe775-982c-4d7f-9e49-bf6e219ec686]. Accessed February 2021. "

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

There is evidence that Malaysia maintains a stockpile of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE) for national use during a public health emergency. "Infectious diseases outbreak rapid response manual" (RRM) produced by the Ministry of Health (MOH) in 2003 has a section on "stockpiles of critical materials", which states that "there should be a four-month buffer stock for vaccines and antibiotics." It delegates the Pharmacy Division to calculate the quantities needed and where to store the stockpiles. A flow-chart is provided for distribution of critical materials. This shows that once new drugs/vaccines for infectious diseases have been approved by the National Drug Committee, the Purchasing Division puts it in the contract list, and stockpiles them for 3 months. The RRM also states that "certain laboratory materials

should be stockpiled and kept by the regional stockpile centers" and provides a list of materials and where they should be stored. [1] There is evidence that this has been implemented. The MOH implemented stockpiling of PPEs in the containment and mitigation phases of the response to the H1N1 influenza outbreak. [2] The MOH uses capacity assessment tool developed for Malaysia by the WHO Regional Office for Western Pacific to estimate needs for additional laboratory supplies and PPE. [3] The "Malaysia strategic workplan for emerging diseases (MySED Workplan), 2012-2015", mentioned stockpiling essential medicines for treatment as one of the measures to be considered in public health emergency planning. [4] The Crisis Preparedness and Response Centre (CPRC) under the Disease Control Division of the MOH, which was created after the RRM was published, has a Supplies and Procurement Unit in charge of ensuring availability of vaccines, drugs, personal protective equipment and other resources for public health emergencies. [5] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted availability of national level risk assessment "that comprise resource identification and mapping, including pharmaceutical and resource stockpile." [6] No further information can be found about current stockpiles in the MOH's "Plan of action 2016-2020"; in its "Pharmacy programme strategic plan 2017-2020"; in the National Public Health Laboratory's "Service handbook 2018"; via the Ministry of Health's website; or from a wider online search. [7, 8, 9]

"[1] Ministry of Health. 2003. "Infectious Diseases Outbreak Rapid Response Manual."
[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiwqYmussvuAhXz73MBHb6cD58QFjAAegQIBBAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945 59584a70494556754c6c7068615735315a476c7549454a4c5543394a626d5a6c593352706233567a583052706332566863325666543356306596e4a6c59577466556c4a4e4c6e426b5a673d3d&usg=AOvVaw25iwY301fChZZL-lSLdfwl]. Accessed January 2021.
[2] Kurup, Devan. N.d. "MOH Malaysia's preparedness in dealing with PHEIC in compliance to IHR 2005." Presentation by Outbreak and Disaster Management Sector, Disease Control Division, Ministry of Health.
[https://www.unog.ch/80256EDD006B8954/(httpAssets)/D6FB09E0D04FAF06C1257CEE003E9A47/$file/MOH+PrepdnsInDealingwithPHEIC+InCmplnceToIHR-02Sept2013-READY.pdf]. Accessed January 2021.
[3] World Health Organization (WHO). 2020. "Malaysia: Strong preparedness and leadership for a successful COVID-19 response." [https://www.who.int/publications/m/item/malaysia-strong-preparedness-and-leadership-for-a-successful-covid-19-response]. Accessed January 2021.
[4] Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021) 1] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)."
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[5] Ministry of Health. " Crisis"Crisis Preparedness and Response Centre." [https://www.slideserve.com/tod/crisis-preparedness-and-response-centre]. Accessed January 2021.
[6] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia."
[https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021. [76] Ministry of Health, Planning Division. 2020. "Strategic Framework of The Medical Programme Ministry of Health Malaysia 2021-2025." [http://vlib.moh.gov.my/cms/documentstorage/com.tms.cms.document.Document_a61cc569-a0188549-4b0d5d00-d8f52a40/spl2021-2025.pdf]. Accessed January 2021. [87] Pharmaceutical Services Division, Ministry of Health. 2017. "Pharmacy programme strategic plan 2017-2020."
[https://www.pharmacy.gov.my/v2/en/documents/pharmacy-programme-strategic-plan-2017-2020.html]. Accessed January 2021. [98] National Public Health Laboratory. 2018. "Service handbook 2018." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=100:nphl-test-handbook2018]. Accessed January 2021."

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: 0

Beyond special provisions made during the COVID-19 pandemic, there is no publicly available regarding the availability of laboratory supplies stockpile that Malaysia maintains for national use during a public health emergency. "Infectious diseases outbreak rapid response manual" (RRM) produced by the Ministry of Health (MOH) in 2003 has a section on "stockpiles of critical laboratories material", which stipulates that stockpile centers should have: 1) specimen containers, transport media, and reagents sufficient to process 500 specimens, and 2) 30 boxes and 30 metal cylinders of containers for hazardous materials (WHO standards. There is a list of materials and where they should be stored. [1] The MOH uses capacity assessment tool developed for Malaysia by the WHO Regional Office for Western Pacific to estimate needs for additional laboratory supplies and PPE. [2] The Crisis Preparedness and Response Centre (CPRC) under the Disease Control Division of the MOH, which was created after the RRM was published, has a Supplies and Procurement Unit in charge of ensuring availability of vaccines, drugs, personal protective equipment and other resources for public health emergencies. [3] A dashboard with daily reports on inventory of reagents and consumables from over 80 MoH hospitals laboratories are maintained by a dedicated team who provide regular updates to National Security council. [4] No further information can be found, including information indicating the actual availability of such stockpile in the MOH's "Plan of action 2016-2020"; in its "Pharmacy programme strategic plan 2017-2020"; in the National Public Health Laboratory's "Service handbook 2018"; via the Ministry of Health's website; or from a wider online search. [5, 6, 7]_

[1] Ministry of Health. 2003. "Infectious Diseases Outbreak Rapid Response Manual." [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiwqYmussvuAhXz73MBHb6cD58QFjAAegQIBBAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595 84a70494556754c6c7068615735315a476c7549454a4c5543394a626d5a6c593352706233567a583052706332566863325666543356306596e4a6c59577466556c4a4e4c6e426b5a673d3d&usg=AOvVaw25iwY301fChZZL-lSLdfwl]. Accessed January 2021.
[2] World Health Organization (WHO). 2020. "Malaysia: Strong preparedness and leadership for a successful COVID-19 response." [https://www.who.int/publications/m/item/malaysia-strong-preparedness-and-leadership-for-a-successful-covid-19-response]. Accessed January 2021.
[3] Ministry of Health. "Crisis Preparedness and Response Centre." [https://www.slideserve.com/tod/crisis-preparedness-and-response-centre]. Accessed January 2021.
[4] Ministry of Health. 2021. "Covid-19 MoH Hospital Laboratory Preparedness, Capacity and Enhancement." [https://www.moh.gov.my/moh/resources/FIGHT%20AGAINST%20UNCERTAINTY%205%20FEB%202021/mobile/index.html#p=69]. Accessed February 2021.
[5] Ministry of Health, Planning Division. 2020. "Strategic Framework of The Medical Programme Ministry of Health Malaysia 2021-2025." [http://vlib.moh.gov.my/cms/documentstorage/com.tms.cms.document.Document_a61cc569-a0188549-4b0d5d00-d8f52a40/spl2021-2025.pdf]. Accessed January 2021.
[6] Pharmaceutical Services Division, Ministry of Health. 2017. "Pharmacy programme strategic plan 2017-2020." [https://www.pharmacy.gov.my/v2/en/documents/pharmacy-programme-strategic-plan-2017-2020.html]. Accessed January 2021.
[7] National Public Health Laboratory. 2018. "Service handbook 2018." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=100:nphl-test-handbook2018]. Accessed January 2021._

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 insufficient evidence that Malaysia conducts or requires annual review of the national stockpile of medical and laboratory supplies to ensure the supply is sufficient for a public health emergency. Key regulation on national stockpile, "Infectious diseases outbreak rapid response manual" (RRM) produced by the Ministry of Health (MOH) in 2003, has provisions regarding buffer, stockpile centres, and flow of distribution of critical material, but does not specifically discuss the requirement regarding stockpile review. [1] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted availability of national level risk assessment "that comprise resource identification and mapping, including pharmaceutical and resource stockpile," but did not discuss requirements to review the stockpile. [2] No further information can be found about annual review of the national stockpiles in the MOH's "Plan of action 2016-2020"; in its "Pharmacy programme strategic plan 2017-2020"; and in the National Public Health Laboratory's "Service handbook 2018". [3, 4, 5] There is no additional publicly available evidence from the Ministry of Health, the Ministry of Defense, the Ministry of Agriculture and Agro-based Industry, nor the National Institutes of Health (including the Institute for Medical Research and Institute of Public Health). [6, 7, 8, 9]

[1] Ministry of Health. 2003. "Infectious Diseases Outbreak Rapid Response Manual." [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiwqYmussvuAhXz73MBHb6cD58QFjAAegQIBBAC&url=https%3A%2F%2Fwww.moh.gov.my%2Findex.php%2Ffile_manager%2Fdl_item%2F554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864746754943596761324633595778686269427765577470644339455958 4a70494556754c6c7068615735315a476c7549454a4c5543394a626d5a6c593352706233567a583052706332566863325666543356305965 6e4a6c59577466556c4a4e4c6e426b5a673d3d&usg=AOvVaw25iwY301fChZZL-lSLdfwl]. Accessed April 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed April 2021.
[3] Ministry of Health, Planning Division. 2020. "Strategic Framework of The Medical Programme Ministry of Health Malaysia 2021-2025." [http://vlib.moh.gov.my/cms/documentstorage/com.tms.cms.document.Document_a61cc569-a0188549-4b0d5d00-d8f52a40/spl2021-2025.pdf]. Accessed April 2021.
[4] Pharmaceutical Services Division, Ministry of Health. 2017. "Pharmacy programme strategic plan 2017-2020." [https://www.pharmacy.gov.my/v2/en/documents/pharmacy-programme-strategic-plan-2017-2020.html]. Accessed April 2021.
[5] National Public Health Laboratory. 2018. "Service handbook 2018." [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=100:nphl-test-handbook2018]. Accessed January 2021.
[6] Ministry of Health. [http://www.moh.gov.my/ alaysi.php]. Accessed January 2021.
[7] Ministry of Defense. [http://www.mod.gov.my/en/]. Accessed January 2021.
[8] Ministry of Agriculture and Agro-based Industry. [http://www.moa.gov.my]. Accessed January 2021.
[9] National Institute of Health. [http://nih.gov.my/web/]. Accessed January 2021.
[10] Biological weapons convention: Malaysia. [https://bwc-ecbm.unog.ch/state/ alaysia]. Accessed January 2021

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 that Malaysia has a plan/agreement/mechanism to leverage domestic capacity to produce and/or procure medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during public health emergencies.

The website of the Ministry of Health provides no information about production and procurement of medical supplies for use during public health emergencies in general. [1] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 discusses only the stockpiling for medical supplies but provides no conclusion regarding production and procurement of medical supplies. [2]

There is evidence for additional resource allocated for procurement of medical supplies and voluntary production by the private sector, but they are COVID-19 specific. In its 2021 budget, Malaysia has allocated RM318 million (around USD 78 million) to procure personal protective equipment (PPE) and hand sanitizers for front liners for national use, particularly to stem the third wave of Covid-19 in 2021. [3] The private sector has voluntarily produced PPE, including those who do not originally produce PPE. [4] Specifically for vaccine, Ministry of Science, Technology and Innovation (MOSTI) and the Ministry of Health have been given the responsibility to prepare a plan to develop and manufacture vaccines. [5] Beyond joining Covax Facility, Malaysian government has signed manufacturing and supply agreement with various companies: Pfizer, BioNTech, Sinovac Biotech, CanSino Biologics, and Gamaleya National Centre of Epidemiology and Microbiology. [6] Government linked company, Pharmaniaga, has also signed agreement with Sinovac to manufacture vaccine domestically. [7]

No other information is found from wider search in the internet.

[1] Ministry of Health. [https://www.moh.gov.my/]. Accessed March 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[3] Ministry of Finance. 2021. "Belanjawan 2021 Touchpoints (2021 Budget Touchpoints)." [http://belanjawan2021.treasury.gov.my/pdf/speech/2021/rub-2021-en.pdf]. Accessed January 2021.
[4] A. Ananthalakshmi, Liz Lee. April 10th, 2021. "Malaysian firms led by world's top glove maker priorities medical supplies." [https://www.thejakartapost.com/news/2020/04/10/malaysian-firms-led-by-worlds-top-glove-maker-prioritise-medical-supplies.html]. Accessed on January 2021.
[5] Arfa Yunus. July 14, 2020. “Malaysia aims to become vaccine-manufacturing country.” New Straits Times. [https://www.nst.com.my/news/nation/2020/07/608594/malaysia-aims-become-vaccine-manufacturing-country-nsttv]. Accessed January 2021.
[6] “Diverse vaccine portfolio will help offset sudden shortage.” January 8, 2021. The Star. [https://www.thestar.com.my/news/nation/2021/01/08/diverse-vaccine-portfolio-will-help-offset-sudden-shortage]. Accessed January 2021.

[7] “Malaysia’s Pharmaniaga signs Covid vaccine agreement with China’s Sinovac.” January 12, 2021. [https://www.reuters.com/article/health-coronavirus-malaysia-sinovac-idUSL1N2JN0C3]. Accessed January 2021."

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 that Malaysia has a plan/agreement/mechanism to leverage domestic capacity to produce and/or procure laboratory supplies for national use during public health emergencies. The website of the Ministry of Health provides no information about production and procurement of laboratory supplies for use during public health emergencies in general. [1] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 discusses only the stockpiling for laboratory supplies but provides no conclusion regarding production and procurement of medical supplies. [2] There are evidence for additional resource allocated for procurement of laboratory supplies, but they are COVID-19 specific. In its 2021 budget, Malaysia has allocated RM475 million (around USD 116 million) to procure laboratory supplies including reagent, viral transport media and consumables in medical laboratories for national use, particularly to stem the third wave of Covid-19 in 2021. [3] There is no indication on a plan to leverage domestic manufacturing capacity to produce laboratory supplies. [1, 2]

[1] Ministry of Health. [https://www.moh.gov.my/]. Accessed March 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[3] Ministry of Finance. 2021. "Belanjawan 2021 Touchpoints (2021 Budget Touchpoints)." [http://belanjawan2021.treasury.gov.my/pdf/speech/2021/rub-2021-en.pdf]. Accessed January 2021._

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 Malaysia has specific guidelines in place for dispensing medical countermeasures during a public health emergency. The Crisis Preparedness and Response Centre (CPRC), under the Disease Control Division of the MOH, has a Supplies and Procurement Unit in charge of ensuring availability of vaccines, drugs, personal protective equipment, and other resources for public health emergencies. [1] The MySED II Workplan does not have explicit activity for dispensing MCM

for national use, but it has strategies in relation to response logistics and stockpiling of medicine, laboratory items, and PPE. [2]The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, indicates that MOH stockpiling guidelines also regulate the deployment of resources, but it does not refer to dispensation. [3]

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." Accessed via Ministry of Health. 2021. "Health management and disease control." [https://www.moh.gov.my › file_manager › dl_item]. Accessed January 2021.
[2] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)".
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[3] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.

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 evidence that Malaysia has a public plan to receive health personnel from other countries to respond to a public health emergency. The "Infectious diseases outbreak rapid response manual" (RRM) [1] produced by the Ministry of Health (MOH) in 2003 instructed the national rapid response team, a precursor to the national Crisis Preparedness and Response Centre (CPRC), to maintain an inventory of international expert resources. The CPRC is now responsible for identifying what resources are needed and mobilizing them. One of its founding aims was to enhance collaboration with international organizations, NGOs and the private sector in emergency preparedness and response. [2] Yet there are no specific measures mentioned to receive foreign health personnel. No other relevant information is found on the website of the Ministry of Health. [3] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 stated that Malaysia has "procedures for sending and receiving national and foreign health professional during public health emergencies," but provides no details about the procedures and their regulatory framework. [4]

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." Accessed via Ministry of Health. 2021. "Health management and disease control."
[https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[2] Ministry of Health. "Crisis Preparedness and Response Centre." [https://www.slideserve.com/tod/crisis-preparedness-and-response-centre]. Accessed January 2021.
[3] Ministry of Health. [www.moh.gov.my]. Accessed March 2021.
[4] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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: 0

2020

World Policy Analysis Center

4.4.1b

Access to skilled birth attendants (% of population)

Input number

Current Year Score: 99.4

2015

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: 432.2

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: 0

For healthcare workers who become sick as a result of responding to a public health emergency, there is no evidence that Malaysia prioritizes health care services to them over other groups. The government simply refers broadly to the need to treat them. For instance, Malaysia's Ministry of Health has issued a manual committing to provide healthcare services to healthcare workers who become sick as a result of responding to a public health emergency. The 2003 "Infectious diseases outbreak rapid response manual" (RRM) states that "Exposed health care workers should also be given counselling and advice on stress management. They must also be provided with post exposure prophylaxis and treatment with follow up if appropriate." [1] This is echoed in the 2017 "One Health manual for handling zoonotic disease outbreaks in Malaysia" endorsed by the directors general of the Ministry of Health and of the Department of Veterinary Services, which advises use of chemoprophylaxis and vaccines for susceptible/exposed populations, including healthcare workers. [2] The guidelines for Brucellosis state that in the case of an outbreak, any staff that develops the disease should be treated promptly. [3] In 2020, a specific COVID-19 SOP for management of healthcare worker (HCW) pandemic was issued that elaborates precautionary measures, protection measures, up to reporting channel in the case where healthcare workers are exposed to Covid-19 but this is not applicable for public health emergency in general. [4]_

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." Accessed via Ministry of Health. 2021. "Health management and disease control." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694 2 7765577470644339455958 4a70494556754c6c7068615735315]. Accessed January 2021.
[2] Khan, A. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/profile/Abdul_Khan165/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia/links/590422eeaca272116d2fccf8/One-Health-Manual-On-Handling-Zoonotic-Disease-Outbreaks-in-Malaysia.pdf] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed February 2021.
[3] Ministry of Health. 2012. "Guidelines for the diagnosis, management, prevention and control of brucellosis in Malaysia." [http://www.moh.gov.my/images/gallery/Garispanduan/Human_Brucellosis.pdf]. Accessed February 2021.
[4] Ministry of Health. 02 November 2020. "Annex 21: Management of Healthcare Workers During COVID-19 Outbreak (Kemaskini 2 Nov 2020)." [http://covid-19.moh.gov.my/garis-panduan/garis-panduan-kkm]. Accessed January 2021._

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: 0

There is insufficient evidence that Malaysia has a system in place on establishing an effective system for public health officials and healthcare workers to communicate during a public health emergency. The Ministry of Health (MOH)'s 2003 "Infectious diseases outbreak rapid response manual" outlines the lines of communication during an outbreak, including alerts to local hospitals and health centers. [1] This manual and the communication system in place was to be reviewed in 2018 according to MySED II Workplan.

In fact, the WHO's Joint External Evaluation of the IHR Core Capacities for Malaysia, conducted in October 2019, states that Malaysia's "MOH has established information sharing and coordination mechanisms across several divisions, as outlined in the Malaysian National IHR Communications Guideline and MySED II (2017-2021) Work Plan" and that its "IHR coordination and communication capacities are regularly tested through real events and simulation exercises". [2]

A system for communication is provided in the 2017 "One Health manual for handling zoonotic disease outbreaks in Malaysia." It contains a chapter on "Communication during disease outbreaks", which states that outbreak teams should plan for communication with all stakeholders, including local hospitals and primary care facilities. Tables are provided detailing how to develop a communication plan for before, during and after an outbreak. This includes a section on how to communicate with "primary defenses" (medical personnel, health departments officials, hospitals) during an outbreak. It lists measures such as an information hotline for clinical support. [3]

[1] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." Accessed via Ministry of Health. 2021. "Health management and disease control." [https://www.moh.gov.my › file_manager › dl_itemhttps://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[2] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January, 2021.
[3] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.

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 Malaysia has a system in place on establishing an effective system for public health officials and healthcare workers to communicate during a public health emergency. Hence, there is no evidence that it includes all healthcare workers in the public and private sectors.
The Ministry of Health (MOH)'s 2003 "Infectious diseases outbreak rapid response manual" outlines the lines of communication during an outbreak, including alerts to local hospitals and health centers. [1] This manual and the

communication system in place was to be reviewed in 2018 according to MySED II Workplan.

In fact, the WHO's Joint External Evaluation of the IHR Core Capacities for Malaysia, conducted in October 2019, states that Malaysia's "MOH has established information sharing and coordination mechanisms across several divisions, as outlined in the Malaysian National IHR Communications Guideline and MySED II (2017-2021) Work Plan" and that its "IHR coordination and communication capacities are regularly tested through real events and simulation exercises". [2]

A system for communication is provided in the 2017 “One Health manual for handling zoonotic disease outbreaks in Malaysia.” It contains a chapter on “Communication during disease outbreaks”, which states that outbreak teams should plan for communication with all stakeholders, including local hospitals and primary care facilities. Tables are provided detailing how to develop a communication plan for before, during and after an outbreak. This includes a section on how to communicate with “primary defenses” (medical personnel, health departments officials, hospitals) during an outbreak. It lists measures such as an information hotline for clinical support. [3]

[1] Ministry of Health. 2003. “Infectious diseases outbreak rapid response manual.” Accessed via Ministry of Health. 2021. “Health management and disease control.” [https://www.moh.gov.my › file_manager › dl_itemhttps://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a70637942515957356b645746754c31426c626d6431636e567a595734675330567a6157686864474675494359676132463359577868626942776557747064433945595 84a70494556754c6c7068615735315]. Accessed January 2021.
[2] World Health Organization (WHO). 21-25 October 2019. “Joint External Evaluation of IHR Core Capacities of Malaysia.” [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January, 2021.
[3] Khan, Abdul. 2017. “One Health manual for handling zoonotic disease outbreaks in Malaysia.” [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.

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

Malaysia's national public health system monitors and tracks the number of healthcare associated infections that take place in healthcare facilities. The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 explains that there is a reporting procedure in compliance with the National Infection Prevention & Control (IPC) Program that is updated regularly, where large hospitals report IPC data to the national authority and smaller hospitals report IPC data to state-level authority. [1] Furthermore, Appendix VI of the updated National Antibiotic Guidelines in human health in 2019 explains about the role of Antimicrobial Stewardship (AMS) Program as an integrated approach and means for surveillance in Malaysia's public health facilities by using Point Prevalence Survey. [2] The JEE reported that National Surveillance of Antimicrobial Resistance

(NSAR) received data from 42 public hospitals and 15 private hospitals in 2018. The MOH's 2013 manual on HCAI surveillance states that: "The prevalence of hospital infections in Malaysia is being observed through the Healthcare Associated Infections (HCAI) surveillance program. The HCAI prevalence is determined through a one-day hospital wide point prevalence survey (PPS) which is conducted twice a year in March and September. The PPS started in 2003 involving 14 MOH and 3 university hospitals. Currently the surveillance data from 20 MOH and 3 university hospitals is analyzed twice a year." [3] Malaysia action plan on antimicrobial resistance (MyAP AMR) 2017-2021 includes the aim to "Strengthen national surveillance on healthcare associated infections prevalence," with action points of revising the HCAI manual and improving the reporting system. [4]

[1] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[2] Ministry of Health. September 2019. "National Antimicrobial Guideline 2019." [https://www.pharmacy.gov.my/v2/sites/default/files/document-upload/national-antimicrobial-guideline-2019-full-version-3rd-edition.pdf]. Accessed January 2021.
[3] Ministry of Health. 2013. "Manual: Point prevalence survey for healthcare associated infection surveillance." 2nd edition, Nov 2013. [https://dokumen.tips/documents/1-manual-on-point-prevalence-survey.html]. Accessed January 2021.
[4] Ministry of Health and Ministry of Agriculture and Agro-based Industry. 2017. "Malaysia action plan on antimicrobial resistance (MyAP AMR) 2017-2021." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Garis%20panduan%20Umum%20(Awam)/National_Action_Plan_-_FINAL_29_june.pdf]. Accessed January 2021.

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

The Ministry of Health (MOH) has imposed a national requirement for ethical review before beginning a clinical trial. The National Institutes of Health, under the MOH, published guidelines on conducting research in 2015. These state that "Research involving human subjects requires prior ethics review and approval by the Medical Research and Ethics Committee (MREC)." [1] This is confirmed on the website of the MREC. [2] A clinical trial should prepare an online submission to MREC for ethics review and approval. [3]

[1] National Institutes of Health, Ministry of Health. 2015. "NIH guidelines for conducting research in Ministry of Health institutions and facilities." [https://www.nmrr.gov.my/doc/NIH_Guidelines_Oct_2015.pdf]. Accessed January 2021.
[2] Medical Research and Ethics Committee. 2018. Official website. [http://www.nih.gov.my/mrec/]. Accessed January 2021.
[3] National Institutes of Health, Ministry of Health. "National Medical Research Register." [https://www.nmrr.gov.my/fwbLoginPage.jsp]. Accessed January 2021.

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: 0

There is no evidence of an expedited process for approving clinical trials for unregistered medical countermeasures to treat ongoing pandemics. The National Institutes of Health (NIH), under the Ministry of Health (MOH), published guidelines on conducting research in 2015. These state that "Research involving human subjects requires prior ethics review and approval by the Medical Research and Ethics Committee (MREC)." The guidelines do not mention an expedited process for approving clinical trials in emergencies. [1] The 4th edition of Malaysian Guideline for Good Clinical Practice list cases where the normal requirements may be waived, but pandemics are not mentioned and does not have any provision pertaining to expedited process in an epidemic situation. [2] The MREC offers an expedited review process but only for non-substantial changes or very low-risk projects. [3] The website of the National Medical Research Register (NMRR), an official portal through which research applications can be made, does not have any updated information in relation to the ongoing COVID-19 epidemic.[4] Expedited approval of new countermeasures is not mentioned in the MOH's key documents on planning and responding to public health emergencies. [5, 6]

[1] National Institutes of Health, Ministry of Health. 2015. "NIH guidelines for conducting research in Ministry of Health institutions and facilities." [https://www.nmrr.gov.my/doc/NIH_Guidelines_Oct_2015.pdf]. Accessed January 2021.
[2] Ministry of Health. 2018. "Malaysian Guideline for Good Clinical Practice. - Fourth Edition." [https://www.nmrr.gov.my/doc/Malaysian_gcp%204th%20Edition%20(Final)%20050318.pdf]. Accessed January 2021.
[3] Medical Research and Ethics Committee. 07 March 2017. "Expedited review." [http://www.nih.gov.my/mrec/expenditure-review/]. Accessed January 2021.
[4] National Medical Research Register. 2018. User manual/documents." [https://www.nmrr.gov.my/fwbPage.jsp?fwbPageId=NMRR_UserInstruction]. Accessed January 2021.
[5] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)". [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[6] Khan, Abdul. 2017. "One Health manual for handling zoonotic disease outbreaks in Malaysia." [https://www.researchgate.net/publication/316169079_One_Health_Manual_On_Handling_Zoonotic_Disease_Outbreaks_in_Malaysia] or through Google Store: [https://play.google.com/store/books/details/Professor_Dr_Abdul_Rashid_Khan_One_Health_Manual?id=wLZmDgAAQBAJ]. Accessed January 2021.

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

Malaysia has a government agency responsible for approving new medical countermeasures for humans. The Drug Control Authority (DCA), which is part of the National Pharmaceutical Regulatory Agency, is responsible for approving new medicines for humans. It was authorized to do so under the Control of Drugs and Cosmetics Regulations 1984. [1, 2] Meanwhile the

Medical Device Authority, part of the Ministry of Health, is responsible for registering new medical devices. It was authorized to do so under the Medical Device Act 2012. [3, 4]

[1] Government of Malaysia. 1984. “Control of drugs and cosmetics regulations 1984.” [http://www.crc.gov.my/wp-content/uploads/documents/Control%20drugs%20%26%20cosmetics%20regulation.pdf]. Accessed January 2021.
[2] National Pharmaceutical Regulatory Agency (NPRA). 15 January 2021. “About the Drug Control Authority (DCA).” [https://www.npra.gov.my/easyarticles/images/users/1096/DCA-Term-Of-Reference.pdf]. Accessed January 2021.
[3] Medical Device Authority. 2021. “MDA Background.” [https://www.mda.gov.my/introduction/background.html]. Accessed January 2021.
[4] Government of Malaysia. 2012. "Medical Device Act". [https://www.mda.gov.my/documents/regulation/685-medical-device-act-2012-eng/file.html]. Accessed January 2021.

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: 0

Beyond Covid-19 related decision to shorten evaluation timelines for clinical trials of products, there is no evidence that Malaysia has an expedited process for approving medical countermeasures (MCM) for human use during all types of public health emergencies. The National Pharmaceutical Regulatory Agency (NPRA) stated that expedited pathway is available for Covid-19 related trials to shorten the evaluation timeline, yet other regulatory requirements are still applicable. The normal timeline for approval is approximately 245 days and the expedited timeline can be 120 or 90 days. [1] Expedited approval of new countermeasures is not mentioned in the Ministry of Health's key documents on planning and responding to public health emergencies. [3]_

[1] National Pharmaceutical Regulatory Agency (NPRA). 19 January 2021. "Managing Clinical Trials during COVID-19 Pandemic in Malaysia'. [https://www.npra.gov.my/index.php/en/component/sppagebuilder/911-faq-managing-clinical-trials-during-covid-19-in-malaysia-npra.html?highlight=WyJjb3ZpZCJd]. Accessed January 2021.
[2] National Pharmaceutical Regulatory Agency. 2019. "Annual Report 2019." [https://www.npra.gov.my/index.php/en/informationen/annual-reports/npra-annual-reports.html]. Accessed January 2021.
[3] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)". [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021._

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: 0

Epidemics and pandemics are not explicitly addressed in Malaysia's main national disaster management strategy, National Security Council Directive No. 20 (Directive 20 or Arahan 20). [1] As identified by UN Office for Disaster Risk Reduction (UNDRR), Malaysia's main disaster risk reduction document is Directive 20 whose enactment led to the creation of The National Disaster Management Agency (NADMA). [2, 3] NADMA publishes information on Malaysia's disaster risk reduction (DRR) policies and initiatives but does not address pandemics other than in stating that DRR planning should be integrated into the health sector. Another key document in the health sector, Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021), has a section on public health emergency preparedness (PHEP) but it also does not discuss pandemics and epidemics in detail. MySED II addresses public health emergencies in general and noted there is a need to improve "emergency operation centers functionality and familiarity with Incident Management System (IMS)" as well as its connection with wider system both domestically and internationally. [4] The RRM published by the MOH in 2003 provides a stand-alone disaster management and disaster relief plan for outbreaks of infectious disease. It states that certain outbreaks of infectious diseases can be a disaster that warrants the invoking of Directive 20. It provides the criteria and procedure for invoking Directive 20. When the national rapid response team (now the Crisis Preparedness and Response Centre, CPRC) considers the outbreak meets the criteria for Arahan 20, it should inform the Director General of Health, who, if he agrees, should recommend to the National Security Council that Directive 20 be invoked. [5] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, reported that Malaysia has several national strategy documents applicable for epidemics and pandemics, as follow: the National Influenza Pandemic Preparation Plan 2006, the National Flood Management Plan 2015, and a business continuity plan of the Ministry of Health, the Crisis and Disaster Management

Plan for Pharmaceutical Services 2016.[6] However, these documents also do not have specific provisions regarding epidemics and pandemics risk reduction. WHO assess Malaysia preparedness capacity to address COVID-19 pandemic at Level 5 (aligned with the WHO SPAR benchmarks capacity levels where Level 5 indicates >80% preparedness.[7]_

[1] Government of Malaysia. 1997. "National Security Council Directive No. 20: Policy and mechanism of national disaster management and relief." [http://www.adrc.asia/management/MYS/Directives_National_Security_Council.html?Fr]. Accessed January 2021.
[2] UN Office for Disaster Risk Reduction. 2020. "Disaster Risk Reduction in Malaysia: Status Report 2020." [https://www.undrr.org/publication/disaster-risk-reduction-malaysia-status-report-2020]. Accessed March 2021.
[3]
[2] Seman, Zainal. 2017. "Disaster management in Malaysia: National Disaster Management Agency." Presentation by deputy director general, operation coordination division, NADMA. [http://www.adrc.asia/acdr/2017/documents/7%20Malaysia%20National%20Disaster%20Management%20Agency%20(NADMA)%20and%20its%20philosophy,%20Mr.%20Zainal%20Azman%20Bin%20Abu%20Seman,%20Deputy%20Director%20General,%20NADMA.pdf]. Accessed February 2021.
[4] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)". [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[5] Ministry of Health. 2003. "Infectious diseases outbreak rapid response manual." [https://www.moh.gov.my/index.php/file_manager/dl_item/554756755a584a6961585268626939485958 4a7063794251595 7356b645746754c31426c626d6431636e567a595734675330567a615768686447467549435967613246335957786862694277655774706443394559584a70494556754c6c7068615735315]. Accessed January 2021.
[6] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia". [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[7] World Health Organization.09 June 2020. "COVID-19 STRATEGIC PREPAREDNESS AND RESPONSE PLAN Country Preparedness and Response Status for COVID-19 as of 9 June 2020". [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/strategies-and-plans]. Accessed January 2021._

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

Malaysia has cross-border agreements and protocols with other countries in the region with regard to public health emergencies, and there is no evidence of gaps in enforcement. Malaysia is part of an ASEAN Emergency Operations Centre (EOC) Network, and has been involved in developing standard operating procedures for regional EOC networking, for the purpose of sharing information and early warnings of disease outbreaks. [1] Malaysia also participates in the Asia Pacific Strategy for Emerging Diseases (APSED, 2010), which is "a common strategic framework for countries and areas of the region

to strengthen their capacity to manage and respond to emerging disease threats." [2] The ASEAN EOC Network is operational and has been utilized by Asean Plus Three countries to provide daily situation updates and response measures regarding Covid-19 since January 20, 2020. [3]

[1] Disease Control Division, Ministry of Health. December 2016. "ASEAN EOC Newsletter." Volume 1, Issue 1. [http://asean.org/storage/2016/12/ASEAN-EOC-Newsletter1.pdf]. Accessed January 2021.
[2] WHO Western Pacific Region. 2018. "Asia Pacific Strategy for Emerging Diseases (APSED, 2010)." [https://iris.wpro.who.int/bitstream/handle/10665.1/13654/9789290618171-eng.pdf]. Accessed January 2021
[3] Li-Lian, Sharon Seah. 2020. ASEAN's Covid-19 Pandemic Response: Practical Next Steps. ISEAS Yusof Ishak Institute. [https://think-asia.org/bitstream/handle/11540/12096/ISEAS_Perspective_2020_47.pdf?sequence=1]. Accessed January 2021.

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

Although Malaysia has an agreement with the other members of ASEAN with regard to animal health emergencies, it has not come into force. In 2016, Malaysia and other ASEAN member states signed an "Agreement on the establishment of the ASEAN Coordinating Centre for Animal Health and Zoonoses", ACCAHZ. The ACCAHZ aims to enable regional cooperation in reducing the risk of, and responding to, animal disease outbreaks. The center is to be initially based in Malaysia, and then rotate within ASEAN Countries. [1-3] However, the agreement has not come into force since not all ASEAN member countries has ratified the agreement. As explained in the ASEAN Legal Instruments website, agreement on the establishment of ACAHZ "shall enter into force on the thirtieth (30th) day after the date on which all ASEAN Member States have deposited their instruments of ratification, acceptance or approval with the Depositary." As of March 2021, one member country - Indonesia, still has not submitted their instrument of ratification. [4, 5] No other evidence was found via the Ministry of Health website. [6]

[1] FAO. 2016. "FAO supports ASEAN initiative in the establishment of a Coordinating Centre for Animal Health and Zoonoses" [http://www.fao.org/asiapacific/news/detail-events/en/c/445508/]. Accessed January 2021.
[2] 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 January 2021.
[3] One Health Network, South East Asia. "FAO supports ASEAN initiative in the establishment of a Coordinating Centre for Animal Health and Zoonoses." [http://www.onehealthsea.org/node/239/]. Accessed March 2021.
[4] Association of Southeast Asian Nations. "ASEAN Legal Instruments." [http://agreement.asean.org/search.html?q=zoonoses]. Accessed January 2021.
[5] Sharon Seah. October 16, 2020. "Does ASEAN have a zoonotic disease prevention and control plan?." The Jakarta Post. [https://www.thejakartapost.com/academia/2020/10/15/does-asean-have-a-zoonotic-disease-prevention-and-control-plan.html]. Accessed January 2021.
[6] Ministry of Health. [https://www.moh.gov.my/] Accessed March 2021.

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: 0

In the current and past three fiscal years, other than funding for Covid-19 response in 2021, there has been no publicly available information on specific funding at national level to improve capacity to address future epidemic threats. [1, 2, 3, 4] When health is highlighted in the budget touchpoints, beyond the regular upgrading and maintenance of health facilities, the topics have consistently been around healthcare tourism and maintenance of healthcare facilities, but not around building future epedemic preparedness. Public health emergency preparedness (PHEP) including emergency operations centres' preparedness in dealing with epidemic-prone diseases is listed as the first focus within Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021), but there are no updates on its implementation progress found at the websites of Prime Minister Office, Ministry of Finance and Ministry of Health. [5, 6, 7, 8]

[1] Ministry of Finance. "Budget 2021 Touchpoints." [http://belanjawan2021.treasury.gov.my/pdf/speech/2021/rub-2021-en.pdf]. Accessed January 2021.
[2] Ministry of Finance. "Budget 2020." [https://www.mof.gov.my/arkib/budget/2020/bs20.pdf] Accessed January 2021.
[3] Ministry of Finance. "Budget 2019." [https://www.mof.gov.my/arkib/budget/bs_Main.html] Accessed January 2021.
[4] Ministry of Finance. "2018 Budget Touchpoints."

[https://www.mof.gov.my/arkib/budget/2018/Touchpoints_2018_BI_Final.pdf]. Accessed January 2021.
[5] Ministry of Health. 2017. "Malaysian Strategy for Emerging Disease (MySED) II Workplan (2017-2021)." [https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[6] Prime Minister's Office of Malaysia. [www.pmo.gov.my]. Accessed January 2021.
[7] Ministry of Finance. [www.mof.gov.my]. Accessed January 2021.
[8] Ministry of Health. [www.moh.gov.my]. Accessed January 2021.

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

Malaysia has a publicly identified special emergency public financing mechanism and funds which the country can access in the face of a public health emergency. The Ministry of Health underscores sustainable financing as an activity required to

develop and test a national all-hazards response plan for public health without mentioning any specific mechanisms.[1] Meanwhile, the International Federation of Red Cross and Red Crescent Societies (IFRC) in 2017 reported that the Economic Planning Unit (EPU) is responsible to prepare the annual disaster management budget for the national and subnational levels.[2] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, asserted that Malaysia has a number of financing mechanisms available for access, at the national and state levels, in the face of a public health emergency. For instance, the 15% contingency fund in the annual MOH budget, the National Disaster Relief Trust Fund coordinated by the National Disaster Management Agency (NADMA), and state-level trust funds. Malaysia has mechanism to expedite emergency disbursement through government accounts AP55 on Emergency Expenditure and AP173.2 on Emergency Allocation.[3] NADMA manages the National Disaster Relief Fund that encourages voluntary donation from private entities and individuals based on shared responsibility principle.[4]
Malaysia is a party to the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) and has access to the AADMER Fund. [5] Another potential regional avenue for emergency response financing is through Southeast Asia Disaster Insurance Facility (SEADRIF) as stated in a Joint Statement of the 4th ASEAN Finance Ministers' and Central Bank Governors' Meeting (AFMGM) of 2018. SEADRIF is a platform for ASEAN countries to access disaster risk financing solutions and increase financial resilience to climate and disaster risks and supported by the World Bank. [6] Nonetheless, both AAADMER and SEADRIF do not explicitly include health emergencies in their definition of disaster._

[1] Ministry of Health, "Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan (2017-2021)".
[https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf]. Accessed January 2021.
[2] International Federation of Red Cross and Red Crescent Societies (IFRC). 2017. "ASEAN Disaster Law Mapping Implementing AADMER: ASEAN Country Profiles".
[https://www.ifrc.org/PageFiles/234171/AADMER%20Implementation%20Country%20Profiles%20FINALpdf.pdf]. Accessed January 2021.
[3] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia".
[https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed January 2021.
[4] National Disaster Management Agency. January 2021. "National Disaster Relief Fund (TBBN)."
[http://www.nadma.gov.my/en/info/national-disaster-relief-fund]. Accessed January 2021.
[5] Being a party to the AADMER, effective since 2009, Malaysia also has access to the AADMER Fund. ASEAN. April 2016. "AADMER Work Programme 2016-2020". [https://www.asean.org/wp-content/uploads/2016/02/AADMER-Work-Programme-2016-2020-v1.6.pdf]. Accessed January 2021. In November 2020, ASEAN adopted the AADMER Work Programme 2021-2025.
[6] ASEAN. April 2018. "Joint Statement of the 4th ASEAN Finance Ministers' and Central Bank Governors' Meeting (AFMGM)". [https://asean.org/wp-content/uploads/2018/04/Joint-Statement-of-the-4th-AFMGM-6-April-2018-Singapore1.pdf]. Accessed January 2021._

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 publicly available evidence that senior leaders in the past three years have made a public commitment either to provide financial assistance to other countries, to improve capacity for addressing epidemic threats, and to improve the country's domestic capacity by expanding financing or requesting support to improve capacity. 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 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] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019, has no information relevant to the aforementioned commitments, and neither do websites of the Ministry of Health, Prime Minister's Office of Malaysia, Ministry of Foreign Affairs, Ministry of Finance, Ministry of Home Affairs and Economic Planning Unit. [2, 3, 4, 5, 6, 7, 8] Information on the commitments made so far has been limited to emergency response funding for Covid-19 pandemic. One such commitment was made when Prime Minister Muhyiddin Yassin proposed the establishment of the ASEAN COVID-19 Response Fund. [9] Prime Minister Yassin's other related proposal to ASEAN regarding ASEAN Comprehensive Recovery Framework has also been unanimously endorsed by ASEAN. [10] The framework is designed as the ASEAN "consolidated exit strategy from Covid-19 crisis," and covers several broad strategic collaboration strategies between ASEAN member countries to improve capacity to address pandemic threats. [11]

[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] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021.
[3] Ministry of Health. [www.moh.gov.my]. Accessed March 2021.
[4] Prime Minister's Office of Malaysia. [www.pmo.gov.my]. Accessed March 2021.
[5] Ministry of Foreign Affairs. [www.kln.gov.my]. Accessed March 2021.
[6] Ministry of Finance. [www.mof.gov.my]. Accessed March 2021.
[7] Ministry of Home Affairs. [www.moha.gov.my]. Accessed March 2021.
[8] Economic Planning Unit. [www.epu.gov.my]. Accessed March 2021.
[9] "Asean endorses Malaysia's proposed comprehensive recovery framework." November 2020. Bernama/Malay Mail. [https://www.malaymail.com/news/malaysia/2020/11/12/asean-endorses-malaysias-proposed-comprehensive-recovery-framework/1922007]. Accessed February 2020.
[10] Prime Minister's Office of Malaysia. "PM's Intervention at the 37th ASEAN Summit." [https://www.pmo.gov.my/2020/11/pms-intervention-at-the-37th-asean-summit/] Accessed February 2020.
[11] ASEAN. 2020. "ASEAN Comprehensive Recovery Framework." [https://asean.org/storage/ASEAN-Comprehensive-Recovery-Framework_Pub_2020_1.pdf]. Accessed February 2021._ _

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 Malaysia has, in the past three years, provided other countries with technical support to improve capacity to address epidemic threat and requested financing or technical support from donors to improve its domestic capacity epidemic threat. An example in technical assistance provided by Malaysia to other countries.

Its Ministry of Health's Disease Control Division is currently responsible for leading the 'ASEAN EOC Network Development and Activities Project', a regional initiative of the ASEAN Health Cooperation. Regular updates regarding activities of the initiative, including a session Malaysia facilitated in April 2020 where for the first time ASEAN EOC Network use their platform to share and learn from a country outside of ASEAN + 3, are updated in its publication page. [1, 2]

According to the Global Health Security Tracker, in the past three years, donors have provided funding to support capacity improvements in Malaysia. For example, from 2019 to 2020, United States Agency for International Development (USAID) has committed 22 Million USD to support One Health University Network in Africa and Southeast Asia, including Malaysia, to prevent, detect and respond to threats of epidemic and pandemic. [3] The program, called One Health Workforce - Next Gen (OHW-NG), supports One Health University Network to "build scalable and sustainable systems for training" to enable health staff in the region, including Malaysia, to combat complex health threats of epidemic and pandemic importance. [3] According to the Tracker's funder profile for the country, there is no evidence of funding provided by Malaysia past 2015. [4]

[1] ASEAN 2020. "ASEAN EOC Newsletter: April 2020. [https://asean.org/storage/2017/02/ASEAN-NEWSLETTER-APRIL-2020.pdf]. Accessed February 2021.
[2] ASEAN. 2020. "ASEAN EOC Network Newsletter." [http://asean.org/asean-socio-cultural/asean-health-ministers-meeting-ahmm/publications-documents/#c86924eed6f621d4e] (No direct link to header, scroll to lower half of the page to find the heading: "2. ASEAN EOC Network Newsletter". Accessed February 2021.
[3] Global Health Security Tracker. "Recipient profile: Malaysia". [https://tracking.ghscosting.org/details/993/recipient]. Accessed 21 May 2021.
[4] Global Health Security Tracker. "Funder profile: Malaysia". [https://tracking.ghscosting.org/details/993/funder]. Accessed 21 May 2021.

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 no publicly available plan or policy for sharing genetic data, epidemiological data, clinical specimens, and/or isolated specimens (biological materials) with international organizations and/or other countries that goes beyond influenza. Relevant plans do not include information on this matter or do not reach the level of a commitment to sharing information. For instance in 2016 MKAK announced that it was participating in the Canada Global Partnership Program (GPP) – ASEAN program, which involved international and regional stakeholders including the ASEAN+3 Partnership Laboratories (APL) and the ASEAN+3 Field Epidemiology Training Network (FETN). However, there is no specific, publicly available provision for data or specimen sharing. [1] FETN website mostly provide information regarding its regular meetings but does not provide specific information regarding sharing of data or specimens. [2] Malaysia is a lead country in 2016-2020 for ASEAN's programme of work aimed at strengthening regional disease surveillance networks. One programme strategy is the establishment of the ASEAN Reference laboratory network. As part of the strategy there are instructions to "Develop guidelines on specimen sharing within AMS, including Material Transfer/Data Agreement" and "Develop regional guidelines on data/information-sharing on EDP". However this is a programme of work, not a stated policy. [3] The Joint External Evaluation (JEE) for Malaysia, conducted in October 2019 noted that there are "regular meeting and informal information sharing between the states where international land borders are shared and their international counterparts," but did not further elaborate whether such sharing is based on a policy and biological materials sharing is part of the exchange. [4]_

[1] National Public Health Laboratory. 2016. "Canada Global Partnership Program (GPP) – ASEAN program," Newsletter, 2 Nov 2016. [http://mkak.moh.gov.my/ms/muat-turun-green/penerbitan.html?download=10:bulletin-gpp-2016&usg=AOvVaw0mRPr4zgizRHyl2vk8m33S]. Accessed February 2021.
[2] ASEAN Plus Three Field Epidemiology Training Network. 2021. "More News & Events." [http://www.aseanplus3fetn.net/?s=7&j=news]. Accessed February 2021.
[3] ASEAN. 2017. "ASEAN Health Cluster 2 Work Programme for 2016 to 2020." [http://asean.org/storage/2017/11/ASEAN-Health-Cluster-2-Work-Programme_FINAL-ENDORSED.pdf]. Accessed February 2021.
[4] World Health Organization (WHO). 21-25 October 2019. "Joint External Evaluation of IHR Core Capacities of Malaysia." [https://apps.who.int/iris/bitstream/handle/10665/336716/9789240015296-eng.pdf?sequence=1&isAllowed=y]. Accessed February 2021._

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 Malaysia has not shared samples in accordance with the PIP framework in the past year. There is evidence that Malaysia participated in the WHO's influenza surveillance up to the end of 2020. [1] No other evidence was found via media sources.

[1] WHO Western Pacific Region. 16 December 2020. "Virological surveillance summary." [https://www.who.int/docs/default-source/wpro---documents/emergency/surveillance/seasonal-influenza/influenza-20201216.pdf?sfvrsn=b3fcfc77_44]. Accessed January 2021.

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 that Malaysia has not shared pandemic pathogen samples during an outbreak in the past two years. [1] Malaysia is listed as one of the countries who has shared COVID-19 sample in GISAID database. [2]

[1] World Health Organization. "Disease outbreaks." [http://www.who.int/emergencies/diseases/en/]. Accessed January 2021.
[2] GISAID. 2021. "Tracking of Variants." [https://www.gisaid.org/hcov19-variants/]. Accessed February 2021._

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: 2

2020

Economist Intelligence

6.1.1b

Quality of bureaucracy (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 2

2020

Economist Intelligence

6.1.1c

Excessive bureaucracy/red tape (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 4

2020

Economist Intelligence

6.1.1d

Vested interests/cronyism (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 2

2020

Economist Intelligence

6.1.1e

Country score on Corruption Perception Index (0-100, where 100=best)

Input number

Current Year Score: 51

2020

Transparency International

6.1.1f

Accountability of public officials (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 2

2020

Economist Intelligence

6.1.1g

Human rights risk (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 2

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: 3

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: 2

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: 3

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: 1

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: 3

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: 94.85

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: 0.73

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

2015

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: 0

According to latest number from Malaysia's Department of Statistics' Informal sector work force survey in 2019, with around 1.26 million workers, informal sector made up 8.3% of total employment. [1]

[1] Department of Statistics Malaysia. July 23, 2020. "Informal Sector Work Force [sic] Survey Report, Malaysia, 2019." [https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=158&bul_id=U0tMZmJudTkzNmhwdjZFb2FmVWxOUT09&menu_id=Tm8zcnRjdVRNWWlpWjRlbmtlaDk1UT09]. Accessed January 2021.

6.2.3c

Coverage of social insurance programs (% of population)

Scored in quartiles (0-3, where 3=best)

Current Year Score: 1

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: 2

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: 2

2021

Economist Intelligence Democracy Index

6.2.6 Inequality

6.2.6a

Gini coefficient

Scored 0-1, where 0=best

Current Year Score: 0.41

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: 4

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: 3

2021

Economist Intelligence

6.4 ENVIRONMENTAL RISKS

6.4.1 Urbanization

6.4.1a

Urban population (% of total population)

Input number

Current Year Score: 76.61

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: 0.36

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: 4

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: 76.0

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: 501.1

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 6.92

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 21.8

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 15.6

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: 96.7

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 99

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: 611.03

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