

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

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

1.1 ANTIMICROBIAL RESISTANCE (AMR)

1.1.1 AMR surveillance, detection, and reporting

1.1.1a

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

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

Current Year Score: 2

China has a National Action Plan to Contain Antimicrobial Resistance (2016-2020), developed by the National Health Commission, that covers the surveillance, detection, and reporting of AMR pathogens. The National Action Plan to Contain Antimicrobial Resistance (2016-2020) lists among its goals: (a) to optimize the surveillance networks of antibacterial agents consumption and antimicrobial resistance in both healthcare and food animal sectors; (b) to set up reference laboratories of antimicrobial resistance and bacterial strain banks; (c) to establish an evaluation system for antimicrobial use and antimicrobial resistance control in healthcare system and animal husbandry; (d) to establish the antimicrobial stewardship program in secondary- and tertiary-level hospitals, and (e) to effectively control the increasing trend of the main antimicrobial-resistant bacteria in healthcare system. [1] There is also a National Health Commission as well as a National Action Plan to Contain Antimicrobial Resistance of Animal Origin (2017-2020) from the Ministry of Agriculture that lists among its goals: (a) to improve the monitoring system for veterinary antibacterial drugs; (b) to establish and improve the technical standards and assessment system for the application of veterinary antibacterial drugs and bacterial resistance monitoring; and (c) to form a monitoring network covering the whole country, with reasonable layout and smooth operation. [2]

[1] National Health Commission of the People's Republic of China. 26 August 2016. "National Action Plan to Contain Antimicrobial Resistance (2016-2020)". [<https://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 12 December 2020.

[2] Ministry of Agriculture of the People's Republic of China. 20 July 2017. "National Action Plan to Contain Antimicrobial Resistance of Animal Origin (2017-2020) 全国遏制动物源细菌耐药行动计划 (2017-2020 年)". [http://www.moa.gov.cn/nybg/b/2017/dqq/201801/t20180103_6133925.htm]. Accessed 12 December 2020."

1.1.1b

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

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

Current Year Score: 2

China has a laboratory system, with designated sentinel sites, that can test for all 7+1 priority AMR pathogens. The Ministry of Health established a National Antibacterial Resistance Surveillance Net (Mohnarin) in 2005 to monitor bacterial resistance. The current iteration of the surveillance network is the China Antimicrobial Resistance Surveillance System (CARSS). CARSS engages primarily in passive monitoring, but active and targeted monitoring is carried out from time to time. [1, 2] Mohnarin

started with 109 hospitals and was then expanded to 1429 hospitals (data for 2019, published in November 2020). Annual reports by CARSS indicate that regular testing occurs for the following priority AMR pathogens: CTX-R ECO (Cefotaxime-resistant *Escherichia coli*); IPM-R ECO (Imipenem-resistant *Escherichia coli*); IPM-R KPN (Imipenem-resistant *Klebsiella pneumoniae*); MRSA (Methicillin-resistant *Staphylococcus aureus*); and PRSP (penicillin-resistant *S. pneumoniae*). [1, 3] Academic publications indicate that in addition to national-level public laboratories, there are provincial- and municipal-level public laboratories that have the capability to test for *Salmonella* spp., *Shigella* spp, *N. gonorrhoeae*, and *Mycobacterium tuberculosis*. [4, 5, 6, 7]

- [1] Wang, Li, Xiulan Zhang, Xiaoyun Liang, and Gerald Bloom. 2016. "Addressing antimicrobial resistance in China: policy implementation in a complex context". *Globalization and Health* 12:30. [https://doi.org/10.1186/s12992-016-0167-7]. Accessed 12 December 2020.
- [2] China Antimicrobial Resistance Surveillance System (CARSS) (全国细菌耐药监测网). "About CARSS (关于全国细菌耐药监测网)". [http://www.carss.cn/Contact]. Accessed 12 December 2020.
- [3] China Antimicrobial Resistance Surveillance System (CARSS) (全国细菌耐药监测网). "National Bacterial Resistance Monitoring Reports". [http://www.carss.cn/Report/Details/770]. Accessed 12 December 2020.
- [4] Song, Qifa, Zhaojun Xu, Hong Gao, and Danyang Zhang. 2018. "Overview of the development of quinolone resistance in *Salmonella* species in China, 2005-2016". *Infection and Drug Resistance* 11: 267–274. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5833789/]. Accessed 12 December 2020.
- [5] Liu, Hongbo, Binghua Zhu, Shaofu Qiu, Yidan Xia, Beibei Liang, Chaojie Yang, Nian Dong, Yongrui Li, Ying Xiang, Shan Wang, Jing Xie, Muti Mahe, Yansong Sun, and Hongbin Song. 2018. "Dominant serotype distribution and antimicrobial resistance profile of *Shigella* spp. in Xinjiang, China". *PLoS ONE* 13 [4] : e0195259. [https://doi.org/10.1371/journal.pone.0195259]. Accessed 12 December 2020.
- [6] Yin, Yue-Ping Yan Han, Xiu-Qin Dai, He-Ping Zheng, Shao-Chun Chen, Bang-Yong Zhu, Gang Yong, Na Zhong, Li-Hua Hu, Wen-Ling Cao, Zhong-Jie Zheng, Feng Wang, Qi Zhi, Xiao-Yu Zhu, and Xiang-Sheng Chen. 2018. "Susceptibility of *Neisseria gonorrhoeae* to azithromycin and ceftriaxone in China: A retrospective study of national surveillance data from 2013 to 2016". *PLoS Med* 15 [2] : e1002499. [https://doi.org/10.1371/journal.pmed.1002499]. Accessed 12 December 2020.
- [7] Yang, Chongguang, Xin Shen, Ying Peng, Rushu Lan, Yuling Zhao, Bo Long, Tao Luo, Guomei Sun, Xia Li, Ke Qiao, Xiaohong Gui, Jie Wu, Jiying Xu, Fabin Li, Dingyue Li, Feiying Liu, Mei Shen, Jianjun Hong, Jian Mei, Kathryn DeRiemer, and Qian Gao. 2015. "Transmission of *Mycobacterium tuberculosis* in China: A Population-Based Molecular Epidemiologic Study". *Clinical Infectious Diseases* 61 [2] : 219-227. [https://doi.org/10.1093/cid/civ255]. Accessed 12 December 2020.

1.1.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that the Chinese government regularly conducts detection or surveillance activities for antimicrobial residues or AMR organisms. China's national AMR plan specifies as one of its goal, "to improve the capacity-building of surveillance techniques and regulations about antimicrobials environmental pollution in water, soil, and solid waste. To carry out research on the ecological impact of antibacterial agent contamination, develop the prevention and management strategies of antimicrobials environmental pollution, and promote the emission reduction of antibacterial agents waste". The AMR tasks the Ministry of Environmental Protection with "the prevention and control of environmental contamination, law enforcement, and capacity building of environmental surveillance associating with antibacterial agents".

[1] Since the publication of China's national AMR plan, the Ministry of Environmental Protection has been reorganized and renamed the Ministry of Ecology and Environment (MEE). The MEE runs a national surface water quality automatic monitoring real-time data release system that monitors levels of pH, DO (dissolved oxygen), CODMn (permanganate index), and NH₃-N (ammonia nitrogen). [2] Additionally, the MEE has conducted some environmental detection in water bodies. For instance, between 2015-2017, a special survey of antimicrobial organisms was conducted in river basins such as the Yangtze River and the Yellow River. [3] However, there is no evidence that regularly monitors antimicrobial residues or AMR organisms.

[1] National Health Commission of the People's Republic of China. 26 August 2016. "National Action Plan to Contain Antimicrobial Resistance (2016-2020)". [<https://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 12 December 2020.

[2] Ministry of Ecology and Environment of the People's Republic of China. [<http://www.mee.gov.cn/>]. Accessed 15 January 2021.

[3] Ministry of Ecology and Environment of the People's Republic of China. 21 September 2020. "Response to Recommendation 1247 from the Third Session of the 13th National People's Congress."

[http://www.mee.gov.cn/xxgk2018/xxgk/xxgk13/202011/t20201124_809435.html]. Accessed 12 December 2020.

1.1.2 Antimicrobial control

1.1.2a

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

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

Current Year Score: 1

China has national regulation in place requiring prescriptions for antibiotic use for humans. In 2003, China's State Food and Drug Administration issued Notice 289, effective from July 2004, which specified five types of antibacterial drugs that can be sold only with a doctor's prescription: antibiotics, sulfonamides, quinolones, anti-tuberculous drugs, and antifungal agents.

[1] In 2006, the Ministry of Health issued Order 53 to formally regulate prescriptions in general. [2] In 2016, the government announced a goal of prescription-only antibiotics by 2020. However, to date, it is still relatively easy to obtain antibiotics without prescriptions in community and retail pharmacies in urban China, indicating there are gaps in enforcement. [3, 4]

[1] China Food and Drug Administration (CFDA). Notice No. 289 of 2003. "Notice of State Food and Drug Administration to strengthen the regulation of sales of antibacterial drugs in retail pharmacies to promote rational drug use (国家食品药品监督管理局关于加强零售药店抗菌药物销售监管促进合理用药的通知)".

[http://law.pharmnet.com.cn/laws/detail_1057.html]. Accessed 12 December 2020.

[2] Ministry of Health of the People's Republic of China. Order No. 53 of 2006. "Prescription Administration (处方管理办法)". [http://www.gov.cn/flfg/2007-03/13/content_549406.htm]. Accessed 12 December 2020.

[3] Chang, Jie, Dan Ye, Bing Lv, Minghuan Jiang, Shan Zhu, Kangkang Yan, Yun Tian, Yu Fang. 2017. "Sale of antibiotics without a prescription at community pharmacies in urban China: a multicentre cross-sectional survey". *Journal of Antimicrobial Chemotherapy* 72

[4] : 1235–1242. [<https://doi.org/10.1093/jac/dkw519>]. Accessed 12 December 2020.

[4] Chen, J., Wang, Y., Chen, X., et al. 2020. "Widespread illegal sales of antibiotics in Chinese pharmacies - a nationwide cross-sectional study." *Antimicrobial Resistance & Infection Control* 9

[12]. [<https://doi.org/10.1186/s13756-019-0655-7>]. Accessed 12 December 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

China has national regulations in place requiring prescriptions for antibiotic use for animals. There are several regulations that pertain to veterinary use of antibiotics in China. The Ministry of Agriculture (MOA) banned the use of chloramphenicol and nitrofurans in the animal production with MOA Notice No. 193 in 2002. [1] MOA Notice No. 839 banned direct injections of chlortetracycline hydrochloride and oxytetracycline in 2007. [2] The MOA has also put forth two lists of veterinary antibiotics that require veterinary prescriptions with Notice No.1997 and Notice No. 2471. [3, 4] Although the government has made efforts to enforce these regulations and reduce the use of antibiotics in farming by publishing the volume of antibiotics use by the country's livestock farms, the majority of farmers surveyed bought antibiotics without prescriptions and did not keep records of their usage. [5]

[1] Ministry of Agriculture of the People's Republic of China (MOA). Notice No. 193 of 2002. 15 April 2002. "List of Veterinary Medicine and Other Compounds Banned for Use in Food Animals (食品动物禁用的兽药及其他化合物清单)". [http://www.moa.gov.cn/gk/tzgg_1/gg/200210/t20021022_16454.htm]. Accessed 12 December 2020.

[2] Ministry of Agriculture of the People's Republic of China (MOA). Notice No. 839 of 2007. 27 March 2007. "Announcement of the Ministry of Agriculture of the People's Republic of China, No. 839 (中华人民共和国农业部公告 第 839 号)". [http://www.moa.gov.cn/gk/tzgg_1/gg/200704/t20070412_801731.htm]. Accessed 12 December 2020.

[3] Ministry of Agriculture of the People's Republic of China (MOA). Notice No. 1997 of 2013. "Catalogue of Veterinary Prescription Drugs—Part One (兽用处方药品种目录 (第一批))". [http://jiuban.moa.gov.cn/sjzz/syj/dongtai/201310/t20131010_3625542.htm]. Accessed 15 January 2021.

[4] Ministry of Agriculture of the People's Republic of China (MOA). Notice No. 2471 of 2016. "Catalogue of Veterinary Prescription Drugs—Part Two (兽用处方药品种目录 (第二批))". [http://jiuban.moa.gov.cn/zwl/m/tzgg/gg/201612/t20161201_5386856.htm]. Accessed 15 January 2021.

[5] Schoenmakers, Kevin. 21 October 2020. "How China is getting its farmers to kick their antibiotics habit." Nature. [https://www.nature.com/articles/d41586-020-02889-y]. Accessed 12 December 2020.

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

China has developed and enacted a series of laws and regulations for the prevention and control of zoonotic diseases, including a Law on Animal Epidemic Prevention in 1997 (amended in 2007) and Regulations on Emergency Response to Major Animal Diseases in 2005. The law does not identify specific diseases, but it specifies in Article 1 that the purpose of strengthening the administration of animal epidemic prevention is to protect human health and maintain public health and safety. The law also includes three categories of diseases (Category I: epidemics that require emergency and rigorous measures, Category II: epidemics that require strict measures; Category III: epidemics that are common and frequently occurring), while the regulations on Emergency Response specify avian influenzas. The Law on Animal Epidemic Prevention in 1997 (amended in 2007) has sections that cover the report, notification and announcement of animal epidemic situation; the

control and elimination of animals epidemics; the quarantine of animals and animal products; and the diagnosis and treatment of animal disease. Supplementing the Law on Animal Epidemic Prevention, the Regulations on Emergency Response to Major Animal Diseases in 2005 call on the veterinary departments at various levels of government, e.g. county, prefecture, province, to have emergency plans for different zoonotic diseases. [1, 2] China has also issued other zoonotic disease-related plans: National Contingency Plan for Major Animal Diseases and the Terrestrial Wild Animal Epidemic Sources and Disease Monitoring Standards. [3]

[1] President of the People's Republic of China. Order No. 71 of 2007. "Law of the People's Republic of China on Animal Epidemic Prevention". [http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471591.htm]. Accessed 12 December 2020.

[2] State Council of the People's Republic of China. Order No. 450 of 2005. 18 November 2005. "Regulations on Emergency Response to Major Animal Diseases (重大动物疫情应急条例)". [http://www.gov.cn/zwggk/2005-11/20/content_103923.htm]. Accessed 12 December 2020.

[3] Liu, Q., Cao, L., and Zhu, X. August 2014. "Major emerging and re-emerging zoonoses in China: a matter of global health and socioeconomic development for 1.3 billion." *International Journal of Infectious Diseases* 25: 65-72. [<https://doi.org/10.1016/j.ijid.2014.04.003>]. Accessed 12 December 2020.

1.2.1b

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

Yes = 1, No = 0

Current Year Score: 1

There is national legislation that includes measures for risk identification and reduction for zoonotic disease spillover events from animals to humans. Per the Law on Animal Epidemic Prevention in 1997 (amended in 2007), the Chinese government prioritizes prevention of animal epidemics and charges the Department for Veterinary Medicine under the State Council of animal epidemic prevention. It also notes that units and individuals engaged in animal raising, slaughtering, marketing, isolating, and transporting, as well as animal product manufacturing, marketing, processing, and storage will abide by the provisions of the Law. Chapter II outlines provisions that note how breeding and raising of livestock must adhere to health standards such as keeping a distance from public places including sources of drinking water, schools, hospitals, and residential areas; monitoring of outbreaks; regular inspections; etc. [1] Furthermore, in 2010, the Ministry of Agriculture updated the 2002 order on the "Measures for Management of Animal Diseases inspection" to ensure the safety of animal products and protect human health. The order includes requirements for establishing local and county-level official veterinaries to be in charge of animal disease inspection, an application system to move animals and animal products, certificates issuance upon passing inspection, etc. [2] China's Wildlife Protection Law (enacted in 1989, revised in 2016 and then again in 2018) contains an article prohibiting the sale or purchase of wild animals without appropriate approvals and notes that wild animals traded in marketplaces like wet markets and outside of market places are subject to oversight and inspection by wildlife and market authorities. [3] In response to COVID-19, the Standing Committee of the National People's Congress (NPCSC) passed a fast-track legislative decision on February 24, 2020, the "NPCSC Decision on Completely Prohibiting the Illegal Wildlife Trade, Eliminating the Bad Habit of Indiscriminately Eating Wild Animals, and Truly Ensuring the Health and Safety of the People." Section 5 and 6 of the legislative decision includes legal ramifications for consuming wild animals and tasks the government at all levels to engage in education campaigns about the risks of consuming wild animals. [4]

[1] President of the People's Republic of China. Order No. 71 of 2007. "Law of the People's Republic of China on Animal Epidemic Prevention". [http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471591.htm]. Accessed 12

December 2020.

[2] Ministry of Agriculture of the People's Republic of China. Order No. 6 of 2010. 21 January 2010. "Measures for Management of Animal Diseases Inspection (动物检疫管理办法)". [http://www.gov.cn/zwgk/2010-01/28/content_1521668.htm]. Accessed 12 December 2020.

[3] Standing Committee of the National People's Congress (NPCSC). 5 November 2018. "Wildlife Protection Law (中华人民共和国野生动物保护法)". [<https://perma.cc/Q7BS-3HAZ>]. Accessed 13 December 2020.

[4] Standing Committee of the National People's Congress (NPCSC). 24 February 2020. "Decision on Completely Prohibiting the Illegal Wildlife Trade, Eliminating the Bad Habit of Indiscriminately Eating Wild Animals, and Truly Ensuring the Health and Safety of the People (全国人民代表大会常务委员会关于全面禁止非法野生动物交易、革除滥食野生动物陋习、切实保障人民群众生命健康安全的决定)". [<https://perma.cc/5LQV-AEB5>]. Accessed 13 December 2020.

1.2.1c

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

Yes = 1, No = 0

Current Year Score: 1

China has national plans and guidelines that account for the surveillance and control of multiple zoonotic pathogens of public health concern. The country has the following zoonotic disease-related plans: National Contingency Plan for Highly Pathogenic Avian Influenza (2004); Contingency Plan of Agricultural Authorities for Human Cases of Swine Influenza Trial (2009); Contingency Plan for Prevention and Control of Foot and Mouth Disease (2010); Contingency Plan for Influenza A H1N1 Infection in Swine Trial (2009); Contingency Plan for Prevention and Control of PPR (ovine rinderpest) (2009); Contingency Plan for Prevention and Control of Equine Influenza (2008); and Contingency Plan of Agricultural Authorities for Human Cases of Highly Pathogenic Avian Influenza (2005). [1] The National Contingency Plan for Highly Pathogenic Avian Influenza covers outbreak confirmation procedures, criteria on classifying the seriousness of the outbreak, division of labour within the emergency command system, outbreak control measures, and security measures. [2] The Contingency Plan of Agricultural Authorities for Human Cases of Swine Influenza Trial also covers outbreak confirmation procedures, e.g. reporting to the National Disease Surveillance Information Reporting Management System within 2 hours, as well as epidemiological field investigations and sample testing in the laboratory and emergency response. [3] The Contingency Plan for Prevention and Control of Foot and Mouth Disease required the creation of a monitoring system and database for foot-and-mouth disease and set out reporting procedures and deadlines in potential epidemic situations and emergency response. [4]

[1] Ministry of Agriculture of the People's Republic of China Veterinary Bureau. "Animal Health in China 2012 [1] ". 14 November 2014. [<http://jiuban.moa.gov.cn/sjzz/syj/kjybz/201310/P020131024580359130205.pdf>]. Accessed 15 January 2021.

[2] State Council of the People's Republic of China. Order 450 of 3 February 2004. "National Contingency Plan for Highly Pathogenic Avian Influenza (全国高致病性禽流感应急预案)". [http://www.gov.cn/gongbao/content/2004/content_63152.htm]. Accessed 13 December 2020.

[3] Ministry of Health of the People's Republic of China. 29 April 2009. "Contingency Plan of Agricultural Authorities for Human Cases of Swine Influenza Trial (人感染猪流感预防控制技术指南)". [http://www.gov.cn/zwgk/2009-04/30/content_1300891.htm]. Accessed 13 December 2020.

[4] Ministry of Agriculture of the People's Republic of China. 27 March 2010. "Contingency Plan for Prevention and Control of Foot and Mouth Disease (口蹄疫防控应急预案)".

[http://www.moa.gov.cn/nybg/b/2010/dsiq/201805/t20180530_6148362.htm]. Accessed 13 December 2020.

1.2.1d

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence of a cross-department, agency or similar unit dedicated to zoonotic disease that functions across ministries in China. Following an avian influenza (HPAI) outbreak in 2004, China established a Veterinary Bureau under the Ministry of Agriculture and appointed a Chief Veterinarian and stipulated that administrations at and above the county-level must establish Animal Disease Prevention and Control Centres specialized in the prevention, control, and eradication of animal diseases including zoonoses. [1] Affiliated with the Ministry of Agriculture, there are national institutions such as the China Animal Disease Control Center (CADC), China Institute of Veterinary Drug Control (IVDC), and the China Animal Health and Epidemiology Center (CAHEC). CADC is responsible for analysis of and response to outbreaks across the country, including major animal diseases. IVDC oversees quality control for animal drugs. CAHEC is responsible for diagnosis and surveillance of major animal diseases as well as supervision and inspection of the animal health and animal products' quality, and coordination of epidemiological research activities with other veterinary technical institutions. [2] While the CADC website seems to be updated through preview updates on a search engine from December 2020, the website is not accessible. [3] There is some evidence that there is coordination between the Ministry of Agriculture and the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ, which is directly administered by the State Council). [1] But on the websites of the MOA, IVDC, CAHEC, CADC, National Health Commission (China's Ministry of Health), there is no apparent link to other ministries for leadership or financial support. [2, 4, 5, 6]. Furthermore, though the Chinese Center for Disease Control and Prevention (CDC) does focus on zoonotic diseases (i.e. host conferences with the CADC, does research, etc.), it is not immediately clear to the public that there is regular coordination between the Chinese CDC and the Ministry of Agriculture other than occasional conferences and meetings. [7]

[1] Zhang, Xiaodong. 27 March 2019. "Veterinary infectious diseases control in China." *Lancet Infectious Diseases* 2019; 14 [4] : 354-356. [<https://www.thelancet.com/journals/laninf/article/PIIS1473-3099>]

[19] 30117-3/fulltext]. Accessed 13 December 2020.

[2] Ministry of Agriculture of the People's Republic of China Veterinary Bureau. "Animal Health in China 2012 [1] ". 14 November 2014. [<http://jiuban.moa.gov.cn/sjzz/syj/kjybz/201310/P020131024580359130205.pdf>]. Accessed 13 December 2020.

[3] China Animal Disease Control Center (CADC). [<http://www.cadc.net.cn/>]. Accessed 15 January 2021.

[4] China Institute for Veterinary Drug Control (IVDC). [<http://www.ivdc.org.cn/>]. Accessed 13 December 2020.

[5] China Animal Health and Epidemiology Centre (CAHEC). [<http://www.cahec.cn/>]. Accessed 13 December 2020.

[6] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[7] Chinese Center for Disease Control and Prevention. 26 July 2019. "National Pathogenic Microbiology Laboratory Biosafety Strategy Research and Training Exchange Conference was held in Qingdao (全国病原微生物实验室生物安全战略研究和培训交流会在青岛召开)". [http://www.chinacdc.cn/yw_9324/201907/t20190726_204302.html]. Accessed on 13 December 2020.

1.2.2 Surveillance systems for zoonotic diseases/pathogens

1.2.2a

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

Yes = 1 , No = 0

Current Year Score: 1

China's 2007 Law on Animal Epidemic Prevention requires that individuals and groups involved in raising animals immediately report to the local government's veterinary medicine department or to an animal health supervision institution when they find or suspect an animal epidemic. The law also mandates that, "before slaughtering, selling or transporting animals, or selling or transporting animal products, the owner shall, according to the regulations of the administrative department for veterinary medicine under the State Council, submit an application to the local animal health supervision institution for quarantine. Upon receiving an application for quarantine, the animal health supervision institution shall, in a timely manner, appoint official veterinarians to perform on-the-spot quarantine on the animals and animal products; it shall issue quarantine certificates for the animals and animal products that have passed the quarantine and attach to them the quarantine marks."

[1] This mandatory livestock inspection serves as a disease surveillance mechanism for livestock owners.

[1] President of the People's Republic of China. Order No. 71 of 2007. "Law of the People's Republic of China on Animal Epidemic Prevention". [http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471591.htm]. Accessed 12 December 2020.

1.2.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is not sufficient evidence of guidelines that safeguard the confidentiality of livestock owners' information generated through surveillance activities for animals. Under the Law of the People's Republic of China on Animal Epidemic Prevention, units and individuals are encouraged to report on potential animal epidemics and Article 30 warns against false reports and concealing facts, but the law does not provide any protection of confidentiality. [1] Secondly, under China's national standard on personal information protection, property information is covered as "sensitive personal information." However, there is no explicit mention of the confidentiality of owners' information generated through surveillance activities for animals. [2] The websites of the National Health Commission (China's Ministry of Health), Ministry of Agriculture, and State Administration for Market Regulation do not have information about safeguarding the confidentiality of livestock owners' information generated through surveillance activities for animal. [3, 4, 5]

[1] President of the People's Republic of China. Order No. 71 of 2007. "Law of the People's Republic of China on Animal Epidemic Prevention". [http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471591.htm]. Accessed 12 December 2020.

[2] National Standard of the People's Republic of China GB/T 35273-2017. 30 November 2017. "Information Technology – Personal Information Security Specification (信息安全技术 个人信息安全规范)". [<https://www.tc260.org.cn/upload/2018-01-24/1516799764389090333.pdf>]. Accessed 13 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[4] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[5] State Administration for Market Regulation of the People's Republic of China. [https://en.nim.ac.cn/node/647]. Accessed 13 December 2020.

1.2.2c

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

Yes = 1 , No = 0

Current Year Score: 1

China conducts surveillance of zoonotic disease in wildlife. China's 2012 "Measures for the Monitoring, Prevention, and Management of Terrestrial Wild Animal Epidemic Diseases" mandates that the forestry authorities above the country administrative level establish monitoring stations for epidemic diseases of terrestrial wild animals in the following locations: (a) centralized distribution areas of terrestrial wild animals; (b) terrestrial wildlife migration channels; (c) terrestrial wild animals domestication and breeding areas and their product distribution centers; (d) Border areas with a high risk of spreading terrestrial wild animal diseases; (e) other areas prone to terrestrial wild animal diseases. [1] The National Forestry and Grassland Administration's disease monitoring and reporting system for wild animals already encompasses 350 national monitoring stations and 768 provincial, municipal, and county stations. [2] There is evidence of monitoring and inspection is detailed on the National Forestry and Grassland Administration of the People's Republic of China website. Just as one example, in 2016, the Shanghai Forestry Bureau and the Municipal Wildlife Protection Station issued a notice to solicit wild animal epidemic disease surveillance from all districts in the county. [3]

[1] Ministry of Agriculture of the People's Republic of China Veterinary Bureau. "Animal Health in China 2012 [1] ". 14 November 2014. [http://jiuban.moa.gov.cn/sjzz/syj/kjybz/201310/P020131024580359130205.pdf]. Accessed 15 January 2021.

[2] State Council of the People's Republic of China. Order 450 of 3 February 2004. "National Contingency Plan for Highly Pathogenic Avian Influenza (全国高致病性禽流感应急预案)". [http://www.gov.cn/gongbao/content/2004/content_63152.htm]. Accessed 13 December 2020.

[3] Ministry of Health of the People's Republic of China. 29 April 2009. "Contingency Plan of Agricultural Authorities for Human Cases of Swine Influenza Trial (人感染猪流感预防控制技术指南)". [http://www.gov.cn/zwgk/2009-04/30/content_1300891.htm]. Accessed 13 December 2020.

[4] Ministry of Agriculture of the People's Republic of China. 27 March 2010. "Contingency Plan for Prevention and Control of Foot and Mouth Disease (口蹄疫防控应急预案)". [http://www.moa.gov.cn/nybg/2010/dsiq/201805/t20180530_6148362.htm]. Accessed 13 December 2020.

1.2.3 International reporting of animal disease outbreaks

1.2.3a

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

Yes = 1 , No = 0

Current Year Score: 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: -

No data available

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: -

No data available

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 not sufficient evidence that China's zoonotic disease-related regulations include mechanisms for working with the private sector in controlling or responding to zoonoses. The Law on Animal Epidemic Prevention of 1997 (amended in 2007) and Regulations on Emergency Response to Major Animal Diseases of 2005 do not explicitly mention the private sector. [1, 2] There is no information on such a mechanism on the websites of the Ministry of Agriculture, National Health Commission, or Chinese Center for Disease Control and Prevention. [3, 4, 5]

[1] President of the People's Republic of China. Order No. 71 of 2007. "Law of the People's Republic of China on Animal Epidemic Prevention". [http://www.npc.gov.cn/zgrdw/englishnpc/Law/2009-02/20/content_1471591.htm]. Accessed 12 December 2020.

[2] State Council of the People's Republic of China. Order No. 450 of 2005. 18 November 2005. "Regulations on Emergency Response to Major Animal Diseases (重大动物疫情应急条例)". [http://www.gov.cn/zwgk/2005-11/20/content_103923.htm]. Accessed 12 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[4] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[5] China Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 13 December 2020.

1.3 BIOSECURITY

1.3.1 Whole-of- government biosecurity systems

1.3.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that China has a record, updated within the past 5 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. Until fairly recently, China has used the terms biosafety and biosecurity interchangeably. [1] According to the 2004 Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories, microorganisms categorized as Risk Group 1 or 2 are considered dangerous and laboratories working with such pathogens must keep a file on that microbial sample and document all activities involving it, e.g. research, storage, transport, etc. Risk Group 1 consists of pathogens that can cause very serious diseases in humans or animals and pathogens that have not been discovered or declared destroyed in China, e.g. Ebola, highly pathogenic avian influenza virus. Risk Group 2 consists of pathogens that can cause serious diseases in humans or animals and that can easily spread among humans and animals, e.g. hog cholera, Bacillus anthracis. Dangerous pathogens are stored separately from other research samples and must have extra security, e.g., electronic entrance codes to guarded entrance area. Furthermore, scientists cannot work alone with a pathogen from Risk Groups 1 or 2. Depositories of dangerous pathogens are designated by and answerable to the relevant authorities in the State Council, i.e. from the National Health Commission and Ministry of Agriculture. Detailed custody records are required. [2] In practice, China has one fully functional high-level biosafety laboratory (classified as a BSL-4). Over the last decade, it has also set up a number of BSL-3 labs. [3] In terms of biosecurity, China has submitted Confidence Building Measures under the Biological Weapons Convention for 1989 -2020; however, these are locked for viewing and are not publicly available. [4]

[1] Wang, Qian. 2014. "Efforts to Strengthen Biosecurity and Biosafety in China". [https://www.nonproliferation.org/wp-content/uploads/2014/02/070917_wang.pdf]. Accessed 13 December 2020.

[2] State Council of the People's Republic of China. Order No. 424 of 5 November 2004. "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/jwqk/2005-05/23/content_256.htm]. Accessed on 13 December 2020.

[3] Wu, Guizhen. September 2019. "Laboratory biosafety in China: past, present, and future." Biosafety and Health 1 [2] : 56-58. [<https://doi.org/10.1016/j.bsheal.2019.10.003>]. Accessed on 13 December 2020.

[4] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 13 December 2020.

1.3.1b

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

Yes = 1 , No = 0

Current Year Score: 1

China has regulations related to biosecurity that 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. Until fairly recently, China has used the terms biosafety and biosecurity interchangeably. [1] Three different legal documents regulate microbial strains should be categorized, stored, sold, used, acquired, transferred, and exchanged among laboratory facilities in China (1980 "Methods on Trial Management of Preservation of Veterinary-Microbiology Strains" (1980); "Methods on Management of Preservation of Medical-Microbiology Strains in China" (1985); "Rules on Management of the Preservation of Microbial Strains in China" (1986)). Laboratories need permission from the Ministry of Health and the Ministry of Agriculture to be able to work with certain pathogens; the more dangerous the pathogen, the more approvals are needed. In case of theft or loss, the incident must be reported to authorities within two hours. Dangerous pathogens must be stored separately with additional security. Laboratories who do not follow the rules will lose their license. [2, 3, 4, 5] On October 17, 2020, in response to COVID-19, the Standing Committee of the PRC National People's Congress passed the Biosecurity Law, which will go into effect on April 15, 2021. The Biosecurity Law is intended to establish a comprehensive legislative framework for the somewhat piecemealed regulations that cover epidemic control of infectious diseases for humans, animals, and plants; research development, and application of biotechnology; biosecurity management of human genetic resources and biological resources; countermeasures for microbial resistance; and prevention of bioterrorism and defending threats of biological weapons. Furthermore, the Law introduces an approval and recording system for biotech research and development activities, a management system for controlled essential equipment and special biological agents, and a biosecurity risk monitoring and early warning system. It also requires those who are involved with related research to engage in safety management and regular reporting, and to have emergency response plans to biosecurity incidents. [6, 7]

- [1] Wang, Qian. 2014. "Efforts to Strengthen Biosecurity and Biosafety in China". [https://www.nonproliferation.org/wp-content/uploads/2014/02/070917_wang.pdf]. Accessed 13 December 2020.
- [2] Hu, Longfei; Xiang, Dapeng; Shi, Yongxia; Huang, Jicheng; Zheng, Kui; Hong, Ye; Li, Xiaobo; and Xing, Luqin. "Chinese Biosafety Laws and Regulations, including Matters of Biosecurity and Oversight of Genetic Engineering Activities." [https://www.nonproliferation.org/wp-content/uploads/2014/02/070917_hu.pdf]. Accessed 15 January 2021.
- [3] Ministry of Agriculture of the People's Republic of China. 25 November 1980. "Methods on Trial Management of Preservation of Veterinary-Microbiology Strains (兽医微生物菌种保藏管理试行办法)". [http://www.moa.gov.cn/govpublic/CYZCFG/201006/t20100606_1532633.htm?keywords=]. Accessed 27 December 2020.
- [4] Ministry of Health of the People's Republic of China. 23 March 1985 "Methods on Management of Preservation of Medical-Microbiology Strains in China (中国医学微生物菌种保藏管理办法)". [<http://fgcx.bjcourt.gov.cn:4601/law?fn=chl213s077.txt>]. Accessed 27 January 2021.
- [5] State Science and Technology Commission of the People's Republic of China. 8 August 1986. "Rules on Management of the Preservation of Microbial Strains in China (中国微生物菌种保藏管理条例)". [http://pkulaw.cn/fulltext_form.aspx?Gid=2927&Db=chl]. Accessed 27 January 2021.
- [6] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)". [<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed 13 December 2020.
- [7] Lam, Horace; Fisher, William; Xiao, Ting. 21 October 2020. "China signs off on PRC Biosecurity Law: What this means for industry players in China." DLA Piper. [<https://www.dlapiper.com/en/us/insights/publications/2020/10/china-signs-off-on-prc-biosecurity-law-what-this-means-for-industry-players-in-china/>]. Accessed on 13 December 2020.

1.3.1c

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

Yes = 1, No = 0

Current Year Score: 1

There are established agencies responsible for the enforcement of biosecurity legislation and regulations. Per the 2020 Biosecurity Law (which will go into effect on April 15, 2021) Article 11, the National Coordination Mechanism for Biosecurity Work will consist of the State Council's Ministries in charge of health, agriculture and rural affairs, science and technology, foreign affairs, and military affairs. [1] In the past, the National Health Commission (formerly the Ministry of Health), Ministry of Science and Technology (formerly the State Science and Technology Commission), and Ministry of Agriculture have all put forth biosecurity related regulations. The National Health Commission and the Ministry of Agriculture were the main responsible authorities. They oversaw approvals for if/when a laboratory can work on certain microbial samples relevant to human and animal health, respectively; they are also the authorities that oversee incidents of theft, loss, and rule-breaking. [2]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".

[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed 13 December 2020.

[2] Wang, Qian. 2014. "Efforts to Strengthen Biosecurity and Biosafety in China". [https://www.nonproliferation.org/wp-content/uploads/2014/02/070917_wang.pdf]. Accessed 13 December 2020.

1.3.1d

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that China is taking actions to control inventories of especially dangerous pathogens. Although under the new Biosecurity Law, Article 42 notes that high-level laboratories engaging in activities with highly pathogenic or suspected highly pathogenic microbes must be approved by the government, China is also seeking to expand the number of labs that are equipped to work with the highest risk pathogens. Currently, China only has one BSL-4 (biosafety level 4) laboratories. However, China has a plan to build between five and seven BSL-4 labs across the country by 2025, thus seeking to expand the number of facilities capable of working with the highest risk pathogens over the next few years. [1, 2, 3] There is no information about this topic on the websites of the National Health Commission, Ministry of Defense, Ministry of Agriculture, Ministry of Science and Technology, or Chinese Center for Disease Control and Prevention. [4, 5, 6, 7, 8] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [9] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate there is an effort to consolidate inventories of especially dangerous pathogens and toxins into a minimum number of facilities. [10]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".

[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed on 13 December 2020.

[2] Cyranoski, David. 22 February 2017. "Inside the Chinese lab poised to study world's most dangerous pathogens." Nature 542: 399-400. [<https://pubmed.ncbi.nlm.nih.gov/28230144/>]. Accessed on 13 December 2020.

[3] Xia, Han; Huang, Yi; Liu, Bobo; Xie, Weiwei; Song, Donglin; and Yuan, Zhiming. May 2019. "Biosafety Level 4 Laboratory User Training Program, China." Emerging Infectious Disease 25

[5]. [<https://doi.org/10.3201/eid2505.180220>]. Accessed on 13 December 2020.

- [4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.
- [5] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 15 January 2021.
- [6] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 January 2021.
- [7] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 15 January 2021.
- [8] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 15 January 2021.
- [9] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 15 January 2021.
- [10] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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 anthrax. Following an anthrax outbreak in Gansu Province in August 2016, scientists from the Chinese Centre for Disease Control and Prevention and from the Gansu Provincial Center for Disease Control and Prevention tested bacteria isolated from collected samples using many different tests, including real-time PCR. [1] There is insufficient evidence of in-country capacity to conduct PCR-based diagnostic testing for Ebola. The Chinese Center for Disease Control and Prevention has training documents on its website about testing for Ebola, including PCR-based diagnostic testing, but does not explicitly mention in-country capacity to conduct PCR-based diagnostic testing for Ebola. [2] During the 2014 Ebola outbreak in Sierra Leone, the China Mobile Laboratory in Sierra Leone used PCR testing kits developed by Chinese companies. [3]

- [1] Yu, Deshan et al. 2018. "Investigation and source-tracing of an anthrax outbreak in Gansu Province, China". PLoS ONE 13 [8] : e0203267. [<https://doi.org/10.1371/journal.pone.0203267>]. Accessed 13 December 2020. 2] Chinese Center for Disease Control and Prevention. 5 November 2014. "Ebola hemorrhagic fever laboratory testing program (version 3) (埃博拉出血热实验室检测方案 (第三版))". [http://www.chinacdc.cn/jkzt/crb/qt/ablcxr/jszl_2273/]. Accessed 15 January 2021.
- [3] Zhang, Xiao-Ai et al. 2017. "A sensitive and specific point-of-care detection assay for Zaire Ebola virus". Emerging Microbes and Infections 6[1] : e5. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5285498/>]. Accessed 15 January 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 train-the-trainer program, for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential?

Yes = 1 , No = 0

Current Year Score: 0

Although there is evidence that training is required, there is insufficient evidence to demonstrate that there is a standardized approach to training. Per the new 2020 Biosecurity Law (which will go into effect on April 15, 2021), Article 21 notes that governments at the county-level or above and relevant departments must draft plans for personnel training and emergency

drills for individuals working with especially dangerous pathogens. Article 35 further notes that units engaged in research, development, and application of biotechnologies are responsible for biosecurity training and emergency response drills but does not specify what the training needs to entail. Article 7 notes that related scientific and research institutes or medical establishments must include biosecurity laws in their education or training curricula. [1] Additionally, for the one biosafety level 4 laboratory in China, there is a user training program developed by the Wuhan Institute of Virology, housed at the Chinese Academy of Sciences. The training program involves theoretical and hands-on training to cover safety, use of laboratory equipment, biosecurity principles and regulations, and emergency protocols. The training program was modeled after international training programs. [2] The "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories" state that laboratory personnel should be properly trained, but do not specify any type of curriculum. [3] There is no mention of a standardized training curriculum for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential on the websites of the National Health Commission, Ministry of Defense, Ministry of Agriculture, nor the Ministry of Science and Technology. [4,5,6,7] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [8] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate there is an effort to require standardized training. [9]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".

[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed on 13 December 2020.

[2] Xia, Han; Huang, Yi; Liu, Bobo; Xie, Weiwei;; Song, Donglin; and Yuan, Zhiming. May 2019. "Biosafety Level 4 Laboratory User Training Program, China." *Emerging Infectious Disease* 25

[5]. [<https://doi.org/10.3201/eid2505.180220>]. Accessed on 13 December 2020.

[3] State Council of the People's Republic of China. Order No. 424 of 5 November 2004. "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories (病原微生物实验室生物安全管理条例)".

[<http://www.nhc.gov.cn/fzs/s3576/201808/90c784098bab4b5296ea367c9572363b.shtml>]. Accessed 13 December 2020.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[5] Ministry of National Defence of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 13 December 2020.

[6] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[7] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 13 December 2020.

[8] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 13 December 2020.

[9] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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

There is no evidence that there is regulation or licensing conditions that specify drug testing, background checks, or psychological checks for personnel with access to especially dangerous pathogens, toxins, or biological materials. The new Biosecurity Law of 2020 (to go into effect April 15, 2021) Article 49 acknowledges the importance of securing laboratories to prevent leaks, loss, and theft of highly pathogenic microbes. It also notes that the state is to establish systems for personnel review for higher-level pathogenic microbiology laboratories, however does not explicitly specify the need for a drug test or a test of mental/psychological fitness. [1] The 2004 "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories" also does not explicitly mandate that personnel undergo drug testing, background checks, and psychological or mental fitness checks. [2] Though it is common practice for employers in China to run background checks on job applicants and job applicants are often asked to provide a "Certificate of No Criminal Conviction" (CNCC) from the local public security bureau before beginning employment, there is no information on the websites of National Health Commission, Ministry of Defense, Ministry of Agriculture, Ministry of Science and Technology, or Chinese Center for Disease Control and Prevention. [3, 4, 5, 6, 7, 8] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [9] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate there is a requirement related to personnel drug testing, background checks, or psychological checks. [10]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".

[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed on 13 December 2020.

[2] State Council of the People's Republic of China. Order No. 424 of 5 November 2004. "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories (病原微生物实验室生物安全管理条例)".

[<http://www.nhc.gov.cn/fzs/s3576/201808/90c784098bab4b5296ea367c9572363b.shtml>]. Accessed 13 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[4] Ministry of National Defence of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 13 December 2020.

[5] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[6] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 13 December 2020.

[7] China Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 13 December 2020.

[8] Davis Wright Tremaine LLP. 27 December 2010. "The Ins and Outs of Employment Background Checks in China".

[https://www.dwt.com/advisories/The_Ins_and_Outs_of_Employment_Background_Checks_in_China_12_27_2010/]. Accessed 13 December 2020.

[9] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 15 January 2021.

[10] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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

China has publicly available information on national regulations on the safe and secure transport of infectious substances (Categories A and B). The 2004 "Regulations on Biosafety Management of Laboratories with Pathogenic Microorganisms" mandate that strains or samples of highly pathogenic microorganisms must be escorted by at least two people during transport. [1] The Ministry of Health has regulations (Order No. 45 of 2005) on the packaging, labelling, and permission requirements for transporting highly pathogenic biological substances and mentions Category A and B. [2] The Ministry of Agriculture has guidance (Notice No. 503 of 2005) on how various types of highly pathogenic animal microbial strains and samples must be packaged for transport. [3]

[1] State Council of the People's Republic of China. Order No. 424 of 2004. "Regulations on Biosafety Management of Laboratories with Pathogenic Microorganisms (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/zwgg/2005-05/23/content_256.htm]. Accessed 13 December 2020.

[2] Ministry of Health of the People's Republic of China. Order No. 45 of 2005. "Regulations on Transportation Management of Highly Pathogenic Microbial Strains or Samples of Microorganisms Contagious to Humans (可感染人类的高致病性病原微生物菌(毒)种或样本运输管理规定)". [http://www.chinacdc.cn/flfg/xzfg/200602/t20060201_41077.html]. Accessed 13 December 2020.

[3] Ministry of Agriculture of the People's Republic of China. Notice No. 503 of 2005. "Packaging Criterion for Transportation of Highly Pathogenic Animal Microbial Strains or Samples (高致病性动物病原微生物菌(毒)种或者样本运输包装规范)". [http://www.law-lib.com/law/law_view.asp?id=111388]. Accessed 13 December 2020.

1.3.5 Cross-border transfer and end-user screening

1.3.5a

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

Yes = 1, No = 0

Current Year Score: 1

China has national guidance in place to oversee the cross-border transfer and end-user screening of especially dangerous pathogens, toxins and pathogens with pandemic potential. Order No. 45 of 2005 from the Ministry of Health states that all laboratories seeking to transport especially pathogenic substances must submit an application and receive approval from the Ministry of Health. [1] Decree No. 365 of 14 October 2002 from the State Council established strict export controls for biological agents (as well as equipment and technologies that may be dual-use). The import and export of biological samples on the export control list is prohibited; the list includes some human and animal pathogens as well as toxins. Among the pathogens on the list: Bacillus anthracis, Ebola virus, African swine virus. Certificates of end-user and end-use are required as part of the application package to request permission to use dual-use biological agents. [2]

[1] Ministry of Health of the People's Republic of China. Order No. 45 of 2005. "Regulations on Transportation Management of Highly Pathogenic Microbial Strains or Samples of Microorganisms Contagious to Humans (可感染人类的高致病性病原微生物菌(毒)种或样本运输管理规定)". [http://www.chinacdc.cn/flfg/xzfg/200602/t20060201_41077.html]. Accessed 13 December 2020.

[2] State Council of the People's Republic of China. Decree No. 365 of 14 October 2002. "Regulations on the Export Control of Dual-Use Biological Agents and Related Equipment and Technologies and Export Control List". [http://english.court.gov.cn/2015-09/11/content_21845462.htm]. Accessed 13 December 2020.

1.4 BIOSAFETY

1.4.1 Whole-of-government biosafety systems

1.4.1a

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

Yes = 1 , No = 0

Current Year Score: 1

China has in place several national biosafety regulations. The 2004 "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories" and the 2008 "Laboratories: General Requirements for Biosafety" both regulate laboratory administration and biosafety practices. They call for the safe design and construction of laboratories, establishment of standard operational procedures, annual review of the facility's safety plan, maintenance of research records, and provision of reports to oversight authorities. [1, 2]. China has a six-level laboratory biosafety management framework that applies to biosafety laboratories and institutes with such laboratories. [3] There are four levels of laboratory biosafety (BSL 1-4), which determine what pathogens laboratories are allowed to work with. China has one BSL-4-laboratory. Such BSL-4 laboratories have strict biocontainment requirements, including filtering air and treating water and waste before they leave the laboratory and stipulating that researchers change clothes and shower before and after using lab facilities. [4, 5] The 2004 "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories" also mandate certain procedures to protect staff who work with dangerous substances. Laboratories must provide protective equipment and if necessary, arrange for vaccinations. Laboratories working with highly pathogenic microorganisms need to conduct health monitoring of laboratory staff, e.g. organize annual physical examinations every year. [2]

[1] General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of the People's Republic of China. 2008. "Laboratories: General Requirements for Biosafety (实验室生物安全通用要求)".

[<http://www.sific.com.cn/static/upload/source/20170605/4595934ba97395de7.pdf>]. Accessed 13 December 2020.

[2] State Council of the People's Republic of China. Order No. 424 of 2004. "Regulations on Biosafety Management of Laboratories with Pathogenic Microorganisms (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/zwgk/2005-05/23/content_256.htm]. Accessed 13 December 2020.

[3] Wu, Guizhen. September 2019. "Laboratory biosafety in China: past, present, and future." Biosafety and Health 1 [2] : 56-58. [<https://doi.org/10.1016/j.bsheal.2019.10.003>]. Accessed 13 December 2020.

[4] Cyranoski, David. 22 February 2017. "Inside the Chinese lab poised to study world's most dangerous pathogens." Nature 542: 399-400. [<https://pubmed.ncbi.nlm.nih.gov/28230144/>]. Accessed on 13 December 2020.

[5] Wang, Keju. 6 January 2018. "Top-level biosafety lab begins work". China Daily. [<http://www.chinadaily.com.cn/a/201801/06/WS5a50063ca31008cf16da565b.html>]. Accessed 13 December 2020.

1.4.1b

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

Yes = 1 , No = 0

Current Year Score: 1

There are established agencies responsible for the enforcement of biosafety legislation and regulations. In 2004, the Office of Laboratory Management in the Chinese Center for Disease Control and Prevention (CDC) was established. This office was charged to establish and improve the laboratory biosafety management system. [1] China National Accreditation Service for Conformity Assessment (CNAS) oversees the laboratory biosafety accreditation process. [2] The 2004 "Regulations on

Administration of Biosafety in Pathogenic Microorganism Laboratories" mandate certain procedures to protect staff who work with dangerous substances, e.g. protective equipment, vaccinations (if necessary), annual physical examinations. The National Health Commission and the Ministry of Agriculture are responsible for overseeing the enforcement of biosafety regulations related to working with human and animal pathogens, respectively. [3]

[1] Wu, Guizhen. September 2019. "Laboratory biosafety in China: past, present, and future." Biosafety and Health 1

[2] : 56-58. [<https://doi.org/10.1016/j.bsheal.2019.10.003>]. Accessed 13 December 2020.

[2] China National Accreditation Service for Conformity Assessment (CNAS). "Rules for the Accreditation of Laboratory Biosafety (实验室生物安全认可规则)".

[<https://www.cnas.org.cn/images/rkgf/sysrk/rkgz/2016/05/11/F83BCA1857694DB36BA34290BDDC39FF.pdf>]. Accessed 13 December 2020.

[3] State Council of the People's Republic of China. Order No. 424 of 2004. "Regulations on Biosafety Management of Laboratories with Pathogenic Microorganisms (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/zwggk/2005-05/23/content_256.htm]. Accessed 13 December 2020.

1.4.2 Biosafety training and practices

1.4.2a

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

Yes = 1, No = 0

Current Year Score: 0

There is evidence that there is required biosafety training with some level of standardization, but there is insufficient evidence to conclude that there is a common curriculum. The regulations governing laboratory biosafety ("Laboratories: General Requirements for Biosafety" and "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories") state that laboratory personnel should be properly trained, but do not specify any type of curriculum. [1, 2] Since 2006, health administrative departments and laboratories at different levels have offered their own laboratory biosafety training programs. In 2008, the China Center for Disease Control and Prevention (CDC) published a video on "Lab Biosafety of Pathogenic Microorganisms", which has been used for large-scale trainings at various disease control institutions. [3] The Chinese CDC and the China Certification and Accreditation Institute periodically run biosafety and biosecurity training courses for laboratory personnel, but there is no indication that the training utilized a standardized curriculum. Past training courses have covered many biosafety-related topics: domestic and international laboratory biosafety regulations, laboratory biosafety management system, risk assessment of pathogenic microorganisms and experimental activities, laboratory facilities and equipment, use and maintenance of important instruments and equipment, management of pathogenic bacteria and samples, management and disposal of medical waste, personal laboratory biosafety precautions, operation of a biosafety laboratories, and packaging of infectious materials. [4] There is no mention of a standardized required training curriculum for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential on the websites of the National Health Commission, Ministry of Defense, Ministry of Agriculture, Ministry of Science and Technology. [5, 6, 7, 8] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [9] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate there is a requirement for training using a standardized approach. [10]

- [1] General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of the People's Republic of China. 2008. "Laboratories: General Requirements for Biosafety (实验室生物安全通用要求)". [<http://www.sific.com.cn/static/upload/source/20170605/4595934ba97395de7.pdf>]. Accessed 13 December 2020.
- [2] State Council of the People's Republic of China. Order No. 424 of 2004. "Regulations on Biosafety Management of Laboratories with Pathogenic Microorganisms (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/zwgg/2005-05/23/content_256.htm]. Accessed 13 December 2020.
- [3] Wu, Guizhen. September 2019. "Laboratory biosafety in China: past, present, and future." *Biosafety and Health* 1 [2] : 56-58. [<https://doi.org/10.1016/j.bsheal.2019.10.003>]. Accessed 13 December 2020.
- [4] Chinese Association for Laboratory Animal Sciences. 5 September 2018. "Notice on the 'Laboratory Biosafety' training course for BSL-2 and 3 (关于举办 BSL-2/3 实验室生物安全培训的通知)". [<http://www.calas.org.cn/index.php?m=content&c=index&a=show&catid=20&id=2168>]. Accessed 14 December 2020.
- [5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.
- [6] Ministry of National Defence of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 13 December 2020.
- [7] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.
- [8] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 13 December 2020.
- [9] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 15 January 2021.
- [10] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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

Though the Chinese government has publicly acknowledged the importance of dual use biological research as an issue and a risk [1, 2], there is no publicly available information about assessments of ongoing research involving dual use pathogens on the websites of the National Health Commission, Ministry of National Defense, Ministry of Agriculture, or Ministry of Science and Technology. [3, 4, 5, 6]. The Chinese Centre for Disease Control and Prevention has information about biosecurity training courses that cover dual-use biotechnology as part of the curriculum, but there is no mention of assessments of ongoing research involving potentially dual use biological materials. [7] There is no mention of assessments of ongoing research involving dual use pathogens in China in the UPMC Center for Health Security report. [8] China has submitted Confidence Building Measures under the Biological Weapons Convention for 1989-2020; however, these are locked for viewing and are not publicly available. [9] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate that China has conducted such an assessment. [10] Further, a literature review indicates that there is not a verification procedure for peaceful development of biotechnology. [11] However, it is worth noting that the newly passed 2020 Biosecurity Law (which will go into effect April 15, 2021 Article 41 notes that the relevant departments of the State Council are to conduct follow up assessments of biotechnology applications and if there are biosecurity risks, the departments need to initiate remedial and control

measures. [12]

- [1] China. "Working Paper submitted by Chinese Delegation to 2012 Meeting of Experts of BWC: The Effect/Impact of Biotechnology Progress on BWC". [<http://www.china-un.ch/eng/hom/t954909.htm>]. Accessed 14 December 2020.
- [2] Ministry of Science and Technology of the People's Republic of China. "National representative participated in the 2018 Expert Meeting of the Biological Weapons Convention and made a special speech (我国代表参加《禁止生物武器公约》2018 年专家会并做专题发言)". [http://www.most.gov.cn/kjbgz/201808/t20180829_141420.htm]. Accessed 14 December 2020.
- [3] Chinese Centre for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 14 December 2020.
- [4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.
- [5] Ministry of National Defence of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 13 December 2020.
- [6] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.
- [7] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 13 December 2020.
- [8] UPMC Center for Health Security. July 2016. "National Biosafety Systems: Case studies to analyze current biosafety approaches and regulations for Brazil, China, India, Israel, Pakistan, Kenya, Russia, Singapore, the United Kingdom, and the United States". [http://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2016/National%20Biosafety%20Systems.pdf]. Accessed 14 December 2020.
- [9] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 14 December 2020.
- [10] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 2021.
- [11] Verma, Brig Vivek. 03 May 2020. "An Assessment of China's Biological Warfare Capabilities and Need for Global Approach to Biosecurity." The United Service Institution of India. [<https://usiofindia.org/publication/cs3-strategic-perspectives/an-assessment-of-chinas-biological-warfare-capabilities-and-need-for-global-approach-to-bio-security/>].
- [12] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)". [<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed 13 December 2020.

1.5.1b

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence that China has legislations requiring oversight of research with especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research. The new Biosecurity Law of 2020 (to go into effect April 15, 2021) Chapter 4 Articles 34-41 covers security in biotechnology research, development, and applications and calls for increased oversight and prohibits engagement in technological research and development activities that endanger public health, harm biological resources, or undermine biological ecosystems. The chapter, once it goes into effect on April 15, 2021, charges the National Health Commission, Ministry of Science and Technology, Ministry of Agriculture and Rural Affairs, and other related ministries to draft standards and risk categories (Article 36). Furthermore, Articles 38-39 notes that those engaged in high and medium-risk biotechnology related research and development must be lawfully established and obtain relevant approvals and requires that purchase and use of equipment and other special biological factors be registered in order to facilitate tracking and tracing by the government, indicating that this is in reference to required government

oversight of research. [1]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".
[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed 13 December 2020.

1.5.1c

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

Yes = 1, No = 0

Current Year Score: 0

There is not enough evidence that China has a designated agency that is responsible for oversight of research with especially dangerous pathogens, pathogens with pandemic potential, and/or other dual use research. However, Article 10 of the new Biosecurity Law passed in 2020 notes that the State will create a "National Coordination Mechanism for Biosecurity Work" and involve the National Health Commission (China's Ministry of Health), Ministry of Science and Technology, Ministry of Agriculture and Rural Affairs, Ministry of Foreign Affairs, and Ministry of Defense to coordinate national biological security efforts, including research. [1] The UPMC Center for Health Security report highlights that biosafety oversight in China fall under the purview of a number of governmental agencies and that there is considerable overlap in responsibility. The National Health Commission oversees human health research and the Ministry of Agriculture oversees animal health research but no evidence of dual use research. [2] Both government bodies have responsibility for approving if/when a laboratory can work on certain microbial samples for human and animal health respectively. The more dangerous a pathogen, the more approvals are needed. These two government bodies maintain lists of human and animal pathogens categorized by level of riskiness. Laboratories are required to submit applications to receive authorization to work with and conduct research on dangerous pathogens. [3] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [4] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not indicate that there is a designated agency for oversight of research on dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research. [5]

[1] The National People's Congress of the People's Republic of China. 17 October 2020. "The People's Republic of China Biosecurity Law (中华人民共和国生物安全法)".
[<http://www.npc.gov.cn/npc/c30834/202010/bb3bee5122854893a69acf4005a66059.shtml>]. Accessed 13 December 2020.

[2] UPMC Center for Health Security. July 2016. "National Biosafety Systems: Case studies to analyze current biosafety approaches and regulations for Brazil, China, India, Israel, Pakistan, Kenya, Russia, Singapore, the United Kingdom, and the United States". [http://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2016/National%20Biosafety%20Systems.pdf]. Accessed 14 December 2020.

[3] General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of the People's Republic of China. 2008. "Laboratories: General Requirements for Biosafety (实验室生物安全通用要求)". [<http://www.sific.com.cn/static/upload/source/20170605/4595934ba97395de7.pdf>]. Accessed 13 December 2020.

[4] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 15 January 2021.

[5] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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

There is not enough evidence to indicate that there is legislation requiring screening of synthesized DNA against lists of known pathogens and toxins before it is sold. China started regulating human genetic research in 1998. Since then, the National Health Commission, Ministry of Science and Technology (MOST), and China Food and Drug Administration (CFDA) have enacted policies to regulate human genetic research, many of which have been updated. [1, 2] Recent regulations include the 2016 "Operation of the Online Reporting System for the Acquisition, Collection, Sale, Export, and Exit of Human Genetic Resources." [3] In response to the gene-editing experiment conducted by biophysicist He Jiankui, China drafted (but has not approved) "Regulations on the Administration of Clinical Application of New Biomedical Technologies" in 2019. [4, 5] However, none of these regulations mention a requirement for synthesized DNA to be screened for sequences related to dangerous agents. [3,4, 5] There is no mention on the websites of MOST, National Health Commission, Ministry of National Defense, Ministry of Agriculture, and the Chinese Center for Disease Control of a requirement for synthesized DNA to be screened for sequences related to dangerous agents. [6, 7, 8, 9, 10] China has submitted Confidence Building Measures under the Biological Weapons Convention from 1989-2020; however, these are locked for viewing and are not publicly available. [11] Additionally, the VERTIC database highlights several Biological Weapons Convention related laws and regulations, but they do not focus on nor indicate there is a requirement for screening of synthesized DNA prior to selling. [12]

[1] Xu, Zhihong. "Human Embryos and Gene-editing Research in China". 30 April 2014.

[<https://www.nationalacademies.org/event/12-03-2015/docs/DAEAC2DD4530AE084D9E2F368494C4C063A9FD1BE2AE>]. Accessed 14 December 2020.

[2] UPMC Center for Health Security. July 2016. "National Biosafety Systems: Case studies to analyze current biosafety approaches and regulations for Brazil, China, India, Israel, Pakistan, Kenya, Russia, Singapore, the United Kingdom, and the United States". [http://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2016/National%20Biosafety%20Systems.pdf]. Accessed 14 December 2020.

[3] Ministry of Science and Technology of the People's Republic of China. Notice No. 758 of 2016. "Notice of the General Office of the Ministry of Science and Technology on the Operation of the Online Reporting System for the Acquisition, Collection, Sale, Export, and Exit of Human Genetic Resources (科技部办公厅关于人类遗传资源采集、收集、买卖、出口、出境审批网上申报系统开通运行的通告)". [http://www.most.gov.cn/xxgk/xinxifenlei/fdzdgknr/qttwj/qttwj2016/201610/t20161017_128247.html]. Accessed 14 December 2020.

[4] Cyranoski, David. 20 May 2019. "China set to introduce gene-editing regulation following CRISPR-baby furore." Nature. [<https://www.nature.com/articles/d41586-019-01580-1>]. Accessed 14 December 2020.

[5] China's Medical Administration and Hospital Authority. 26 February 2019. "Regulation on the Administration of Clinical Application of New Biomedical Technologies (Draft for Solicitation of Comments) 关于生物医学新技术临床应用管理条例 (征求意见稿)". [<http://www.nhc.gov.cn/yzygj/s7659/201902/0f24ddc242c24212abc42aa8b539584d.shtml>]. Accessed 14 December 2020.

[6] Chinese Centre for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 14 December 2020.

[7] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[8] Ministry of National Defence of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 13 December 2020.

[9] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[10] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 13 December 2020.

[11] Biological Weapons Convention (BWC) Electronic Confidence Building Measures Portal. "China". [<https://bwc-ecbm.unog.ch/state/china>]. Accessed 15 January 2021.

[12] Vertic. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/c/>]. Accessed 15 January 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: 2

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: 0

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

China has a national laboratory system that can conduct all six of the WHO-defined common core tests. Academic publications by researchers affiliated with various public hospitals and state research institutes indicate that there are domestic laboratories in China that can conduct all of the following diagnostic tests: polymerase chain reaction (PCR) testing for Influenza virus (flu); virus culture for poliovirus (polio); serology for HIV; microscopy for mycobacterium tuberculosis (tuberculosis/TB); rapid diagnostic testing for plasmodium spp. (malaria); and bacterial culture for Salmonella enteritidis serotype Typhi (typhoid). [1, 2, 3, 4, 5, 6] Even though China was one of the contributing countries to help develop action packages for the Global Health Security Agenda, there is no information about the country-defined tests on the websites of the National Health Commission or the Chinese Centre for Disease Control and Prevention. Nor does either website make available a central list of the diseases that can be tested for. [7, 8, 9]

- [1] Gao, Rongbao et al. 2011. "Development and implementation of the quality control panel of RT-PCR and real-time RT-PCR for avian influenza A (H5N1) surveillance network in mainland China". BMC Infectious Diseases 11: 67. [https://bmcinfectdis.biomedcentral.com/articles/10.1186/1471-2334-11-67]. Accessed 14 December 2020.
- [2] Tao, Zexin et al. 2013. "Isolation and Characterization of a Type 2 Vaccine-Derived Poliovirus from Environmental Surveillance in China. 2012". PLoS ONE 8 [12] : e83975. [https://doi.org/10.1371/journal.pone.0083975]. Accessed 14 December 2020.
- [3] Xu, Jun-Jie et al. 2016. "High HIV incidence epidemic among men who have sex with men in china: results from a multi-site cross-sectional study". Infectious Diseases of Poverty 5: 82. [https://idpjournal.biomedcentral.com/articles/10.1186/s40249-016-0178-x]. Accessed 14 December 2020.
- [4] Huang, Zikun et al. 2015. "Evaluation of the microscopic observation drug susceptibility assay for the rapid detection of MDR-TB and XDR-TB in China: a prospective multicentre study". Journal of Antimicrobial Chemotherapy 70 [2] : 456-462. [https://academic.oup.com/jac/article/70/2/456/2911188]. Accessed 14 December 2020.
- [5] Yan, Juan et al. 2013. "Performance of two rapid diagnostic tests for malaria diagnosis at the China-Myanmar border area". Malaria Journal. 12: 73. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3599043/]. Accessed 14 December 2020.
- [6] Dong, Bai-Qing et al. 2010. "Trends and disease burden of enteric fever in Guangxi province, China, 1994-2004". Bulletin of the World Health Organization 88 [9] : 689-96. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930361/]. Accessed 14 December 2020.
- [7] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 14 December 2020.
- [8] China Center for Disease Control and Prevention. [http://www.chinacdc.cn/en/]. Accessed 14 December 2020.
- [9] Centers for Disease Control and Prevention. "Global Health Security Agenda: GHSA National Laboratory System Action Package (GHSA Action Package Detect-1)." [https://www.cdc.gov/globalhealth/security/actionpackages/national_laboratory.htm#footnote4]. Accessed 14 December 2020.

2.1.1b

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

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

Current Year Score: 1

There are plans for public health emergencies that have some information about testing but there is insufficient evidence that there is a plan for novel pathogen testing, scaling and the goals of testing. After the 2003 SARS outbreak, China issued the 2003 "Regulations on Public Health Emergencies" and 2006 "The National Contingency Plan for Public Health Emergencies". [1] These two documents include provisions for setting up emergency response centers, identifying which state entities are responsible for responding to the emergency, monitoring and early warning systems, measures to respond, and scaling up medical facilities and resources for epidemiological investigation to diagnose and test cases. Additionally, the 2006 National Contingency Plan for Public Health Emergencies Section 4.2.4 which focuses on China's Center for Disease Prevention and Control (CDC)'s responsibilities during a public health emergency, note that the CDC is responsible for testing to determine the cause of the illness or outbreak. Section 6.1.2 has information about how national, provincial, and local level governments should improve laboratory and testing capabilities in anticipation of an emergency. However, there is insufficient evidence in these documents to provide specific information on testing such as scaling capacity and other goals for testing during a public health emergency. [2,3] There is not specific information on the National Health Commission, Ministry of Agriculture and Rural Affairs, or the Chinese CDC websites regarding testing for novel pathogens, scaling capacity, and defining goals for testing. [4, 5, 6]

[1] Library of Congress. "China: Legal Responses to Health Emergencies." [https://www.loc.gov/law/help/health-emergencies/china.php#_ftnref10]. Accessed 15 December 2020.

[2] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/jwqk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[3] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[4] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 15 January 2021.

[5] Ministry of Agriculture of the People's Republic of China. [http://www.moa.gov.cn/]. Accessed 15 January 2021.

[6] Chinese Center for Disease Control and Prevention. [http://www.chinacdc.cn/]. Accessed 15 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

There is evidence that some of the main national laboratories that serve as a reference facility are accredited. The China National Accreditation Service for Conformity Assessment (CNAS) is the national accreditation body of China responsible for the accreditation of certification bodies, laboratories and inspection bodies. [1] There are numerous labs that serve as reference facilities that have received CNAS accreditation, such as private laboratories including Leadman Reference Laboratory and university laboratories such as the Swine Flu Reference Laboratory at Nanjing Agricultural University. [2, 3] Additionally, some national level reference laboratories such as the China Center for Disease Control and Prevention (CDC) National Institute for Parasitic Diseases received its CNAS accreditation in 2017. [4] However, websites of other national level reference facilities such as the China CDC's National Institute for Viral Disease Control and Prevention, National Center for Tuberculosis Control and Prevention, and National Center for AIDS/STD Control and Prevention do not have information about their own accreditation. For instance, the National Institute for Viral Disease Control and Prevention has a section with documents regarding general laboratory accreditation and CNAS guidelines, but there is not explicit information or a document

that indicates its own accreditation. [5, 6, 7, 8] There is also no information on the National Health Commission (China's Ministry of Health) on accreditation of a national reference laboratory. [9]

[1] China National Accreditation Service for Conformity Assessment (CNAS).

[https://www.cnas.org.cn/sysrk/sysrkly/index.shtml]. Accessed 15 December 2020.

[2] Leadman. 1 January 2019. "Leadman Reference Laboratory Receives CNAS Accreditation! (利德曼参考实验室正式通过 CNAS 认可!)" [http://www.leadmanbio.com/html/news/gs/1396.html]. Accessed 15 December 2020.

[3] Nanjing Agricultural University. 7 January 2020. "Our School's OIE Swine Flu Reference Laboratory is Accredited by CNAS (我校 OIE 猪链球菌病参考实验室通过 CNAS 认可)". [http://www.njau.edu.cn/2020/0107/c577a105504/pagem.htm]. Accessed 15 December 2020.

[4] China CDC National Institute for Parasitic Diseases. 10 July 2017. "National Institute for Parasitic Diseases Passed CNAS/CMA Certification and Accreditation Regular Supervision and Expansion Review (寄生虫病所通过 CNAS/CMA 认证认可定期监督暨扩项评审)". [http://www.ipd.org.cn/view4444.html]. Accessed 17 January 2021.

[5] China CDC National Institute for Viral Disease Control and Prevention. [http://www.chinaivdc.cn/]. Accessed 15 December 2020.

[6] China CDC National Institute for Viral Disease Control and Prevention. 28 March 2012. "Laboratory Accreditation (实验室资质)". [http://ivdc.chinacdc.cn/sysgl/zlgl/syszz/]. Accessed 17 January 2021.

[7] China CDC National Center for Tuberculosis Control and Prevention. [http://tb.chinacdc.cn/]. Accessed 15 December 2020.

[8] China CDC National Center for AIDS/STD Control and Prevention. [http://ncaids.chinacdc.cn/]. Accessed 15 December 2020.

[9] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 15 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

China's national laboratory that serves as a reference facility is subject to external quality assurance review. The China Center for Disease Control and Prevention (China CDC) is home to several national institutes that serve as World Health Organization (WHO) reference laboratories. China CDC's National Institute for Viral Disease Control and Prevention is a WHO Influenza Collaboration Reference Center and a WHO Western-Pacific Region (WPR) Polio Reference Laboratory. The National Institute for Parasitic Diseases is a WHO Collaborating Center for Tropical Diseases (formerly WHO Collaborating Center for Malaria, Schistosomiasis, and Filariasis). China CDC also has a National Center for Tuberculosis Control and Prevention and National Center for AIDS/STD Control and Prevention. [1] There is evidence from academic publications that the Chinese Center for Disease Control and Prevention (China CDC) is subject to external quality assurance (EQA) review. Published studies by researchers affiliated with China CDC indicate that external quality assessments have been conducted at several China CDC-affiliated laboratories. [2, 3, 4] For example, 10 provincial/city-level CDCs participated in a laboratory EQA review based on the serological specific antibodies detection and rapid PCR amplifying targeted genes of rickettsiae in 2008. [2] The Anhui Provincial Institute of Parasitic Diseases and the Jiangxi Provincial Institute of Parasitic Diseases participated in a WHO Western Pacific Region EQA exercise involving several national Neglected Tropical Diseases laboratories from 2012 to 2015. [3] The Sichuan Provincial Institute of Parasitic Diseases conducted an EQA study of reagents for detecting schistosome circulating antigens (SCAg). [4]

- [1] China Center for Disease Control and Prevention. [<http://www.chinacdc.cn/en/>]. Accessed 15 December 2020.
- [2] Zhang, Lijuan, Daxin Ni, and Zijian Feng. 2010. "External quality assessment of the detection of rickettsioses in China". Asian Pacific Journal of Tropical Medicine. 851-854. [<https://core.ac.uk/download/pdf/82144177.pdf>]. Accessed 15 December 2020.
- [3] Lu, Yan et al. 2017. "Urgent needs in fostering neglected tropical diseases (NTDs) laboratory capacity in WHO Western Pacific Region: results from the external quality assessment on NTDs diagnosis in 2012-2015". Infectious Diseases of Poverty 6[1] : 106. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5463369/>]. Accessed 15 December 2020.
- [4] Wang, Xiuzhen et al. 2006. "Study on external quality assessment of reagent for detection of schistosome circulating antigen". Chinese Journal of Schistosomiasis Control. [http://en.cnki.com.cn/Article_en/CJFDTOTAL-XXCB200601015.htm]. Accessed 15 December 2020.

2.2 LABORATORY SUPPLY CHAINS

2.2.1 Specimen referral and transport system

2.2.1a

Is there a nationwide specimen transport system?

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence of a nationwide specimen transport system. China has regulations issued by the State Council, the National Health, and Ministry of Agriculture on how specimens to be transported must be packaged and escorted. Specimens should not be transported via public transportation. Whenever possible, specimens should be transported via ground transportation. When being transported via aircraft, there are additional requirements. Highly pathogenic specimens require an escort of at least two people. [1, 2, 3] These existing regulations do not mention public or private courier services. There is no mention of specimen courier services for specimen transport on the websites of the National Health Commission, Ministry of Agriculture, or China Center for Disease Control and Prevention. [4, 5, 6] There is also no mention of specimen transport as an option on the websites of the larger domestic private courier services like ZTO Express and YTO Express. [7, 8] There are private diagnostic and medical labs that offer specimen transport services, though there is insufficient information to determine whether those services can reach every part of the country. [9, 10]

- [1] State Council of the People's Republic of China. Order No. 424 of 5 November 2004. "Regulations on Administration of Biosafety in Pathogenic Microorganism Laboratories (病原微生物实验室生物安全管理条例)". [http://www.gov.cn/jwqk/2005-05/23/content_256.htm]. Accessed on 13 December 2020.
- [2] Ministry of Health of the People's Republic of China. Order No. 45 of 2005. "Regulations on Transportation Management of Highly Pathogenic Microbial Strains or Samples of Microorganisms Contagious to Humans (可感染人类的高致病性病原微生物菌(毒)种或样本运输管理规定)". [http://www.chinacdc.cn/flfg/xzfg/200602/t20060201_41077.html]/ Accessed 15 December 2020.
- [3] Ministry of Agriculture of the People's Republic of China. Notice No. 503 of 2005. "Packaging Criterion for Transportation of Highly Pathogenic Animal Microbial Strains or Samples (高致病性动物病原微生物菌(毒)种或者样本运输包装规范)". [http://www.law-lib.com/law/law_view.asp?id=111388]. Accessed 15 December 2020.
- [4] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 14 December 2020.
- [5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.
- [6] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.
- [7] ZTO Express. [<https://www.zto.com/>]. Accessed 15 December 2020.
- [8] YTO Express. [<http://www.yto.net.cn/>]. Accessed 15 December 2020.

[9] Sinopatho. [<http://www.sinopatho.com/wap/>]. Accessed 15 December 2020.

[10] Chain Medical Labs. [<http://www.cmlabs.com.cn>]. Accessed 15 December 2020

2.2.2 Laboratory cooperation and coordination

2.2.2a

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

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

Current Year Score: 0

There is insufficient evidence to indicate there is a plan to rapidly authorize or license laboratories to supplement the capacity of the national public health laboratory system to scale up testing during an outbreak. The 2003 "Regulations on Public Health Emergencies" and the 2006 "National Contingency Plan for Public Health Emergencies" do not explicitly mention a plan to rapidly authorize or license laboratories to supplement the capacity to scale up testing during an outbreak. [1,2] There is not information about licensing laboratories to supplement the capacity of national public health laboratory system to scale up testing on the websites of the National Health Commission (China's Ministry of Health), Chinese Center for Disease Control and Prevention, or the Ministry of Agriculture and Rural Affairs.[3, 4, 5]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwgk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 14 December 2020.

[4] China Center for Disease Control and Prevention. [<http://www.chinacdc.cn/en/>]. Accessed 14 December 2020.

[5] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 15 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: 1

Although there is evidence of ongoing event-based surveillance and data collection, there is insufficient evidence that the data is being analyzed on a daily basis. Drawing upon lessons learned from the 2003 SARS outbreak, China established the National Notifiable Disease Surveillance System, the Public Health Emergency Event Surveillance System, and the China Infectious Disease Automated-Alert and Response System (CIDARS). These systems range from the national to the county level and include all health care institutions across the country. The Chinese Center for Disease Control and Prevention (CDC)

analyzed the performance of CIDARS, which tracks hospital-reported cases, in 2016 and found that over 92% of the reports on the system were responded to within 24 hours. [1] The National Notifiable Infectious Disease System also monitors and records on incidence on a daily basis. [2] The Public Health Emergency Events Surveillance System is an online system through which disease control centers, medical and health institutions at the county-level and above, and township hospitals can report case-by-case data in addition to any other relevant information directly to the central government in order to inform decisionmaking. [3] Furthermore, in light of COVID-19, the National Health Commission is working on improving data collection by integrating health information systems with data centers, 5G networks, and artificial intelligence to improve early warning systems. [4] However, there is no evidence to indicate that this data is being analyzed on a daily basis.

[1] Cao, Yulong; Shan, Jiao; Gong, Zhizhong; Kuang, Jiqui; and Gao, Yan. 29 May 2020. "Status and Challenges of Public Health Emergency Management in China Related to COVID-19." *Front Public Health* 8: 250.

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273973/#B12]. Accessed 15 December 2020.

[2] Wang, Liping; Ren, Xiang; Cowling, Benjamin; Zeng, Lingjia; Geng, Mengjie; Wu, Peng; Li, Zhongjie; Yu Hongjie; and Cao, George. 30 May 2019. "Systematic Review: National Notifiable Infectious Disease System in China." *Online Journal of Public Health Information* 11[1] : e414. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6606182/]. Accessed 15 December 2020.

[3] Hong, Zhiheng; Ni, Daxin; Cao, Yang; Meng, Ling; Tu, Wenxiao; and Li, Leilei. 2015. "Development of an index system for the comprehensive evaluation on public health emergency events surveillance system in China". *Chinese Journal of Epidemiology*, 36

[6] :547-551. [http://html.rhhz.net/zhlxhx/20150602.htm]. Accessed 15 December 2020.

[4] State Council of the People's Republic of China. 9 September 2020. "National Health Commission: Accelerate the improvement of the surveillance system for infectious diseases and public health emergencies (国家卫健委：加快完善传染病疫情和突发公共卫生事件监测系统)". [http://www.gov.cn/xinwen/2020-09/09/content_5542058.htm]. Accessed 15 December 2020.

2.3.1b

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that the country reported a potential public health emergency of international concern (PHEIC) to the WHO within the last two years. The World Health Organization (WHO) China Country Office received information about a cluster of coronavirus cases on December 31, 2019. On January 11 and 12, China's National Health Commission reported additional information to the WHO about the COVID-19 outbreak. At the time, among the 41 confirmed cases, there had been one death. [1]

[1] World Health Organization (WHO). 12 January 2020. "Novel Coronavirus - China". [https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/]. Accessed 15 December 2020.

2.3.2 Interoperable, interconnected, electronic real-time reporting systems

2.3.2a

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

Yes = 1 , No = 0

Current Year Score: 1

The government operates an electronic reporting surveillance system at both the national and sub-national level. Drawing upon lessons learned from the 2003 SARS outbreak, China established the National Notifiable Disease Surveillance System, the Public Health Emergency Event Surveillance System, and the China Infectious Disease Automated-Alert and Response System (CIDARS). These systems range from the national to the county level and include all health care institutions across the country. [1] The China Public Health Emergency Events Surveillance System is an online direct reporting network that covers disease control centres nationwide, medical and health institutions at the county-level and above, and township hospitals. [2,3] Additionally, the National Centre for Public Health Surveillance and Information Services under the Chinese Center for Disease Control and Prevention (China CDC) is responsible for a national public health information network. [4]

[1] Cao, Yulong; Shan, Jiao; Gong, Zhizhong; Kuang, Jiqui; and Gao, Yan. 29 May 2020. "Status and Challenges of Public Health Emergency Management in China Related to COVID-19." *Front Public Health* 8: 250.

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273973/#B12]. Accessed 15 December 2020.

[2] Hong, Zhiheng; Ni, Daxin; Cao, Yang; Meng, Ling; Tu, Wenxiao; and Li, Leilei. 2015. "Development of an index system for the comprehensive evaluation on public health emergency events surveillance system in China". *Chinese Journal of Epidemiology*, 36

[6] :547-551. [http://html.rhhz.net/zhlxbs/20150602.htm]. Accessed 15 December 2020.

[3] Chinese Center for Disease Control and Prevention. "Project to Create a National Infectious Diseases and Public Health Outbreak Online System for Direct Report Information (国家传染病与突发公共卫生事件网络直报信息系统建设项目)". [http://www.chinacdc.cn/kjxm/kjcg/201104/t20110426_42256.html]. Accessed 16 December 2020.

[4] Chinese Center for Disease Control and Prevention. "Public Health Surveillance and Information Services". [http://www.chinacdc.cn/en/aboutus/orc_9349/]. Accessed 16 December 2020.

2.3.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that the system collects ongoing/real time laboratory data. China Public Health Emergency Events Surveillance System (CPHEESS) is the Chinese Center for Disease Control and Prevention's (China CDC) direct online reporting network. It includes disease control centers nationwide, medical and health institutions at the county-level and above, and township hospitals. It is electronic, but there is no evidence that it feeds into the relevant systems without needing to do manual updates. [1,2] Additionally, a study following the outbreak of the COVID-19 pandemic on China's public health emergency system notes that all infectious disease cases should be reported in real time directly from the hospitals into the China Infectious Disease Automated-alert and Response System (CIDARS) via the Internet. Serious and unknown-cause infectious diseases, such as the plague, cholera, and COVID-19, must be reported to professional agencies designated by health administrative authorities within 2 hours by telephone or fax. However, there is insufficient evidence that it feeds into the relevant systems without needing to do manual updates. [3] There is not additional information on this capability on the websites of the China CDC and National Health Commission (China's Ministry of Health). [4, 5]

[1] Hong, Zhiheng et al. 2015. "Development of an index system for the comprehensive evaluation on public health emergency events surveillance system in China (中国突发公共卫生事件监测系统评价指标体系初探)". *Chinese Journal of Epidemiology* 36

[6] : 547-551. [http://html.rhhz.net/zhlxbs/20150602.htm]. Accessed 17 January 2021.

[2] Chinese Center for Disease Control and Prevention. "Project to Create a National Infectious Diseases and Public Health

Outbreak Online System for Direct Report Information (国家传染病与突发公共卫生事件网络直报信息系统建设项目).

[http://www.chinacdc.cn/kjxm/kjcg/201104/t20110426_42256.html] Accessed 17 January 2021.

[3] Cao, Yulong; Shan, Jiao; Gong, Zhizhong; Kuang, Jiqiu; and Gao, Yan. 29 May 2020. "Status and Challenges of Public Health Emergency Management in China Related to COVID-19." *Front Public Health* 8: 250.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273973/#B12>]. Accessed 15 December 2020.

[4] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 14 December 2020.

[5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

2.4 SURVEILLANCE DATA ACCESSIBILITY AND TRANSPARENCY

2.4.1 Coverage and use of electronic health records

2.4.1a

Are electronic health records commonly in use?

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

Current Year Score: 2

There is publicly available evidence that electronic health records are commonly in use in China. A 2018 study on big data and medical research in China notes that over 90% of hospitals in China use electronic records, but the accessibility and the quality of the data is not even and the records are used for clinical purpose, not research purposes. Adoption of individual electronic health records has been impeded by incompatibility between different hospital systems. China has over 300 commercial providers of hospital information systems with various technical structures and data standards. Furthermore, healthcare systems are not required to exchange data with each other. Some regions are planning to establish regional electronic health records but most are in preliminary stages. [1] Furthermore, on the National Health Commission (China's Ministry of Health) website, the most recent news on electronic health records was from July 2016 when China participated in an Asia-Pacific Electronic Health Record Conference. Over 500 health experts, academics, and policymakers attended. The conference emphasized the importance of using big data to improve healthcare and that the government will work on developing a national health information system. However, beyond this news brief highlighting the forum, there is not further information about the progress in which electronic health records are used in China. [2]

[1] Zhang, Luxia; Wang, Haibo; Li, Quanzheng; Zhao, Minghui; and Zhan, Qi-Min. 5 February 2018. "Big data and medical research in China." *BMJ*. [<https://doi.org/10.1136/bmj.j5910>]. Accessed 16 December 2020.

[2] National Health Commission of the People's Republic of China. 19 July 2016. "2016 Asia Pacific Electronic Health Record Conference Held (2016 亚太电子健康纪录会议暨大中华电子健康及医疗讯息化论坛召开)."

[<http://www.nhc.gov.cn/mohwsbwstjxxzx/s8555/201607/b6d8517a867d426989d7170b348de473.shtml>]. Accessed 27 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: 0

Although there are electronic health records, there is insufficient evidence that China's national public health system has access to electronic health records (EHR) of individuals in the country. China's national public health system consists of

primary public and clinical health care (e.g. subdistrict health centers, urban community health service centers, township health service centers, rural village clinics) and secondary and tertiary curative health care (e.g. public and private hospitals).

[1] In 2011, the National Health Commission allocated 9.5 billion yuan for establishing electronic medical records and electronic health records (EHR). Nearly all health care providers (over 90%) have set up an electronic health records system. However, there are more than 300 commercial providers of hospital information systems in China, which means multiple technical structures and data standards. Healthcare systems are also not required to exchange data with each other. When seeing doctors at different hospitals, patients usually have to bring a printout of their own health records. Adoption of individual EHR has been hampered by incompatibility between different hospital systems. [1, 2] In June 2016, in order to promote data integration and utilization, China's State Council issued Opinions on Promoting and Regulating the Development of Big Data Applications in Healthcare. It aims to accelerate the construction of a unified population healthcare information platform including four levels: national, provincial, municipal, and county. However, according to a study on electronic medical and health records integration, despite the release of these regulations and financial support from all levels of the government, little progress has yet been made in EMR data integration. [3] There is not information on the National Health Commission (China's Ministry of Health) or the China Center for Disease Control and Prevention to indicate that the national public health system has access to individuals' EHR. [4, 5]

[1] Sun, Yuelian, Hans Gregersen, and Wei Yuan. 2017. "Chinese Health Care System and Clinical Epidemiology". *Clinical Epidemiology* 9: 167-178. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5360409/>]. Accessed 17 December 2020.

[2] Zhang, Luxia; Wang, Haibo; Li, Quanzheng; Zhao, Minghui; and Zhan, Qi-Min. 5 February 2018. "Big data and medical research in China." *BMJ*. [<https://doi.org/10.1136/bmj.j5910>]. Accessed 16 December 2020.

[3] Wang, Zhong. 1 April 2019. "Data integration of electronic medical record under administrative decentralization of medical insurance and healthcare in China: a case study". *Israel Journal of Health Policy Research* 8:24. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6442402/>]. Accessed 15 January 2021.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[5] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 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: 1

Data standards to ensure comparability exist, but there is insufficient evidence to indicate that they are being implemented. In 2009, the Chinese government issued an "Electronic Health Record Architecture and Data Standard", one aspect of which is related to ISO/TS18308. [1] The purpose of ISO/TS18308 is to assemble and collate a set of clinical and technical requirements for an electronic health records to support using, sharing, and exchanging electronic health records across different health sectors, different countries, and different models of healthcare delivery. The requirements are formulated to ensure that these EHRs are faithful to the needs of healthcare delivery, are clinically valid and reliable, are ethically sound, meet prevailing legal requirements, support good clinical practice and facilitate data analysis for a multitude of purposes. [2] A study shows that this standard conforms to the international standard ISO/TS18308 by about 62.1% (77 of the 124 required items). [3] But there is evidence that indicates that there needs to be more improvement in terms of information management systems to ensure that data adheres to the standards. A study conducted in 2019 noted that in China, independent and uncoordinated purchase of electronic health record systems led to inconsistent data and hospitals often do not use a standardized code for billing or healthcare classification. Hospitals may also not be incentivized to standardize their data since it may increase their costs. [4]

- [1] Sun, Yuelian, Hans Gregersen, and Wei Yuan. 2017. "Chinese Health Care System and Clinical Epidemiology". *Clinical Epidemiology* 9: 167-178. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5360409/]. Accessed 17 December 2020.
- [2] Zhang, Luxia; Wang, Haibo; Li, Quanzheng; Zhao, Minghui; and Zhan, Qi-Min. 5 February 2018. "Big data and medical research in China." *BMJ*. [https://doi.org/10.1136/bmj.j5910]. Accessed 16 December 2020.
- [3] Wang, Zhong. 1 April 2019. "Data integration of electronic medical record under administrative decentralization of medical insurance and healthcare in China: a case study". *Israel Journal of Health Policy Research* 8:24. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6442402/]. Accessed 15 January 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: 0

There is no evidence of established mechanisms at the relevant ministries responsible for animal, human and wildlife surveillance to share data. One of the objectives of the National Antimicrobial Resistance Plan (2016-2020) is to develop interactive mechanisms between the health care system and the breeding industry in the surveillance of antimicrobials consumption and antimicrobial resistance. [1] However, there is not publicly available evidence to suggest that there is an integrated human-animal disease surveillance. There is no relevant information on the websites of the National Health Commission, Ministry of Agriculture, Ministry of Ecology and Environment, and Chinese Center for Disease Control and Prevention. [2, 3, 4, 5] Recent research calls for a need to develop a national intelligent syndromic surveillance system (NISSS) as an early warning of epidemics and this system should be linked with other information systems, including environmental, agricultural, and wildlife. [6]

- [1] National Health Commission of the People's Republic of China. 26 August 2016. "National Action Plan to Contain Antimicrobial Resistance (2016-2020)". [https://www.who.int/antimicrobial-resistance/national-action-plans/library/en/]. Accessed 12 December 2020.
- [2] Chinese Center for Disease Control and Prevention. [http://www.chinacdc.cn/]. Accessed 14 December 2020.
- [3] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 13 December 2020.
- [4] Ministry of Agriculture of the People's Republic of China. [http://www.moa.gov.cn/]. Accessed 13 December 2020.
- [5] Ministry of Ecology and Environment of the People's Republic of China. [http://www.mee.gov.cn/] Accessed 13 December 2020.
- [6] Jia, Peng and Yang, Shujuan. 27 October 2020. "Early warning of epidemics: towards a national intelligent syndromic surveillance system (NISSS) in China". *BMJ Global Health*, 5
- [10]. [http://dx.doi.org/10.1136/bmjgh-2020-002925]. Accessed 17 December 2020.

2.4.3 Transparency of surveillance data

2.4.3a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence to conclude that China makes de-identified health surveillance data on infectious diseases publicly available on at least a weekly basis. The National Bureau of Statistics publishes annual figures for the number of people with various infectious diseases and the number of deaths from various infectious diseases, e.g. AIDS, malaria, anthrax, etc. [1] The Chinese Center for Disease Control and Prevention (China CDC) collects a large volume of health surveillance data and has created a large data set, which fits into the national priority of applying big data to health and medicine. The China CDC data set is just one of several health and healthcare-related data sets that are available to researchers. [2] There is no evidence that these big data sets are publicly available; these data sets are not available on the websites of the National Bureau of Statistics, National Health Commission, Ministry of Science and Technology, or the China CDC. [1, 3, 4, 5]

[1] National Bureau of Statistics of China. [https://data.stats.gov.cn/english/easyquery.htm?cn=C01]. Accessed 17 January 2021.

[2] Zhang, Luxia et al. 2017. "Big data and medical research in China". BMJ 360: j5910. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5797979/]. Accessed 17 January 2021.

[3] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 15 January 2021.

[4] Chinese Center for Disease Control and Prevention. [http://www.chinacdc.cn/]. Accessed 15 January 2021.

[5] Ministry of Science and Technology of the People's Republic of China. [http://www.most.gov.cn/]. Accessed 15 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

The National Health Commission publishes daily update reports on COVID-19 cases and deaths. For instance, on December 17 (the latest report available at the time of research), there were 12 new cases: 4 in Shanghai, 4 in Guangdong Province, 1 in Shanxi Province, 1 in Henan Province, 1 in Sichuan Province, and 1 in Yunnan Province. There were no deaths. 9 people were discharged from the hospital and 494 close contacts were released from medical observation. [1]

[1] National Health Commission of the People's Republic of China. 18 December 2020. "Latest Update on COVID-19 as of Midnight on 17 December 2020 (截至 12 月 17 日 24 时新型冠状病毒肺炎疫情最新情况)".

[http://www.nhc.gov.cn/yjb/s7860/202012/f0af51f645dd493d8b4905a8a3ac3fbc.shtml]. Accessed 18 December 2020.

2.4.4 Ethical considerations during surveillance

2.4.4a

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

Yes = 1, No = 0

Current Year Score: 1

China has guidelines that safeguard the confidentiality of identifiable health information for individuals. In 2017, China announced a new national standard on personal information protection. Health information are covered as "sensitive personal information" under the new standards. [1] Legal experts say that while the new standards are not a law or regulation that requires mandatory compliance, they can still (and will likely) be used by Chinese government agencies as guidelines to determine whether companies are following China's data protection rules. [2, 3] Prior to these new standards, health information was not explicitly protected under general data protection rules, namely the 2012 "Decision on Strengthening Online Information Protection" and the 2012 "Information Security Technology - Guideline for Personal Information Protection within Information System for Public and Commercial." The latter document does mention that genetic information is protected under the category of "personal sensitive information." [3, 4, 5]

[1] National Standard of the People's Republic of China GB/T 35273-2017. 30 November 2017. "Information Technology – Personal Information Security Specification (信息安全技术 个人信息安全规范)". [<https://www.tc260.org.cn/upload/2018-01-24/1516799764389090333.pdf>]. Accessed 18 December 2020.

[2] Xia, Sara. 28 February 2018. "China's Personal Information Security Specification: Get Ready for May 1". [<https://www.chinalawblog.com/2018/02/chinas-personal-information-security-specification-get-ready-for-may-1.html>]. Accessed 18 December 2020.

[3] DLA Piper. 29 January 2018. "Data Protection Laws of the World: China". [<https://www.dlapiperdataprotection.com/index.html?t=law&c=CN>]. Accessed 18 December 2020.

[4] Standing Committee of the National People's Congress of the People's Republic of China. 28 December 2012. "Decision on Strengthening Online Information Protection (全国人大常委会关于加强网络信息保护的决定)". [http://www.gov.cn/jrzq/2012-12/28/content_2301231.htm]. Accessed 17 January 2021.

[5] People's Republic of China Personal Information Protection Assessment (PIPA) Office. 18 May 2015. "Information Security Technology - Guideline for Personal Information Protection within Information System for Public and Commercial Services (中华人民共和国国家标准化指导性技术文件 GB/Z 28828-2012 信息安全技术公共及商用服务信息系统个人信息保护指南)". [<http://www.pipa.org.cn/NewsDetail.asp?Id=1002>]. Accessed 17 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

There is a law safeguarding the confidentiality of identifiable health information for individuals include mention of protections from cyber attacks. China's 2017 National Standards on Personal Information Security categorize health information as "sensitive personal information," but do not explicitly mention protections from cyber attacks. [1] China's 2017 Cybersecurity Law, however, explicitly protects personal information, including biometrics and health data, against "illegal methods" of collection such as cyber attacks. Network operators are required to "adopt technical measures to prevent computer viruses, cyber attacks, network intrusions, and other actions endangering cybersecurity." [2]

[1] National Standard of the People's Republic of China GB/T 35273-2017. 30 November 2017. "Information Technology – Personal Information Security Specification (信息安全技术 个人信息安全规范)". [<https://www.tc260.org.cn/upload/2018-01-24/1516799764389090333.pdf>]. Accessed 18 December 2020.

[2] New America. "Translation: Cybersecurity Law of the People's Republic of China (Effective June 1, 2017)". [<https://www.newamerica.org/cybersecurity-initiative/digichina/blog/translation-cybersecurity-law-peoples-republic-china/>].

Accessed 18 December 2020.

2.4.5 International data sharing

2.4.5a

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

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

Current Year Score: 2

There is evidence that the government has made a commitment via public statement or agreement to share surveillance data for more than one disease with other countries in the region. For instance, China is a member of the Mekong Basin Disease Surveillance Consortium (MBDS), where member countries signed a memorandum of understanding to support the network and improve cross-border surveillance. The other member countries are Cambodia, Laos, Myanmar, Thailand, and Vietnam. [1] MBDS has a cross-border information exchange program that requires reports of infectious diseases and surveillance data on potential public health emergency of international concern (PHEIC) to be shared within 24 hours of diagnosis. The MBDS cross-border information exchange program specifically lists several infectious diseases of concern about which information must be shared within 24 hours of diagnosis: H1N1, AFP, SARS, Cholera/Severe Diarrhea, Encephalitis, Tetanus, Meningitis, Diphtheria, and other PHEIC. [2]

[1] Mekong Basin Disease Surveillance Consortium (MBDS). [<http://www.mbdnet.org/>]. Accessed 18 December 2020.

[2] Mekong Basin Disease Surveillance Consortium (MBDS). "MBDS: Cross-Border Information". [<http://mbdnet.org/mbds-cross-border-information/>]. Accessed 18 December 2020.

2.5 CASE-BASED INVESTIGATION

2.5.1 Case investigation and contact tracing

2.5.1a

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

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

Current Year Score: 1

There is some evidence that the national government supports sub-national systems to conduct contract tracing, but only in response to active public health emergencies. There is legislation to indicate that the national level health unit (the National Health Commission) is to provide provincial and local governments management and supervision during a public health emergency and the government has published guidelines for contact tracing, there is not an explicit system in which the National Health Commission provides support at the sub-national level to conduct contact tracing during a public health emergency. Following the 2003 SARS outbreak, interventions and control measures were introduced, including epidemiological tracing of close contacts. [1] In 2003, the Ministry of Health (now known as the National Health Commission) issued an order on "Measures for the Prevention and Control of Infectious Atypical Pneumonia-like Diseases". Article 4 and 5 charges the Ministry of Health to provide management and supervision to local and provincial level administrative

departments to raise awareness and mobilize to control channels of transmission. [2] According to the National Health Commission website, during COVID-19, the government published relevant guidelines on contact tracing (i.e. tracking using social media applications like WeChat, following up with patients after discharge, etc.), but does not specify how it would support sub-national governments to conduct contact tracing. [3]

[1] Zanin, Mark; Xiao, Cheng; Liang, Tingting; Ling, Shiman; Zhao Fengming; Huang, Zhenting; Lin, Fangmei; Lin, Xia; Jiang, Zhanpeng; and Wong, Sook-san. August 2020. "The public health response to the COVID-19 outbreak in mainland China: a narrative review". *Journal of Thoracic Diseases*, 12

[8] : 4434-4449. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7475588/#r18>]. Accessed 18 December 2020.

[2] National Health Commission of the People's Republic of China. 12 May 2003. "Order No. 35 Administrative Measures to Prevent and Control Infectious Atypical Pneumonia-Like Diseases (第 35 号传染性非典型肺炎防治管理办法)".

[<http://www.nhc.gov.cn/wjw/bmgz/200804/111f50e92a1d45a68e04b32c352b9484.shtml>]. Accessed 18 December 2020.

[3] National Health Commission of the People's Republic of China. 17 February 2020. "Notice on Tracing and Following Up with Discharged Patients (国家卫生健康委办公厅关于做好新型冠状病毒肺炎出院患者跟踪随访工作的通知)".

[http://www.gov.cn/zhengce/zhengceku/2020-02/20/content_5481166.htm]. Accessed 17 January 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: 0

There is insufficient evidence that China provides wraparound services to enable infected people and their contacts to self-isolate or quarantine as recommended, particularly economic support (paycheck, job security) and medical attention. There is some evidence that China tried to provide medical attention for those in isolation by being supportive of telemedicine, including issuing guidance encouraging reimbursement for online consultations and drug prescriptions. But there is not evidence that this meant that those in self-isolation actually received the medical attention they needed and it was unclear that this was implemented evenly across China. [1] China provides some level of subsidies during public health emergencies, but the subsidies are more intended to stimulate the economy than to necessarily provide for those who have been asked to self-isolate. For instance, in March 2020, city of Nanjing announced that it would issue 318 million yuan in vouchers. A few days later, the city of Hangzhou announced the distribution of 1.68 billion yuan in vouchers. The city of Shenzhen issued 30 million WeChat (a multi-purpose messenger app in China) vouchers. These vouchers would help purpose daily necessities including food and clothing. These announcements were towards the tail end of the lockdown so these subsidies were not specifically for confirmed or suspected cases to isolate. [2]

[1] Mou, Martin. 22 October 2020. "Covid-19 Gives Boost to China's Telemedicine Industry". *Wall Street Journal*.

[<https://www.wsj.com/articles/covid-19-gives-boost-to-chinas-telemedicine-industry-11603379296>]. Accessed 18 December 2020.

[2] China Central Television (CCTV). 1 April 2020. "Countries Providing Subsidies, China Provides Vouchers, Have You Received Yours? (多国发放现金补助, 中国多地可领消费券, 你领了吗)".

[<http://news.cctv.com/2020/04/01/ARTI2NYEJWNOW9L9pS4xi2fo200401.shtml>]. Accessed 18 December 2020.

2.5.1c

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

Yes = 1, No = 0

Current Year Score: 1

The National Health Commission in China publishes daily situation reports on COVID-19 cases, deaths, and number of contacts traced. For instance, for December 17 (the latest available report during which the research was conducted on December 18), it notes that 890,102 close contacts have been traced and 7,014 close contacts are still under observation. [1] Furthermore, other research reports and studies have been able to use contact tracing data from these daily situation reports to conduct studies on contact patterns and the impact of contact tracing. [2, 3]

[1] National Health Commission of the People's Republic of China. 18 December 2020. "Latest Update on COVID-19 as of Midnight on 17 December 2020 (截至 12 月 17 日 24 时新型冠状病毒肺炎疫情最新情况)".

[http://www.nhc.gov.cn/yjb/s7860/202012/f0af51f645dd493d8b4905a8a3ac3fbc.shtml]. Accessed 18 December 2020.

[2] Zhang, Juanjuan; Litvinova, Maria; Liang, Yuxia; Wang, Yan; Wang, Wei; Zhao, Shanlu; Wu, Qianhui; et al. 26 June 2020. "Changes in contact patterns shape the dynamics of the COVID-19 outbreak in China". *Science*, 368(6498): 1481-1486.

[https://science.sciencemag.org/content/368/6498/1481.full]. Accessed 18 December 2020.

[3] Dirlikov, Emilio; Zhou, Suizan; Han, Lifeng; Li, Zhijun; Hao, Ling; Millman, Alexander; and Marston, Barbara. 7 December 2020. "Use of Public Data to Describe COVID-19 Contact Tracing in China during January 20–February 29, 2020". *MedRx*.

[https://doi.org/10.1101/2020.12.04.20243972]. Accessed 18 December 2020.

2.5.2 Point of entry management

2.5.2a

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

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

Current Year Score: 1

There is some evidence indicating that there is a joint agreement between the National Health Commission (Ministry of Health) and the General Administration of Customs to identify suspected and potential cases, but only during active public health emergencies. The 1986 "Frontier Health and Quarantine Law of the People's Republic of China" was formulated to prevent infectious diseases from spreading into and out of the country. [1] The 1989 "Rules for the Implementation of Frontier Health and Quarantine Law of the People's Republic of China" note the roles of the Ministry of Health (now the National Health Commission) and the General Administration of Customs (border control authorities) in setting up a "health and quarantine unit" to identify suspected and potential cases in international traveler. [2] On the websites of the National Health Commission and the General Administration of Customs, following the COVID-19 outbreak, the two entities issued a joint announcement with guidance for international travelers and also reinstituted the health declaration form for inbound and outbound travelers. [3, 4]

[1] Standing Committee of the Sixth National People's Congress. 2 December 1986. "Frontier Health and Quarantine Law of the People's Republic of China." [http://www.asianlii.org/cn/legis/cen/laws/fhaqlotproc561/]. Accessed 18 December 2020.

[2] "Rules for the Implementation of the Frontier Health and Quarantine Law of the People's Republic of China." 6 March 1989. [<http://english.mofcom.gov.cn/article/lawsdata/chineselaw/200211/20021100050736.shtml>]. Accessed 18 December 2020.

[3] General Administration of Customs. 24 January 2020. "GACC and National Health Commission Announcement No.15 of 2020 (on Prevention and Control of the Novel Coronavirus-Related Pneumonia)". [<http://english.customs.gov.cn/Statics/3cef3ead-4a04-4623-bd6b-0f1bc1474465.html>]. Accessed 18 December 2020.

[4] General Administration of Customs. 24 January 2020. "GACC Announcement No.16 of 2020 (on Re-adopting the Health Declaration Form for Inbound and Outbound Travellers)". [<http://english.customs.gov.cn/Statics/f64ce2ac-230a-4397-8816-6f44356fc34f.html>]. Accessed 18 December 2020.

2.6 EPIDEMIOLOGY WORKFORCE

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

2.6.1a

Does the country meet one of the following criteria?

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

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

Current Year Score: 1

There is a Chinese Field Epidemiology Training Program (CFETP) and the China Field Epidemiology Training Program for Veterinarians (CFETPV). [1] Established in 2001, the CFETP has enrolled 356 of China's epidemiologists from national and local level public health agencies to respond to health emergencies. The advanced training is a 2 year program. Additionally, in 2016, the China Center for Disease Control and Prevention (CDC) developed a new project called Western FETP, which consists of nine months of on-the-job training. [2] There is also evidence that China has provided resources for staff to train in other countries, such as Thailand. [3]

[1] Food and Agriculture Organisation of the United Nations (FAO) China. "CFETPV and CFETP planned for future joint collaborations to promote One Health application". [<http://www.fao.org/china/news/detail-events/en/c/462521/>]. Accessed 18 December 2020.

[2] Tephinet. "China Field Epidemiology Training Program." [<https://www.tephinet.org/training-programs/china-field-epidemiology-training-program>]. Accessed 18 December 2020.

[3] U.S. Center for Disease Control and Prevention. 8 September 2020. "Thailand FETP Celebrates 40 Years of Training, Mentorship, and Public Health Successes". [<https://www.cdc.gov/globalhealth/healthprotection/fetp-40th-anniversary/stories/thailand-fetp-40.html>]. Accessed 18 December 2020.

2.6.1b

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

Yes = 1 , No = 0

Current Year Score: 1

There is a specific animal health field epidemiology training program offered (such as FETPV). The China Field Epidemiology Training Program for Veterinarians (China FETPV) provides training on scientific and risk based approaches for controlling transboundary animal diseases and emerging infectious diseases. China FETPV is a collaborative effort by China's Ministry of Agriculture (MOA), the Food and Agriculture Organization of United Nations (FAO), and the United States Agency for International Development (USAID). [1]

[1] Royal Veterinary College of the University of London. "China Field Epidemiology Training Programme for Veterinarians (FETPV)". [https://www.rvc.ac.uk/research/research-centres-and-facilities/veterinary-epidemiology-economics-and-public-health/projects/china-field-epidemiology-training-programme-for-veterinarians-fetpv]. Accessed 18 December 2020.

2.6.2 Epidemiology workforce capacity

2.6.2a

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

Yes = 1, No = 0

Current Year Score: 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

China has an overarching national public health emergency response plan in place which addresses planning for multiple communicable diseases with pandemic potential. According to China's "Regulations on Contingent Public Health Emergencies," if a public health crisis is declared, the State Council will set up an emergency command center that includes representatives from the National Health Commission and Department of Defense. An advisory committee of health experts

are tasked with evaluating the public health threat and recommending whether existing contingency plans should be implemented. These regulations list epidemics as a type of public health emergency. [1] In 2006, China also issued a "National Contingency Plan for Public Health Emergencies" which identifies roles and responsibilities, reporting, and prevention of spread of infectious diseases. [2]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwggk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 18 December 2020.

3.1.1b

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

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

Current Year Score: 0

According to a history of China's legal responses to health emergencies, the 2006 "National Contingency Plan for Public Health Emergencies" has not been updated in the last three years. [1]

[1] Library of Congress. "China: Legal Responses to Health Emergencies." 24 July 2020.

[https://www.loc.gov/law/help/health-emergencies/china.php#_ftnref10]. Accessed 15 December 2020.

3.1.1c

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

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

Current Year Score: 1

The 2006 "National Contingency Plan for Public Health Emergencies" includes considerations for pediatric and other vulnerable populations. Section 3.1.1 calls for paediatric and other vulnerable populations (e.g. old, sick, disabled, pregnant) to be individually notified about public health emergencies during such situations. [1]

[1] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 18 December 2020.

3.1.1d

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

Yes = 1, No = 0

Current Year Score: 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 no mention of engaging the private sector in the official documents relevant to public health emergencies, namely the 2003 "Regulations on Contingent Public Health Emergencies," the 2006 "Overall Contingency Plan for National Public Emergencies", the 2007 "Emergency Response Law of the People's Republic of China". [1, 2, 3] There is also no mention of engaging the private sector to assist with outbreak emergency preparedness and response on the websites of the National Health Commission or the Chinese Center for Disease Control and Prevention. [4, 5]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwgk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 18 December 2020.

[3] President of the People's Republic of China. Order No. 69 of 2007. "Emergency Response Law of the People's Republic of China. [http://english.gov.cn/archive/laws_regulations/2014/08/23/content_281474983042515.htm]. Accessed 19 December 2020.

[4] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 14 December 2020.

[5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

3.1.3 Non-pharmaceutical interventions planning

3.1.3a

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

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

Current Year Score: 2

China has guidelines to implement non-pharmaceutical interventions during an epidemic or pandemic in place for more than one disease. In 2018, the National Health Commission issued Order No. 17 "Measures for the Implementation of the Law of the People's Republic of China on the Prevention and Control of Infectious Diseases". Section 4 provides guidelines on how to control and limit the spread of the disease, noting that different diseases require different measures. Article 45-50 note the different interventions depending on what the categories of infectious diseases are. NPI measures include isolation, protecting source of drinking water, strengthening sanitation and cleaning measures, and increasing public awareness about

the outbreak. [1] NPI interventions for COVID-19 included isolation of individuals who are ill, contact tracing, quarantine of exposed individuals, travel restrictions, cancellation of mass gatherings, etc. [2]

[1] National Health Commission of the People's Republic of China. 30 August 2018. "National Health Commission Order No. 17 Measures for the Implementation of the Law of the People's Republic of China on the Prevention and Control of Infectious Diseases (中华人民共和国卫生部令第 17 号中华人民共和国传染病防治法实施办法)".

[http://www.nhc.gov.cn/fzs/s3576/201808/58d2b24710c14c2f97ae6de5a8059b73.shtml]. Accessed 19 December 2020.

[2] Lia, Shengjie; Ruktanonchai, Nick W.; Zhou, Liangcai; Prosper, Olivia; Luo, Wei; Floyd, Jessica R.; Wesolowski, Amy; Santillana, Mauricio; Zhang, Chi; Du, Xiangjun; Yu, Hongjie; and Tatem, Andrew J. 4 May 2020. "Effect of non-pharmaceutical interventions to contain COVID-19 in China". Nature, 585: 410-413. [https://doi.org/10.1038/s41586-020-2293-x]. Accessed 19 December 2020.

3.2 EXERCISING RESPONSE PLANS

3.2.1 Activating response plans

3.2.1a

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 1

There is evidence that China has completed a national-level biological threat-focused exercise and activated their national emergency response plan for COVID-19 in the last year. According to the Chinese Center for Disease Control and Prevention (CDC) website, China conducted the largest scale to date simulation exercise of an infectious disease outbreak at the national level in the last year (July 25, 2019). The exercise was conducted virtually with all 31 provinces with over 8,200 participants. The scenario was that a flight carrying a person infected with Virus X from Country A landed at the airport in a city called Ningxia. Participants discussed how to respond, how to initiate quarantine, how to conduct contact tracing, how to report information to the National Health Commission and the CDC, etc. [1] Secondly, there is evidence that the country has activated their national emergency response plan for an infectious disease in the last year. Specifically, the COVID-19 response draws upon the "Regulations on Public Health Emergencies" and the "National Contingency Plan for Public Health Emergencies", including prevention and control measures such as isolation, contact tracing, etc. [2, 3]

[1] Chinese Center for Disease Control and Prevention. 5 August 2019. "Post-SARS, Largest Emergency Response Simulation (后 SARS 时代, 上演最大规模应急演练)". [http://www.chinacdc.cn/mtbd_8067/201908/t20190805_204455.html]. Accessed 19 December 2020.

[2] National Health Commission of the People's Republic of China. 25 January 2020. "Notice on Strengthening Community Prevention and Control of Novel Coronavirus Infection (解读《关于加强新型冠状病毒感染的肺炎疫情社区防控工作的通知》)". [http://www.nhc.gov.cn/jkj/s3578/202001/5d3cec60403e4455af0b94eabcef8373.shtml]. Accessed 19 December 2020.

[3] National Health Commission of the People's Republic of China. 25 January 2020. "Regarding Strengthening Prevention and

Control of Novel Coronavirus (关于加强新型冠状病毒感染的肺炎疫情社区防控工作的通知)".

[<http://www.nhc.gov.cn/jkj/s3577/202001/dd1e502534004a8d88b6a10f329a3369.shtml>]. Accessed 19 December 2020.

3.2.1b

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

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

Current Year Score: 0

There is evidence that China has considered gaps in its emergency health response but it has not developed a publicly available plan to improve response capacity. Following the July 2019 large-scale outbreak simulation exercise, the National Health Commission noted that lessons from the exercise will inform the emergency health response section of the "14th Five-Year Plan". [1] Additionally, in June 2020, State Council published a white paper on "China's Actions to Fight COVID-19". Subsequently, the Director of the National Health Commission (China's Ministry of Health) held a press conference in which he outlined five steps to improve the public health emergency response system: 1) improve public health investments; 2) strengthen national, provincial, and local level disease control and prevention systems; 3) develop linkages between the disease prevention components of the medical system and the medical treatment components; 4) improve early warning systems by developing stronger direct reporting networks; and 5) cultivate talents in epidemiology. However, the press conference did not provide specific details and the plan is not publicly available. [2] Additionally, the plan is not available on either the National Health Commission or the Center for Disease Control and Prevention websites. [3, 4] The World Health Organization (WHO) website does not have any after action reviews available for China and its country page does not include a plan to improve response capacity either. [5, 6]

[1] Chinese Center for Disease Control and Prevention. 5 August 2019. "Post-SARS, Largest Emergency Response Simulation (后 SARS 时代, 上演最大规模应急演练)". [http://www.chinacdc.cn/mtbd_8067/201908/t20190805_204455.html]. Accessed 19 December 2020.

[2] The State Council Information Office of the People's Republic of China. 7 June 2020. "Measures to Strengthen the Public Health System and Emergency Public Health Response System (多举措加强公共卫生体系和突发公共卫生事件体系建设)". [<http://www.scio.gov.cn/xwfbh/xwbfbh/wqfbh/42311/43134/zy43138/Document/1681826/1681826.htm>]. Accessed 19 Decembr 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[4] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 January 2021.

[5] World Health Organization (WHO). "China". [<https://www.who.int/countries/chn/>]. Accessed 17 January 2021.

[6] World Health Organization (WHO). "After Action Review (AAR) - China". [<https://extranet.who.int/sph/after-action-review?region=All&country=338>]. Accessed 17 January 2021.

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 insufficient evidence to indicate that the country has undergone a national-level biological threat focused exercise that included private sector officials in the last year. During the July 25, 2019 exercise, which was to test the effectiveness of the National Health Emergency Response Plan, there was no evidence that private sector representatives were included. The exercise included over 8,200 people but these participants were public officials, including the health committees of the 31 provinces. [1] Other than press and information regarding the July 2019 exercise, there is no further evidence that there has been a national-level exercise in the past year that included private sector officials on the National Health Commission or the Chinese Center for Disease Control and Prevention (CDC) websites. [2, 3] Additionally, there is no publicly available After Action Reviews for China listed on the World Health Organization (WHO) website and there is no indicate of such an exercise on the WHO China page or the WHO Simulation Exercises website. The last simulation that China conducted was in November 2017. [4, 5, 6]

[1] Chinese Center for Disease Control and Prevention. 5 August 2019. "Post-SARS, Largest Emergency Response Simulation (后 SARS 时代, 上演最大规模应急演练)". [http://www.chinacdc.cn/mtbd_8067/201908/t20190805_204455.html]. Accessed 19 December 2020.

[2] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[3] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 January 2021.

[4] World Health Organization (WHO). "China". [<https://www.who.int/countries/chn/>]. Accessed 17 January 2021.

[5] World Health Organization (WHO). "After Action Review (AAR) - China". [<https://extranet.who.int/sph/after-action-review?region=All&country=338>]. Accessed 17 January 2021.

[6] World Health Organization (WHO). "Simulation Exercise - China". [<https://extranet.who.int/sph/simulation-exercise?region=All&country=338>]. Accessed 28 January 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

China has in place an Emergency Operations Center. The Public Health Emergency Center (PHEC) is part of the Chinese Center for Disease Control and Prevention, which is under the supervision of the National Health Commission. PHEC "leads the national public health emergency preparedness and response activities. The mission of PHEC is to protect public health and reduce the impacts of emergencies by preparing systematically for public health threats and responding effectively to public health emergencies, including natural or human-made disasters, outbreaks of infectious diseases, group poisoning, and mass gathering." [1] Additionally, the National Health Commission has an "Emergency Command Center for Public Health Emergencies". The responsibilities of this Command Center include addressing public health emergencies, conduct drills, monitor for emergencies, and share public health information during emergencies. [2]

[1] Chinese Center for Disease Control and Prevention. "Health Emergency".

[http://www.chinacdc.cn/en/aboutus/orc_9348/]. Accessed 19 December 2020.

[2] National Health Commission of the People's Republic of China. 11 September 2018. "Responsibilities of the Health Emergency Office (Emergency Command Center for Public Health Emergencies) (卫生应急办公室 (突发公共卫生事件应

急指挥中心) 主要职责)". [<http://www.nhc.gov.cn/yjb/pzyzz/lmtt.shtml>]. Accessed 19 December 2020.

3.3.1b

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

Yes = 1 , No = 0

Current Year Score: 0

Even though there are guidelines for Health Emergency Exercises (Drills), which were published in 2013 and outline components of the drills, there is no publicly available evidence to indicate that the Chinese Center for Disease Control and Prevention's Public Health Emergency Center or the National Health Commission Health Emergency Office is required to conduct drills for public health emergencies at least once per year or that it actually conducts drills on the CDC or National Health Commission website. [1, 2, 3] The last public health emergency drill was conducted from June 10-13, 2019 and revolved around response following a natural disaster, including medical rescue, post disaster epidemic prevention, etc. However, there is no further evidence that such drills happen on an annual basis. [4]

[1] Chinese Center for Disease Control and Prevention. 2013. "Guidelines of Health Emergency Exercises (卫生应急演练技术指南)". [<http://www.chinacdc.cn/tzgg/201312/P020131231512234213243.pdf>]. Accessed 19 December 2020.

[2] Chinese Center for Disease Control and Prevention. 11 April 2019. "Public Health Emergency Center (卫生应急中心)". http://www.chinacdc.cn/jgxx/zzjgt/zxznscs/200506/t20050610_8278.html. Accessed 19 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[4] National Health Commission of the People's Republic of China. 14 June 2019. "The 2019 National Health Emergency Drill and the Beijing-Tianjin-Hebei Joint Drill Held in Hebei (2019 年国家卫生应急演练暨京津冀联合演练在河北举办)". [<http://www.nhc.gov.cn/yjb/jdt/201906/17f5b995ee4c42c8b48175e2a4d63315.shtml>]. Accessed 24 April 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 not publicly available evidence to indicate that China's National Health Commission's Emergency Command Center for Public Health or the Chinese Center for Disease Control and Prevention Public Health Emergency Center coordinated an emergency response within 120 minutes or coordinated an emergency response exercise on either websites. [1, 2]. In regards to the COVID-19 outbreak, a white paper detailing China's action plan to fighting COVID-19 published in June 2020 covers a brief timeline of the initial outbreak. On December 27, 2019, a hospital in Wuhan reported a case of pneumonia with unknown cause to the provincial-level Center for Disease Control and Prevention. It was not until December 31, 2019 did the National Health Commission begin organizing and sending a team to investigate the outbreak. Further, not until January 23 did the National Health Commission begin launching an emergency response. [3]

[1] Chinese Center for Disease Control and Prevention. 11 April 2019. "Public Health Emergency Center (卫生应急中心)". http://www.chinacdc.cn/jgxx/zzjgt/zxznscs/200506/t20050610_8278.html. Accessed 19 December 2020.

[2] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[3] State Council of the People's Republic of China. 7 June 2020. "China's Action Plan to Fight COVID-19 (抗击新冠肺炎疫情的中国行动)". [http://www.gov.cn/zhengce/2020-06/07/content_5517737.htm]. Accessed 19 December 2020.

3.4 LINKING PUBLIC HEALTH AND SECURITY AUTHORITIES

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

3.4.1a

Does the country meet one of the following criteria?

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

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

Current Year Score: 0

There is no public evidence that public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event; there are no publicly available standard operating procedures, guidelines, MOUs or other agreements between the public health and security authorities to respond to a potential deliberate biological event. There is no relevant information on this topic on the websites of the National Health Commission, Ministry of National Defense, Ministry of Public Safety, and Chinese Center for Disease Control and Prevention. [1, 2, 3, 4] Older news coverage indicates that simulation exercises to prepare for potential bioterrorism attacks take place, especially before big national events. For example, before the 2008 Beijing Olympics, experts speculated that authorities were preparing for potential deliberate biological events involving anthrax, plagues, and SARS. No details of such exercises were made public, but experts noticed that the Chinese Academy of Inspection and Quarantine had a project for rapid inspection and diagnosis, e.g. deploying biosensors at airports, subway stations, and in stadiums, which suggested a focus on anthrax, plague and SARS. [5] Scholars affiliated with the Centre for Disease Control and Prevention of the Xinjiang Military Command note that while medical professionals affiliated with the military are exposed to courses and exercises that involve bioterrorism, medical professionals not affiliated with the military typically are not, which is a problem of emergency medical preparedness and response. [6]

[1] Chinese Center for Disease Control and Prevention. 11 April 2019. "Public Health Emergency Center (卫生应急中心)". [http://www.chinacdc.cn/jgxx/zzjgt/zxncs/200506/t20050610_8278.html]. Accessed 19 December 2020.

[2] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[3] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 19 December 2020.

[4] Ministry of Public Safety of the People's Republic of China. [<http://www.gov.cn/fuwu/bm/gab/index.htm>]. Accessed 19 December 2020.

[5] Miks, Jason. 7 May 2009. "Bioterrorism in Asia". [<https://thediplomat.com/2009/05/bioterrorism-in-asia/>]. Accessed 19 December 2020.

[6] Li, Hai-Long et al. 2015. "Emergency Response to Nuclear, Biological and Chemical Incidents: Challenges and Countermeasures". *Military Medical Research* 2: 19. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4561417/>]. Accessed 19 December 2020.

3.5 RISK COMMUNICATIONS

3.5.1 Public communication

3.5.1b

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

Yes = 1 , No = 0

Current Year Score: 1

The strategy document that can be used to guide national public health response outlines how messages will reach populations and sectors with different communications needs. China's 2006 National Contingency Plan for Public Emergencies" covers four types of national public emergencies, of which public health emergencies is one. The plan mentions various ways that information can be conveyed to the public, e.g. radio, television, newspapers, communications, internet networks, alarms, advertising vehicles, or individual notifications to the elderly, young, sick, disabled, pregnant. It also suggests that special places such as schools and alarm blind spots need to adopt more targeted communication methods. [1]

[1] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)." [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

3.5.1 Risk communication planning

3.5.1a

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

Yes = 1 , No = 0

Current Year Score: 1

China has several regulatory and strategy documents relevant to national public health emergency response planning, some of which include a risk communication plan that can be used during a public health emergency. The 2003 "Regulations on Contingent Public Health Emergencies" detail how the public and institutions can report information to authorities, but it does not mention a risk communication plan for how government authorities and health experts would get information to the public. [1] To communicate risk, China's 2006 National Contingency Plan for Public Emergencies Section 3.1.1 mentions various ways that information can be conveyed to the public, e.g. radio, television, newspapers, communications, internet networks, alarms, advertising vehicles, or individual notifications to the elderly, young, sick, disabled, pregnant. It also suggests that special places such as schools need to adopt more targeted communication methods. [2] The 2007 "Emergency Response Law of the People's Republic of China" and the 2014 "Overall Contingency Plan for National Public Emergencies" are meant for general public emergencies, which includes public health emergencies. The 2014 document contains a risk communication plan that can be used during a public health emergency. [3, 4]

[1] State Council of the People's Republic of China. Order No. 376 of 9 May 2003. "Regulations on Contingent Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwgk/2005-05/20/content_145.htm]. Accessed 17

January 2021.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)." [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] President of the People's Republic of China. Order No. 69 of 2007. "Emergency Response Law of the People's Republic of China. [http://english.gov.cn/archive/laws_regulations/2014/08/23/content_281474983042515.htm]. Accessed 17 January 2021.

[4] State Council of the People's Republic of China. Notice No. 119 of 2014. "Overall Contingency Plan for National Public Emergencies (国家突发公共事件总体应急预案)". [http://www.gov.cn/yjgl/2005-08/07/content_21048.htm]. Accessed 17 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

Although China's risk communication plans and orders designate the National Health Commission (China's Ministry of Health) as the department in charge of sharing information, there is insufficient evidence in the plans or orders to indicate that there is a specific spokesperson or position within the department. China's State Council 2003 Order No. 376 Emergency Regulations for Public Health Emergencies Article 25 notes that the National Health Commission is responsible for sharing information on emergencies with the public. When necessary, the health departments at the province level may be called upon to share information on emergencies in their administrative areas. [1] The 2006 National Contingency Plan for Public Health Emergencies Section 4.2.1 and 4.2.2 notes that the National Health Commission and local and provincial health departments are charged with sharing relevant health information with the public. However, the plan does not designate a specific spokesperson or position within the government. [2] Aside from these aforementioned order and plan, there is not further information on the National Health Commission or the Chinese Center for Disease Control and Prevention websites to indicate that there is a specific position within the government to serve as the primary spokesperson during a public health emergency. [3, 4]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwgk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)." [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] Chinese Center for Disease Control and Prevention. [http://www.chinacdc.cn/]. Accessed 15 January 2021.

[4] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 15 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

There is evidence that the National Health Commission (China's Ministry of Health) regularly shares information on health concerns using its website and social media to inform the public about an ongoing public health concern and to dispel rumors and misinformation. In the last year, one way that the Chinese National Health Commission is trying to dispel misinformation and rumors regarding public health concerns, particularly COVID-19, is by highlighting the legal ramifications of disseminating false information according to various regulations including the "Emergency Response Law", noting that violators could be detained and be fined and in serious cases where social order is seriously disrupted, can be imprisoned for up to 3 years. [1] Additionally, during COVID-19 the National Health Commission shares daily briefs on cases, locations, etc. since February 3, 2020 on its website. [2] Pre-pandemic, the National Health Commission also regularly shared information online, including tips for improving one's eyesight, new standards for community hospitals, information about strokes, etc. during the month of July 2019. [3] The National Health Commission also a Weibo (blog) and WeChat (social media) channel ("Healthy China") that it regularly shares information on. [4]

[1] National Health Commission of the People's Republic of China. 12 February 2020. "What legal responsibilities should those who fabricate or deliberately spread false information about the epidemic bear? (编造、故意传播虚假疫情信息的人，要承担什么法律责任?)". [<http://www.nhc.gov.cn/xcs/pfzs/202002/af94be0d409e42ec9db566a004357904.shtml>]. Accessed 21 December 2020.

[2] National Health Commission. 21 December 2020. "Dec 21: Daily briefing on novel coronavirus cases in China". [http://en.nhc.gov.cn/2020-12/21/c_82486.htm]. Accessed 21 December 2020.

[3] National Health Commission. "News". [http://en.nhc.gov.cn/news_200.html]. Accessed 21 December 2020.

[4] National Health Commission. "Healthy China Weibo and WeChat Accounts (健康中国微博、微信)". [<http://www.nhc.gov.cn/wjw/weib/201901/4edc73dbde5b48fa9b1156a5fb29ffa8.shtml>]. Accessed 17 January 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 indicate that Chinese senior leaders have shared misinformation or disinformation on infectious diseases in the past two years. It was not explicitly stated during a senior leader speech or on a senior leader's social media publication, during the COVID-19 initial outbreak, the government attempted to censor Dr. Li Wenliang's attempts to share information about the virus and spread misinformation that the public did not need to be alarmed and that the virus was not as concerning as the doctor claimed. [1] Further, international news outlets have indicated that the Chinese Communist Party and officials have shared misinformation on the handling of COVID-19. For instance, in February 2020, the head of the country's high-level expert team on the epidemic Zhong Nanshan began noting that the virus might not

have originated from China. This led the Ministry of Foreign Affairs spokesman Zhao Lijian to put forth the theory that the U.S. military had brought the disease to Wuhan. His message was amplified on Twitter by dozens of other Chinese embassies. [2, 3] There is no further evidence on the websites of international media.

[1] Yu, Vernan, Kuo, Lily and Huang, Jiahui. 7 February 2020. "'Hero who told the truth': Chinese rage over coronavirus death of whistleblower doctor". The Guardian. [<https://www.theguardian.com/global-development/2020/feb/07/coronavirus-chinese-rage-death-whistleblower-doctor-li-wenliang>]. Accessed 17 January 2021.

[2] Myers, Steven Lee. 13 March 2020. "China Spins Tale That the U.S. Army Started the Coronavirus Epidemic". The New York Times. [<https://www.nytimes.com/2020/03/13/world/asia/coronavirus-china-conspiracy-theory.html>]. Accessed 21 December 2020.

[3] Nossel, Suzanne. 9 March 2020. "Truth Has Become a Coronavirus Casualty." Foreign Policy. [<https://foreignpolicy.com/2020/03/09/truth-coronavirus-china-trump-pence/>]. Accessed 21 December 2020.

3.6 ACCESS TO COMMUNICATIONS INFRASTRUCTURE

3.6.1 Internet users

3.6.1a

Percentage of households with Internet

Input number

Current Year Score: 54.3

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: 120.36

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: 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: 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, China has restricted exports/imports of medical goods due to an infectious disease outbreak without international or bilateral support. As of March 31, 2020, China restricted exports of test kits and medical supplies, requiring companies to obtain government approval prior to virus detection reagents, medical masks, ventilators, infrared thermometers, etc. due to the COVID-19 pandemic. There is no evidence to indicate that this restriction was done with international support. [1]

[1] International Trade Center. "Market Access Map - COVID-19 Temporary Trade Measures."
[<https://www.macmap.org/covid19#>]. Accessed 21 December 2020.

3.7.1b

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

Yes = 0, No = 1

Current Year Score: 0

In the past year, China has restricted imports and exports of non-medical goods due to an infectious disease outbreak without international or bilateral support. Due to the COVID-19 pandemic, China has restricted imports or imposed stringent controls on imports of frozen foods, where imported food products must be fully tested and disinfected. As of November 12, 2020, the National Health Commission reported that the country has suspended imports of 99 suppliers from 20 countries.

[1]

[1] Cadell, Cate. 13 November 2020. "China's sweeping COVID controls put frozen food importers on ice." Reuters. [https://www.reuters.com/article/health-coronavirus-china-frozenfood/chinas-sweeping-covid-controls-put-frozen-food-importers-on-ice-idUSL4N2HY2BH]. Accessed 21 December 2020.

3.7.2 Travel restrictions

3.7.2a

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

Yes = 0, No = 1

Current Year Score: 0

In the past year, China has implemented a ban on travelers arriving from other countries without international or bilateral support due to an infectious outbreak. Due to the COVID-19 pandemic, beginning March 28, 2020, China restricted foreigners (non-Chinese citizens) from entering the country. [1]

[1] State Council of the People's Republic of China. 27 March 2020. "Announcement by the Ministry of Foreign Affairs and the National Immigration Administration on Temporary Suspension of Foreigners with Valid Visas and Residence Permits from Entering the Country (中华人民共和国外交部、国家移民管理局关于暂时停止持有效中国签证、居留许可的外国人入境的公告)". [http://www.gov.cn/xinwen/2020-03/27/content_5496131.htm]. Accessed 22 December 2020.

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

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

4.1.1 Available human resources for the broader healthcare system

4.1.1a

Doctors per 100,000 people

Input number

Current Year Score: 197.98

2017

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 266.21

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

There is insufficient evidence to indicate that China has a health workforce strategy in place that has been updated in the past five years to identify fields where there is an insufficient workforce and strategies to address these shortcomings. In 2011, China's Ministry of Health (now the National Health Commission) released the "National Guidelines for Mid-long Term Human Resources for Health Development from 2011 to 2020." These guidelines note the shortages of trained medical personnel, lack of innovation, and lack of standardized training, particularly for rural areas. Some strategies to address included increasing recruitment, standardizing training for resident physicians, implement urban-rural long-term support programs (in which urban areas would provide support for rural areas), increase funding for medical research etc. [1] These workforce strategy guidelines are still valid, but there is no indication that they have been updated in the past five years on the websites of the National Health Commission, Ministry of Human Resources and Social Security, or Ministry of Education. [2, 3, 4] During the COVID-19 pandemic, the Director of the Chinese Center for Disease Control and Prevention (CDC) called for better training and development of a larger healthcare workforce. [5]

[1] National Health Commission. 28 April 2011. "The Ministry of Health Announces "Health Workforce Mid-to-Long-Term Development Plan 2011-2020 (卫生部关于印发《医药卫生中长期人才发展规划（2011-2020年）》的通知)".

[http://www.nhc.gov.cn/wjw/gfxwj/201304/b449c48ff32045a4818d54a4eba86e3b.shtml]. Accessed 22 December 2020.

[2] National Health Commission of the People's Republic of China. [http://en.nhc.gov.cn/]. Accessed 21 December 2020.

[3] Ministry of Human Resources and Social Security of the People's Republic of China. [http://www.mohrss.gov.cn/]. Accessed 22 December 2020.

[4] Ministry of Education of the People's Republic of China. [http://www.moe.gov.cn/]. Accessed 22 December 2020.

[5] Xiao, Longping. 11 April 2020. "Director of the Chinese Center for Disease Control and Prevention, Li Liming, Says: Training Public Healthcare Talent" (国家疾控中心首任主任李立明：培养能“一锤定音”的公共卫生人才)." Sina News.

[https://m.us.sina.com/gb/china/thebeijingnews/2020-04-11/detail-ifzvhyfh6177647.shtml]. Accessed 22 December 2020.

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 431.0

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: 1

China has the capacity to isolate patients with highly communicable diseases in a biocontainment patient care unit and/or patient isolation facility located within the country. Since 2003, China has required the establishment of patient isolation facilities in designated hospitals. [1, 2] For example, the Infectious Disease Department of Shanghai's Zhongshan Hospital has two negative pressure wards. [3]

[1] Ministry of Health of the People's Republic of China. 4 May 2003. "Guiding Principles for Hospital Infection Control of Infectious Atypical Pneumonia (Trial) (传染性非典型肺炎医院感染控制指导原则 (试行)". [<http://www.law-lib.com/lawhtm/2003/74522.htm>]. Accessed 22 December 2020.

[2] World Health Organization (WHO). 18-24 April 2013. "China—WHO Joint Mission on Human Infection with Avian Influenza A(H7N9) Virus Mission Report". [http://www.who.int/influenza/human_animal_interface/influenza_h7n9/ChinaH7N9JointMissionReport2013.pdf]. Accessed 22 December 2020.

[3] Zhongshan Hospital (Shanghai). "Infectious Disease Department 感染病科". [<http://www.zs-hospital.sh.cn/zsyy/n33/n35/n48/n195/n196/u1ai1787.html>]. Accessed 22 December 2020.

4.1.2c

Does the country meet one of the following criteria?

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

Yes = 1, No = 0

Current Year Score: 1

There is evidence that China has demonstrated capacity to expand isolation capacity in response to an infectious disease outbreak in the last two years, but it does not have a recently updated plan regarding expanding isolation capacity. During the COVID-19 outbreak, China was able to rapidly scale up and build large-scale quarantine and isolation facilities for confirmed, non-critical cases. During the pandemic, China quickly stood up over 20 mass quarantine facilities in Wuhan. [1, 2] There were three types of facilities for isolation: 1) fangcang shelter hospitals (makeshift hospitals), 2) refitted non-designated hospitals, and 3) quarantine hotels. These facilities mitigated the immediate high demand for space. Precautionary measures were taken to minimize infection risk. [3] However, China has not recently developed, updated, or tested a plan that focuses on expanding isolation capacity. In 2019, the National Health Commission (China's Ministry of Health) issued a notice on "Further Strengthening the Work of Infection Prevention and Control in Medical Institutions", but this notice, although it provides guidelines on isolation, it does not specify expanding isolation capacity during an outbreak. [4] Additionally, a document on "Technique Standard for Isolation in Hospitals" has not been updated since 2009. [5] There is

not further information on plans related to expanding isolation capacity in response to a disease outbreak on the websites of the National Health Commission, Center for Disease Control and Prevention, or Ministry of Emergency Management. [6, 7, 8] China does not have a World Health Organization (WHO) Joint External Evaluation (JEE) report. [9]

[1] Dickens, Borame L.; Koo, Joel R.; Wilder-Smith, Annelies; and Cook, Alex R. May 16, 2020. "Institutional, not home-based, isolation could contain the COVID-19 outbreak." *The Lancet* 395(10236), 1541-1542. [[https://doi.org/10.1016/S0140-6736\(20\)31016-3](https://doi.org/10.1016/S0140-6736(20)31016-3)]. Accessed 24 April 2021.

[2] Feng, Emily. 24 February 2020. "China Has Built Over 20 Mass Quarantine Centers for Coronavirus Patients in Wuhan." NPR. [<https://www.npr.org/2020/02/24/808995258/china-has-built-over-20-mass-quarantine-centers-for-coronavirus-patients-in-wu-ha>]. Accessed 24 April 2021.

[3] Wang, Xianliang, et al. 22 April 2021. "Facilities for Centralized Isolation and Quarantine for the Observation and Treatment of Patients with COVID-19: Experience from Wuhan, China." *Engineering*. [<https://doi.org/10.1016/j.eng.2021.03.010>]. Accessed 24 April 2021.

[4] National Health Commission of the People's Republic of China. 23 May 2019. "National Health Commission Notice on 'Further Strengthening the Work of Infection Prevention and Control in MEDical Institutions (国家卫生健康委办公厅关于进一步加强医疗机构感染预防与控制工作的通知)".

[<http://www.nhc.gov.cn/zyygj/s7659/201905/d831719a5ebf450f991ce47baf944829.shtml>]. Accessed 24 April 2021.

[5] National Health Commission (formerly the Ministry of Health) of the People's Republic of China. "Technique standard for isolation in hospitals (医院隔离技术规范)".

[<http://www.nhc.gov.cn/wjw/s9496/200904/40116/files/3f2c129ec8d74c1ab1d40e16c1ebd321.pdf>]. Accessed 24 April 2021.

[6] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 24 April 2021.

[7] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 24 April 2021.

[8] Ministry of Emergency Management of the People's Republic of China. [<https://www.mem.gov.cn/>]. Accessed 24 April 2021.

[9] World Health Organization. "WHO Western Pacific Region: JEE mission reports."

[<https://www.who.int/ihr/procedures/mission-reports-western-pacific/en/>]. Accessed 24 April 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

China has a "Government Procurement Law" and "Tendering and Bidding Law" to govern the general procurement process for laboratory equipment and medical supplies by the National Health Commission and other relevant ministries, including the Ministry of Agriculture and Rural Affairs, that need to acquire laboratory or other medical supplies. The State Council determines and publishes a central procurement catalogue for items to be purchased from the central government's budget. Government procurement may take place via public invitation, invited bidding, competitive negotiation, single-source

procurement, inquiry about quotations; and other methods as permitted by the State Council. Public invitation is the principal method of government procurement. [1, 2] There is a central government procurement portal where calls for tender and successful bids are posted. Although the State Council oversees government procurement through a centralized procurement catalogue, departments with specific needs are exempt and can procure goods and services on their own if necessary. The National Health Commission is one such exemption. [3] Besides the central government procurement portal, national laboratories can also list their public tender announcements about procuring equipment on their own websites or through the Ministry of Finance. [4, 5] The Ministry of Agriculture has also posted tender announcements for laboratory equipment on its own website. [6]

[1] National People's Congress of the People's Republic of China. 29 June 2002. "The People's Republic of China Government Procurement Law (中华人民共和国政府采购法)". [http://www.npc.gov.cn/wxzl/wxzl/2002-07/10/content_297298.htm]. Accessed 22 December 2020.

[2] President of the People's Republic of China. Order No. 21 of 30 August 1999. "Law of the People's Republic of China on Tenders and Bids (中华人民共和国招标投标法)". [http://www.npc.gov.cn/wxzl/gongbao/2000-12/05/content_5004749.htm]. Accessed 22 December 2020.

[3] Chinese Government Procurement Portal (中国政府购买服务信息平台)". [<http://www.ccgp.gov.cn/>]. Accessed 22 December 2020.

[4] State Council of the People's Republic of China. 26 December 2018. "State Council releases catalog, standards for centralized procurement". [http://english.gov.cn/policies/latest_releases/2016/12/27/content_281475526620925.htm]. Accessed 22 December 2020.

[5] Ministry of Finance of the People's Republic of China. 27 July 2018. "2018 Laboratory Equipment Purchase Public Tender Notice for the Chinese Academy of Inspection and Quarantine (中国检科院 2018 年度实验室仪器设备采购公开招标公告)". [http://jjs.mof.gov.cn/mofhome/mof/xinxi/zhongyangbiaoxun/zhaoxiaogonggao/201807/t20180727_2974453.html]. Accessed 23 December 2020.

[6] Ministry of Agriculture and Rural Affairs of the People's Republic of China. 26 August 2015. "Ministry of Agriculture Key Laboratory Construction Project Equipment Uniform Bidding and Purchasing - Tender Notice for Laboratory Analysis Instruments (农业部重点实验室建设项目仪器设备统一招标采购——实验室分析仪器招标公告)". [http://www.moa.gov.cn/gk/cwgk_1/xmgl/201508/t20150826_4805927.htm]. Accessed 23 December 2020.

4.2.2 Stockpiling for emergencies

4.2.2a

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

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

Current Year Score: 2

There is evidence that China has stockpiles of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE) for national use during a public health emergency. The State Council issued a "Notice on Reforming and Strengthening the Management of Medical Reserves" in 1997 and the "Measures for the Administration of National Medical Reserves" in 1999. These two documents provide the guidelines for the national medical reserves for medical supplies and the importance of having financial reserves to procure additional supplies as well. However, they do not specify in detail what is required or the number of items that need to be stockpiled. [1, 2] Additionally, the National Health Commission website does not provide details on what the stockpile entails either. [3] Sinopharm, the state-owned enterprise, which supports the country's Central Medical Reserve did not have specifics on what is in the stockpiles either. [4] During the COVID-19 pandemic, there was reference on the National Health Commission website noting the use of gloves and other protective clothing and PPE from

the Central Medical Reserves. [5] In 2008, a national Tamiflu stockpile of 500,000 doses and a local Tamiflu stockpile of 37,900 doses, production from two Chinese manufacturers—with an annual capacity of about 15 million courses of treatment, and a production cycle of about 3 months were incorporated into the country's strategic stockpile for influenza pandemics. The China Center for Disease Control and Prevention stockpiled 20,000 doses of the vaccine for avian influenza control. [6]

[1] State Council of the People's Republic of China. 1997. "Notice on Reforming and Strengthening the Management of Medical Reserves (国务院关于改革和加强医药储备管理工作的通知)."

[http://www.gansu.gov.cn:8443/art/2020/7/2/art_11138_16289.html]. Accessed 23 December 2020.

[2] National Economic and Trade Commission of the People's Republic of China. 14 June 1999. "Measures for the Administration of the National Medical Reserves (国家医药储备管理办法)".

[http://pkulaw.cn/fulltext_form.aspx?Gid=23152&Db=chl]. Accessed 23 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 21 December 2020.

[4] Sinopharm. "About Us (关于我们)". [<http://www.sinopharm.com/1073.html>]. Accessed 23 December 2020.

[5] National Health Commission of the People's Republic of China. 24 January 2020. "Pandemic Report: 830 Confirmed Cases (家卫健委疫情通报：累计报告确诊病例 830 例)".

[<http://www.nhc.gov.cn/xcs/s7847/202001/4393c682a09f4f448365ac14b87036e5.shtml>]. Accessed 23 December 2020.

[6] Xue Lan and Zeng Guang. 24 November 2018. "China's Prevention and Control and Policy Changes to the Influenza A (H1N1) Pandemic". Nature Public Health Emergency Collection, 45-74.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7123143/>]. Accessed 23 December 2020.

4.2.2b

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

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

Current Year Score: 2

There is evidence that China has some stockpiles of laboratory supplies for national use during a public health emergency. The State Council issued a "Notice on Reforming and Strengthening the Management of Medical Reserves" in 1997 and the "Measures for the Administration of National Medical Reserves" in 1999. These two documents provide the guidelines for the national medical reserves for laboratory supplies and the importance of having financial reserves to procure additional supplies as well. However, they do not specify in detail what is required or the number of items that need to be stockpiled.

[1, 2] Additionally, the National Health Commission website does not provide details on what the stockpile entails either. [3] Sinopharm, the state-owned enterprise, which supports the country's Central Medical Reserve did not have specifics on what is in the stockpiles either. [4] However, other reports have noted what might be included in the stockpiles. For instance, during the H1N1 pandemic, the country stockpiled laboratory reagents. It is noted that the stockpiles were woefully inadequate and because there was both stockpiling at the national and local levels, it was difficult to obtain comprehensive information on the stockpiles. [5]

[1] State Council of the People's Republic of China. 1997. "Notice on Reforming and Strengthening the Management of Medical Reserves (国务院关于改革和加强医药储备管理工作的通知)."

[http://www.gansu.gov.cn:8443/art/2020/7/2/art_11138_16289.html]. Accessed 23 December 2020.

[2] National Economic and Trade Commission of the People's Republic of China. 14 June 1999. "Measures for the Administration of the National Medical Reserves (国家医药储备管理办法)".

[http://pkulaw.cn/fulltext_form.aspx?Gid=23152&Db=chl]. Accessed 23 December 2020.

- [3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 21 December 2020.
- [4] Sinopharm. "About Us (关于我们)". [<http://www.sinopharm.com/1073.html>]. Accessed 23 December 2020.
- [5] Xue Lan and Zeng Guang. 24 November 2018. "An Evaluation of China's Influenza A (H1N1) Emergency Response Measures". Nature Public Health Emergency Collection, 107-158. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7122931/>]. Accessed 23 December 2020.

4.2.2c

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

Yes = 1, No = 0

Current Year Score: 1

There is evidence that China requires an annual review of the national stockpile of medical supplies. According to the 1999 "Measures for the Administration of the National Medical Reserves" in Section 2, the Ministry of Commerce (formerly the National Economic and Trade Commission) is responsible for managing the reserves, including developing an annual plan. Section 4 Article 14 notes that the Ministry of Commerce must meet with relevant departments (including the National Health Commission, formerly the Ministry of Health) to review disaster and epidemic forecasts around the end of February of each year to plan and review the national stockpile of medical reserve supplies. [1]

[1] National Economic and Trade Commission of the People's Republic of China. 14 June 1999. "Measures for the Administration of the National Medical Reserves (国家医药储备管理办法)". [http://pkulaw.cn/fulltext_form.aspx?Gid=23152&Db=chl]. Accessed 24 April 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: 1

There is evidence of a plan that would allow the government to procure medical supplies for national use during a public health emergency, but there is not a publicly available plan to leverage domestic manufacturing capacity to produce medical supplies during a public health emergency. Article 85 of the 2002 Government Procurement Law notes that during an emergency (including public health emergencies), the government can engage in single-source procurement and can expedite review processes to meet demand and need to procure medical supplies such as protective goggles, medical masks, protective gowns, and boots. [1] During COVID-19, China demonstrated the capacity to be able to domestically manufacture medical PPE and equipment. In February 2020, China went from producing 20 million masks per day to over 110 million (increase of 450%) by mobilizing and working with private manufacturers such as FoxConn and BYD. The government provided expedited approvals and generous subsidies. It also worked with the state-owned firm Sinopec to start new production lines for raw materials for PPE. [2] However, there is not publicly available information about any plans or agreements to leverage the domestic manufacturing capacity during a public health emergency on the websites of the

National Health Commission, Center for Disease Control and Prevention, the Ministry of Defense, or the Ministry of Emergency Management. [3, 4, 5, 6] Nonetheless, China demonstrates the capacity to be able to manufacture medical countermeasures, particularly vaccines, during the COVID-19 pandemic. China reported that it plans to roll out as many as 600 million doses of the vaccine before the end of 2020. In fact, a Chinese expert on vaccine and immunology noted that the COVID-19 vaccines in China are produced using the Vero cell culture method, which is also used for producing the rabies and other inactivated vaccines in the country. So China does not anticipate a supply shortage or issues with supply chain. [7]

[1] "Impact of COVID-19 on Government Procurement and Tendering Measures (新冠肺炎疫情对政府采购和招投标的影响及应对措施)." Legal Daily. [http://www.legaldaily.com.cn/zt/content/2020-03/05/content_8134603.htm]. Accessed 23 December 2020.

[2] Ren, Daniel. "China boosts face mask production capacity by 450 percent in a month, threatening a glut scenario." South China Morning Post. [<https://www.scmp.com/business/companies/article/3075289/china-boosts-face-mask-production-capacity-450-cent-month>]. Accessed 28 January 2021.

[3] Ministry of Emergency Management of the People's Republic of China. [<https://www.mem.gov.cn/>]. Accessed 28 January 2021.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 28 January 2021.

[5] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 28 January 2021.

[6] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 28 January 2021.

[7] Global Times. 4 December 2020. "China ensures COVID-19 vaccine with full supply chain amid Pfizer doses cuts". [<https://www.globaltimes.cn/content/1209004.shtml>] Accessed 23 December 2020.

4.2.3b

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 0

There is insufficient evidence that China has a plan or agreement to leverage domestic manufacturing capacity to produce or procure laboratory supplies for national use during a public health emergency. Article 85 of the 2002 Government Procurement Law notes that during an emergency (including public health emergencies), the government can engage in single-source procurement and can expedite review processes to meet demand. However, it does not explicitly state this in reference to laboratory supplies. [1] Nonetheless, during the 2009 H1N1 pandemic, the Chinese government's priority was to manufacture reagent so the Chinese Center for Disease Control and Prevention (CDC) signed a strategic alliance agreement with the Beijing Kinghawk Pharmaceutical Co. Ltd, to conduct research and develop reagents. [2] There is not specific information about such plans or agreements that would be applicable to any type of public health emergency (and not just a one time situation) on the websites of the National Health Commission, Center for Disease Control and Prevention, or the Ministry of Defense. [3, 4, 5]

[1] "Impact of COVID-19 on Government Procurement and Tendering Measures (新冠肺炎疫情对政府采购和招投标的影响及应对措施)." Legal Daily. [http://www.legaldaily.com.cn/zt/content/2020-03/05/content_8134603.htm]. Accessed 23 December 2020.

[2] Xue, Lan and Zeng, Guang. 24 November 2018. "China's Institutional Mechanisms for Influenza A (H1N1) Prevention and

Control." Nature Public Health Emergency Collection. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7123036/>]. Accessed 23 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[4] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 15 January 2021.

[5] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 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

Although China has a number of documents and plans to distribute medical countermeasures (MCMs), there is not sufficient publicly available evidence on the dispensing of MCMs. The 2005 "Regulations on Vaccine Circulation and Vaccination Management" Section 1 Article 2 notes that these regulations cover emergency vaccinations as well as routine immunizations and other vaccinations that citizens may voluntarily get. These regulations outline which departments at the national, provincial, and local levels are responsible for developing plans for distributing the vaccine, testing, quality control, responding to adverse reactions to vaccinations, monitoring, and other legal implications. Article 31 grants the State Council the authority to conduct mass vaccination campaigns during cases of public health emergencies. [1] Article 20 of the 2019 "Vaccination Administration Law" also grants the State Council the authority to make recommendations for emergency use of vaccines and mass vaccination campaigns. Further according to Article 69 if a relevant vaccine already exists during a public health emergency, the license holder of the vaccine must produce and supply the vaccines in a timely manner. Local and provincial level governments are tasked with developing plans to vaccinate individuals. [2] Additionally, there is evidence that during a public health emergency, China has developed a plan and guidelines to distribute medical countermeasures, such as vaccines. For instance, during the H1N1 pandemic, the Ministry of Health and Family Planning (now the National Health Commission) issued two guiding documents for distributing the vaccine: the "Guidelines on Vaccination Against Influenza A (H1N1) Autumn and Winter 2019" and "Work Plan for Vaccination Against Influenza A H1N1 in Autumn and Winter 2019". [3] The work plan notes that the vaccine is for people over 3 years of age and prioritizes health workers, public service personnel in key positions, students, teachers, and patients with chronic diseases. The plan also notes how to store and transport the vaccination and provides guidance to monitor the patient after vaccination for adverse effects. [4] There is not publicly available information on these plans or guidelines on the National Health Commission, Center for Disease Control and Prevention, or Ministry of Defense websites. [5,6, 7]

[1] National Health Commission. 24 March 2005. "Regulations on Vaccine Circulation and Vaccination Management (疫苗流通和预防接种管理条例)". [http://www.gov.cn/zwgg/2005-05/23/content_275.htm]. Accessed 23 December 2020.

[2] Standing Committee of the 13th National People's Congress. 29 June 2019. "Vaccination Administration Law of the People's Republic of China (中华人民共和国疫苗管理法)". [<https://perma.cc/K7Q4-CN5R>]. Accessed 23 December 2020.

[3] National Health Commission of the People's Republic of China. 21 December 2009. "The Ministry of Health Presents the H1N1 Situation (卫生部介绍甲型 H1N1 流感疫苗预防接种情况)".

[<http://www.nhc.gov.cn/wsb/pwsyw/200912/44894.shtml>]. Accessed 23 December 2020.

[4] Quzhou College of Technology. 24 September 2009. "Ministry of Health Releases H1N1 Vaccine Work Plan (卫生部发布

甲型 H1N1 流感疫苗预防接种方案)". [<https://www.qzct.net/2009/0924/c22a15387/page.htm>]. Accessed 23 December 2020.

[5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[6] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 15 January 2021.

[7] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 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 of a public plan in place to receive health personnel from other countries to respond to a public health emergency. There is no relevant information on the websites of the National Health Commission, Ministry of National Defense, and Chinese Center for Disease Control and Prevention. [1, 2, 3]

[1] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/en/>]. Accessed 23 December 2020.

[2] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[3] Ministry of National Defense of the People's Republic of China. [<http://www.mod.gov.cn/>]. Accessed 19 December 2020.

4.4 HEALTHCARE ACCESS

4.4.1 Access to healthcare

4.4.1a

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

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

Current Year Score: 2

2020

World Policy Analysis Center

4.4.1b

Access to skilled birth attendants (% of population)

Input number

Current Year Score: 99.9

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: 303.23

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

China has a number of regulations that acknowledge the importance of frontline healthcare workers during public health emergencies, but do not explicitly state that these individuals will be prioritized to receive care if they become sick as a result of responding to a public health emergency. The 2003 "National Public Health Emergency Regulations" Article 9 states that the government shall provide appropriate subsidies and health allowances to medical and health personnel responding to public health emergencies. Additionally, those who have died or became ill as a result of duties, corresponding pensions and subsidies will be provided to their family. [1] The 2006 "National Public Health Emergency Contingency Plan" Section 5.2 notes that individuals who are involved with responding to public health emergencies shall be honored and rewarded. [2] Article 51 of the 2019 "Vaccinations Administration Law" mandates that during an epidemic or public health emergency, local level governments are to prioritize healthcare professionals to receive vaccines. [3] However, none of these regulations and legal guidelines explicitly state that healthcare services will be prioritized for healthcare workers who become sick as a result of responding to a public health emergency. During the COVID-19 pandemic, the National Health Commission issued a "Notice on the Work Plan and Distribution of Work to Fight COVID-19 in the Near Future". Section 5 of this notice focuses on the care of medical personnel, including highlighting the importance of proper training, having proper PPE, and focuses on mental health and not overworking personnel. It also reiterates that personnel that contracted COVID-19 as a result of duties and/or have died will receive appropriate subsidies and pension. [4] There is not publicly available evidence on this on the National Health Commission (China's Ministry of Health) or the Chinese Center for Disease Control and Prevention websites.

[5,6]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwggk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] Standing Committee of the 13th National People's Congress. 29 June 2019. "Vaccination Administration Law of the People's Republic of China (中华人民共和国疫苗管理法)". [<https://perma.cc/K7Q4-CN5R>]. Accessed 23 December 2020.

[4] National Health Commission of the People's Republic of China. 28 January 2020. "Notice on the Work Plan and the Distribution of Work to Fight COVID-19 in the Near Future (关于印发近期防控新型冠状病毒感染的肺炎工作方案的通知)". [<http://www.nhc.gov.cn/tigs/s7848/202001/808bbf75e5ce415aa19f74c78ddc653f.shtml>]. Accessed 24 December 2020.

[5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[6] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 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 not public evidence that there is a system in place for public health officials and healthcare workers to communicate during a public health emergency. China's regulatory and strategy documents relevant to national public health emergency response planning (i.e. 2003 "National Public Health Emergency Regulations" and the 2006 "National Public Health Emergency Contingency Plan") note that doctors and other medical personnel are responsible for reporting potential cases of infectious diseases, but do not mention a system of communication. [1, 2] Additionally, the National Health Commission (China's Ministry of Health) and the Chinese Center for Disease Control and Prevention website does not contain information about communication system for public health officials and healthcare workers during a public health emergency either. [3, 4]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwggk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 24 December 2020.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 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 not sufficiently available public evidence that there is a system in place for public health officials and healthcare workers to communicate during a public health emergency that encompasses healthcare workers in both the public and private sectors. China's regulatory and strategy documents relevant to national public health emergency response planning (i.e. 2003 "National Public Health Emergency Regulations" and the 2006 "National Public Health Emergency Contingency Plan") note that doctors and other medical personnel are responsible for reporting potential cases of infectious diseases, but do not mention a system of communication. [1, 2] Additionally, the National Health Commission (China's Ministry of Health) and the Chinese Center for Disease Control and Prevention website does not contain information about communication system for public health officials and public or private healthcare workers during a public health emergency either. [3,4]

[1] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwggk/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[2] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December 2020.

[3] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 24 December 2020.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 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

There is evidence that the number of health care associated infections (HCAI) that take place in healthcare facilities are being monitored and tracked. China's National Nosocomial Infection Management and Quality Control Center (NNIMQCC) was established in 2013 to track healthcare associated infections (HCAI) and to improve the management of HCAI. Upon establishment, the NNIMQCC developed a Minimum Data Set and corresponding quality indicators to establish a national HCAI surveillance system. [1] Researchers from various public hospitals and NNIMQCC have published studies based on HCAI data collected at acute care hospitals across China. [2,3,4,5]

[1] Yao, Hongwu; Suo, Jijiang; Xing, Yubin; Du, Mingmei; Bai, Yanling; Liu, Bowei; Li, Lu; Huo, Rui; Lin, Jian; Chen, Chunping; Fu, Qiang; and Liu, Yunxi. 7 July 2019. "The Minimum Data Set and Quality Indicators for National Healthcare-Associated Infection Surveillance in Mainland China: Towards Precision Management".

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6642767/>]. Accessed 24 December 2020.

[2] Wang, J. et al. 2017. "Burden of healthcare-associated infections in China: results of the 2015 point prevalence survey in Dong Guan City". *Journal of Hospital Infection* 96

[2] : 132-138. [<https://www.ncbi.nlm.nih.gov/pubmed/28325579>]. Accessed 18 January 2021.

[3] Zhang, Yaowen et al. 2016. "Annual surveys for point-prevalence of healthcare-associated infection in a tertiary hospital in Beijing, China, 2012-2014". *BMC Infectious Diseases* 16: 161. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4835875/>]. Accessed 18 January 2021.

[4] Zhou, Yunfang et al. 2014. "Healthcare-Associated Infections and Shanghai Clinicians: A Multicenter Cross-Sectional Study". *PLoS ONE* 9

[8] : e105838. [<https://doi.org/10.1371/journal.pone.0105838>]. Accessed 18 January 2021.

[5] Liu, J.Y. et al. 2016. "Point-prevalence survey of healthcare-associated infections in Beijing, China: a survey and analysis in 2014". *Journal of Hospital Infection* 93

[3] : 271-279. [<https://doi.org/10.1016/j.jhin.2016.03.019>]. Accessed 18 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

Chinese regulations require ethical review before beginning a clinical trial. In 2003, the State Food and Drug Administration (SFDA) released the "Quality Management of Drug Clinical Trial Standards" that required all medical institutions conducting clinical trials to establish independent research ethics committees and submit that information to the SFDA. [1] The SFDA was first reorganized into the China Food and Drug Administration (CFDA); then it became the China Drug Administration (CDA) and has now been folded under the newly formed State Administration for Market Supervision. In 2016, the National Health and Family Planning Commission (now the National Health Commission) released the "Measures for the Ethical Review of Biomedical Research Involving Humans," which clarified the responsibilities and tasks of medical ethics committees at medical institutions as well as those at the national and provincial level. It also delineated the processes and standards of ethical review. [2] China's ethical review of clinical trial applications is a decentralized process: it requires institutional level ethics committee approval for each trial site. [3]

[1] State Food and Drug Administration of the People's Republic of China (SFDA). Order No. 3 of 6 August 2003. "Quality Management of Drug Clinical Trial Standards (药物临床试验质量管理规范)".

[<https://www.bjcancer.org/Html/News/Articles/3159.html>]. Accessed 24 December 2020.

[2] National Health and Family Planning Commission of the People's Republic of China (NHFPC). 30 September 2016.

"Measures for the Ethical Review of Biomedical Research Involving Humans (涉及人的生物医学研究伦理审查办法)".

[<http://www.nhc.gov.cn/fzs/s3576/201610/84b33b81d8e747eaaf048f68b174f829.shtml>]. Accessed 24 December 2020.

[3] National Institutes of Health (NIH) ClinRegs. "China". [https://clinregs.niaid.nih.gov/country/china#_top]. Accessed 24 December 2020.

4.7.1b

Is there an expedited process for approving clinical trials for unregistered medical countermeasures (MCM) to treat ongoing epidemics?

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that there is an expedited process for approving clinical trials for unregistered medical countermeasures during an epidemic. The China Food and Drug Administration (CFDA), formerly the State Food and Drug Administration (SFDA), is the government entity that oversees the review and approval of clinical trials applications and drug registrations in China. In 2015, CFDA announced new guidance ("Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations"), which streamlined the review and approval of clinical trials in general. There was no specific mention of clinical trials for unregistered medical countermeasures. [2] There is separate guidance on clinical trials (still in draft form) meant to further streamline the clinical trial application and approval process for the express purpose of encouraging innovation, speeding up the creation of new drugs, and meeting public health needs. While there is no mention of an expedited review process for unregistered medical countermeasures to treat ongoing pandemics, there is mention of special consideration for new medicines and medicines that address a public health concern in case of disagreement about the review process. [2] Additionally, on January 15, 2020, the State Administration for Market Regulation met to review the "Administrative Measures for Drug Approvals" and approved an expedited process for approving clinical trials for unregistered medical countermeasures during the COVID-19 pandemic. The regulation came into effect on July 1, 2020. Section 4 on special processes, Article 72 specifies that during a public health emergency, the China Drug Administration may implement a special approval process for medical countermeasures required to treat the public health emergency. [3] There is not evidence of an expedited approval process on the National Health Commission (China's Ministry of Health) or the Chinese Center for Disease Control and Prevention websites. [4, 5]

[1] China Food and Drug Administration (CFDA). Notice No. 230 of 11 November 2015. "Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations (国家食品药品监督管理总局关于药品注册审评审批若干政策的公告)" [http://law.pharmnet.com.cn/laws/detail_3247.html]. Accessed 20 January 2021.

[2] State Council of the People's Republic of China. 2018. "Notice on adjusting clinical drug trial applications and approvals (关于调整药物临床试验审评审批的公告)". [https://members.wto.org/crnattachments/2018/TBT/CHN/18_0439_00_x.pdf]. Accessed 20 January 2021.

[3] State Administration for Market Regulation of the People's Republic of China. 22 January 2020. "Public Announcement No. 27 Administrative Measures for Drug Approvals (药品注册管理办法第 27 号公布)". [http://www.gov.cn/gongbao/content/2020/content_5512563.htm]. Accessed 24 December 2020.

[4] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 15 January 2021.

[5] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/>]. Accessed 15 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

The China Drug Administration (CDA), formerly known as the China Food and Drug Administration (CFDA) and before that, the State Food and Drug Administration (SFDA), is the government entity that oversees the review and approval of clinical trials applications, new drugs (domestic and imported), and medical devices in China. The relevant CDA/CFDA/SFDA

regulations are the "Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations," "Quality Management of Drug Clinical Trial Standards," and the "Deepening the Reform of the Review and Approval System for Drugs and Medical Devices. [1,2,3]

[1] China Food and Drug Administration (CFDA). Notice No. 230 of 11 November 2015. "Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations (国家食品药品监督管理总局关于药品注册审评审批若干政策的公告)" [http://law.pharmnet.com.cn/laws/detail_3247.html]. Accessed 24 December 2020.

[2] State Food and Drug Administration of the People's Republic of China (SFDA). Order No. 3 of 6 August 2003. "Quality Management of Drug Clinical Trial Standards (药物临床试验质量管理规范)". [<https://www.bjcancer.org/Html/News/Articles/3159.html>]. Accessed 24 December 2020.

[3] State Council, People's Republic of China. Notice No. 42 of 8 October 2017. "Opinion on Deepening the Reform of the Review and Approval System for Drugs and Medical Devices to Encourage Innovation (关于深化审评审批制度改革鼓励药品医疗器械创新的意见)". [http://www.gov.cn/zhengce/2017-10/08/content_5230105.htm]. Accessed 24 December 2020.

4.7.2b

Is there an expedited process for approving medical countermeasures (MCM) for human use during public health emergencies?

Yes = 1 , No = 0

Current Year Score: 1

There is an expedited process for approving medical countermeasures for human use during public health emergencies. In 2015, China Food and Drug Administration (CFDA, now the China Drug Administration CDA) announced new guidance ("Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations") on the review and approval of certain drug registrations that would give priority and expedited review to innovative drugs and drugs for which there is urgent need. Section 7 of the guidance identifies urgent need to include infectious disease outbreaks, treatment of AIDS, major national science and technology research and development, etc. [1]

[1] China Food and Drug Administration (CFDA). Notice No. 230 of 11 November 2015. "Circular on Certain Policies Pertaining to the Review and Approval of Drug Registrations (国家食品药品监督管理总局关于药品注册审评审批若干政策的公告)" [http://law.pharmnet.com.cn/laws/detail_3247.html]. Accessed 24 December 2020.

Category 5: Commitments to improving national capacity, financing plans to address gaps, and adhering to global norms

5.1 INTERNATIONAL HEALTH REGULATIONS (IHR) REPORTING COMPLIANCE AND DISASTER RISK REDUCTION

5.1.1 Official IHR reporting

5.1.1a

Has the country submitted IHR reports to the WHO for the previous calendar year?

Yes = 1 , No = 0

Current Year Score: 1

2020

World Health Organization

5.1.2 Integration of health into disaster risk reduction

5.1.2a

Are epidemics and pandemics integrated into the national risk reduction strategy or is there a standalone national disaster risk reduction strategy for epidemics and pandemics?

Yes = 1 , No = 0

Current Year Score: 0

Epidemics or pandemics are not integrated into the national risk reduction strategy, nor is there a standalone national risk reduction strategy for pandemics. China's 2009 Disaster Prevention and Reduction Plan, mentions animal epidemics, but not human epidemics. The 2016-2020 Disaster Prevention and Reduction Plan does not mention epidemics at all. [1, 2] Public health emergency preparedness and response activities are led by the Public Health Emergency Center (PHEC) of the Chinese Center for Disease Control and Prevention (China CDC). Pandemic risk prevention and reduction would fall under its purview. [3] In 2020, the Chinese CDC released a draft set of "Technical Guidelines for the Prevention and Control of Natural Disasters and Infectious Diseases" on its website in 2020. The document notes that the occurrence of natural disasters have increased in frequency, leading to an imbalance between people and their living environment and increasing the risk of epidemic conditions. Thus, it is important to prevent and control natural disasters and infectious diseases. The guidelines include sections on how natural disasters and other factors can contribute to the spread of infectious diseases, how to reduce risk prior to natural disasters, and a strategy to reduce the risk of diseases spreading after a natural disaster. The guidelines draw upon the 2007 "Emergency Response Law of the People's Republic of China", 2005 "Law on the Prevention and Control of Infectious Diseases", and 2009 "Natural Disaster Emergency Response Work". [4] There is not further evidence of epidemics and pandemics being integrated into the national risk reduction strategy or a standalone risk reduction strategy for epidemics and pandemics on the National Health Commission (China's Ministry of Health) or the Ministry of Emergency Management websites. [5, 6]

- [1] Information Office of the State Council of the People's Republic of China. "China's Actions for Disaster Prevention and Reduction". 2009. [<https://reliefweb.int/report/china/full-text-chinas-actions-disaster-prevention-and-reduction>]. Accessed 20 January 2021.
- [2] State Council of the People's Republic of China. Notice No. 104 of 29 December 2016. "National Comprehensive Disaster Prevention and Mitigation Plan (2016-2020) (国务院办公厅关于印发国家综合防灾减灾规划 (2016—2020 年) 的通知)". [http://www.gov.cn/zhengce/content/2017-01/13/content_5159459.htm]. Accessed 20 January 2021.
- [3] Chinese Center for Disease Control and Prevention. "Health Emergency". [http://www.chinacdc.cn/en/aboutus/orc_9348/]. Accessed 20 January 2021.
- [4] Chinese Center for Disease Control and Prevention. 11 May 2020. "Technical Guidelines for the Prevention and Control of Natural Disasters and Infectious Diseases (自然灾害传染病预防控制工作技术指南)". [http://www.chinacdc.cn/jkzt/tfggwssj/zt/hanz_11862/zdfa/202005/t20200511_216637.html]. Accessed 24 December 2020.
- [5] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 20 January 2021.
- [6] Ministry of Emergency Management of the People's Republic of China. [<https://www.mem.gov.cn/>]. Accessed 20 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

China has cross-border agreements with neighboring countries and as part of a regional group with regards to public health emergencies. China is part of the Mekong Basin Disease Surveillance Project (MBDS) Project, originally funded by the Rockefeller Foundation. The other project member countries are Myanmar, Thailand, Cambodia, Lao People's Democratic Republic, and Vietnam. The MBDS Project began in 2001 with the purpose of building local capacity, sharing information, and cooperating in outbreak response and pandemic preparedness. In May 2007, the six participating countries signed MOUs to continue this cross-border project indefinitely. [1] During the COVID-19 pandemic, the MBDS members shared information with each other and the network produces a monthly newsletter to provide an update on the COVID-19 situation and highlight ongoing work to control the pandemic and prevent infectious diseases. According to the newsletter, the MBDS members organized a "Regional Collaborative Event Base Surveillance Application Training" in November 2020. The training was intended to help support sharing of public health related event-based surveillance information in real time in cross border provinces. Additionally, the MBDS board, which included Dr. Dong Xiaoping, the Director of the Center for Global Public Health at the Chinese Center for Disease Control and Prevention, participated in the "3rd China-ASEAN Disease Prevention and Control Collaboration Forum" in November 2020. [2]

1] World Health Organization (WHO) Regional Office for South-East Asia. "An Urgent Front: Cross-border Collaboration to Secure a Malaria-Free South-East Asia Region". [<http://apps.who.int/iris/bitstream/handle/10665/274309/9789290226659-eng.pdf?sequence=1&isAllowed=y>]. Accessed 24 December 2020.

[2] Mekong Basin Disease Surveillance (MBDS). "November 2020 eNewsletter".

[http://mbdsnet.org/enewsletter_november_2020/]. Accessed 24 December 2020.

5.2.1b

Does the country have cross-border agreements, protocols, or MOUs with neighboring countries, or as part of a regional group, with regards to animal health emergencies?

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

Current Year Score: 0

There is insufficient evidence that China has cross-border agreements as part of a regional group with regards to animal health emergencies and there is evidence of implementation.

China is part of the Food and Agriculture Organization (FAO)-China South-South Cooperation Project on Transboundary Animal Disease Control in the Greater Mekong Sub-Region. The project is funded by the government of China and implemented by the FAO. Other project country members are Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam. The work includes a program of vaccination, animal movement control, quarantine, public awareness campaigns, enhanced surveillance and reporting and coordination among trading partners.[1]

China is also part of a Northeast Asia subregional mechanism for joint prevention and control of transboundary animal diseases (TADs). Mongolia and Russia are the other partner countries and there is public evidence to indicate that this regional cooperation has met to discuss cooperation on TAD in 2014 and 2016. [2, 3]

[1] Food and Agriculture Organization of the United Nations (FAO). 3 July 2018. "New South-South agreement between China and FAO aims to reduce the spread of cross-border animal disease in the Greater Mekong Subregion".

[<http://www.fao.org/asiapacific/news/detail-events/en/c/1143792/>]. Accessed 24 December 2020.

[2] Ministry of Agriculture of the People's Republic of China. 24 August 2014. "China, Mongolia & Russia meet for stronger TAD control". [http://english.agri.gov.cn/zxxw/201408/t20140826_23800.htm]. Accessed 24 December 2020.

[3] Ministry of Agriculture of the People's Republic of China. 17 October 2016. "China, Mongolia, & Russia to strengthen TAD control". [http://english.agri.gov.cn/news/dqnf/201610/t20161017_221335.htm]. Accessed 20 January 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: 4

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: 0

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: 0

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.4.1b

Has the country completed and published, within the last five years, either a National Action Plan for Health Security (NAPHS) to address gaps identified through the Joint External Evaluation (JEE) assessment or a national GHSA roadmap that sets milestones for achieving each of the GHSA targets?

Yes = 1, No = 0

Current Year Score: 0

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.4.2 Completion and publication of a Performance of Veterinary Services (PVS) assessment and gap analysis

5.4.2a

Has the country completed and published a Performance of Veterinary Services (PVS) assessment in the last five years?

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.4.2b

Has the country completed and published a Performance of Veterinary Services (PVS) gap analysis in the last five years?

Yes = 1 , No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5 FINANCING

5.5.1 National financing for epidemic preparedness

5.5.1a

Is there evidence that the country has allocated national funds to improve capacity to address epidemic threats within the past three years?

Yes = 1 , No = 0

Current Year Score: 1

There is evidence to indicate that China has invested funds to improve the country's capacity to address epidemic threats in the past three years. In 2017, the central government allocated \$2.6 million USD (170 million yuan) to support local and provincial centers for disease control and prevention and develop their capacity to address epidemic threats. [1] Additionally, in March 2020, China allocated \$45 million USD (320 million yuan) to 68 research projects to fight COVID-19. These funds focused on development of vaccines, development of test kits, and virus strain analysis. [2]

[1] National Health Commission of the People's Republic of China. 9 January 2018. "Response to the Medical Inquiry No. 2961 from the Fifth Meeting of the 12th National Committee of the People's Political Consultative Meeting (关于政协十二届全国委员会第五次会议第 2961 号提案答复的函)".

[<http://www.nhc.gov.cn/zwgk/tian/201801/919453a0ff714788a78fe2ae63f74d0f.shtml>]. Accessed 24 December 2020.

[2] China Daily. 3 April 2020. "China allocates millions in COVID-19 research funding".

[<https://www.chinadaily.com.cn/a/202004/03/WS5e86fe33a3101282172844df.html>]. Accessed 24 December 2020.

5.5.2 Financing under Joint External Evaluation (JEE) and Performance of Veterinary Services (PVS) reports and gap analyses

5.5.2a

Does the Joint External Evaluation (JEE) report, National Action Plan for Health Security (NAPHS), and/or national GHSA roadmap allocate or describe specific funding from the national budget (covering a time-period either in the future or within the past five years) to address the identified gaps?

Yes = 1 , No/country has not conducted a JEE = 0

Current Year Score: 0

2021

WHO Strategic Partnership for IHR and Health Security (SPH); Global Health Security Agenda

5.5.2b

Does the Performance of Veterinary Services (PVS) gap analysis and/or PVS assessment allocate or describe specific funding from the national budget (covering a time-period either in the future or within the past five years) to address the identified gaps?

Yes = 1 , No/country has not conducted a PVS = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5.3 Financing for emergency response

5.5.3a

Is there a publicly identified special emergency public financing mechanism and funds which the country can access in the face of a public health emergency (such as through a dedicated national reserve fund, an established agreement with the World Bank pandemic financing facility/other multilateral emergency funding mechanism, or other pathway identified through a public health or state of emergency act)?

Yes = 1 , No = 0

Current Year Score: 0

Although there is evidence that China allocates funding for emergencies, there is not enough evidence to suggest that there is a special emergency public financing mechanism and funds in which the country can access in the face of a public health emergency. China is not IDA-eligible, which means it does not qualify for the World Bank Pandemic Financing Facility. [1, 2] Government regulations related to disaster and public health emergency management, such as the Regulations on Contingent Public Health Emergencies (2003), Emergency Response Law (2007), and Overall Contingency Plan for National Public Emergencies (2006) mention the need for funds to be set aside in case of disaster or public health emergencies, but there is no further information about how that emergency public financing would work. [3,4,5] One research paper notes that in 2014, the government allocated \$81 million USD (529 million yuan) to the fund, but in 2019, the government rolled back its annual allocation to \$68.9 million USD (450 million yuan). The research notes that compared to other countries like the U.S. and in the European Union, this is inadequate. [6] There is no public information about how such public funds are collected and allocated available on the websites of the National Health Commission, Ministry of Finance, Ministry of Emergency Management. [7, 8, 9]

[1] World Bank Group. "IDA Borrowing Countries." [<http://ida.worldbank.org/about/borrowing-countries>]. Accessed 28 January 2021.

[2] World Bank Group. December 2017. "Pandemic Emergency Financing Facility (PEF)". [<http://pubdocs.worldbank.org/en/119961516647620597/PEF-Operational-Brief-Dec-2017.pdf>]. Accessed 28 January 2021.

[3] People's Republic of China State Council. 9 May 2003. "Order No. 376 Emergency Regulations for Public Health Emergencies (突发公共卫生事件应急条例)". [http://www.gov.cn/zwgg/2005-05/20/content_145.htm]. Accessed on 15 December 2020.

[4] President of the People's Republic of China. Order No. 69 of 2007. "Emergency Response Law of the People's Republic of China. [http://english.gov.cn/archive/laws_regulations/2014/08/23/content_281474983042515.htm]. Accessed 19 December 2020.

[5] People's Republic of China State Council. 26 February 2006. "National Contingency Plan for Public Health Emergencies (国家突发公共卫生事件应急预案)". [http://www.gov.cn/yjgl/2006-02/26/content_211654.htm]. Accessed on 15 December

2020.

[6] Cao, Yulong; Shan, Jiao; Gong, Zhizhong; Kuang, Jiqui; and Gao, Yan. 29 May 2020. "Status and Challenges of Public Health Emergency Management in China Related to COVID-19." *Front Public Health* 8: 250.

[<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273973/#B12>]. Accessed 15 December 2020.

[7] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 20 January 2021.

[8] Ministry of Finance of the People's Republic of China. [<http://www.mof.gov.cn/index.htm>]. Accessed 20 January 2021.

[9] Ministry of Emergency Management of the People's Republic of China. [<https://www.mem.gov.cn/>]. Accessed 20 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

In the past three years, there is some evidence that senior leaders have made a public commitment to support other countries to improve capacity to address epidemic threats and also a verbal commitment to improve the country's own domestic capacity. During the 2018 Forum on China-Africa Cooperation (FOCAC), President Xi Jinping announced a health care initiative, which includes projects such as supporting the African Center for Disease Control and Prevention and cooperation programs to prevent and control emerging and re-emerging infectious diseases. The initiative would help support programs on the prevention and control of emerging and re-emerging communicable diseases, including HIV/AIDS and malaria. The initiative would train more medical specialists for Africa and continue to send medical teams that better meet Africa's needs. But there is not explicit mention of the committed or obligated amount of funding for this initiative. [1] Regarding China improving its own domestic capacity to address epidemic threats, in response to COVID-19, in June 2020, President Xi Jinping called for efforts to strengthen the public health system in China by improving early-stage epidemic monitoring and warning systems, investing more resources in innovations, and developing human capital in scientific research. However, it is unclear that there was a specific financial amount associated with his call to action to strengthen the public health system. [2]

[1] Xinhua. 3 September 2018. "Full text of Chinese President Xi Jinping's speech at opening ceremony of 2018 FOCAC Beijing Summit". [http://www.xinhuanet.com/english/2018-09/03/c_129946189.htm]. Accessed 24 December 2020.

[2] CGTN News. 2 June 2020. "Xi Jinping says China must strengthen public health system after COVID-19." [<https://news.cgtn.com/news/2020-06-02/Xi-says-China-must-strengthen-public-health-system-after-COVID-19-QZYi0ayQ9O/index.html>]. Accessed 28 January 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

In the past three years, there is evidence that the country has invested resources both to support other countries to improve capacity to address epidemic threats and to improve its own domestic capacity to address epidemic threats. China has been and is currently supporting neighboring countries to increase their capacity to address epidemic threats. Since 2018, China has been assisting Myanmar with malaria surveillance and control. [1] It is also funding the new FAO-China South-South Cooperation Project on Transboundary Animal Disease Control in the Greater Mekong Sub-Region and is the largest donor to the \$80 million fund. The project is being implemented by the Food and Agriculture Organization of the United Nations (FAO). [2] Additionally, in a press conference held by the State Council Information Office, the Deputy Minister of Foreign Affairs Luo Zhaohui said that during the 2020 COVID-19 pandemic, the Chinese government provided and pledged assistance to 89 countries and the African Union, including a \$20 million USD donation to the WHO in the fight against the virus. During the initial outbreak of COVID-19 in China, 79 countries and 10 international organizations provided support to the country. [3] As for obtaining funds to improve its own capacity to address epidemic threats, China received \$30.7 million (USD) in 2017, 62.32 million (USD) in 2018, and 84.73 million (USD) in 2019 in donor funding for International Health Regulations (IHR) capacity building funding. The disbursed funds were allocated for real time surveillance, zoonotic diseases, antimicrobial resistance, risk communication, etc. The top three sources of disbursed funds were United Nations Children's Fund (UNICEF), Bill and Melinda Gates Foundation, and International Bank for Reconstruction and Development (World Bank). For instance, the International Bank for Reconstruction and Development (World Bank) loaned \$300 million USD to China for an "Emerging Infectious Diseases Prevention, Preparedness and Response Project" (2020-2025). [4]

[1] World Health Organization (WHO) Regional Office for South-East Asia. "An Urgent Front: Cross-border Collaboration to Secure a Malaria-Free South-East Asia Region". [<http://apps.who.int/iris/bitstream/handle/10665/274309/9789290226659-eng.pdf?sequence=1&isAllowed=y>]. Accessed 20 January 2021.

[2] Food and Agriculture Organization of the United Nations (FAO). 3 July 2018. "New South-South agreement between China and FAO aims to reduce the spread of cross-border animal disease in the Greater Mekong Subregion". [<http://www.fao.org/asiapacific/news/detail-events/en/c/1143792/>]. Accessed 20 January 2021.

[3] State Council Information Office of the People's Republic of China. 26 March 2020. "State Council Information Office Holds Press Conference on China's International Cooperation in the Fight Against COVID-19 "国务院新闻办就中国关于抗击疫情的国际合作情况举行发布会". [http://www.gov.cn/xinwen/2020-03/26/content_5495712.htm#1]. Accessed 24 December 2020.

[4] Georgetown Center for Global Health Science and Security Global Health Security Funding Tracking Dashboard. "China: Recipient Profile". [<https://tracking.ghscosting.org/#analysis/CN/r>]. Accessed 20 January 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 not sufficient evidence to indicate that China has a publicly available plan or policy for sharing genetic data, clinical specimens, and/or isolated specimens with international organizations or countries that goes beyond influenza. China released "Interim Measures of Human Genetic Resources" in 1998, which encompasses genetic data, biological materials, and other clinical specimens. The measures stipulate that domestic institutions have the exclusive possession over this information and the only lawful means for an overseas entity to access this data is through an international collaboration project with a Chinese institution. In 2012, the Ministry of Science and Technology drafted the "Regulation on Human Genetic Resources", which focuses on research and development activities of overseas entities in China and domestic institutions with overseas investments. The emphasis in these regulations is the importance of national security and that individuals or entities working with genetic material must provide reasonable justification to engage in international collaboration and export of genetic resources. An article analyzing the Chinese legal frameworks for international genetic data sharing notes that these restrictions are a distinct contrast with the international consensus on the imperative of genomic data sharing. Between 2011 and 2013, the government launched a nationwide audit campaign to identify international collaboration projects that are unauthorized or non-compliant with these policies. [1] There is no information about a plan for sharing genetic data, epidemiological data, and biological materials with international organizations and/or other countries on the websites of the Ministry of Agriculture, National Health Commission, Ministry of Science and Technology, or Chinese Center for Disease Control and Prevention (China CDC). [2, 3, 4, 5]

[1] Chen, Y. and Song, L. 15 July 2018. "China: concurring regulation of cross-border genomic data sharing for statist control and individual protection." Human Genetics, 137

[8] : 605-615. [<https://europepmc.org/article/pmc/pmc6132628>]. Accessed 24 December 2020.

[2] Chinese Center for Disease Control and Prevention. [<http://www.chinacdc.cn/en/>]. Accessed 23 December 2020.

[3] National Health Commission of the People's Republic of China. [<http://en.nhc.gov.cn/>]. Accessed 13 December 2020.

[4] Ministry of Agriculture of the People's Republic of China. [<http://www.moa.gov.cn/>]. Accessed 13 December 2020.

[5] Ministry of Science and Technology of the People's Republic of China. [<http://www.most.gov.cn/>]. Accessed 24 December 2020.

5.6.1b

Is there public evidence that the country has not shared samples in accordance with the Pandemic Influenza Preparedness (PIP) framework in the past two years?

Yes = 0 , No = 1

Current Year Score: 1

There is insufficient evidence that China has not shared samples in accordance with the Pandemic Influenza Preparedness (PIP) framework in the past two years. While there is evidence that China may not have shared samples in previous years, these incidents occurred over two years previously. The New York Times reported in August 2018 that China was supposed to share samples of a type of bird flu called H7N9, but did not. China denied the claim, with the China Daily reporting that the Chinese Center for Disease Control and Prevention (CDC) sent the samples to the U.S. in July 2018. Senior U.S. officials countered these statements. The reporting notes that China has a history of covering up disease outbreaks. [1] No additional evidence is available through media reports.

[1] Bollyky, Thomas J. and Fidler, David P. 8 September 2018. "The decline in virus sample sharing is not just about China". CNN. [<https://www.cnn.com/2018/09/08/opinions/china-virus-sample-sharing-bollyky-fidler/index.html>]. Accessed 24 December 2020.

5.6.1c

Is there public evidence that the country has not shared pandemic pathogen samples during an outbreak in the past two years?

Yes = 0 , No = 1

Current Year Score: 0

There is evidence from the last two years that China has not shared pandemic pathogen samples in a timely manner. During the COVID-19 outbreak, although China published the SARS-CoV-2 genetic sequence in a public database in January 2020, the first physical samples of the virus were isolated from travelers from Wuhan that arrived in Australia and the United States. [1] Additionally, even into February 2020, there were news reports that China was still not sharing important information regarding the virus. [2]

[1] Snyder, Alison. 14 May 2020. "Coronavirus pandemic exposes legal gaps for sharing virus samples". Axios. [<https://www.axios.com/coronavirus-pandemic-international-law-virus-samples-de777ec6-be08-4be6-8558-4c8430f509d8.html>]. Accessed 24 December 2020.

[2] Baragona, Steve. 13 February 2020. "China Still Not Sharing Coronavirus Information, Experts Say". Voice of America. [<https://www.voanews.com/science-health/coronavirus-outbreak/china-still-not-sharing-coronavirus-information-experts-say>]. Accessed 24 December 2020.

Category 6: Overall risk environment and vulnerability to biological threats

6.1 POLITICAL AND SECURITY RISK

6.1.1 Government effectiveness

6.1.1a

Policy formation (Economist Intelligence score; 0-4, where 4=best)

Input number

Current Year Score: 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: 2

2020

Economist Intelligence

6.1.1d

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

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1e

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

Input number

Current Year Score: 42

2020

Transparency International

6.1.1f

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

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1g

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

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.2 Orderly transfers of power

6.1.2a

How clear, established, and accepted are constitutional mechanisms for the orderly transfer of power from one government to another?

Very clear, established and accepted = 4, Clear, established and accepted = 3, One of the three criteria (clear, established, accepted) is missing = 2, Two of the three criteria (clear, established, accepted) are missing = 1, Not clear, not established, not accepted = 0

Current Year Score: 1

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: 3

2021

Economist Intelligence

6.1.4 Illicit activities by non-state actors

6.1.4a

How likely is it that domestic or foreign terrorists will attack with a frequency or severity that causes substantial disruption?

No threat = 4, Low threat = 3, Moderate threat = 2, High threat = 1, Very high threat = 0

Current Year Score: 3

2021

Economist Intelligence

6.1.4b

What is the level of illicit arms flows within the country?

4 = Very high, 3 = High, 2 = Moderate, 1 = Low, 0 = Very low

Current Year Score: 4

2020

UN Office of Drugs and Crime (UNODC)

6.1.4c

How high is the risk of organized criminal activity to the government or businesses in the country?

Very low = 4, Low = 3, Moderate = 2, High = 1, Very high = 0

Current Year Score: 2

2021

Economist Intelligence

6.1.5 Armed conflict

6.1.5a

Is this country presently subject to an armed conflict, or is there at least a moderate risk of such conflict in the future?

No armed conflict exists = 4, Yes; sporadic conflict = 3, Yes; incursional conflict = 2, Yes, low-level insurgency = 1, Yes; territorial conflict = 0

Current Year Score: 4

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: 1

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: 96.84

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: 0.84

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: 0.1

2016

World Bank; Economist Impact

6.2.3b

Share of employment in the informal sector

Greater than 50% = 2, Between 25-50% = 1, Less than 25% = 0

Current Year Score: 2

Over 60% of all employment in China is in the informal sector as of 2017. This is a growing trend. In the early 2000s, informal sector employment accounted for less than 35%. [1] According to a 2018 estimate from the International Labor Organization, more than half of the country's urban workforce participates in the informal sector (54.5%), ranging from freelancers and private contractors to migrants working without formal employment contracts and proprietors of small-scale private enterprises. [2]

[1] Rozelle, Scott; Xia, Yiran; Friesen, Dimitris; Vanderjack, Bronson; and Cohen, Nourya. 21 October 2020. "Moving Beyond Lewis: Employment and Wage Trends in China's High- and Low-Skilled Industries and the Emergence of an Era of Polarization". *Comparative Economic Studies* 62: 555-589. [<https://link.springer.com/article/10.1057/s41294-020-00137-w>]. Accessed 20 January 2021.

[2] International Labor Organization. 2018. "Women and Men in the Informal Economy: A Statistical Picture". [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_626831.pdf]. Accessed 18 December 2020.

6.2.3c

Coverage of social insurance programs (% of population)

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

Current Year Score: 2

2016, or latest available

World Bank; Economist Impact calculations

6.2.4 Public confidence in government

6.2.4a

Level of confidence in public institutions

Input number

Current Year Score: 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: 0

2021

Economist Intelligence Democracy Index

6.2.6 Inequality

6.2.6a

Gini coefficient

Scored 0-1, where 0=best

Current Year Score: 0.39

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: 3

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: 3

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: 60.31

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: 2.16

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: 1

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: 76.7

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: 491.5

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 11.47

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 24.7

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 6.2

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: 92.85

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 84.76

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: 527.6

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: 1

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