

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

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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

There is public evidence that a national AMR plan for the surveillance, detection and reporting of priority AMR pathogens exists in Ghana. According to the Joint External Evaluation for Ghana, conducted in February 2017, Ghana had not yet published its National Action Plan (NAP) for antimicrobial resistance. [3] However, in April 2018 Ghana launched its NAP and antimicrobial resistance policy, which includes a strategic plan as well as an operational plan (which addresses the surveillance, detection and reporting of AMR pathogens). [1,2] Although the NAP describes existing antimicrobial resistance as "nascent", it outlines a plan to develop a surveillance system for AMR pathogens, in both human and non-human health sectors. Measures include a structure that will include the national health laboratory, and national guidelines on surveillance. For detection, the NAP describes the development of standard operating procedures (SOPs) and unified protocols for "standardized diagnostics and methodology for sensitivity testing" of AMR pathogens, and training about those SOPs at sentinel sites. There are also plans to develop a national AMR database and a web-based repository of AMR research, which would facilitate the reporting of data, access to that data by relevant entities. [3]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Food and Agriculture Organization (FAO). 30 April 2018. "Ghana launches its AMR Policy and National Action Plan". [<http://www.fao.org/ghana/news/detail-events/en/c/1127767/>]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. 2017. "Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021". [http://www.moh.gov.gh/wp-content/uploads/2018/04/NAP_FINAL_PDF_A4_19.03.2018-SIGNED-1.pdf]. Accessed 17 September 2020.

1.1.1b

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

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

Current Year Score: 1

While there is public evidence that the national laboratory/laboratory system tests for some AMR pathogens, there is not enough evidence to confirm which pathogens Ghanaian laboratories have the capacity to test for. The Joint External Evaluation (JEE) for Ghana, conducted in February 2017, notes that "designated laboratories are conducting detection and reporting of some priority AMR pathogens"; it does not specify which priority pathogens. The JEE also notes that there are

some sentinel sites conducting antimicrobial resistance (AMR) surveillance of "pathogens of public health importance". [1] Neither the Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021 or the Global Database for Antimicrobial Resistance Country Self-Assessment site provides more detail on the national laboratory system. [2,3] Ghana's Ministry of Food & Agriculture or Ministry of Health website also do not include information or AMR testing. [4,5] According to the US Centers for Disease Control and Prevention, Ghana's National Public Health and Reference Laboratory, Accra, earns high marks for organisation, handling specimens, biosafety infrastructure, and diagnosis of measles and rubella by serologic analysis. However, the laboratory struggles with molecular biology and virology activities, and requires more training of technical personnel for molecular techniques and funding for laboratory equipment, reagents and supplies. [6] The laboratory does not have its own website.

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. 2017. "Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021". [http://www.moh.gov.gh/wp-content/uploads/2018/04/NAP_FINAL_PDF_A4_19.03.2018-SIGNED-1.pdf]. Accessed 17 September 2020.

[3] World Health Organization. "Global Database for Antimicrobial Resistance Country Self Assessment". [<http://amrcountryprogress.org/>]. Accessed 17 September 2020.

[4] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 9 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 9 September 2020.

[6] Centers for Disease Control and Prevention. December 2017. "Assessment of National Public Health and Reference Laboratory, Accra, Ghana, within Framework of Global Health Security". [https://wwwnc.cdc.gov/eid/article/23/13/17-0372_article#r2]. Accessed 19 September 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 no publicly available evidence that Ghana conducts environmental detection or surveillance activities for antimicrobial residues or AMR organisms. According to the Joint External Evaluation for Ghana, conducted in February 2017, there is no evidence of detection or surveillance activities for antimicrobial residues or AMR organisms. [1] According to the Ghana Ministry of Health, environmental surveillance is limited and surveillance is not conducted for antimicrobial residues. [2] The WHO Library of national action plans does not include an entry for Ghana. [3] In April 2018 Ghana launched its National Action Plan (NAP) and antimicrobial resistance policy. [4] While the NAP mentions the importance of preventing AMR pathogens in the environment, and proposes to include the environmental sector in its various activities, it does not describe any specific plan for AMR monitoring in the environment. In any case, there is no evidence that the activities of the NAP have yet been put into place. [5]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. 2017. "Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021". [http://www.moh.gov.gh/wp-content/uploads/2018/04/NAP_FINAL_PDF_A4_19.03.2018-SIGNED-1.pdf]. Accessed 17 September 2020.

[3] World Health Organization (WHO). "Antimicrobial resistance - Library of National Action Plans".

[<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 18 September 2020.

[4] Food and Agriculture Organization (FAO). 30 April 2018. "Ghana launches its AMR Policy and National Action Plan".

[<http://www.fao.org/ghana/news/detail-events/en/c/1127767/>]. Accessed 17 September 2020.

[5] Ministry of Health, Republic of Ghana. 2017. "Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021".

[http://www.moh.gov.gh/wp-content/uploads/2018/04/NAP_FINAL_PDF_A4_19.03.2018-SIGNED-1.pdf]. Accessed 17 September 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

There is national legislation in place requiring prescriptions for antibiotic use for humans. According to the Joint External Evaluation for Ghana, which was conducted in February 2017, the Public Health Act of 2012 (Act 851) requires that a prescription must be obtained for antibiotic use for humans. [1,2] Research published in the past two years in the journals *Frontiers in Public Health* and *The Journal of Pharmaceutical Policy and Practice*, suggests, however, that antibiotics are frequently purchased without a prescription in Ghana from illegal providers, particularly in rural and lower-income areas. [3,4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[<http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf>]. Accessed 17 September 2020.

[3] Afari-Asiedu S, Oppong FB, Tostmann A, Ali Abdulai M, Boamah-Kaali E, Gyaase S, Agyei O, Kinsman J, Hulscher M, Wertheim HFL and Asante KP. 2020. "Determinants of Inappropriate Antibiotics Use in Rural Central Ghana Using a Mixed Methods Approach." *Front. Public Health* 8:90. doi: 10.3389/fpubh.2020.00090.

[<https://www.frontiersin.org/articles/10.3389/fpubh.2020.00090/full>]. Accessed 18 September 2020.

[4] Afari-Asiedu, S., Kinsman, J., Boamah-Kaali, E. et al. 2018. "To sell or not to sell; the differences between regulatory and community demands regarding access to antibiotics in rural Ghana." *J of Pharm Policy and Pract* 11, 30.

[<https://doi.org/10.1186/s40545-018-0158-6>]

1.1.2b

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

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

Current Year Score: 1

There is national legislation in place requiring prescriptions for antibiotic use for animals. According to the Joint External Evaluation for Ghana, conducted in February 2017, the Public Health Act of 2012 (Act 851) requires that antibiotics "should not be sold for use in animals without a prescription". [1,2] There is, however, evidence of gaps in enforcement. A 2019 PhD thesis from the University for Development Studies, Tamale, suggests that illegal or inappropriate use of antibiotics is not uncommon in livestock farming in Ghana. [3]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[<http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf>]. Accessed 18 September 2020.

[3] Akansale, Richard. 2019. University for Development Studies, Tamale. "An Assessment of antibiotic usage in ruminant livestock and analysis of antibiotic residues in beef and chevon in the Sunyani municipality, Ghana. [<http://www.udsspace.uds.edu.gh/handle/123456789/2601>] Accessed 18 September 2020.

1.2 ZONOTIC DISEASE

1.2.1 National planning for zoonotic diseases/pathogens

1.2.1a

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence of a national law, plan, or equivalent strategy document, on zoonotic disease. According to the Joint External Evaluation report for Ghana, conducted in January 2017, a formal law, plan or strategy does not currently exist for zoonotic outbreaks. [1] However, Ghana's 2012 Public Health Act (PHA), which is a law "to prevent disease, promote, safeguard, maintain and protect the health of humans and animals and to provide for related matters", does mention certain disease prevention measures that apply equally to zoonoses and other pathogens. Further, it explicitly includes animal-borne diseases in its description of communicable diseases, which it defines as "an illness caused by a specific infectious agent or its toxic products which arises through transmission of that agent or its products from an infected person, animal, or inanimate reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector, or the inanimate environment". Additionally, it empowers the Ministry of Health in "the regulation of zoonotic diseases". It also defines the "vectors" and "reservoirs" that it refers to in describing various disease control measures as including animals. [2] It also defines animal-borne pathogens as being included in the diseases that public health authorities have the responsibility to control. [2] The World Organisation for Animal Health's 2017 report, "Veterinary Legislation Support Programme" states that the PHA "does cover animal diseases when they can be transmitted to humans", but does not document further evidence of a specific strategy for zoonotic diseases. [3] Neither the Ministry of Food & Agriculture or Ministry of Health websites reference a national strategy for zoonotic disease. [4,5]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2012. Public Health Act. [<http://extwprlegs1.fao.org/docs/pdf/gha136559.pdf>]. Accessed 10 May 2021.

[3] World Organisation for Animal Health (OIE). 2017. "Veterinary Legislation Support Programme". [https://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/FinalReport_VLSP_Identification_Ghana.pdf]. Accessed 10 May 2021.

[4] Republic of Ghana. Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 18 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

1.2.1b

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence that Ghana has national legislation that includes measures for risk identification and reduction for zoonotic disease spillover events from animals to humans. Ghana's 2012 Public Health Act (PHA), which is a law "to prevent disease, promote, safeguard, maintain and protect the health of humans and animals and to provide for related matters", describes certain disease prevention measures that apply equally to zoonoses and other pathogens. Further, it explicitly includes animal-borne diseases in its description of communicable diseases, which it defines as "an illness caused by a specific infectious agent or its toxic products which arises through transmission of that agent or its products from an infected person, animal, or inanimate reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector, or the inanimate environment". Additionally, it empowers the Ministry of Health in "the regulation of zoonotic diseases". [1] The Act includes the provision that authorities at borders monitor the passage of physical items from "affected areas ... so that they are maintained in such a condition that they are free of sources of infection or contamination, including vectors and reservoirs". [1] The Diseases of Animals Act, a 1961 law, does not directly mention zoonoses or human health, but does prescribe measures in response to animal health outbreaks that amount to zoonotic disease risk mitigation. For example, the law describes how the bodies of diseased animals should be disposed of, and describes measures to manage animals in areas suffering from disease outbreaks. [2] There is no other evidence of other relevant laws or plans in Ghana. The Global Health Security Agenda (GHSA) program, funded by USAID, is helping 17 countries in Africa and Asia, including Ghana, to improve their capacity to prevent, detect and respond to disease threats. The GHSA program is encouraging these 17 countries to adopt policies and practices to identify and reduce zoonotic disease transfer to humans. There is, however, no evidence that these policies are yet in place in Ghana. [3] The Ghana National Action Plan for Antimicrobial Use and Resistance 2017-2021 says that the Veterinary Public Health and Food Safety Unit has the aim of preventing zoonotic diseases in humans and ensuring food safety, but not does not allude to any specific plans or strategy documents on this issue. [4] Additionally, the Veterinary Public Health and Food Safety Unit does not have a standalone website. An information page on the Ministry of Food and Agriculture website for the veterinary unit outlines its mission and important functions but does not go into much detail on strategy to mitigate zoonotic disease. [5] There is no additional relevant information on either the Ministry of Health or the Ministry of Food and Agriculture website. [6,7] According to the Joint External Evaluation report for Ghana, conducted in January 2017, a formal law, plan or strategy does not currently exist for zoonotic outbreaks. [8]

[1] Republic of Ghana. 2012. Public Health Act. [<http://extwprlegs1.fao.org/docs/pdf/gha136559.pdf>]. Accessed 10 May 2021.

[2] Republic of Ghana. 1961. "Diseases of Animals Act". [<http://extwprlegs1.fao.org/docs/pdf/gha91981.pdf>]. Accessed 10 May 2021.

[3] Food and Agriculture Organization of the United Nations. "Protecting People and Animals from Disease Threats." [<http://www.fao.org/3/i8747en/i8747EN.pdf>]. Accessed 18 September 2020.

[4] World Organisation for Animal Health (OIE). "Veterinary Legislation Support Programme: Ghana." [https://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/FinalReport_VLSP_Identification_Ghana.pdf]. Accessed 18 September 2020.

[5] Ministry of Food and Agriculture. "Veterinary Services." [<http://mofa.gov.gh/site/directorates/technical-directorates/veterinary-services>]. Accessed 18 September 2020.

[6] Ministry of Health, Ghana. [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

[7] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>]. Accessed 18 September 2020.

[8] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 10 May 2021.

1.2.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence of national plans, guidelines, or laws that account for the surveillance and control of multiple zoonotic pathogens of public health concern. The Joint External Evaluation report for Ghana, conducted in January 2017, does not reference a strategy for surveillance and control of multiple zoonotic pathogens of public health concern, nor does the World Health Organisation's Veterinary Legislation Identification Mission Report for Ghana (2017). [1,2] The Ministry of Food & Agriculture or Ministry of Health websites do not include evidence of such plans. [3,4]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] World Organization for Animal Health (OIE). August 2011. "Veterinary Legislation Support Programme: Ghana. Veterinary Legislation Identification Mission Report". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/FinalReport_VLSP_Identification_Ghana.pdf]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 18 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 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 some evidence of a unit dedicated to zoonotic disease that functions across ministries in Ghana, but it is not clear that the unit conducts substantial operations between different ministries. The Veterinary Public Health and Regulatory Unit is a subdivision of the Ministry of Food and Agriculture. The unit does not have a standalone website, but an information page on the Ministry of Food and Agriculture website says that the unit has a "liaison role between the Ministry of Food and Agriculture and the Ministry of Health with regard to diseases common to humans and animals" but there is not evidence of joint staffing, funding or reporting by more than one ministry. [1]

[1] Ministry of Food and Agriculture. "Veterinary Services." [<http://mofa.gov.gh/site/directorates/technical-directorates/veterinary-services>]. Accessed 18 September 2020.

1.2.2 Surveillance systems for zoonotic diseases/pathogens

1.2.2a

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

Yes = 1 , No = 0

Current Year Score: 1

There is a national mechanism for owners of livestock to conduct and report on disease surveillance to a central government agency in Ghana. There is a national requirement for disease surveillance and reporting by livestock owners under Section 3 of the 1961 Diseases of Animals Act, which states "Every owner or person having the charge of an animal which has died of, or is suffering from a disease...shall forthwith notify the nearest veterinary authority". [1,2] According to Ghana's Joint External Evaluation report, conducted in February 2017, "livestock farmers are trained in disease recognition and reporting including reporting of unusual events". [3] Trained staff at the community level detect and report diseases to the districts, with a framework for disease confirmation and response. [3]

[1] Ministry of Health, Republic of Ghana. 1961. "Diseases of Animals Act".

[<http://extwprlegs1.fao.org/docs/pdf/gha91981.pdf>]. Accessed 17 September 2020.

[2] World Organization for Animal Health (OIE). August 2011. "Veterinary Legislation Support Programme: Ghana. Veterinary Legislation Identification Mission Report".

[http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/FinalReport_VLSP_Identification_Ghana.pdf]. Accessed 17 September 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

1.2.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that Ghana has laws or guidelines that safeguard the confidentiality of information generated through surveillance activities for animals. There is no evidence of such laws or guidelines in the Joint External Evaluation for Ghana, conducted in February 2017, nor in the World Organisation for Animal Health (OIE) Performance of Veterinary Services (PVS) Gap Analysis report or the PVS Veterinary Legislation Identification Mission Report for Ghana. [1, 2, 3] There is a general data protection law (Data Protection Act, 2012) but this does not specify details for livestock owners reporting through surveillance activities. [4] No information found in the Republic of Ghana's Ministry of Food & Agriculture or Ministry of Health websites. [5,6]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] World Organization for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana".

[http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 17 September 2020.

[3] World Organization for Animal Health (OIE). August 2011. "Veterinary Legislation Support Programme: Ghana. Veterinary Legislation Identification Mission Report".

[http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/FinalReport_VLSP_Identification_Ghana.pdf].

Accessed 17 September 2020.

[4] The Data Protection Commission (DPC). 2012. "Data Protection Act (Act 843)".

[<https://www.dataprotection.org.gh/sites/default/files/Data%20Protection%20Act%20%2C%202012%20%28Act%20843%29.pdf>]. Accessed 17 September 2020.

[5] Republic of Ghana, Ministry of Food & Agriculture.?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020

[6] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 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: 0

There is insufficient evidence that Ghana conducts surveillance of zoonotic disease in wildlife. According to Ghana's Joint External Evaluation (JEE) report, conducted in February 2017, the wildlife sector is responsible for conducting surveillance of zoonotic diseases. [1] The JEE refers to the "National Integrated Strategic Plan for PHEIC 2015-2019" for this information and states that the plan is still in draft form. However, this draft could not be located via public sources. There is no relevant information on the Ministry of Health or the Ministry of Food and Agriculture websites. [2,3]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 12 October 2020.

[3] Ministry of Food and Agriculture. [<http://mofa.gov.gh/site/>] Accessed 12 October 2020.

1.2.3 International reporting of animal disease outbreaks

1.2.3a

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

Yes = 1 , No = 0

Current Year Score: 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: 0.41

2017

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: 2.46

2017

OIE WAHIS database

1.2.5 Private sector and zoonotic

1.2.5a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that the national plan on zoonotic disease or other legislation, regulation or plan include mechanisms for working with the private sector in controlling or responding to zoonoses. According to the Joint External Evaluation for Ghana, conducted in February 2017, communication between the private and public sector is limited and represents an opportunity for further development. [1] There is no evidence of mechanisms for working with the private sector in controlling or responding to zoonoses on the websites of the Ministry of Food & Agriculture or Ministry of Health. [2,3] The National Public Health and Reference Laboratory, Accra does not have a website, but an assessment of the laboratory from the Centers for Disease Control and Prevention (USA) does not refer to private sector collaboration. [4]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture. ?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 9 November 2018.

[4] Centers for Disease Control and Prevention. December 2017. "Assessment of National Public Health and Reference Laboratory, Accra, Ghana, within Framework of Global Health Security". [https://wwwnc.cdc.gov/eid/article/23/13/17-0372_article#r2]. Accessed 17 September 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

Although there is some evidence of record-keeping, there is insufficient evidence that Ghana has in place a record of the facilities in which especially dangerous pathogens and toxins are stored or processed that has been updated within the past 5 years. According to the Joint External Evaluation for Ghana, conducted in February 2017, there are two biosafety-level 3 (BSL3) flagship laboratories--Noguchi Memorial Institute for Medical Research (NMIMR) and Kumasi Centre for Collaborative Research in Tropical Medicine (KCCR)-- focused on human health. In the list of reviewed documentation in the JEE report, there is an entry labelled "documentation of dangerous pathogen collections housed in the country - NMIMR and KCCR records". However, it is unclear whether this list is comprehensive from the available evidence, or whether or not it has been updated in the past five years. No further detail is available in the JEE report. [1] There is no evidence of such legislation or regulations on the websites of the Ministry of Food and Agriculture, Ministry of Defence or Ministry of Health. [2,3,4] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [5] There is no relevant legislation on the VERTIC database except the 2011 Biosafety Act, which does not address this issue. [6]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture. ?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[5] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[6] VERTIC Database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 12 October 2020.

[6] VERTIC Database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>] Accessed 12 October 2020.

1.3.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that Ghana has 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. According to the Joint External Evaluation for Ghana, conducted in February 2017, Ghana has biosafety legislation but not a comprehensive, current legal framework for biosecurity; biosecurity regulations are limited to periodic training for institutional laboratory staff and waste management. [1,2] The VERTIC database does not list any laws or regulations for Ghana regarding biosecurity. [3] There is no evidence of such legislation or regulations on the websites of the Ministry of Food and Agriculture, Ministry of Defence or Ministry of Health. [4,5,6] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports." [7]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 17 September 2020.

[3] VERTIC. "Legislation Database". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 17 September 2020.

[4] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[5] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[6] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[7] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 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: 0

There is no evidence of an active agency responsible for the enforcement of biosecurity legislation and regulations. According to the Joint External Evaluation for Ghana, conducted in February 2017, strengthening biosecurity oversight and enforcement mechanisms in Ghana represents a priority action. [1] No information was found on the Republic of Ghana's Ministry of Food & Agriculture, Ministry of Defence, or Ministry of Health websites. [2,3,4] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [5] The 2011 Biosafety Act established a National Biosafety Authority which is principally concerned with the use of genetically modified organisms in Ghana and does not address biosecurity specifically. [6] There is no other relevant information on the VERTIC database. [7]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Defence.

[<https://web.archive.org/web/20190927172228/http://www.ghana.gov.gh:80/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[5] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[6] Parliament of the Republic of Ghana. "Biosafety Act, 2011." [https://www.vertic.org/media/National%20Legislation/Ghana/GH_Biosafety_Act_2011.pdf] Accessed 12 October 2020.

[7] VERTIC Database. 'G'. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>] Accessed 12 October 2020.

1.3.1d

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that Ghana has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities. A plan to consolidate inventories of especially dangerous pathogens and toxins into a minimum number of facilities needs to be developed according to Ghana's Joint External Evaluation report (2017). [1] No further information was found on the websites of the Ministry of Food & Agriculture, Ministry of Defence or Ministry of Health. [2,3,4] Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [5] The 2011 Biosafety Act does not address this issue and there is no other relevant legislation on the VERTIC database. [6]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture.?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor?and?https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[5] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[6] VERTIC Database."G". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>] Accessed 12 October 2020.

1.3.1e

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

Yes = 1 , No = 0

Current Year Score: 0

There is no 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. According to the "Technical guidelines for Integrated Disease Surveillance and Response in Ghana" (2002), an antibody test (IgM) is used to test for Ebola. These guidelines do not include information on diagnostic testing for Anthrax. [1] No further evidence was found in Ghana's Joint External Evaluation

Report, conducted in February 2017, or on websites of the Ministry of Food & Agriculture, Ministry of Defence or Ministry of Health. [2,3,4,5] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] Ministry of Health, Republic of Ghana. 2002. "Technical Guidelines for Integrated Disease Surveillance and Response in Ghana". [<http://www.moh.gov.gh/wp-content/uploads/2016/02/Integrated-Disease-Surveillance-and-Response-Ghana-Guidelines.pdf>]. Accessed 17 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Food & Agriculture.?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[4] Republic of Ghana, Ministry of Defence.

[<https://web.archive.org/web/20190927172228/http://www.ghana.gov.gh:80/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor>]. Accessed 17 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

1.3.2 Biosecurity training and practices

1.3.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that biosecurity training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential is required. According to the Joint External Evaluation for Ghana, conducted in February 2017, there is a lack of training programmes and a standardised curriculum for biosafety and biosecurity training in public health and clinical laboratories. [1] There is also no train-the-trainer programme for biosafety or biosecurity. [1] There is no evidence that Ghana requires biosecurity training according to the Public Health Act (2012), the 2007 Biosafety (management of biotechnology) Regulations, or the Biosafety Act (Act 831). [2,3,4] There is no evidence of such regulations on the websites of the Ministry of Food & Agriculture, Ministry of Defence or Ministry of Health. [5,6,7] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [8] There is no other relevant legislation on the VERTIC database. [9]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[<http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf>]. Accessed 17 September 2020.

[3] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 17 September 2020.

[4] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 17 September 2020.

[5] Republic of Ghana, Ministry of Food & Agriculture.?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[6] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of>

defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor?and?https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26]. Accessed 17 September 2020.

[7] Ministry of Health, Republic of Ghana. [http://www.moh.gov.gh]. Accessed 17 September 2020.

[8] United Nations. "Confidence Building Measures: Ghana". [https://bwc-ecbm.unog.ch/state/ghana]. Accessed 17 September 2020.

[9] VERTIC Database [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/]. Accessed 12 October 2020.

1.3.3 Personnel vetting: regulating access to sensitive locations

1.3.3a

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

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

Current Year Score: 0

Regulations and licensing conditions do not specify that security and other personnel with access to especially dangerous pathogens, toxins, or biological materials with pandemic potential are subject to drug testing, background checks, and psychological or mental fitness checks. There is no available evidence of such requirements in the 2007 Biosafety (management of biotechnology) Regulations or the Biosafety Act (Act 831). [1,2] The websites of the Ministry of Defence, Ministry of Food & Agriculture and Ministry of Health also do not have evidence of drug testing, background checks, and psychological or mental fitness checks for security and other personnel. [3,4,5] The VERTIC database does not list any laws or regulations for Ghana regarding biosecurity training. [6] Ghana National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [7]

[1] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations".

[http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf]. Accessed 17 September 2020.

[2] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf]. Accessed 17 September 2020.

[3] Ministry of Defence, Republic of Ghana. [http://mod.gov.gh/] Accessed 17 September 2020.

[4] Ministry of Food & Agriculture, Republic of Ghana. [http://mofa.gov.gh/site/]. Accessed 17 September 2020.

[5] Ministry of Health, Republic of Ghana. [http://www.moh.gov.gh]. Accessed 17 September 2020.

[6] VERTIC. "Legislation Database". https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/. Accessed 17 September 2020.

[7] United Nations. "Confidence Building Measures: Ghana". [https://bwc-ecbm.unog.ch/state/ghana]. Accessed 17 September 2020.

1.3.4 Transportation security

1.3.4a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence on national regulations regarding the safe and secure transport of infectious substances in Ghana. According to the Joint External Evaluation for Ghana, conducted in February 2017, although transport of infectious substances are in accordance to International Air Transport Association (IATA) standards, national regulations on the safe and secure transport of infectious substance are still lacking. [1] There is no information on the websites of the Ministry of Food & Agriculture, Ministry of Defence or Ministry of Health. [2,3,4] The VERTIC database does not list any laws or regulations for Ghana regarding transport of infectious substances. [5] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [6]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture.?[<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 9 November 2018.

[5] VERTIC. "Legislation Database". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 17 September 2020.

[6] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

1.3.5 Cross-border transfer and end-user screening

1.3.5a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that a national legislation/regulation is in place to oversee the cross-border transfer and end-user screening of especially dangerous pathogens, toxins and pathogens with pandemic potential. There is no information in the Ghana Shipping Act (2003, section 331-333) or the Ghana Civil Aviation Regulations (section 8.14) referring specifically to overseeing the transfer of dangerous pathogens/toxins/pathogens with pandemic potential. [1,2] There is no evidence on the websites of the Ministry of Defence, the Ministry of Food & Agriculture or the Ministry of Health. [3,4,5] Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [6] The 2011 Biosafety Act does not address this issue and there is no other relevant legislation in the VERTIC database. [7]

- [1] Republic of Ghana. 2003. Ghana Shipping Act (Act 645). [www.ilo.org/dyn/normlex/en/f?p=1000:53:::53:P53_FILE_ID:3132804]. Accessed 17 September 2020.
- [2] Ghana Civil Aviation Regulations. [http://www.gcaa.com.gh/reg/?page_id=2960]. Accessed 17 September 2020.
- [3] Ministry of Defence, Republic of Ghana. [http://mod.gov.gh/]. Accessed 17 September 2020.
- [4] Republic of Ghana. Ministry of Food & Agriculture. [http://mofa.gov.gh/site/]. Accessed 17 September 2020.
- [5] Ministry of Health, Republic of Ghana. [http://www.moh.gov.gh]. Accessed 17 September 2020.
- [6] United Nations. "Confidence Building Measures: Ghana". [https://bwc-ecbm.unog.ch/state/ghana]. Accessed 17 September 2020.
- [7] VERTIC Database. [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/]. Accessed 12 October.

1.4 BIOSAFETY

1.4.1 Whole-of-government biosafety systems

1.4.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that the country has in place national biosafety legislation and/or regulations. Ghana's Biosafety Act (2011) and Biosafety (management of biotechnology) Regulations (2007) refer mainly to genetically modified organisms (GMOs) in Ghana, rather than prevention of accidents that involve the release of harmful biological substances. [1,2,3] As a priority action, the Joint External Evaluation (JEE) report recommended the integration of biosafety and biosecurity into legislation. [4] The JEE notes Ghana's Biosafety Act (2011) does not cover pathogens in general. [4] Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [5] There is no other relevant legislation listed in the VERTIC database. [6]

- [1] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf]. Accessed 19 September 2020.
- [2] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf]. Accessed 19 September 2020.
- [3] VERTIC. "Legislation Database". [http://www.vertic.org/pages/homepage/programmes/national-implementation-measures/biological-weapons-and-materials/bwc-legislation-database/g.php]. Accessed 18 September 2020.
- [4] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1]. Accessed 18 September 2020.
- [5] United Nations. "Confidence Building Measures: Ghana". [https://bwc-ecbm.unog.ch/state/ghana]. Accessed 18 September 2020.
- [6] VERTIC Database. [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/] Accessed 12 October 2020.

1.4.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no agency responsible for the enforcement of biosafety regulations. According to Ghana's Joint External Evaluation report, conducted in February 2017, biosafety regulation enforcement is an area that requires strengthening in Ghana. [1] There is no relevant information on the websites of the Ministry of Food & Agriculture or Ministry of Health. [2,3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [4] The 2011 Biosafety Act established a National Biosafety Authority, but it is principally concerned with the use of genetically modified organisms. There is no other relevant legislation in the VERTIC database.[5]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[4] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[5] VERTIC database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>] Accessed 12 October 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 no public evidence that Ghana requires biosafety training, using a standardised, required approach, for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential. According to the Joint External Evaluation for Ghana, conducted in February 2017, public health and clinical laboratories lack training programmes and a standardised curriculum for biosafety and biosecurity trainings. There is no train-the-trainer programme for biosafety or biosecurity. [1] There is no evidence of training for biosafety in the Public Health Act (2012), Biosafety (management of biotechnology) Regulations and the Biosafety Act (Act 831). [2,3,4] There is no relevant evidence on the websites of the Ministry of Food & Agriculture or Ministry of Health. [5,6] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [7] There is no other relevant legislation in the VERTIC database. [8]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[<http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf>]. Accessed 17 September 2020.

[3] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations".

[<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 17 September 2020.

[4] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 19 September 2018.

[5] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 9 November 2018.

[6] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[7] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[8] VERTIC Database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 12 October 2020.

1.5 DUAL-USE RESEARCH AND CULTURE OF RESPONSIBLE SCIENCE

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

1.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that Ghana has conducted an assessment to determine whether dual use research, including ongoing research on dangerous pathogens is occurring. The Joint External Evaluation for Ghana, conducted in February 2017, does not include references to an assessment to determine whether dual use research is occurring. [1] There is no information on dual use research in the Public Health Act (2012), the Biosafety (management of biotechnology) Regulations, or the Biosafety Act (Act 831). [2,3,4] There is no information on dual use research on the websites of the Ministry of Food & Agriculture or the Ministry of Defence. [5,6] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [7] There is no relevant legislation in the VERTIC database. [8]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[<http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf>]. Accessed 17 September 2020.

[3] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 17 September 2020.

[4] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 17 September 2020.

[5] Republic of Ghana. Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[6] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[7] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[8] VERTIC database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 12 October 2020.

1.5.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that Ghana has a national policy requiring oversight of dual use research. The Joint External Evaluation for Ghana, conducted in February 2017, does not include references to a national policy requiring oversight of dual use research. [1] The Biosafety (management of biotechnology) Regulations and the Biosafety Act (Act 831) do not contain such information. [2,3] There is no evidence of oversight for dual use research on the websites of the Ministry of Food & Agriculture, the Ministry of Defence, the Ministry of Health, or Ghana Health Service. [4,5,6,7] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [8] There is no other relevant legislation in the VERTIC database. [9]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 19 September 2020.

[3] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 19 September 2020.

[4] Republic of Ghana. Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[5] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[6] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[7] Ghana Health Service. [<http://www.ghanhealthservice.org/ghs-category.php?cid=5>]. Accessed 19 September 2020.

[8] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[9] VERTIC database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 12 October 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 no public evidence that there is an agency responsible for oversight of research with especially dangerous pathogens, pathogens with pandemic potential. According to the Biosafety Act (section 33), there are biosafety inspectors but these are specific to Genetically Modified Organisms (GMOs). [1] There is no evidence of a dedicated oversight agency on the websites of the Ministry of Food & Agriculture, Ministry of Defence or the Ministry of Health (including the Ghana Health Service). [2,3,4] The Biosafety (management of biotechnology) Regulations provides details on a National Biosafety Committee but this is also specific to GMOs (sections 1-8). [5] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence

that it has submitted Confidence-Building Measures reports. [6] There is no relevant legislation in the VERTIC database. [7]

[1] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 17 September 2020.

[2] Republic of Ghana. Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[5] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 17 September 2020.

[6] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

[7] VERTIC database. [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>] Accessed 12 October 2020.

1.5.2 Screening guidance for providers of genetic material

1.5.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence of a national legislation/ regulation/policy/guidance, requiring the screening of synthesised DNA before it is sold. There are two policy documents, the Biosafety (management of biotechnology) Regulations and the Biosafety Act (Act 831), both of which refer to genetically modified organisms (GMOs), but neither specify that screening is required before selling. [1,2] There is no evidence of such legislation on the websites of the Ministry of Food & Agriculture, Ministry of Defence or Ministry of Health (including the Ghana Health Service). [3,4,5,6] The VERTIC database does not list any laws or regulations for Ghana regarding the screening of synthesised DNA before it is sold. [7] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. Although Ghana is party to the Biological Weapons Convention, there is no public evidence that it has submitted Confidence-Building Measures reports. [8]

[1] Republic of Ghana. 2007. "Biosafety (management of biotechnology) Regulations". [<http://extwprlegs1.fao.org/docs/pdf/gha137105.pdf>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2011. "Biosafety Act (Act 831)". [<http://extwprlegs1.fao.org/docs/pdf/gha136733.pdf>]. Accessed 17 September 2020.

[3] Republic of Ghana. Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[4] Republic of Ghana, Ministry of Defence. [<http://mod.gov.gh/>]. Accessed 17 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[6] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 17 September 2020.

[7] VERTIC. "Legislation Database". [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/g/>]. Accessed 17 September 2020.

[8] United Nations. "Confidence Building Measures: Ghana". [<https://bwc-ecbm.unog.ch/state/ghana>]. Accessed 17 September 2020.

1.6 IMMUNIZATION

1.6.1 Vaccination rates

1.6.1a

Immunization rate (measles/MCV2)

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

Current Year Score: 1

2019

World Health Organization

1.6.1b

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

Yes = 1, No = 0

Current Year Score: 1

2020

OIE WAHIS database

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

2.1 LABORATORY SYSTEMS STRENGTH AND QUALITY

2.1.1 Laboratory testing for detection of priority diseases

2.1.1a

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

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

Current Year Score: 0

There is no public evidence that the national laboratory system has the capacity to conduct diagnostic tests for at least 5 of the 10 WHO-defined core tests. According to the Joint External Evaluation report for Ghana, conducted in February 2017, Ghana has an advanced laboratory system and has the capacity to test multiple diseases which include HIV, tuberculosis (TB), malaria and influenza, which are of World Health Organisation standards.[1] However, the report does not contain

information regarding the specific types of tests conducted for these disease in the report. According to the Centers for Disease Control and Prevention (USA), the National Public Health and Reference Laboratory, Accra is proficient for diagnosis of measles and rubella by serologic analysis; however, there is little expertise regarding molecular biology and virology activities. [2] The Ghana Health Service's Research and Development Division does not refer to testing capabilities on its website and there is no relevant information on the Ministry of Health website. [3,4] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Centers for Disease Control and Prevention. December 2017. "Assessment of National Public Health and Reference Laboratory, Accra, Ghana, within Framework of Global Health Security". [https://wwwnc.cdc.gov/eid/article/23/13/17-0372_article#r2]. Accessed 17 September 2020.

[3] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 17 September 2020.

[4] Ministry of Health. [<http://www.moh.gov.gh>] Accessed 12 October 2020.

2.1.1b

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

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

Current Year Score: 1

There is evidence that Ghana has a national plan for conducting testing during a public health emergency in Ghana; however, there is insufficient evidence to show that the plan includes considerations for novel pathogens. The National Guidelines for Laboratory Testing and Reporting on Respiratory and Infectious Diseases in Health Facilities in Ghana describes guidelines, goals, and responsibilities for testing during outbreaks, including considerations for scaling capacity. For example, the guidelines state the goals of "appropriate, accurate, early confirmation of cases and sustainable diagnostic testing capacities to respond to public health and clinical care needs of the country" and putting in place "measures to ensure surge capacity to process a large volume of specimens to cope with the public health response strategies". Specifically, the guidelines describe the existing network of COVID-19 testing centers, and plans to expand to new locations. They also describe governance of testing activities, quality assurance, requirements for the testing workforce, how to process and store samples, and how to report results. However, while the guidelines are meant to apply to respiratory and infectious disease outbreaks in general, they make no reference to the considerations for novel pathogens, aside from the novel coronavirus that causes COVID-19.

[1] Aside from these guidelines, there is no other relevant evidence of a testing strategy. Ghana's National Disaster Management Organisation (NADMO) published a National Disaster Management Plan in 2015, but the document is no longer accessible via the NADMO website. [2] The Ministry of Health and Ministry of Food and Agriculture websites do not share any relevant documents. [3,4] Ghana's National Public Health and Reference Laboratory, Accra, does not have its own website.

[1] Ministry of Health. June 2020. "National Guidelines for Laboratory Testing and Reporting on Respiratory and Infectious Diseases in Health Facilities in Ghana". [<https://www.moh.gov.gh/wp-content/uploads/2020/07/National-Guidelines-for-Lab-Testing-and-Reporting-on-Resp-Infectious-Diseases-Ghana.pdf>]. Accessed 11 May 2021.

[2] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[3] Ministry of Health [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

[4] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>]. Accessed 18 September 2020.

2.1.2 Laboratory quality systems

2.1.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that the national laboratory that serves as a reference facility is accredited. The National Public Health and Reference Laboratory (NPHRL) is part of the Strengthening Laboratory Management Toward Accreditation (SLMTA) program which describes itself as "a structured quality improvement program" which teaches laboratory managers how to implement practical quality management systems in resource-limited settings using available resources. SLMTA is supported with funds from the U.S. government, according to its website. [1,2] According to the Joint External Evaluation report for Ghana, conducted in February 2017, the African Society for Laboratory Medicine (ASLM) has carried out audits of regional and national laboratories, using the SLIPTA process. [3] As of 2017 however, on the ASLM website states that accreditation for NPHRL has expired (audit date: 1/11/2013) and only the Noguchi Memorial Institute for Medical Research laboratory was shown to have current accreditation (audit date: 1/9/2017). [4] There is no relevant information on the Ministry of Health or Ministry of Food and Agriculture. [5,6]

[1] Ogee-Nwankwo A, Opare D, Boateng G, Nyaku M, Haynes LM, Balajee SA, et al. "Assessment of national public health and reference laboratory, Accra, Ghana, within framework of global health security". *Emerg Infect Dis.* 2017 Suppl.

[<https://doi.org/10.3201/eid2313.170372>]. Accessed 17 September 2020.

[2] Strengthening Laboratory Management Toward Accreditation [<https://slmta.org/>] Accessed 12 October 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[4] African Society for Laboratory Medicine (ASLM). "SLIPTA Database".

[<https://web.archive.org/web/20181005071921/http://www.aslm.org:80/resource-centre/slipta-map/slipta-2017-2/>]. Accessed 17 September 2020.

[5] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 12 October.

[6] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>] Accessed 12 October 2020.

2.1.2b

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that the national laboratory that serves as a reference facility for Ghana is subject to external quality assurance review. The National Public Health and Reference Laboratory (NPHRL) is part of the Strengthening Laboratory Management Toward Accreditation (SLMTA) programme which describes itself as "a structured quality improvement program" which teaches laboratory managers how to implement practical quality management systems in resource-limited settings using available resources. SLMTA is supported with funds from the U.S. government, according to its website. [1,2]

According to Ghana's Joint External Evaluation report, conducted in February 2017, the NPHRL is subject to external quality assurance review by the African Society for Laboratory Medicine (ASLM). [3,4]

[1] Ogee-Nwankwo A, Opare D, Boateng G, Nyaku M, Haynes LM, Balajee SA, et al. 2017. "Assessment of national public health and reference laboratory, Accra, Ghana, within framework of global health security". Emerg Infect Dis. [https://doi.org/10.3201/eid2313.170372]. Accessed 17 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1]. Accessed 17 September 2020.

[3] African Society for Laboratory Medicine (ASLM). "SLIPTA Database". [https://web.archive.org/web/20181005071921/http://www.aslm.org:80/resource-centre/slipta-map/slipta-2017-2/]. Accessed 17 September 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 evidence of a specimen transport system in Ghana, but not one that is nationwide. According to the Joint External Evaluation (JEE) for Ghana, conducted in February 2017, there is a specimen transport system in place (with Standard Operating Procedures) for priority diseases under surveillance, but not for routine clinical specimens. [1] However, the JEE assessment recommended the development of a national referral and transportation system was recommended as a priority action. [1] Further details on the existing system are not available on the websites of the Ministry of Health or the Ministry of Food and Agriculture. [2,3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. [http://www.moh.gov.gh]. Accessed 17 September 2020.

[3] Ministry of Food and Agriculture, Republic of Ghana. [http://mofa.gov.gh/site/]. Accessed 17 September 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 no evidence of a publicly shared 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. Neither the Ministry of Health nor the Ministry of Food and Agriculture website share any relevant publications. [1,2] Ghana's National Public Health and Reference

Laboratory, Accra, does not have its own website. The Brookings Institution reports that in response to the COVID-19 outbreak, Ghana expanded COVID-19 testing from three laboratories to ten laboratories. The country is reportedly using a "pooled approach" to testing, where samples from multiple people are combined and tested together to increase testing capacity. COVID-19 samples are being collected from more than 1,000 health facilities but there is no evidence of a formal plan in place. [3]

[1] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 18 September 2020.

[2] Ministry of Food and Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 18 September 2020.

[3] The Brookings Institution. July 2020. "How well is Ghana -- with one of the best testing capacities in Africa -- responding to COVID-19?". [<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-capacities-in-africa-responding-to-covid-19/>]. Accessed 18 September 2020.

2.3 REAL-TIME SURVEILLANCE AND REPORTING

2.3.1 Indicator and event-based surveillance and reporting systems

2.3.1a

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

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

Current Year Score: 1

There is evidence that Ghana conducts ongoing event-based surveillance (EBS), but not that the data it generates is analysed on a daily basis. According to Ghana's Joint External Evaluation (JEE) report, completed in February 2017, "the surveillance system in human health incorporates indicator, syndromic and event-based surveillance". However, the report also notes that EBS in the country has shortcomings, and there is a lack of training and standard operating procedures. There is no mention in the report of the frequency of data analysis. [1] There is no relevant information shared via a public website by the Ministry of Food & Agriculture or Ministry of Health. [2,3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 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 Ghana reported a potential public health emergency of international concern (PHEIC) to the World Health Organisation (WHO) within the last two years. Ghana made an infectious disease report to the World Health

Organisation' for "circulating vaccine derived poliovirus type 2" in September 2019. [1] A cholera outbreak was last reported in November 2016, but Ghana does not appear to have reported a COVID-19 outbreak through the Disease Outbreak News channel. [2,3] The first COVID-19 cases in Ghana were reported in March 2020, after COVID-19 was already declared a PHEIC. [4]

[1] World Health Organisation (WHO). "Disease Outbreak News: Ghana".

[<http://www.who.int/csr/don/archive/country/gha/en/>]. Accessed 18 September 2020.

[2] Reliefweb. Ghana. [<https://reliefweb.int/disasters?country=102#content>]. Accessed 18 September 2020.

[3] Reliefweb. Ghana. [<https://reliefweb.int/sites/reliefweb.int/files/resources/662926-MDRGH012.pdf>].

[4] Zhang, J., J. Nonvignon, and W. Mao. 28 July 2020. "How well is Ghana—with one of the best testing capacities in Africa—responding to COVID-19?". [<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-capacities-in-africa-responding-to-covid-19/>]. Accessed 11 May 2021.

2.3.2 Interoperable, interconnected, electronic real-time reporting systems

2.3.2a

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

Yes = 1 , No = 0

Current Year Score: 1

The government operates an electronic reporting surveillance system at both the national and sub-national level. According to Ghana's Joint External Evaluation report, conducted in February 2017, "there is web-based electronic reporting from the district up to the national level". However, for animal health, they do not have in place electronic reporting systems. [1] The Ministry of Health rolled out an e-health service (rolling out began in 2016, programme update published in April 2018) called the "national e-health project with bio-surveillance (early warning) system". [2]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] The Ministry of Health, Republic of Ghana. 22 April 2018. "National e-health project with bio-surveillance (early warning) system". [<http://www.moh.gov.gh/national-e-health-project-with-bio-surveillance-early-warning-system/>]. Accessed 17 September 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 public evidence that the electronic reporting surveillance system collect ongoing or real-time laboratory data. There is no evidence that the reporting system collects real-time data in Ghana's Joint External Evaluation report, conducted in February 2017 or World Organisation for Animal Health Performance of Veterinary Services (PVS) Gap Analysis Report for Ghana, conducted in August 2011. [1,2] There is no information on real-time laboratory data on the website of the Ministry of Health. [3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

2.4 SURVEILLANCE DATA ACCESSIBILITY AND TRANSPARENCY

2.4.1 Coverage and use of electronic health records

2.4.1a

Are electronic health records commonly in use?

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

Current Year Score: 1

Electronic health records are not commonly in use in Ghana, although a new e-health system that uses electronic health records has been rolled out nationwide. A nationwide electronic medical record and patient management system was launched in November 2017, according to Ghanaweb, Ghana's independent news portal. [1] The Ministry of Health also published an article "Ministry of Health launches national bio-Surveillance system with electronic medical records project" on 22 November 2017, which details the aims of the project aims further. The Ministry of Health notes that the system was operational in just 26 health institutions across the country as of November 2017. [2] According to Tech Nova (a digital platform that focuses on technology in Ghana), "A nationwide electronic medical record and patient management system has officially been launched by the Ghana Ministry Of Health. All agencies under the Ministry of Health including the Food and Drugs Authority and Ghana Health service will be networked with all hospitals, clinics and community health centres in Ghana". [3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] Ghanaweb. 23 November 2017. "Chief of Staff launches electronic medical records system" [<https://www.ghanaweb.com/GhanaHomePage/health/Chief-of-Staff-launches-electronic-medical-records-system-603144>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. "Ministry of Health launches national bio-Surveillance system with electronic medical records project". [<http://www.moh.gov.gh/moh-launches-national-bio-surveillance-system-with-electronic-medical-records-project/>]. Accessed 17 September 2020.

[3] Tech Nova. 26 November 2017. [<https://technovagh.com/2017/11/26/digital-health-ministry-health-launch-electronic-medical-management-system/>]. Accessed 17 September 2020.

2.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence that the national Ghana Health Service has access to electronic health records of individuals in the country. The EHR system in Ghana remains in its infancy, having launched in just 26 health institutions nationwide in

November 2017. [1] The websites of the Ghana Health Service and Ministry of Health do not have any additional supporting information. [2,3] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website. A research study published in Open Access Scientific Reports in 2020 says that the Tamale Teaching Hospital (a major hospital in Ghana) has no EHR system in place. [4]

[1] Ministry of Health, Republic of Ghana. "MOH launches national bio-surveillance system with electronic medical records project". 22 November 2017. [<http://www.moh.gov.gh/moh-launches-national-bio-surveillance-system-with-electronic-medical-records-project/>]. Accessed 18 September 2020.

[2] Ghana Health Service. [<http://www.ghanahealthservice.org/>]. Accessed 1 October 2018.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/>]. Accessed 18 September 2020.

[4] Achampong, Emmanuel. (2012). Electronic Health Record System: A Survey in Ghanaian Hospitals. Open Access Scientific Reports. 1. 10.4172/scientificreports.164.

[https://www.researchgate.net/publication/233727232_Electronic_Health_Record_System_A_Survey_in_Ghanaian_Hospitals] Accessed 12 October 2020.

2.4.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence on whether there are data standards to ensure data are comparable. There is no information on data standards and ISO comparability on either the Ministry of Health website or the Ghana Health Service website. [1,2] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] Ministry of Health, Ghana. [<http://www.moh.gov.gh/>]. Accessed 19 September 2020.

[2] Ghana Health Service. [<http://www.ghanahealthservice.org/>]. Accessed 19 September 2020.

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

2.4.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient public evidence that there is an established mechanism between the different ministries to share surveillance data. According to Ghana's Joint External Evaluation (JEE) Report, conducted in December 2017, "there is a mechanism for timely and systematic information exchange between animal surveillance units, laboratories, human health surveillance units and other relevant sectors regarding potential zoonotic risks events through routine reporting and quarterly stakeholder meetings"; however, the JEE goes on to note "there is no formal channel between the public health and animal sectors to share information or collaborate." The JEE also notes that "neither event-based nor syndromic surveillance is well established in the animal health sector", making it somewhat unclear how effective the existing cross-sectoral mechanism is. [1] There is no evidence of an established mechanism for sharing surveillance data in either the World Organisation for Animal Health PVS Gap Analysis Report for Ghana, conducted in August 2011, or on the websites for the

Ministry of Food & Agriculture, Ministry of Health or Ministry of Environment, Science, Technology and Innovation. [2,3,4,5] Ghana's National Public Health and Reference Laboratory, Accra, does not have a website.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 17 September 2020.

[3] Republic of Ghana, Ministry of Food & Agriculture. [<http://mofa.gov.gh/site/>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

[5] Ministry of Environment, Science, Technology and Innovation, Republic of Ghana. [<http://mesti.gov.gh/>]. Accessed 17 September 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

Ghana makes de-identified health surveillance data on disease outbreaks publicly available via reports on the Ghana Health Service website; however, these data are published irregularly and through a variety of media rather than a centralised source. [1] Data include press releases and health alerts on outbreaks and annual fact sheets (on number of cases by disease, number of deaths etc.). Both the Ghana Health Service and Ministry of Health publish annual reports, though the last two reports were published in 2016 and 2014. [2,3]

[1] Ghana Health Service. 1 March 2018 "Press Release On Confirmed Lassa Fever Case In Ghana" [<http://www.ghanahealthservice.org/ghs-item-list.php?scid=22>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 20 November 2018.

[3] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 17 September 2020.

2.4.3b

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

Yes = 1 , No = 0

Current Year Score: 0

Ghana does not make deidentified COVID-19 surveillance data available on a daily basis. Ghana's Health Service website has a COVID-19 tracker which shares information such as case count and mortality rates, but it is not clear how frequently the tracker is updated. On 20 September 2020, for example, the tracker displayed data from 17 September 2020, suggesting the tracker is not updated daily. The COVID-19 tracker does not display historical data. [1] There is no other relevant information on the Ministry of Health website or the Ministry of Food and Agriculture website. [2,3] Ghana's national laboratory in Accra

does not have a standalone website.

[1] Ghana Health Service. "COVID-19: Ghana's Outbreak Response Management Updates."

[https://ghanahealthservice.org/covid19/latest.php#]. Accessed 18 September 2020.

[2] Ministry of Health. [https://www.moh.gov.gh/]. Accessed 18 September 2020.

[3] Ministry of Food and Agriculture website. [http://www.mofa.gov.gh/]. Accessed 18 September 2020.

2.4.4 Ethical considerations during surveillance

2.4.4a

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

Yes = 1 , No = 0

Current Year Score: 1

There are laws/regulations/guidelines that safeguard the confidentiality of identifiable health information for individuals, such as that generated through health surveillance activities in Ghana. According to Article 21 ("Reporting and exchange of information") of the 2012 Public Health Act, "The reporting and exchange of information under the Convention shall be subject to national law regarding confidentiality and privacy. The Parties shall protect, as mutually agreed, any confidential information that is exchanged." [1] Annex 17 ("Managing Public Health Surveillance Data") of the Technical guidelines for Integrated Disease Surveillance and Response in Ghana also ensures the need for privacy is met, addressing privacy, informed consent and patient confidentiality. [2] The government also has in place the Data Protection Act (Act 843), from 2012, which addresses confidentiality of personal data as well as patient data. [3]

[1] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. 2002. "Technical Guidelines for Integrated Disease Surveillance and Response in Ghana". [http://www.moh.gov.gh/wp-content/uploads/2016/02/Integrated-Disease-Surveillance-and-Response-Ghana-Guidelines.pdf]. Accessed 17 September 2020.

[3] Republic of Ghana, The Data Protection Commission (DPC). 2012. "Data Protection Act (Act 843)". [https://www.dataprotection.org.gh/sites/default/files/Data%20Protection%20Act%20%2C%202012%20%28Act%20843%29.pdf]. Accessed 17 September 2020.

2.4.4b

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

Yes = 1 , No = 0

Current Year Score: 1

There are policies and strategies specifically designed for national cyber security which includes enacting data protection law for patient confidentiality (under the Data Protection Act). [1,2,3] The Ghana National Cyber Security Policy & Strategy specifically refers to public health, as well as the Data Protection Act (Act 843), from 2012, which addresses confidentiality of personal data as well as patient data. [1,2]

- [1] Republic of Ghana, The Data Protection Commission (DPC). 2012. "Data Protection Act (Act 843)". [https://www.dataprotection.org.gh/sites/default/files/Data%20Protection%20Act%20%2C%202012%20%28Act%20843%29.pdf]. Accessed 18 September 2020.
- [2] Republic of Ghana, Ministry of Communications. 2014. "Ghana National Cyber Security Policy & Strategy". [https://www.sbs.ox.ac.uk/cybersecurity-capacity/system/files/Ghana_Cyber-Security-Policy-Strategy_Final_0.pdf]. Accessed 18 September 2020.
- [3] Republic of Ghana, Ministry of Health. 2005. "Health Sector ICT Policy and Strategy". [https://www.ghanahealthservice.org/downloads/Health%20Sector%20ICT%20Policy%20and%20Strategy.pdf]. Accessed 18 September 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 = 2, Yes, commitments have been made to share data only for one disease = 1, No = 0

Current Year Score: 0

There is insufficient evidence to show that Ghana has made a specific commitment via public statements, legislation or a cooperative agreement to share surveillance data during a public health emergency with other countries in the region, whether for a single or multiple diseases. Ghana has made a general commitment to share surveillance data with other countries in the region; however, this commitment is not specific to public health emergencies. Further, there is insufficient evidence to show that Ghana has begun participating in regional disease surveillance activities. Ghana's Ministry of Health has an International Health Regulations (IHR) national focal point which facilitates the dissemination of surveillance information, but it is not clear that it conducts such sharing with other countries in the region. According to Ghana's Joint External Evaluation report, conducted in February 2017, Ghana's IHR focal point shares information about disease outbreaks with the World Health Organization (WHO); there is no mention of collaboration with other regional countries. [1] Ghana is slated to be a beneficiary of the Regional Disease Surveillance Systems Enhancement Project in West Africa (REDISSE), which involves the sharing of surveillance data during public health emergencies, but there is insufficient evidence to show that its participation has taken effect. [3,4,5] REDISSE benefits all 15 countries in the Economic Community of West African States and Mauritania; project descriptions do not mention specific diseases, except to note that REDISSE was in part a response to West African Ebola outbreak of 2014. [3,8] Ghana was slated to be included in Phase 2 of the project. [3] But while other Phase II countries, such as Nigeria have already announced their participation, there is no similar evidence involving Ghana. [6] There is no mention of REDISSE on Ghanaian government websites, such as those of the Ministry of Health. [7] Ghana's National Public Health and Reference Laboratory, Accra, does not have its own website. An October 2020 World Bank release on REDISSE noted that the University of Ghana had a subcontract under the project, but this does not show that Ghana is participating in data sharing under REDISSE. [9]

- [1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1]. Accessed 17 September 2020.
- [2] The International Association of National Public Health Institute. May 2016. "Public Health Surveillance: A Call to Share Data". [http://ianphi.org/news/2016/datasharing1.html]. Accessed 17 September 2020.
- [3] The World Bank. Regional Disease Surveillance Systems Enhancement (REDISSE). [http://projects.worldbank.org/P154807/?lang=en&tab=overview]. Accessed 17 September 2020.

- [4] The World Bank. "West Africa Regional Disease Surveillance Systems Enhancement Project (REDISSE) P154807". [<http://pubdocs.worldbank.org/en/769681467208334446/REV5-English-WEST-AFRICA-REGIONAL-DISEASE-SURVEILLANCE-Project-2pager.pdf>]. Accessed 17 September 2020.
- [5] The World Bank. June 2016. "Project Appraisal Document for a Regional Disease Surveillance Systems Enhancement Project in West Africa". [<http://documents.worldbank.org/curated/en/965001467305866621/pdf/PAD1752-PAD-P154807-OUO-9-IDA-R2016-0154-1-Box396265B.pdf>]. Accessed 17 September 2020.
- [6] Nigerian Centre for Disease Control. "Projects". [<https://ncdc.gov.ng/projects>]. Accessed 11 May 2021.
- [7] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 11 May 2021.
- [8] World Bank. 29 June 2016. "World Bank Contributes to Improved Disease Surveillance and Health Systems in West Africa following Ebola Epidemic". [<https://reliefweb.int/report/sierra-leone/world-bank-contributes-improved-disease-surveillance-and-health-systems-west>]. Accessed 12 October 2020.
- [9] World Bank. 12 October 2020. "Epidemic Preparedness and Response". [<https://www.worldbank.org/en/results/2020/10/12/epidemic-preparedness-and-response>]. Accessed 11 May 2021.

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 evidence that Ghana has a national system in place to provide support at the subnational level to conduct contact tracing in response to an active public health emergency (the COVID-19 pandemic), though there is insufficient evidence to show such a system exists to prepare for future public health emergencies. The November 2020 Ghana COVID-19 Emergency Preparedness and Response Project includes a variety of measures to support contact tracing in response to the pandemic, including the "training of contact tracing coordination teams and networks at the national, regional and district levels", training of district and sub-district level health workers, and laboratory personnel". The project also supports community-level engagement with contact tracing. [1] The precise funding for each of these activities is not clear in the document that describes them, but they are part of a World Bank-funded project, "COVID-19 Emergency Preparedness and Response Project Investment Project", which allocates \$130 million of Ghana over five years. [1,2] Additionally, Ghana has launched a COVID-19 Tracker App for mobile phones to identify people who may have come into contact with infected individuals. [3,4] The BBC reports that Ghana introduced an "aggressive" contact tracing program in response to COVID-19 which identified "current and potential hotspots." [5] The Brookings Institution says that the government started contact tracing in Ghana immediately after the first cases of COVID-19 were confirmed, successfully slowing early spread of the virus. [4] There is no other relevant evidence shared via the public websites of the Ministry of Health or the Ministry of Food and Agriculture. [6,7] Ghana's national laboratory in Accra does not have a standalone website.

[1] Ministry of Health. November 2020. "COVID-19 Emergency Preparedness and Response Project Investment Project".

[<https://www.moh.gov.gh/wp-content/uploads/2016/02/FINAL-COVID-19-ESMF.pdf>]. Accessed 13 May 2021.

[2] World Bank. 29 April 2021. "World Bank Group's Operational Response to COVID-19 (coronavirus) – Projects List".

[<https://www.worldbank.org/en/about/what-we-do/brief/world-bank-group-operational-response-covid-19-coronavirus>].

projects-list]. Accessed 13 May 2021.

[3] Ministry of Communications and Digitalization. "Launch of GH COVID-19 Tracker App". [<https://www.moc.gov.gh/launch-gh-covid-19-tracker-app>]. Accessed 13 May 2021.

[4] Zhang, J., J. Nonvignon, and W. Mao. 28 July 2020. "How well is Ghana—with one of the best testing capacities in Africa—responding to COVID-19?". [<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-capacities-in-africa-responding-to-covid-19/>]. Accessed 11 May 2021.

[5] BBC News Pidgin. "Coronavirus: How Ghana plan to fight COVID-19 without lockdown." [<https://www.bbc.com/pidgin/tori-52351594>] Accessed 18 September 2020.

[6] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 18 September 2020.

[7] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>] Accessed 18 September 2020.

2.5.1b

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

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

Current Year Score: 1

There is evidence to show that Ghana provides wraparound services to help enable infected people and their contacts to self-isolate or quarantine as recommended, including economic support, but just for an ongoing disease outbreak.

In response to COVID-19, Ghana's president announced some economic support for frontline health workers, but not other citizens. These incentives for health workers include; Exemption from the payment of tax on their employment emoluments for a three-month period commencing from April 2020, A daily allowance of GHS150 (approx. US\$26) payable to those undertaking contact tracing, Additional allowance of 50% of their basic salary per month for a four-month period commencing from March 2020, and an Insurance package, with an assured sum of GHS350,000 (approx. US\$60,345). There is no additional information on the Ministry of Health website. [2] Ghana's national laboratory in Accra does not have a standalone website.

As part of the World Bank-funded project a World Bank-funded project, "COVID-19 Emergency Preparedness and Response Project Investment Project Financing", which allocates \$130 million of Ghana over five years, Ghana does provide financial support to those in quarantine because of COVID-19. [3,4] The November 2020 document "COVID-19 Emergency Preparedness and Response Project Investment Project Financing" describes these services: "Patients and their families needing support, especially those who are isolated or quarantined would be provided psychosocial counseling support, food-baskets and feeding during the isolation, quarantine and treatment period". The project also includes "cash transfers and support to access and use needed health services", and fee waivers for medical services. [3] However, these measures are all implemented exclusively in response to the COVID-19 pandemic, and do not apply to other emergencies that would require quarantining.

[1] EY. "Ghana announces plans to provide relief to frontline health workers in response to COVID-19"

[https://www.ey.com/en_gl/tax-alerts/ghana-announces-plans-to-provide-relief-to-frontline-health-workers-in-response-to-covid-19]. Accessed 18 September 2020.

[2] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 18 September 2020.

[3] Ministry of Health. November 2020. "COVID-19 Emergency Preparedness and Response Project Investment Project". [<https://www.moh.gov.gh/wp-content/uploads/2016/02/FINAL-COVID-19-ESMF.pdf>]. Accessed 13 May 2021.

[4] World Bank. 29 April 2021. "World Bank Group's Operational Response to COVID-19 (coronavirus) – Projects List".

[<https://www.worldbank.org/en/about/what-we-do/brief/world-bank-group-operational-response-covid-19-coronavirus-projects-list>]. Accessed 13 May 2021.

2.5.1c

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

Yes = 1, No = 0

Current Year Score: 0

Ghana does include data on the number of patients who were contact traced for COVID-19 that tested positive, but not on a daily basis. Ghana's Health Service website has a COVID-19 tracker which shares information such as case count, mortality rates and number of patients who were contact traced that tested positive, but it is not clear how frequently the tracker is updated. On 20 September 2020, for example, the tracker displayed data from 17 September 2020, suggesting the tracker is not updated daily. The COVID-19 tracker does not display historical data. [1] There is no other relevant information on the Ministry of Health website or the Ministry of Food and Agriculture website. [2,3] Ghana's national laboratory in Accra does not have a standalone website.

[1] Ghana Health Service. "COVID-19: Ghana's Outbreak Response Management Updates."

[<https://ghanahealthservice.org/covid19/latest.php#>]. Accessed 18 September 2020.

[2] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

[3] Ministry of Food and Agriculture website. [<http://www.mofa.gov.gh/>]. Accessed 18 September 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: 0

There is no public evidence of a joint plan between the public health system and border control authorities to identify potential cases in travellers in the event of a public health emergency in Ghana, whether in response to an active emergency or to plan for a future emergency. According to the Brookings Institution, Ghana announced social distancing measures on March 15 in response to COVID-19, and a day later, it restricted foreign nationals from entering the country. Starting March 22, all air, land, and sea border checkpoints were closed, and on March 27, a partial lockdown was imposed in several big cities. [1]The Ghana Immigration Service says on its website that it is involved in screening people wishing to enter the country for COVID-19, but there is not a document or plan outlining how this service works with the Minsitry of Health.[2] There is no additional relevant information on the Ministry of Health website. [3]

[1] The Brookings Institution. "How well is Ghana—with one of the best testing capacities in Africa—responding to COVID-19?"[<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-capacities-in-africa-responding-to-covid-19/>]. Accessed 18 September 2020.

[2] [<http://home.gis.gov.gh/news-and-information/>]. Accessed 18 September 2020.

[3] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 18 September 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

Ghana has two field epidemiology training programmes (FETP) which are fully developed and well established, and the government supports sending citizens to another country to specifically participate in training programmes. According to the Joint External Evaluation for Ghana, conducted in February 2017, Ghana's FETP regime is "robust, mature and includes veterinarians". A key strength of the FETP regime is ongoing support of international exchanges to and from other countries. [1] Two programmes are active: a frontline short course jointly led by the Ghana School of Public Health and the Ghana Health Service, and a two-year advanced FETP at the Ghana School of Public Health. [1] The two-year advanced Ghana Field Epidemiology and Laboratory Training Programme (GFELTP) is a member of the African Field Epidemiology Network (AFENET). [2] There is no evidence if resources are provided by the government to send citizens to another country to participate in applied epidemiology training programmes. [1]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ghana Field Epidemiology and Laboratory Training Programme (GFELTP). [<http://ghanafeltp.com/about-us/>]. Accessed 17 September 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 evidence that the available field epidemiology training programmes are explicitly inclusive of animal health professionals in Ghana. There are two field epidemiology training programmes (FETP) which are fully developed and well established and explicitly include staff from the animal health sector. According to Ghana's Joint External Evaluation report, conducted in February 2017 the "field epidemiology training programme (FETP) is robust, mature and includes veterinarians". [1] The FETP programme is run by the Ghana Field Epidemiology and Laboratory Training Programme

(GFELTP), which has close links with the School of Public Health at the University of Ghana. [2] The GFELTP states that the FETP course "is a combination of didactic lectures and field placement activities for service and on the job learning for Physicians, Veterinarians and Laboratory Scientist. The unique characteristic of the programme is its approach of enforcing the principle of One Health among health workers." [2] Additionally, in 2018, the FAO and the Institute for Infectious Animal Diseases (IIAD) at Texas A&M AgriLife Research launched the In-Service Applied Veterinary Epidemiology (ISAVET) program in 14 countries, including Ghana. [3,4] The program is a four-month frontline field epidemiology program to train veterinary field epidemiologists. [5]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ghana Field Epidemiology and Laboratory Training Programme (GFELTP). [<http://ghanafeltp.com/about-us/>]. Accessed 17 September 2020

[3] Food and Agriculture Organisation (FAO) of the United Nations. October 2018. "New training for veterinarians in 14 African countries to help combat infectious diseases." [<http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/1161401>]. Accessed 17 September 2020.

[4] Institute for Infectious Animal Diseases. "Frontline ISAVET." [<https://iiad.tamu.edu/frontline-isavet/>]. Accessed 17 September 2020.

[5] Food and Agriculture Organisation (FAO) of the United Nations. October 2019. "First FAO ISAVET training programme held in Uganda." [<http://www.fao.org/resilience/news-events/detail/en/c/1171750>]. Accessed 17 September 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: 0

There is insufficient evidence that Ghana has an overarching national public health emergency response plan in place which addresses planning for multiple communicable diseases with pandemic potential. A National Disaster Management Plan exists but is no longer accessible. [1] The Ghana Health Service is the lead agency for epidemic planning and management. However, the Ghana Health Service's roles and responsibilities in its 2016 Annual report do not refer to planning for multiple communicable diseases with pandemic potential. [2] There is no other evidence for a public health emergency response plan that addresses planning for multiple communicable diseases with pandemic potential in Ghana's Joint External Evaluation report, conducted in February 2017, the World Organisation for Animal Health Performance of Veterinary Gap Analysis Report for Ghana, conducted in August 2011 or the Ministry of Health website. [3,4,5]

[1] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[2] Ghana Health Service. "2016 Annual Report". [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 18 September 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[4] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 18 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 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

There is no evidence that Ghana has an overarching national plan in place, and hence no evidence that it has been updated in the past three years. Ghana's National Disaster Management Plan was published in 2010, but it is no longer accessible online. [1] There is no evidence of a more current plan in Ghana's Joint External Evaluation report, conducted in February 2017 or the World Organisation for Animal Health PVS Gap Analysis Report for Ghana, conducted in August 2011 or the Ministry of Health website. [2,3,4]

[1] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[3] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 17

September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 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: 0

There is no evidence that an overarching plan is in place, and hence no evidence that it includes considerations for vulnerable populations. Ghana published a national public health emergency response plan in 2010 but it is no longer accessible online.

[1] There is no evidence of a specific approach to vulnerable populations in Ghana's Joint External Evaluation report, conducted in February 2017 or the World Organisation for Animal Health PVS Gap Analysis Report for Ghana, conducted in August 2011 or the Ministry of Health website. [2,3,4]

[1] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[3] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 18 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 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 evidence that Ghana has a national public health emergency response plan in place, and hence no evidence that it has a specific mechanism for engaging with the private sector. Ghana published a National Disaster Management Plan in 2010, but it is no longer accessible. [1] There is no evidence of a specific mechanism for engaging with the private sector to assist with outbreak emergency preparedness and response in Ghana's Joint External Evaluation report, conducted in February 2017 or the World Organisation for Animal Health PVS Gap Analysis Report for Ghana, conducted in August 2011, or the Ministry of Health website. [2,3,4]

[1] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[3] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 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: 0

There is insufficient evidence to show that Ghana has a policy, plan or guidelines in place to implement non-pharmaceutical interventions (NPIs) during an epidemic or pandemic, whether for a single disease or multiple diseases. Ghana's president announced the imposition of several NPIs in March 2020 in response to the COVID-19 pandemic, but they were published as part of a speech, and no reference was made to their issuance as part of a plan. The measures mentioned in the speech included the closure of schools and public gatherings, and requirements for social distancing and certain hygiene measures in some businesses. [1] Ghana does not appear to have a publicly accessible COVID-19 response plan, but media reports and social media suggest the Ministry of Health is encouraging social distancing, expanded cleaning and other measures to prevent the virus from spreading. [2] There is no other relevant evidence shared via the public websites of the Ministry of Health, the Ghana Health Service or the National Disaster Management Organisation website. [3,4,5]

[1] Ministry of Health. 15 March 2020. "President Akufo-Addo Addresses Nation On Measures Taken By Gov't To Combat The Coronavirus Pandemic". [<https://www.moh.gov.gh/president-akufo-addo-addresses-nation-on-measures-taken-by-govt-to-combat-the-coronavirus-pandemic/>]. Accessed 13 May 2021.

[2] The Brookings Institution. "How well is Ghana—with one of the best testing capacities in Africa—responding to COVID-19?" [<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-capacities-in-africa-responding-to-covid-19/>]. Accessed 12 October 2020.

[3] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

[4] Ghana Health Service. [<https://www.ghanahealthservice.org/>]. Accessed 18 September 2020.

[5] National Disaster Management Organisation. [<https://www.nadmo.gov.gh/>]. Accessed 18 September 2020.

3.2 EXERCISING RESPONSE PLANS

3.2.1 Activating response plans

3.2.1a

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 1

There is no publicly available evidence that Ghana has activated their national emergency response plan for an infectious disease outbreak in the past year, but there is evidence that it has completed a national-level biological threat-focused exercise in the past year. There is no national emergency response plan accessible via the National Disaster Management Organisation website though one was published in 2010. [1] Ghana completed a simulation exercises in 2019 according to the World Health Organization website. It participated in exercise on Viral Haemorrhagic Fever and exercise was to assess how the healthcare workers at the Nsawam Government Hospital and the Municipal Health Administration will follow laid down protocols and standard operating procedures to contain a simulated public health event. [2] There is no other relevant information on the Ministry of Health website. [3] Ghana does not appear to have a publicly accessible COVID-19 response plan.

[1] National Disaster Management Organisation (NADMO). [<https://www.nadmo.gov.gh/>]. Accessed 18 September 2020.

[2] World Health Organization. "Simulation Exercise." [<https://extranet.who.int/sph/simulation-exercise>] Accessed 18 September 2020.

[3] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 18 September 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 not sufficient evidence that Ghana has identified a list of gaps and best practices in response to biological threat or infectious disease focused exercises in the past year, nor that it has developed a plan to improve response capabilities. Ghana conducted a biological threat-focused IHR exercise with the World Health Organisation in 2018. [1] Ghana's Joint External Evaluation report, conducted in February 2017 stated that it will be "important to periodically conduct simulation exercises and after action reviews to test the functionality and resilience of structures, systems and procedures". [2] However, there is no evidence that Ghana has conducted an after action review after the April 2018 exercise, nor that it

developed any plan to improve response capabilities.[3] There are no relevant documents on the Ministry of Health website or the National Disaster Management Organisation website. [4,5]

[1] World Health Organisation. "Strategic Partnership for International Health Regulations (2005) and Health Security (SPH)". [https://extranet.who.int/sph/simulation-exercise]. Accessed 17 September 2020.

[2] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1]. Accessed 17 September 2020.

[3] World Health Organisation. "After Action Review." [https://extranet.who.int/sph/after-action-review] Accessed 12 October 2020.

[4] Ministry of Health. [https://www.moh.gov.gh/] Accessed 17 September 2020.

[5] National Disaster Management Organisation. [https://www.nadmo.gov.gh/]. Accessed 17 September 2020.

3.2.2 Private sector engagement in exercises

3.2.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that Ghana has completed a national-level biological threat-focused exercise involving private sector representatives in the past year. Ghana completed an exercise in April 2018, but there is no evidence that it conducted a simulation exercise. There is no additional relevant information on the National Disaster Management Organisation website. [1,2] There is no other relevant information on the Ministry of Health website. [3]

[1] National Disaster Management Organisation (NADMO). [https://www.nadmo.gov.gh/]. Accessed 18 September 2020.

[2] World Health Organization. "Simulation Exercise." [https://extranet.who.int/sph/simulation-exercise] Accessed 18 September 2020.

[3] Ministry of Health. [https://www.moh.gov.gh/] Accessed 18 September 2020

3.3 EMERGENCY RESPONSE OPERATION

3.3.1 Emergency response operation

3.3.1a

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

Yes = 1 , No = 0

Current Year Score: 1

Ghana has in place an Emergency Operations Centre (EOC). According to the Joint External Evaluation for Ghana, conducted in February 2017, there is an established public health EOC. [1] This EOC is managed by the National Disaster Management Organisation (NADMO) according to an article published on Reliefweb in 2015, within the Department of Disease Epidemics according to the NADMO website. [2,3]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Reliefweb. 26 July 2015. "NADMO's new Web-EOC commissioned". [<https://reliefweb.int/report/ghana/nadmo-s-new-web-eoc-commissioned>]. Accessed 17 September 2020.

[3] National Disaster Management Organisation (NADMO). [<https://www.nadmo.gov.gh/index.php/about>]. Accessed 17 September 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

There is no public evidence that the Emergency Operations Centre is required to conduct a drill at least once per year, or that it does conduct such an annual drill. No such information was found in Ghana's Joint External Evaluation report, conducted in February 2017. [1] No evidence was found on the National Disaster Management Organisation (NADMO) website. The National Disaster Management Plan (2010) refers to drills and exercises, although the plan does not specify if exercises must be conducted at least once per year. As of 18 September 2020, the plan was no longer accessible on the NADMO website. [2,3] No relevant information could be found on the Ministry of Health website. [4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 17 September 2020.

[3] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

3.3.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that the Emergency Operations Centre can conduct, or has conducted within the last year, a coordinated emergency response or emergency response exercise activated within 120 minutes of the identification of the public health emergency/scenario. There is no evidence of a coordinated emergency response drill or operation in Ghana's Joint External Evaluation report, conducted in February 2017 or the National Disaster Management Organisation (NADMO) website. [1,2] No information could be found on the Ministry of Health website. [3]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>].

Accessed 17 September 2020.

[2] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 17 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/>]. Accessed 17 September 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 publicly available evidence that public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event. There is no evidence of a publicly available standard operating procedure/guidelines/MOUs or other agreements between the public health and security authorities to respond to a potential deliberate biological event. National Standard Operation Procedures for Emergency Response, Section 4.0 states that: "The National Security Council and the Ministry of the Interior shall ensure the general readiness of the National Disaster Management Organisation (NADMO), response agencies and the population to respond to emergencies and disasters" but does not specify whether this is in response to a deliberate biological event. [1] There is no evidence of such an exercise on the National Disaster Management Organisation (NADMO) website, in Ghana's Joint External Evaluation report, conducted in February 2017 or in the World Organisation for Animal Health PVS Gap Analysis Report for Ghana, conducted in August 2011. [2,3,4] No information could be found on the Ministry of Health website. [5]

[1] National Disaster Management Organisation (NADMO). January 2010. "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Accessed 18 September 2020.

[2] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 18 September 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[4] World Organisation for Animal Health (OIE). August 2011. "PVS Gap Analysis Report: Ghana". [http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/pdf/PVSGapAnalysis-Report_Ghana.pdf]. Accessed 18 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/>]. Accessed 18 September 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: 0

There is no public evidence that the strategy outlines how messages will reach populations and sectors with different communications needs. There is no public evidence that Ghana has in place a legislation/regulation/strategy document detailing a risk communication plan that is specifically intended for use during a public health emergency. There is no evidence of a plan or a plan with a specific design for the strategy to reach population segments with different communication needs in Ghana's Joint External Evaluation report, conducted in February 2017. [1] The National Standard Operation Procedures for Emergency Response (2010) and the National Disaster Management Plan (2010) are no longer accessible online. [2,3] There is no other relevant information on the Ministry of Health website. [4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] National Disaster Management Organisation (NADMO). January 2010. "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Not accessible as of 17 September 2020.

[3] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 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: 0

There is no public evidence that Ghana has in place a legislation/regulation/strategy document detailing a risk communication strategy that is specifically intended for use during a public health emergency. The 2010 National Disaster Management Plan and National Standard Operation Procedures for Emergency Response are no longer publicly accessible online. [1,2] According to Ghana's Joint External Evaluation report, conducted in February 2017, "There is a technical working group (TWG) for National Risk Communication and Social Mobilization that meets regularly" and "there is a draft framework with SOPs and guidelines in place.". However, as of 2017, there was no approved national communications plan and nothing

more recent could be found. [3] No information could be found on the Ministry of Health website. [4]

[1] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 17 September 2020.

[2] National Disaster Management Organisation (NADMO). January 2010. "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Not accessible as of 17 September 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

3.5.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence of a risk communication plan or strategy document used to guide national public health responses in Ghana. The National Disaster Management Organisation (NADMO) published a National Disaster Management Plan in 2010, but the document is no longer accessible via their website. [1]There are no relevant strategy documents on the NADMO website, or the Ministry of Health website. [2,3]

[1] Government of Ghana, National Disaster Management Organisation. 2010. "The National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[2] National Disaster Management Organisation. [<http://nadmo.gov.gh>] Accessed 18 September 2020.

[3] Ministry of Health [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

3.5.2 Public communication

3.5.2a

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

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

Current Year Score: 2

There is evidence that Ghana's has regularly shared information about health concerns in the past year. Ghana's Ministry of Health is active on Twitter, and has recently posted about the COVID-19 health emergency, in addition non-emergency health concerns such as how to spot jaundice in new born babies, and encouraging the use of contraceptive injections. [1]

The Ministry of Health shares statistics on COVID-19 cases almost daily and has retweeted posts highlighting misinformation about the disease, including a list of fake "COVID-19 hotspots" circulating in Ghana. [2]

[1] Official Twitter Account of the Ministry of Health. [<https://twitter.com/mohgovgh?lang=en>] Accessed 18 September 2020.

[2] Official Twitter Account of The Director General of The Ghana Health Service. @Aboagye_DG_GHS.

[https://twitter.com/Aboagye_DG_GHS/status/1260677574923096064]. Accessed 18 September 2020.

3.5.2b

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

No = 1, Yes = 0

Current Year Score: 1

There is no evidence that senior leaders have shared misinformation on infectious diseases in the past two years in Ghana. In 2020, there was a rumour that the president of Ghana claimed that COVID-19 was created in a lab, but this rumour has been debunked and the video proved to be a fake impersonation of the president.[1] During the 2014 Ebola outbreak, there were many incidents of misinformation about the disease being shared in local media and on social media, which sowed distrust of authority figures among local people. According to a recent BBC report, there have been many widely shared stories in Africa that contain misinformation about COVID-19, but none stemming from leaders in Ghana. [3]

[1] Poynter. "FALSE: A 15-minute video in which the President of the Republic of Ghana, Nana Akufo-Addo, allegedly reveals that the coronavirus has been created in a laboratory and spread throughout the world."

[https://www.poynter.org/?ifcn_misinformation=a-15-minute-video-in-which-the-president-of-the-republic-of-ghana-nana-akufo-addo-allegedly-reveals-that-the-coronavirus-has-been-created-in-a-laboratory-and-spread-throughout-the-world]

Accessed 18 September 2020.

[2] Seidu I. (2018). And Ghana was scared: Media Representations of the Risk of an Ebola Outbreak in Ghana. Online journal of public health informatics, 10

[2], e206. [<https://doi.org/10.5210/ojphi.v10i2.9229>]. Accessed 18 September 2020.

[3] BBC. "Coronavirus: Fact-checking fake stories in Africa." [<https://www.bbc.com/news/53684037>]. Accessed 18 September 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: 39

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: 134.32

2019

International Telecommunication Union (ITU)

3.6.3 Female access to a mobile phone

3.6.3a

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

Input number

Current Year Score: 5.0

2019

Gallup; Economist Impact calculation

3.6.4 Female access to the Internet

3.6.4a

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

Input number

Current Year Score: 11.0

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: 1

There is no public evidence that Ghana has issued a restriction on the import or export of medical goods in the past year due to an infectious disease outbreak. There is no information regarding import/export restrictions on the Ministry of Health,

Ghana Health Service, Ministry of Food and Agriculture, Ministry of Foreign Affairs and Regional Integration, or the Ghana Immigration Service websites. [1,2,3,4,5] According to the Ministry of Foreign Affairs and Regional Integration, Ghana has received large donations of medical supplies from China, which Ghana is responsible for distributing to other countries in the region. [6]

- [1] Ministry of Health [<https://www.moh.gov.gh/>][Accessed 18 September 2020. 2] Ghana Health Service [<https://www.ghanahealthservice.org/ghs-item-list.php?scid=22>]. Accessed 18 September 2020.
[3] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>] Accessed 18 September 2020.
[4] Ministry of Foreign Affairs and Regional Integration. [<https://mfa.gov.gh/>]. Accessed 18 September 2020.
[5] Ghana Immigration Service [<http://home.gis.gov.gh/>] Accessed 18 September 2020.
[6] "Foreign Minister Takes Delivery Of Covid-19 Medical Supplies". [<https://mfa.gov.gh/index.php/foreign-minister-takes-delivery-of-covid-19-medical-supplies/>] Accessed 18 September 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: 1

There is no public evidence that Ghana has issued a restriction on the import or export of non-medical goods in the past year due to an infectious disease outbreak. There is no information regarding import/export restrictions on the Ministry of Health, Ghana Health Service, Ministry of Food and Agriculture, Ministry of Foreign Affairs and Regional Integration, or the Ghana Immigration Service websites. [1,2,3,4,5]

- [1] Ministry of Health [<https://www.moh.gov.gh/>][Accessed 18 September 2020. 2] Ghana Health Service [<https://www.ghanahealthservice.org/ghs-item-list.php?scid=22>]. Accessed 18 September 2020.
[3] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>] Accessed 18 September 2020.
[4] Ministry of Foreign Affairs and Regional Integration. [<https://mfa.gov.gh/>]. Accessed 18 September 2020.
[5] Ghana Immigration Service [<http://home.gis.gov.gh/>] Accessed 18 September 2020.

3.7.2 Travel restrictions

3.7.2a

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

Yes = 0 , No = 1

Current Year Score: 0

There is evidence that Ghana has implemented a ban on travelers arriving from other countries due to an infectious disease outbreak. In response to the COVID-19 outbreak, Ghana restricted all foreign nationals from entering the country on March 16 2020. On March 22, Ghana closed all air, land and sea checkpoints and imposed a partial lockdown in some major cities which lasted several weeks. [1]

- [1] The Brookings Institution. "How well is Ghana—with one of the best testing capacities in Africa—responding to COVID-19?". [<https://www.brookings.edu/blog/future-development/2020/07/28/how-well-is-ghana-with-one-of-the-best-testing-19/>].

capacities-in-africa-responding-to-covid-19/]. Accessed 18 September 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: 13.59

2017

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 420.01

2018

WHO; national sources

4.1.1c

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

Yes = 1, No = 0

Current Year Score: 0

Ghana does not have a public workforce strategy in place to identify fields where there is an insufficient workforce and strategies to address these shortcomings. According to Ghana's Joint External Evaluation report, conducted in February 2017, "there is no workforce strategy for the public health workforce in place, but there is a general strategy for workforce development". [1] There is evidence that Ghana has acknowledged its health workforce shortcomings in the past, and made efforts to address them. According to a 2015 World Health Organisation (WHO) report, "Ghana: Vision 2020", a 1995

document, recommended "a number of key reforms including those directly related to improving its health workforce". The WHO report also states that other policies, over the decades, have strengthened the health workforce. [2] However, there is no other evidence that these policies constitute a discrete public health workforce strategy at the national level. No further evidence could be found via the Ministry of Health website or the Ministry of Employment and Labour Relations website. [3,4]

- [1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.
- [2] World Health Organisation. 2015. "Joining Hands for Health Workforce Improvements: Ghana Hosts Consultation on New Global Health Workforce Strategy". [https://www.who.int/hrh/news/2015/hrh-improvements_ghana-consult/en/]. Accessed 17 September 2020.
- [3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/>]. Accessed 17 September 2020.
- [4] Ministry of Employment and Labour Relations. [<http://www.melr.gov.gh/>]. Accessed 17 September 2020.

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 90

2011

WHO/World Bank; national sources

4.1.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that Ghana 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. According to Ghana's Joint External Evaluation report, conducted in February 2017, "insufficient infection prevention and control (IPC) for isolation/holding/treatment centres for dangerous pathogens pose significant biological risks for the spread of disease". [1] There is no evidence of such an isolation capability at Nyaho Medical Centre, Korle Bu Teaching Hospital or The Trust Hospital. [2,3,4] No further information could be found on the Ministry of Health website. [5] During the COVID-19 outbreak, self-quarantining was recommended for people who came into contact with someone who tested positive for the virus. [6] In July 2020, the government in Ghana announced plans to build a two-storey isolation centre at the Kaneshie Polyclinic, a health facility in Accra. [7]

- [1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 1 October 2018.

- [2] Nyaho Medical Centre. [<https://www.nyahomedical.com/about>]. Accessed 2 October 2018.
- [3] Korle Bu Teaching Hospital. [<http://kbth.gov.gh/>]. Accessed 2 October 2018.
- [4] The Trust Hospital. [<http://thetrusthospital.com/about-us/>]. Accessed 2 October 2018.
- [5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 9 November 2018.
- [6] Ghana Health Service. "Ghana Coronavirus Disease 2019: Self-quarantine guide." [https://www.ghanahealthservice.org/covid19/downloads/covid_19_self_quarantine.pdf]
- [7] Citi Newsroom. 1 July 2020. "COVID-19: AMA to construct two-storey isolation centre at Kaneshie Polyclinic". [<https://citinewsroom.com/2020/07/covid-19-ama-to-construct-two-storey-isolation-centre-at-kaneshie-polyclinic/>] Accessed 18 September 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 Ghana has demonstrated some capacity to expand isolation capacity in response to an infectious disease outbreak in the past two years, though no evidence that the country has developed, updated or tested a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years. According to an academic study, Ghana's government has established new isolation centers in response to the COVID-19 pandemic, and the private sector has also constructed new isolation facilities, such as a 100-bed unit announced in April 2020. [1,2] The government also announced that it would build 88 new hospitals in part in response to the isolation needs of the COVID-19 pandemic, but as of spring 2021 it was not clear how this plan had progressed. [3] As part of the World Bank-funded project a World Bank-funded project, "COVID-19 Emergency Preparedness and Response Project Investment Project Financing", which allocates \$130 million to Ghana over five years, Ghana announced that "a number of holding, isolation, quarantine and treatment centers have been identified across the country." [4,5] However, it was unclear as of Spring 2021 which of these had been established as isolation facilities. There is no other relevant information shared via the public website of the Ministry of Health. [6]

- [1] Sibiri, H., D. Prah, and S. Zankawa. March 2021. "Containing the impact of COVID-19: Review of Ghana's response approach". *Health Policy Technology* 10[1] : 13–15.
- [2] GhanaWeb. 12 April 2020. "comGhana COVID-19 Private Sector Fund to construct 100-bed isolation and treatment facility". [<https://www.ghanaweb.com/GhanaHomePage/business/Health-Ministry-Armed-Forces-to-build-100-bed-facility-for-Ga-East-Municipal-hospital-921847>]. Accessed 13 May 2021.
- [3] Ministry of Health. "COVID-19: Government to begin construction of 88 district hospitals this year – Nana Addo". [<https://www.moh.gov.gh/covid-19-government-to-begin-construction-of-88-district-hospitals-this-year-nana-addo/>]. Accessed 13 May 2021.
- [4] Ministry of Health. November 2020. "COVID-19 Emergency Preparedness and Response Project Investment Project". [<https://www.moh.gov.gh/wp-content/uploads/2016/02/FINAL-COVID-19-ESMF.pdf>]. Accessed 13 May 2021.
- [5] World Bank. 29 April 2021. "World Bank Group's Operational Response to COVID-19 (coronavirus) – Projects List". [<https://www.worldbank.org/en/about/what-we-do/brief/world-bank-group-operational-response-covid-19-coronavirus-projects-list>]. Accessed 13 May 2021.

[6] Ministry of Health. [<https://www.moh.gov.gh/>]. Accessed 13 May 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: 0

There is insufficient evidence of 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. According to Ghana's Joint External Evaluation report, conducted in February 2017, the Government of Ghana has in place a National Procurement Act (2003, Act 663) under the Public Procurement Authority department, which the Ministry of Health follows for the procurement process of laboratory supplies. However, these laboratory supplies mostly come from donors in other countries. However, there is no evidence this exists for medical supplies nor that the Ministry of Agriculture can utilise this protocol. The JEE report also notes that "although formal plans are absent, Ghana does have experience in receiving medical countermeasures such as vaccines and personal protective equipment during public health emergencies." [1,2] Ghana's national laboratory in Accra does not have its own website. There is no further relevant information shared via the public websites of the Ministry of Health or the Ministry of Food and Agriculture. [3,4]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2003. "Public Procurement Act (Act 663). [<https://www.ppghana.org/documents/Public%20Procurement%20Act%202003%20Act%20663.pdf>]. Accessed 17 September 2020.

[3] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 12 October 2020.

[4] Ministry of Food and Agriculture. [<http://www.mofa.gov.gh/>]. Accessed 14 May 2021.

4.2.2 Stockpiling for emergencies

4.2.2a

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

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

Current Year Score: 1

There is evidence to show that Ghana maintains a stockpile of medical supplies (including equipment, PPE, and medical countermeasures) for national use during a public health emergency but limited evidence on what is contained. The Joint

External Evaluation report (JEE) for Ghana mentions that Ghana only has a stockpile of medical countermeasures to respond to cholera outbreaks (without providing specifics of the stockpile's contents); but for public health emergencies in general, "stocks had not been prepositioned for priority risks". [1] No relevant information is shared via the public websites of the Ministry of Defence or Ministry of Health. [2,3] During the COVID-19 outbreak, Ghana accepted several large donations of medical equipment and personal protective clothing from China and the World Health Organization among other sources. [4] However, there is no evidence that this resulted in the establishment of a longer-term stockpile.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 14 May 2021.

[2] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor> and <https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 14 May 2021.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 14 May 2021.

[4] Ministry of Foreign Affairs and Regional Integration. "Foreign Minister Takes Delivery of COVID-19 Medical Supplies". [<https://mfa.gov.gh/index.php/foreign-minister-takes-delivery-of-covid-19-medical-supplies/>]. Accessed 18 September 2020.

4.2.2b

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

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

Current Year Score: 0

There is insufficient evidence that Ghana maintains a stockpile of laboratory supplies for use in a public health emergency. According to Ghana's Joint External Evaluation report, conducted in February 2017, Ghana does not produce any laboratory reagents and is very reliant on donations for supplies. Additionally the report says that stock-outs of reagents are a frequent challenge. [1] No information could be found on the Ministry of Health or Ministry of Defence websites. [2,3] Ghana's national laboratory in Accra does not have its own website.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[2] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor> and <https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

4.2.2c

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Ghana conducts or requires an annual review of a national stockpile to ensure the supply is sufficient for a public health emergency, nor that it maintains such a stockpile. The Joint External Evaluation report (JEE) for

Ghana mentions that Ghana only has a stockpile of medical countermeasures to respond to cholera outbreaks (without providing specifics of the stockpile's contents); but for public health emergencies in general, "stocks had not been prepositioned for priority risks". [1] No relevant information is shared via the public websites of the Ministry of Defence or Ministry of Health. [2,3] During the COVID-19 outbreak, Ghana accepted several large donations of medical equipment and personal protective clothing from China and the World Health Organization among other sources. [4] However, there is no evidence that this resulted in the establishment of a longer-term stockpile.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 14 May 2021.

[2] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor> and <https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 14 May 2021.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 14 May 2021.

[4] Ministry of Foreign Affairs and Regional Integration. "Foreign Minister Takes Delivery of COVID-19 Medical Supplies". [<https://mfa.gov.gh/index.php/foreign-minister-takes-delivery-of-covid-19-medical-supplies/>]. Accessed 18 September 2020.

4.2.3 Manufacturing and procurement for emergencies

4.2.3a

Does the country meet one of the following criteria?

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

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

Current Year Score: 0

There is no evidence of a plan or agreement to leverage domestic manufacturing capacity to produce medical supplies (including equipment, PPE, or medical countermeasures) for use during a public health emergency, or to procure such supplies for use during a public health emergency. According to Ghana's Joint External Evaluation report, conducted in February 2017, there is "limited capacity to produce vaccines, laboratory diagnostics or equipment in country" and no formal plan for receiving "medical countermeasures such as vaccines and personal protective equipment during public health emergencies". [1] There is no additional relevant information shared via the public websites of the Ministry of Health, the Ghana Food and Drugs Authority, or the National Disaster Management Organisation websites. The national laboratory does not have its own website. [2,3,4]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health [<https://www.moh.gov.gh/>]. Accessed 18 September 2020.

[3] Ghana Food and Drugs Authority. [<http://www.fdaghana.gov.gh/>] Accessed 12 October 2020.

[4] National Disaster Management Organisation. [<https://www.nadmo.gov.gh/>] Accessed 18 September 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 limited evidence of a national procurement protocol in place which can be utilized by the Ministries of Health and Agriculture for the acquisition of laboratory needs in the event of a public health emergency, and no evidence of a plan to leverage domestic manufacturing capacity. According to Ghana's Joint External Evaluation report, conducted in February 2017, the Government of Ghana has in place a National Procurement Act (2003, Act 663) under the Public Procurement Authority department, which the Ministry of Health follows for the routine procurement process of laboratory supplies. However, these laboratory supplies mostly come from donors in other countries. The JEE notes that Ghana has very limited domestic manufacturing capacity. [1,2] The Ministry of Health and the National Disaster Management Organisation (NADMO) do not share any more details. [3,4]

[1] World Health Organization (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Republic of Ghana. 2003. "Public Procurement Act (Act 663).

[<https://www.ppghana.org/documents/Public%20Procurement%20Act%202003%20Act%20663.pdf>]. Accessed 17 September 2020.

[3] Ministry of Health. [<https://www.moh.gov.gh/>] Accessed 12 October 2020.

[4] National Disaster Management Organisation (NADMO). [<http://www.nadmo.gov.gh/>] Accessed 12 October 2020.

4.3 MEDICAL COUNTERMEASURES AND PERSONNEL DEPLOYMENT

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

4.3.1a

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

Yes = 1, No = 0

Current Year Score: 0

There is no publicly available evidence that Ghana has a plan in place for dispensing medical countermeasures for national use during a public health emergency. According to Ghana's Joint External Evaluation (JEE) report, conducted in February 2017, "there is no plan in place that identifies procedures and decision-making related to sending and receiving medical countermeasures during a public health emergency". The JEE does not specifically discuss the dispensing of medical countermeasures, but does state that there is no plan for "distributing medical countermeasures during a shortage". [1] There is no evidence of a plan for dispensing medical countermeasures during a public health emergency on the websites of the Ministry of Defence and Ministry of Health. [2,3] The National Disaster Management Organisation (NADMO) National

Disaster Management Plan, published in 2010, is no longer publicly accessible. [4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[2] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor?and?https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

[4] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

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

4.3.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public plan in place in Ghana to receive health personnel from other countries to respond to a public health emergency. There is a draft plan for staffing in public health emergency response which also includes guidance for requesting personnel from other countries, according to Ghana's Joint External Evaluation (JEE) report, conducted in February 2017. [1] The JEE report states that "the country is not part of any regional/international personnel deployment agreements such as the Global Outbreak and Alert Response Network (GOARN)." There is no evidence of a public plan to receive health personnel from other countries in response to a public health emergency on the websites of the Ministry of Defence, Ministry of Health or the National Disaster Management Organisation. [2,3,4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 18 September 2020.

[2] Republic of Ghana, Ministry of Defence. [<http://www.ghana.gov.gh/index.php/media-center/news/2990-ministry-of-defence-committed-to-safeguarding-the-security-of-country-dr-kunbuor> and <https://www.ghanaweb.com/GhanaHomePage/republic/ministry.profile.php?ID=26>]. Accessed 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

[4] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 18 September 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: 70.8

2014

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: 59.18

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

There is no public evidence that the government issued legislation, a policy or a public statement committing to provide prioritised health care services to healthcare workers who become sick as a result of responding to a public health emergency. The National Disaster Management Organisation's (NADMO) National Standard Operation Procedures for Emergency Response and the 2010 National Disaster Management Plan are no longer accessible via the NADMO website. [1,2] No information could be found on the Ministry of Health website. [3]

[1] National Disaster Management Organisation (NADMO). January 2010. "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Not accessible as of 18 September 2020.

[2] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [http://www.moh.gov.gh]. Accessed 18 September 2020.

4.5 COMMUNICATIONS WITH HEALTHCARE WORKERS DURING A PUBLIC HEALTH EMERGENCY

4.5.1 Communication with healthcare workers

4.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that there is a specific system in place for public health officials and healthcare workers to communicate during a public health emergency in Ghana. No evidence could be found in National Disaster Management Organisation (NADMO) website, and neither the National Standard Operation Procedures for Emergency Response nor the National Disaster Management Plan (2010) are publicly accessible via the NADMO website. [1,2,3] Ghana has a National Preparedness and Response Plan for the Prevention and Control of Ebola Viral Disease (EVD) which provides a communications plan under section 3.2.4. "Social Mobilization and Risk Communication", but this is in reference to EVD only. Further, while the EVD plan provides some detail on communications between officials and communities, and emphasizes the need for the participation of all stakeholders in communications plans, it does not specifically outline a system for communication between officials and healthcare workers. [4] There is no evidence of such a communication system on the Ministry of Health's website. [5]

[1] National Disaster Management Organisation (NADMO). [http://nadmo.gov.gh]. Accessed 17 September 2020.

[2] National Disaster Management Organisation (NADMO). "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Not accessible as of 18 September 2020.

[3] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[4] National Preparedness and Response Plan for the Prevention and Control of Ebola Viral Disease. August 2014.

[<https://ebolacommunicationnetwork.org/wp-content/uploads/2014/09/Ghana-Ebola-National-Plan-Sep2014.pdf>]. Accessed 18 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/?s=national+communication+plan>]. Accessed 18 September 2020.

4.5.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that there is a specific system in place for public health officials and healthcare workers to communicate during a public health emergency in Ghana, nor one that encompasses healthcare workers in both the public and private sector. No evidence could be found in National Disaster Management Organisation website, and neither the National Standard Operation Procedures for Emergency Response or the National Disaster Management Plan are accessible via that website. [1,2,3] Ghana has a National Preparedness and Response Plan for the Prevention and Control of Ebola Viral Disease (EVD) which provides a communications plan under section 3.2.4. "Social Mobilization and Risk Communication", however this is in reference to EVD only. One of the objectives under this section is to "ensure coordinated and consistent routine and emergency communication between authorities in all sectors, within and between government agencies, with other organizations and with the public". While it emphasizes the need for the participation of all stakeholders in communications plans, it does not specifically outline a system for communication between officials and healthcare workers. [4] There is no evidence of such a system on the Ministry of Health's website. [5]

[1] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh>]. Accessed 18 September 2020.

[2] National Disaster Management Organisation (NADMO). January 2010. "National Standard Operation Procedures for Emergency Response." [http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/SOP_WEB.pdf]. Not accessible as of 18 September 2020.

[3] National Disaster Management Organisation (NADMO). January 2010. "National Disaster Management Plan". [http://nadmo.gov.gh/images/NADMO_documents/2015_documents/Disaster%20Magt%20Plan.pdf]. Not accessible as of 18 September 2020.

[4] National Preparedness and Response Plan for the Prevention and Control of Ebola Viral Disease. August 2014.

[<https://ebolacommunicationnetwork.org/wp-content/uploads/2014/09/Ghana-Ebola-National-Plan-Sep2014.pdf>]. Accessed 18 September 2020.

[5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/?s=national+communication+plan>]. Accessed 18 September 2020.

4.6 INFECTION CONTROL PRACTICES AND AVAILABILITY OF EQUIPMENT

4.6.1 Healthcare associated infection (HCAI) prevention and control programs

4.6.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that the national public health system in Ghana monitors and tracks the number of health care associated infections that take place in healthcare facilities. According to Ghana's Joint External Evaluation report, conducted in February 2017, a policy and strategy (as well as SOPs and guidelines) for infection, prevention, control (IPC) are available and there are designated IPC professionals in all tertiary and major hospitals. [1] The Ministry of Health's National Policy and Guidelines for Infection Prevention and Control in Health Care Settings (under section 25: Surveillance and Monitoring) states the following objectives: Increase health care workers' awareness of HCAI, monitor incidence and distribution of health care-associated infections and their prevalence, identify areas for improvement in patient care, identify the need for strengthening IPC activities, and disseminate relevant information to stakeholders. [2] However, there is no public evidence that the national public health system monitoring for and tracking the number of health care associated infections that take place in healthcare facilities. There is no evidence that Ghana has tracked COVID-19 infections among healthworkers. The country's COVID-19 info hub website does not contain relevant information. [3] There is no evidence that Ghana has publicly shared a COVID-19 response plan.

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. 2015. "National Policy and Guidelines for Infection Prevention and Control in Health Care Settings".

[https://www.ghanahelthservice.org/downloads/National_Policy_and_Guidelines%20_for_Infection_Prevention_and_Contr ol_in_Health_Care_Settings_2015.pdf]. Accessed 17 September 2020.

[3] Republic of Ghana. "Ghana COVID 19 Hub". [<https://ghcovid19-statsghana.hub.arcgis.com/>]. Accessed 14 May 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

There is a national requirement for ethical review before beginning a clinical trial in Ghana. Guidelines from the Ghana Food and Drugs Authority, entitled "Regulation of Clinical Trials in Ghana", cover the regulatory requirements for the authorisation of clinical trials in the country, applicable to all stages of drug development. The intended audience includes investigators, the pharmaceutical industry, clinical research organisations and sponsors of clinical trials. [1] The guidelines stem from Section 150-166 (Part 8) of the Public Health Act 2012, Act 851 requires "an ethical clearance issued by an approved institute for medical research where applicable, and the relevant information as provided under the guidelines for conducting clinical trials, and... an international registration number in respect of the product." [2] Further, standard operating procedures (SOPs) from Ghana's Health Service (GHS) Ethics Review Committee also describes an ethics review protocol for clinical trials that contains several requirements for the initiation of a clinical trial. The SOPs apply only to research conducted in GHS

facilities, or which involves its staff. (The GHS is a body within the Ministry of Health.) [3,4]

- [1] Food and Drugs Authority Ghana. "Regulation of clinical trials in Ghana". [http://www.fdaghana.gov.gh/images/stories/pdfs/Clinical%20Trials/REGULATION%20OF%20CLINICAL%20TRIALS%20IN%20GHANA.pdf]. Accessed 17 September 2020.
- [2] Ministry of Health, Republic of Ghana. Act 851. "Public Health Act 2012"[http://www.moh.gov.gh/wp-content/uploads/2016/02/Public-Health-Act-851.pdf]. Accessed 17 September 2020.
- [3] Ghana Health Service Ethics Review Committee. 2015. "Standard Operating Procedures". [https://www.ghanahealthservice.org/downloads/Standard_Operating_Procedures.pdf]. Accessed 17 September 2020.
- [4] Ghana Health Service. [http://www.ghanahealthservice.org/]. Accessed 17 September 2020.

4.7.1b

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that Ghana has an expedited process for approving clinical trials for unregistered medical countermeasures to treat ongoing pandemics. There are guidelines for the general expedited process: "Guidelines for conduct of clinical trials during emergencies" (27th January, 2016), found on the Food and Drugs Authority Ghana website, where section 8.0 details the fast-track process; section 8.3 mentions that it applies in the case of an emergency. [1] However, the guidelines do not explicitly mention unregistered medical countermeasures to treat ongoing pandemics.

- [1] Food and Drugs Authority Ghana. 27th January, 2016. "Guidelines for conduct of clinical trials during emergencies". [http://www.fdaghana.gov.gh/images/stories/pdfs/downloads/drugs%20guidelines/GUIDELINES%20FOR%20TRIALS%20IN%20EMERGENCIES1.pdf]. Accessed 17 September 2020.

4.7.2 Regulatory process for approving medical countermeasures

4.7.2a

Is there a government agency responsible for approving new medical countermeasures (MCM) for humans?

Yes = 1 , No = 0

Current Year Score: 1

The Food and Drugs Authority (FDA) Ghana is the sole government agency responsible for approving new medicines for humans. The FDA specifically notes that it regulates medical countermeasures including (but not limited to): biologics (such as vaccines, blood and blood components, and biotechnology-derived medicinal products), medical devices (class I-IV), and drugs. [1]

- [1] Food and Drugs Authority Ghana. [http://www.fdaghana.gov.gh/]. Accessed 17 September 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: 0

There is no publicly available evidence of an expedited process for approving medical countermeasures for human use during public health emergencies. Neither the Food and Drugs Authority Ghana or the Ministry of Health have any information on such a process on their websites. [1,2]

[1] Food and Drugs Authority Ghana. [<http://www.fdaghana.gov.gh/>]. Accessed 16 September 2020. [1] Ministry of Health, Republic of Ghana.[<http://www.moh.gov.gh/>]. Accessed 16 September 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

There is no public evidence that pandemics are integrated into the national risk reduction strategy, nor is there a standalone national disaster risk reduction strategy for pandemics. The National Disaster Management Organisation (NADMO) published a "Ghana plan of action on disaster risk reduction and climate change adaptation" but it is no longer accessible. [1] There is no evidence of a standalone national disaster risk reduction strategy for pandemics on the Ministry of Health website. [2]

[1] National Disaster Management Organisation (NADMO). 2015. "Ghana plan of action on disaster risk reduction & climate change adaptation".

[http://www.nadmo.gov.gh/images/NADMO_documents/2015_documents/GHANA%20PLAN%20OF%20ACTION%20ON%20DRRCCA%202011-2015.pdf]. Not accessible as of 12 October 2020. September 2020.

[2] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 17 September 2020.

5.2 CROSS-BORDER AGREEMENTS ON PUBLIC HEALTH AND ANIMAL HEALTH EMERGENCY RESPONSE

5.2.1 Cross-border agreements

5.2.1a

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

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

Current Year Score: 0

There is insufficient public evidence that Ghana has cross-border agreements, protocols or MOUs with neighbouring countries, or as part of a regional group, with regards to public health emergencies. There are established activities that fall short of regular, formal collaboration. According to Ghana's Joint External Evaluation report, conducted in February 2017, "Ghana has a well-established cross-border exchange of health information, with regular quarterly epidemiological meetings being conducted between district health staff and border agents in neighbouring countries; a WhatsApp group allows for direct information exchange between border agents. These mechanisms keep port health staff aware of outbreaks occurring on either side of the border." [1] On 30 November 2016, the International Organisation for Migration held a workshop between Ghana and Togo to improve cross-border disease surveillance response. They reported "By facilitating this workshop and other related activities, the Ghana Health Security Agenda (GHSA) hopes to facilitate the signing of an MOU between neighbouring countries so they are able to regularise cross-border meetings and information-sharing sessions across the three major border posts of Aflao, Akanu and Paga." [2] There is no evidence of international MOUs specifically covering public health emergencies on the websites of the Ministry of Health, Ghana Health Service or National Disaster Management Organisation (NADMO). [3,4,5] Ghana signed an MOU with the Japan International Co-operation Agency (JICA) to strengthen the implementation of Community-Based Health Planning and Services (CHPS) policy, though the MOU does not reference public health emergencies. [6]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] International Organisation for Migration. 30 November 2016. "IOM Hosts Workshop to Improve Ghana-Togo Cross-Border Disease Surveillance and Response" [<https://www.iom.int/news/iom-hosts-workshop-improve-ghana-togo-cross-border-disease-surveillance-and-response>]. Accessed 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

[4] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 18 September 2020.

[5] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 18 September 2020.

[6] Government of Ghana. "Government signs MOU with JICA to strengthen CHPS policy implementation." December 2016. [<http://www.ghana.gov.gh/index.php/media-center/news/3275-government-signs-mou-with-jica-to-strengthen-chps-policy-implementation>] Accessed 18 September 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 no public evidence that Ghana has cross-border agreements, protocols or MOUs with neighbouring countries, or as part of a regional group, with regards to animal health emergencies. There are instances of irregular collaboration across borders that fall short of formal collaboration. According to Ghana's Joint External Evaluation report, conducted in February 2017, "Ghana has a well-established cross-border exchange of health information, with regular quarterly epidemiological meetings being conducted between district health staff and border agents in neighbouring countries; a WhatsApp group allows for direct information exchange between border agents. These mechanisms keep port health staff aware of outbreaks occurring on either side of the border." These activities were not specific to animal health emergencies. [1] No additional information on international agreements pertaining to animal health emergencies could be found on the websites of the Ministry of Health, Ghana Health Service, and National Disaster Management Organisation (NADMO). [2,3,4]

[1] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 17 September 2020.

[2] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

[3] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 18 September 2020.

[4] National Disaster Management Organisation (NADMO). [<http://nadmo.gov.gh/>]. Accessed 18 September 2020.

5.3 INTERNATIONAL COMMITMENTS

5.3.1 Participation in international agreements

5.3.1a

Does the county have signatory and ratification (or same legal effect) status to the Biological Weapons Convention?

Signed and ratified (or action having the same legal effect) = 2, Signed = 1, Non-compliant or not a member = 0

Current Year Score: 2

2021

Biological Weapons Convention

5.3.1b

Has the country submitted confidence building measures for the Biological Weapons Convention in the past three years?

Yes = 1, No = 0

Current Year Score: 0

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: 2

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: 1

2021

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

5.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

2021

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

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

5.4.2a

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

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.4.2b

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

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5 FINANCING

5.5.1 National financing for epidemic preparedness

5.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is not sufficient public evidence to say that Ghana has allocated national funds to improve its capacity to address epidemic threats within the past three years. Budgets for the Ministry of Health, shared by the Ministry of Finance for 2020, 2019 and 2018, do not have any budget line items for epidemic threats. [1] There is no relevant information on the Ministry of Health website. [2]

[1] Ministry of Finance. "Budget Estimates of Ministry of Health" [<https://www.mofep.gov.gh/publications/budget-estimates/>] Accessed 18 September 2020.

[2] Ministry of Health. [<https://www.moh.gov.gh>] Accessed 18 September 2020

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

5.5.2a

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

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

Current Year Score: 0

2021

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

5.5.2b

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

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

Current Year Score: 0

2021

OIE PVS assessments

5.5.3 Financing for emergency response

5.5.3a

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence of a publicly identified special emergency public financing mechanism and funds which the country can access in the face of a public health emergency. Ghana is eligible to receive IDA resources as a designated borrowing country, and is thus eligible for the WB Pandemic Financing Facility. [1,2] According to Ghana's Joint External Evaluation report, conducted in February 2017, "there are contingency funds set aside for emergency outbreak situations." [3]

[1] The International Development Association (IDA). "Borrowing Countries" [<http://ida.worldbank.org/about/borrowing-countries>]. Accessed 16 September 2020.

[2] World Bank Pandemic Financing Facility. [<http://pubdocs.worldbank.org/en/119961516647620597/PEF-Operational-Brief-Dec-2017.pdf>] Accessed 12 October 2020.

[3] World Health Organisation (WHO). 6-10 February 2017. "Joint External Evaluation of IHR Core Capacities of the Republic of The Ghana". [<http://apps.who.int/iris/bitstream/handle/10665/255578/WHO-WHE-CPI-2017.26-eng.pdf?sequence=1>]. Accessed 16 September 2020.

5.5.4 Accountability for commitments made at the international stage for addressing epidemic threats

5.5.4a

Is there evidence that senior leaders (president or ministers), in the past three years, have made a public commitment either to:

- Support other countries to improve capacity to address epidemic threats by providing financing or support?
- Improve the country's domestic capacity to address epidemic threats by expanding financing or requesting support to improve capacity?

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

Current Year Score: 0

There is insufficient publicly available evidence to confirm that senior leaders of Ghana have, in the past three years, made a public commitment either to improve its own domestic capacity to address epidemic threats by expanding financing or requesting support, or to support other countries to improve capacity to address epidemic threats by providing financing or support. According to the Global Health Security Funding Tracking Dashboard, Ghana continues to receive funds from international donors. The largest donors are Canada, the United States, the Global Fund, the Global Alliance for vaccines and

Immunisation (GAVI), and the United Kingdom—collectively, these donors have disbursed well over US\$500m in support of prevention, detection and response. [1] However, there is no evidence of Ghana's leaders' public commitments to improve its own domestic capacity to address epidemic threats by expanding financing or requesting support to improve capacity in the past three years. There is no other relevant information shared via a public website by the Global Health Security Agenda, the Ministry of Health, the Ghana Health Service, the Ministry of Foreign Affairs and Regional Integration, or the office of the president. [2,3,4,5,6]

[1] Global Health Security Funding Tracking Dashboard, [<https://tracking.ghscosting.org/#analysis/GH/r>]. Accessed 18 September 2020.

[2] Global Health Security Agenda. [<https://www.ghsagenda.org/where-ghsa>]. Accessed 18 September 2020.

[3] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

[4] Ghana Health Service. [<http://www.ghanahealthservice.org/ghs-category.php?cid=5>]. Accessed 18 September 2020.

[5] Ministry of Foreign Affairs and Regional Integration. [<https://mfa.gov.gh/>]. Accessed 18 September 2020.

[6] Presidency of Ghana. [<https://presidency.gov.gh/>]. Accessed 18 September 2020.

5.5.4b

Is there evidence that the country has, in the past three years, either:

- Provided other countries with financing or technical support to improve capacity to address epidemic threats?
- Requested financing or technical support from donors to improve the country's domestic capacity to address epidemic threats?

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

Current Year Score: 1

Ghana has, in the past three years, invested finances (from donors or national budget) to improve its own domestic capacity to address epidemic threats; however, there is no evidence it has supported other countries to improve their capacity to address epidemic threats. According to the Global Health Security Funding Tracking Dashboard, Ghana continues to receive funds from international donors. The largest donors are Canada, the United States, the Global Fund, the Global Alliance for vaccines and Immunisation (GAVI), and the United Kingdom—collectively, these donors have disbursed well over US\$500m in support of prevention, detection and response. For example, within the past three years, Canada contributed approximately US\$2.3m for support to prepare for Ebola Virus Disease. [1] Among these funds, at least some are related to Pan-African Network for Rapid Research, Response, Relief and Preparedness for Infectious Diseases Epidemics (PANDORA), a European Union-funded project of which Ghana is a beneficiary. [1,2] However, the Dashboard does not list a specific amount for investment in Ghana for this project, and there is no mention of it on Ghanaian government websites. There is no other publicly available relevant information shared by the Global Health Security Agenda or on the websites of the Ministry of Health, Ghana Health Service, or Ministry of Foreign Affairs and Regional Integration. [3,4,5,6] Ghana is also a beneficiary of a World Bank-funded project, "COVID-19 Emergency Preparedness and Response Project Investment Project Financing", which allocates \$130 million to Ghana over five years. [7,8]

[1] Global Health Security Funding Tracking Dashboard. "Ghana". [<https://tracking.ghscosting.org/#analysis/GH/r/table>]. Accessed 18 September 2020.

[2] Global Research Coordination for Infectious Disease Preparedness (GLOPID-R). "PANDORA: Pan-African Network for Rapid Research, Response, Relief and Preparedness for Infectious Diseases Epidemics". [<http://www.glopid-r.org/clinical-trial-network/pandora-pan-african-network-for-rapid-research-response-relief-and-preparedness-for-infectious-diseases-epidemics/>]. Accessed 17 September 2020.

[3] Global Health Security Agenda. [<https://www.ghsagenda.org/where-ghsa>]. Accessed 18 September 2020.

[4] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.

- [5] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh>]. Accessed 18 September 2020.
- [6] Ministry of Foreign Affairs, Republic of Ghana. [<https://mfa.gov.gh/index.php/media/>]. Accessed 18 September 2020.
- [7] Ministry of Health. November 2020. "COVID-19 Emergency Preparedness and Response Project Investment Project". [<https://www.moh.gov.gh/wp-content/uploads/2016/02/FINAL-COVID-19-ESMF.pdf>]. Accessed 13 May 2021.
- [8] World Bank. 29 April 2021. "World Bank Group's Operational Response to COVID-19 (coronavirus) – Projects List". [<https://www.worldbank.org/en/about/what-we-do/brief/world-bank-group-operational-response-covid-19-coronavirus-projects-list>]. Accessed 13 May 2021.

5.5.4c

Is there evidence that the country has fulfilled its full contribution to the WHO within the past two years?

Yes = 1 , No = 0

Current Year Score: 0

2021

Economist Impact analyst qualitative assessment based on official national sources, which vary by country

5.6 COMMITMENT TO SHARING OF GENETIC AND BIOLOGICAL DATA AND SPECIMENS

5.6.1 Commitment to sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) in both emergency and nonemergency research

5.6.1a

Is there a publicly available plan or policy for sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) along with the associated epidemiological data with international organizations and/or other countries that goes beyond influenza?

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that there is a publicly available plan or policy for sharing genetic data, epidemiological data, clinical specimens, and/or isolated specimens in Ghana. There is no evidence of such a plan on the websites of the Ministry of Health, Ministry of Food & Agriculture, or Ministry of Environment, Science, Technology & Innovation. [1,2,3]

[1] Ministry of Health, Republic of Ghana. [<http://www.moh.gov.gh/>]. Accessed 17 September 2020.

[2] Food and Agriculture Organisation (FAO). [<http://www.fao.org/>]. Accessed 17 September 2020.

[3] Ministry of Environment, Science, Technology & Innovation. [<http://mesti.gov.gh/>]. Accessed 17 September 2020.

5.6.1b

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

Yes = 0 , No = 1

Current Year Score: 1

There is no public evidence that the Ghana has not shared samples in accordance with the PIP framework in the past two years according to media outlets and the WHO media page. [1,2]

- [1] World Health Organisation (WHO). 2015. Pandemic Influenza Preparedness Framework. [http://www.who.int/influenza/pip/benefit_sharing/PC_AnnualReport2015.pdf]. Accessed 18 September 2020.
[2] World Health Organisation. "News". [<http://www.who.int/news-room>]. Accessed 18 September 2020.

5.6.1c

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

Yes = 0, No = 1

Current Year Score: 1

There is no public evidence that the Ghana has not shared pandemic pathogen samples during an outbreak in the past two years. No evidence was found in news media sources, the World Health Organisation (WHO) news page, or the WHO country page for Ghana. [1,2]

- [1] World Health Organization. "News". [<http://www.who.int/news-room>]. Accessed 18 September 2020.
[2] World Health Organization. "Ghana". [<https://www.who.int/countries/gha/en/>]. Accessed 18 September 2020.

Category 6: Overall risk environment and vulnerability to biological threats

6.1 POLITICAL AND SECURITY RISK

6.1.1 Government effectiveness

6.1.1a

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

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1b

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

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1c

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

Input number

Current Year Score: 1

2020

Economist Intelligence

6.1.1d

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

Input number

Current Year Score: 2

2020

Economist Intelligence

6.1.1e

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

Input number

Current Year Score: 43

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: 2

2020

Economist Intelligence

6.1.2 Orderly transfers of power

6.1.2a

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

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

Current Year Score: 3

2021

Economist Intelligence

6.1.3 Risk of social unrest

6.1.3a

What is the risk of disruptive social unrest?

Very low: Social unrest is very unlikely = 4, Low: There is some prospect of social unrest, but disruption would be very limited = 3, Moderate: There is a considerable chance of social unrest, but disruption would be limited = 2, High: Major social unrest is likely, and would cause considerable disruption = 1, Very high: Large-scale social unrest on such a level as to seriously challenge government control of the country is very likely = 0

Current Year Score: 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: 2

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: 3

2020

UN Office of Drugs and Crime (UNODC)

6.1.4c

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

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

Current Year Score: 2

2021

Economist Intelligence

6.1.5 Armed conflict

6.1.5a

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

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

Current Year Score: 3

2021

Economist Intelligence

6.1.6 Government territorial control

6.1.6a

Does the government's authority extend over the full territory of the country?

Yes = 1, No = 0

Current Year Score: 1

2021

Economist Intelligence

6.1.7 International tensions

6.1.7a

Is there a threat that international disputes/tensions could have a negative effect?

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

Current Year Score: 3

2021

Economist Intelligence

6.2 SOCIO-ECONOMIC RESILIENCE

6.2.1 Literacy

6.2.1a

Adult literacy rate, population 15+ years, both sexes (%)

Input number

Current Year Score: 79.04

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: 0.46

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: 4.6

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

The share of employment in the informal sector in Ghana is 83.18% according to 2015 International Labour Organization (ILOSTAT) database statistics shared by the World Bank. [1]

[1] The World Bank. "Informal employment (% of total non-agricultural employment) - Ghana."

[<https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS?end=2015&locations=GH&start=2015&view=bar>]. Accessed 18 September 2020.

6.2.3c

Coverage of social insurance programs (% of population)

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

Current Year Score: 3

2016, or latest available

World Bank; Economist Impact calculations

6.2.4 Public confidence in government

6.2.4a

Level of confidence in public institutions

Input number

Current Year Score: 1

2021

Economist Intelligence Democracy Index

6.2.5 Local media and reporting

6.2.5a

Is media coverage robust? Is there open and free discussion of public issues, with a reasonable diversity of opinions?

Input number

Current Year Score: 1

2021

Economist Intelligence Democracy Index

6.2.6 Inequality

6.2.6a

Gini coefficient

Scored 0-1, where 0=best

Current Year Score: 0.43

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: 1

2021

Economist Intelligence

6.3.2 Adequacy of airports

6.3.2a

What is the risk that air transport will prove inadequate to meet needs?

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

Current Year Score: 2

2021

Economist Intelligence

6.3.3 Adequacy of power network

6.3.3a

What is the risk that power shortages could be disruptive?

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

Current Year Score: 2

2021

Economist Intelligence

6.4 ENVIRONMENTAL RISKS

6.4.1 Urbanization

6.4.1a

Urban population (% of total population)

Input number

Current Year Score: 56.71

2019

World Bank

6.4.2 Land use

6.4.2a

Percentage point change in forest area between 2006–2016

Input number

Current Year Score: -0.67

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: 3

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: 63.78

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: 618.3

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 3.1

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 3.7

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 10.9

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: 81.45

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 18.47

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: 65.33

2018

WHO Global Health Expenditure database

6.5.4 Trust in medical and health advice

6.5.4a

Trust medical and health advice from the government

Share of population that trust medical and health advice from the government , More than 80% = 2, Between 60-80%, or no data available = 1, Less than 60% = 0

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018

6.5.4b

Trust medical and health advice from medical workers

Share of population that trust medical and health advice from health professionals , More than 80% = 2, Between 60-80%, or no data available = 1, Less than 60% = 0

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018