

Madagascar

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

CATEGORY 1: PREVENTING THE EMERGENCE OR RELEASE OF PATHOGENS WITH POTENTIAL FOR INTERNATIONAL CONCERN	4
1.1 Antimicrobial resistance (AMR)	4
1.2 Zoonotic disease	10
1.3 Biosecurity	18
1.4 Biosafety	26
1.5 Dual-use research and culture of responsible science	30
1.6 Immunization	33
CATEGORY 2: EARLY DETECTION AND REPORTING FOR EPIDEMICS OF POTENTIAL INTERNATIONAL CONCERN	34
2.1 Laboratory systems strength and quality	34
2.2 Laboratory supply chains	39
2.3 Real-time surveillance and reporting	41
2.4 Surveillance data accessibility and transparency	44
2.5 Case-based investigation	50
2.6 Epidemiology workforce	54
CATEGORY 3: RAPID RESPONSE TO AND MITIGATION OF THE SPREAD OF AN EPIDEMIC	56
3.1 Emergency preparedness and response planning	56
3.2 Exercising response plans	60
3.3 Emergency response operation	62
3.4 Linking public health and security authorities	65
3.5 Risk communications	66
3.6 Access to communications infrastructure	70

3.7 Trade and travel restrictions	71
-----------------------------------	----

CATEGORY 4: SUFFICIENT AND ROBUST HEALTH SECTOR TO TREAT THE SICK AND PROTECT HEALTH WORKERS 73

4.1 Health capacity in clinics, hospitals, and community care centers	73
---	----

4.2 Supply chain for health system and healthcare workers	77
---	----

4.3 Medical countermeasures and personnel deployment	82
--	----

4.4 Healthcare access	83
-----------------------	----

4.5 Communications with healthcare workers during a public health emergency	85
---	----

4.6 Infection control practices and availability of equipment	87
---	----

4.7 Capacity to test and approve new medical countermeasures	88
--	----

CATEGORY 5: COMMITMENTS TO IMPROVING NATIONAL CAPACITY, FINANCING PLANS TO ADDRESS GAPS, AND ADHERING TO GLOBAL NORMS 90

5.1 International Health Regulations (IHR) reporting compliance and disaster risk reduction	90
---	----

5.2 Cross-border agreements on public health and animal health emergency response	91
---	----

5.3 International commitments	92
-------------------------------	----

5.4 Joint External Evaluation (JEE) and Performance of Veterinary Services Pathway (PVS)	93
--	----

5.5 Financing	94
---------------	----

5.6 Commitment to sharing of genetic and biological data and specimens	98
--	----

CATEGORY 6: OVERALL RISK ENVIRONMENT AND VULNERABILITY TO BIOLOGICAL THREATS 99

6.1 Political and security risk	99
---------------------------------	----

6.2 Socio-economic resilience	103
-------------------------------	-----

6.3 Infrastructure adequacy	106
-----------------------------	-----

6.4 Environmental risks	106
-------------------------	-----

6.5 Public health vulnerabilities	107
-----------------------------------	-----

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: 0

There is some evidence that Madagascar has a national AMR plan, but it is not available online. The 2017 WHO Joint External Evaluation for Madagascar stated that there was no national multi-sectorial plan for combatting AMR, and that sentinel sites had not been designated despite the existence of laboratories capable of performing this role.[1] In August 2019, the Ministry of Public Health, the Ministry for the Environment and the Ministry of Agriculture of the Republic of Madagascar held a workshop together with the World Health Organization (WHO), the Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE) to launch the antimicrobial resistance control process and present the national action plan on fighting AMR for 2019-2023, whose "main objective is to ensure the prevention of infections and to control the spread of antimicrobial resistance"[2,3,4]. The national action plan on fighting AMR is not available on the websites of the Ministry of Public Health, the Ministry of Agriculture and Livestock, the Ministry for the Environment and Sustainable Development or from a wider online search. [5,6,7] The WHO library of national action plans does not contain a plan for Madagascar. [8] There is a 2020 multisectorial emergency plan, but it does not refer to AMR. [9]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 24 September 2020.

[2] Office of the Prime Minister of Madagascar. 2019. "(Government council of Wednesday, 7 August 2019 (Conseil du gouvernement du Mercredi 07 Août 2019)". [<http://www.primature.gov.mg/index.php/2019/08/07/conseil-du-gouvernement-du-mercredi-07-aout-2019/>] Accessed 24 September 2020.

[3] World Health Organisation (WHO) Madagascar. 2019. Official Facebook page, post on 8 August 2019. [<https://www.facebook.com/OMSMadagascar/posts/1142760142581046>] Accessed 24 September 2020.

[4] Ministry of Public Health of Madagascar. Official Facebook page, post on 8 August 2019 [<https://www.facebook.com/minsanp/posts/2501521959912373>] Accessed 18 August 2020.

[5] Ministry of Public Health of Madagascar. 2020. Official Website [<http://www.sante.gov.mg/ministere-sante-publique/>] and "Documents" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>]. Accessed 18 August 2020.

[6] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website [<http://www.maep.gov.mg>] Accessed 18 August 2020.

[7] Ministry for the Environment and Sustainable Development. 2020. Official Website [<https://www.environnement.mg>] Accessed 18 August 2020

[8] World Health Organization (WHO). 2020. "Antimicrobial Resistance. Library of national action plans". [<https://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>] Accessed 18 August 2020.

[9] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel

d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 24 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

Madagascar has a national laboratory system which tests for at least 4 of the World Health Organisation (WHO)'s priority AMR pathogens. [1,2] According to the 2017 WHO Joint External Evaluation for Madagascar, Madagascar has 13 laboratories for human health and 2 for animal health capable of detecting (unspecified) pathogens, 35 sentinel veterinary services for disease surveillance, and monitoring plans for Mycobacterium tuberculosis (TB) and Yersinia pestis (plague), for which pathogens are systematically isolated and antibiograms are carried out (#1).[3, 4] The Pasteur Institute of Madagascar (PIM), a non-governmental institute, has been designated as a reference laboratory for AMR.[3] Its catalogue of bio-medical analyses is available online, but it does not include testing for S. pneumoniae, Salmonella spp., Shigella spp., or N. gonorrhoeae. [5] In 2016, the Mériex Foundation carried out a pilot project with the health ministry to establish bacteriology services at the University Hospital Joseph Raseta Befelatanana (HJRB) in Antananarivo. HJRB's laboratory now tests for AMR strains of E. coli (#2), K. pneumoniae (#3), S. aureus (#4) and Acinetobacter baumannii. As of May 2018, 6 other hospitals had expressed an interest in establishing microbiology labs.[6] As of June 2020, Madagascar has a system of sentinel sites consisting of 24 laboratories, the "Network of Laboratories in Madagascar (RESAMAD)". 13 of these laboratories focus on bacteriological testing (5 in Antananarivo, 1 in Antsirabe, 1 in Toamasina, 1 in Fianarantsoa, 1 in Toliary, 1 in Fort Dauphin, 1 in Ambatondrazaka, 1 in Mahajanga, 1 in Antsiranana), but it is not clear for which pathogens they can test. [7] The sentinel laboratories do not have websites. There is no evidence from the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Indian Ocean Region's One Health Network, the Pasteur Institute of Madagascar, the Mériex Foundation or the WHO that testing for other priority AMR pathogens is available in Madagascar since the JEE assessment was published.[8, 9, 10, 11, 1, 2, 3] The JEE assessment assigned scores of 1 (non-existent capacity) for the indicators 'Detection of AMR' and 'Surveillance of infections caused by AMR pathogens'.[1]

[1] Pasteur Institute of Madagascar. 2019. "Report of activities 2018 (Rapport d'activités 2018)".

[<http://www.pasteur.mg/publication/rapport-dactivites-2018/>] Accessed 19 August 2020

[2] Mériex Foundation Madagascar. 2020. "The laboratory Rodolphe Mériex of Antananarivo, Madagascar (Laboratoire Rodolphe Mériex D'antananarivo, Madagascar)". [<https://www.fondation-merieux.org/ce-que-nous-faisons/accroitre-access-diagnostic/mettre-en-place-infrastructures/laboratoire-rodolphe-merieux-antananarivo-madagascar/>] Accessed on 19 August 2020

[3] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacités RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020

[4] SEGA One Health Network and One Health - OI. 2017. Bulletin of epidemiological information: Animal health, Indian Ocean (Bulletin d'Informations épidémiologiques: Santé animale - Océan Indien). No. 20, Jul-Dec 2017. [https://www.onehealth-oi.org/content/download/4465/33285/version/1/file/BIE_Sante+animale+OI_DEUXIE%CC%80ME+SEMESTRE+2017.pdf]. Accessed 19 August 2020.

[5] Pasteur Institute of Madagascar. 2020. "Catalogue of bio-medical analyses (Catalogue des analyses de biologie médicale)" [http://www.pasteur.mg/wp-content/uploads/2020/08/CBC_MP_001_02_Catalogue_des_analyses_CBC_MAJ_170820_V3-1.pdf] Accessed 24 September 2020.

- [6] Rasoanandrasana, S. et al. 2018. "Establishment of a medical bacteriology laboratory in Madagascar (Mise en place d'un laboratoire de bactériologie médicale à Madagascar)". AMR Control, Edition française, vol. 1, May 2018. [<http://resistancecontrol.info/wp-content/uploads/2018/05/94-98.pdf>]. Accessed 19 August 2020.
- [7] Ministry of Public Health of Madagascar. 19 June 2020. Official Website. "Project RESAMAD, or network of laboratories of Madagascar (Projet RESAMAD ou reseau de laboratoires de madagascar" [<http://www.sante.gov.mg/ministere-sante-publique/2020/06/19/projet-resamad-ou-reseau-de-laboratoires-de-madagascar/>] Accessed 19 August 2020
- [8] Ministry of Public Health of Madagascar. 2020. Official Website [<http://www.sante.gov.mg/ministere-sante-publique/>] and "Documents" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>]. Accessed 24 September 2020.
- [9] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website [<http://www.maep.gov.mg>] Accessed 24 September 2020.
- [10] DP One Health OI. 2020. Official Website. "About us (Qui sommes nous)" [<https://www.onehealth-oi.org/a-propos-du-reseau/qui-sommes-nous>] and "Risk Modeling (Modelisation des risques)" [<https://www.onehealth-oi.org/thematiques/modelisation-des-risques>] Accessed 24 September 2020.
- [11] World Health Organisation (WHO). 2020. "Antimicrobial resistance: Library of national action plans." [<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 24 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 public evidence that the government of Madagascar is conducting environmental surveillance for antimicrobial residues or AMR organisms. The 2017 WHO Joint External Evaluation for Madagascar does not mention AMR monitoring in the environment and assigns a score of 1 (non-existent capacity) for the indicator 'Detection of AMR'.^[1] There is no information on this from the Ministry of Environment, Ecology and Forests, or from the National Environmental Office (ONE) which is tasked with environmental protection and surveillance.^[2, 3] ONE maintains an Atlas of Environmental Data, but AMR pathogens are not among its data sets.^[4] There is no evidence of AMR surveillance in the 2011 National Policy on Health and the Environment, the 2010 Implementation of the Libreville Declaration in Madagascar, the 2016 National Policy on the Environment and Sustainable Development, or the National policy on the management of medical waste and the security of injections in Madagascar, which mention other aspects of environmental surveillance.^[5, 6, 7, 8]

There is some evidence that Madagascar has a national AMR plan, as in August 2019, the Ministry of Public Health, the Ministry for the Environment and the Ministry of Agriculture of the Republic of Madagascar held a workshop together with the World Health Organization (WHO), the Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE) to launch the antimicrobial resistance control process and present the national action plan on fighting AMR for 2019-2023 ^[9, 10]. However, the national action plan on fighting AMR is not available on the websites of the Ministry of Public Health, the Ministry of Agriculture and Livestock, the Ministry for the Environment and Sustainable Development, or from a wider online search. ^[11, 12, 13]

The World Health Organization (WHO)'s library of national action plans does not contain a plan for Madagascar.^[14]

There is no evidence of activities relating to environmental surveillance for antimicrobial residues or AMR organisms on the websites of the Ministry of Public Health or the Ministry of Agriculture, Animal Husbandry and Fisheries. ^[11, 12]

- [1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.
- [2] Ministry of Environment, Ecology and Forests. 2018. Official website. [<http://www.ecologie.gov.mg/>]. Accessed 19 August 2020.
- [3] National Environment Office. 2018. Official website. [<https://www.pnae.mg/>]; and "Regulatory framework (Cadre réglementaire)". [<https://www.pnae.mg/ee/cadre-reglementaire>]. Accessed 20 September 2018.
- [4] National Environmental Office (ONE). 2018. "Atlas of environmental data (Atlas des données environnementales)". [<http://madagascarportal.org/lizmap/lizmap/www/index.php/view/map/?repository=madagascar&project=BLOCAP>]. Accessed 19 August 2020.
- [5] Ministry of Public Health and Ministry of Environment and Forests. 2011. "National Policy on Health and the Environment (Politique Nationale en Santé et Environnement)". [<http://www.ecologie.gov.mg/download/politique-nationale-en-sante-et-environnement/>]. Accessed 19 August 2020.
- [6] Government of Madagascar. 2010. "Implementation of the Libreville Declaration in Madagascar (Mise en Oeuvre de la Déclaration de Libreville a Madagascar)". [<http://www.ecologie.gov.mg/download/aseb-final/>]. Accessed 19 August 2020.
- [7] Government of Madagascar. 2016. "National Policy on the Environment and Sustainable Development (Politique Nationale de l'Environnement pour le Développement Durable)". [<http://www.ecologie.gov.mg/download/document-de-pnedd/>]. Accessed 19 August 2020.
- [8] Ministry of Public Health. 2020. Official Website. "National policy on the management of medical waste and the security of injections in Madagascar (Politique nationale de gestion des dechets medicaux et de la securite des injections a madagascar)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/5a57a-pngdm_2017.pdf] Accessed 19 August 2020.
- [9] World Health Organisation (WHO) Madagascar. 2018. Official Facebook page, post on 8 August 2019 [<https://www.facebook.com/OMSMadagascar/posts/1142760142581046>]
- [10] Ministry of Public Health of Madagascar. Official Facebook page, post on 8 August 2019 [<https://www.facebook.com/minsanp/posts/2501521959912373>] Accessed 18 August 2020.
- [11] Ministry of Public Health of Madagascar. 2020. Official Website [<http://www.sante.gov.mg/ministere-sante-publique/>] Accessed 18 August 2020
- [12] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website [<http://www.maep.gov.mg>] Accessed 18 August 2020.
- [13] Ministry for the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg>] Accessed 18 August 2020.
- [14] World Health Organisation (WHO). 2018. "Library of national action plans." [<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 19 August 2020.

1.1.2 Antimicrobial control

1.1.2a

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

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

Current Year Score: 1

Madagascar has legislation in place requiring prescriptions for all medications for human use, including antibiotics, but there is evidence for gaps in enforcement. The 2017 WHO Joint External Evaluation for Madagascar states: "Management of antibiotics remains a problem despite the existence of norms and legal rules on their usage and a control on imports." It does

not cite specific regulations relating to antibiotics. [1] The 2011 Health Code does not specifically mandate prescriptions for antibiotics, nor are any restrictions mentioned in the 2015 Health sector development plan. [2, 3] The Health Code assigns penalties for dispensing any medications without a prescription, but there is no evidence that the Code is being enforced. [2] A 2011 report by the health ministry and World Health Organisation (WHO) describes the sale of antibiotics without prescription as an illegal practice "associated with the illicit sale of medicines and self-medication." [4] There is evidence that people can buy antibiotics without prescription. The 2011 report states that this "sometimes" happens, while an academic study published in 2017 states: "In practice, few pharmacies require a prescription when selling drugs." [4, 5] There is no action plan for Madagascar available from the WHO Library of national action plans on AMR. [6] The WHO Global Database for Antimicrobial Resistance does not include a Self Assessment from Madagascar. [7] There is no relevant evidence from the Madagascar Medicines Agency, which plays an official role in quality assurance and proper use of medicines. [8] There is no evidence in the national pharmacovigilance policy. The latter provides information on a national pharmaceutical policy, revised in 2011 [9]. There is no evidence that the pharmaceutical policy addresses antibiotics use. [10]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 18 August 2020.

[3] Ministry of Public Health. 2015. "Health Sector Development Plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.nationalplanningcycles.org/sites/default/files/planning_cycle_repository/madagascar/pdss_2015.pdf]. Accessed 19 August 2020.

[4] Ministry of Public Health and World Health Organisation (WHO). 2011. "Republic of Madagascar: Pharmaceutical country profile (République de Madagascar: Profil pharmaceutique du pays)". [http://www.who.int/medicines/areas/coordination/Madagascar_PSCPNarrativeQuestionnaire_29062011.pdf]. Accessed 19 August 2020.

[5] Mattern, C. 2017. "Le marché informel du médicament à Madagascar: une revanche populaire", PhD thesis presented to the Catholic University of Louvain, 13 Dec 2017. [https://dial.uclouvain.be/pr/boreal/object/boreal%3A191542/datastream/PDF_01/view]. P.147. Accessed 19 August 2020.

[6] World Health Organisation (WHO). 2018. "Antimicrobial resistance: Library of national action plans." [<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 19 August 2020.

[7] World Health Organisation (WHO). 2018. "Global Database for Antimicrobial Resistance Country Self Assessment." [<http://amrcountryprogress.org/>]. Accessed 19 August 2020

[8] Madagascar Medicines Agency. 2018. Official website. [<http://www.agmed.mg/>]. Accessed 19 August 2020.

[9] Ministry of Public Health and Medicines Agency of Madagascar. 2011. "Madagascar national pharmacovigilance policy (Politique nationale de pharmacovigilance à Madagascar)". [http://www.agmed.mg/Pdf/Politique_National_Phv.pdf]. Accessed 19 August 2020.

1.1.2b

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

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

Current Year Score: 0

There is insufficient evidence that Madagascar has legislation requiring prescriptions for antibiotic use for animals.

The 2017 WHO Joint External Evaluation for Madagascar states: "Management of antibiotics remains a problem despite the existence of norms and legal rules on their usage and a control on imports." It does not cite specific regulations relating to antibiotic prescriptions for veterinary purposes.[1] A legal restriction for antibiotic use on animals exists in the 2006 Law on Livestock, which states that only registered veterinary doctors or pharmacists may dispense animal medicines.[2] According to a doctoral thesis on risks related to antibiotics use in animal husbandry in Madagascar, prescriptions for veterinary drugs are not always issued, nor demanded. Furthermore, the thesis notes that there is an illegal market for the procurement of animal drugs, which is widely used. [3]

The 2016 Manual of animal husbandry procedures describes authorisation procedures for the import of animal medicines, but does not address prescriptions for dispensing them.[4] The WHO Library of national action plans on AMR does not contain an action plan for Madagascar [5]. The WHO Global Database for Antimicrobial Resistance Country Self Assessment does not contain a self-assessment on AMR progress by Madagascar.[6] There is no relevant evidence from the Madagascar Medicines Agency, which plays an official role in quality assurance and proper use of medicines.[7] There is no evidence in the national pharmacovigilance policy. The latter provides information on a national pharmaceutical policy, revised in 2011. There is no evidence that the pharmaceutical policy addresses antibiotics use on animals.[8] There is no evidence on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry for the Environment and Sustainable Development or from a wider web search. [9,10,11]

[1] World Health Organisation (WHO). 2020. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Elevage à Madagascar)". [<http://www.assemblee-nationale.mg/?loi=loi-n2006-030&lang=en>]. Accessed 19 August 2020.

[3] Batie, Chloé. 2018. "Perception of risks related to the use of antibiotics in pork and poultry farms in the commune of Imerintsiatosika ain Madagascar (Perception des risques liés à l'utilisation des antibiotiques dans les élevages de porcs et de volailles de la commune d'Imerintsiatosika à Madagascar). Doctoral thesis in veterinary medicine, National Veterinary School of Toulouse, France - ENVT, p. 52.54. [https://oatao.univ-toulouse.fr/23920/1/Batie_23920.pdf] Accessed 17 October 2020

[4] Ministry of Agriculture and Livestock. 2016. "Manual of animal husbandry procedures (Manuel de procédures en élevage)". [http://www.mpa.gov.mg/wp-content/uploads/2016/11/MANUEL_DE_PROCEDURES_EN_ELEVAGE_v_20_oct_16.pdf].

[5] World Health Organisation (WHO). 2020. "Antimicrobial resistance: Library of national action plans." [<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>]. Accessed 19 August 2020.

[6] World Health Organisation (WHO). 2020. "Global Database for Antimicrobial Resistance Country Self Assessment." [<http://amrcountryprogress.org/>]. Accessed 19 August 2020.

[7] Madagascar Medicines Agency. 2020. Official website. [<http://www.agmed.mg/>]. Accessed 19 August 2020.

[8] Ministry of Public Health and Medicines Agency of Madagascar. 2011. "Madagascar national pharmacovigilance policy (Politique nationale de pharmacovigilance à Madagascar)". [http://www.agmed.mg/Pdf/Politique_National_Phiv.pdf]. Accessed 19 August 2020.

[9] Ministry of Public Health of Madagascar. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and "Documents" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>]. Accessed 25 September 2020.

[10] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website. [<http://www.maep.gov.mg>] Accessed 25 September 2020.

[11] Ministry for the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg>]

Accessed 25 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

Although Madagascar does not have one overarching plan or law on zoonotic disease, it has plans for neglected tropical diseases (some of which are zoonotic) which adopt a One Health approach, integrating animal, human and food health aspects. According to the 2017 WHO Joint External Evaluation for Madagascar, policies and legal provisions exist to address zoonoses, and a surveillance system is functioning, but standard operating procedures still need to be defined. The assessment does not cite specific documents.[1] A 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020' provides a strategic plan for diseases including 4 which are recognised as zoonoses by the WHO: taeniasis/cysticercosis, rabies, dengue and plague.[2, 3] It calls for a One Health approach, and while focusing on the public health impacts, refers to integrated programmes for animal and human health in controlling and monitoring these zoonoses, with the involvement of the human, animal and food health authorities.[2] There is also a national strategic plan for combatting TB, according to the 'Health sector development plan 2015-2019', but it is not available online.[4] There is no law on zoonoses. The Public Health Code 2011 does not mention zoonoses.[5] The 2006 Law on Livestock outlines mandatory reporting and response measures for contagious animal diseases, but fails to specify zoonoses or interaction between animal and human health authorities. [6] In the framework of the One Health network, Madagascar monitors zoonoses through the Pasteur Institute. [7] There is no further information on the web, or Facebook pages of the Ministries of Public Health or Agriculture, Animal Husbandry and Fisheries regarding a law or plan for zoonoses.[8, 9, 10, 11]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)". [http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 19 August 2020.

[3] World Health Organisation (WHO). 2018. "Zoonoses." [<http://www.who.int/zoonoses/diseases/en/>]. Accessed 19 August 2020.

[4] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.nationalplanningcycles.org/sites/default/files/planning_cycle_repository/madagascar/pdss_2015.pdf]. Accessed 19 August 2020.

[5] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 19 August 2020.

[6] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Élevage à Madagascar)". [<https://apimadagascar.files.wordpress.com/2014/05/textes-rc3a9cents-c3a9lvg-renvoi-mj-11-06-12.pdf>].

Accessed 19 August 2020.

[7] DP One Health OI. 2020. "Madagascar" [<https://www.onehealth-oi.org/terrains/madagascar>] Accessed 25 September 2020.

[8] Ministry of Public Health of Madagascar. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and "Documents" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>]. Accessed 25 September 2020.

[9] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website. [<http://www.maep.gov.mg>] Accessed 25 September 2020.

[10] Ministry of Public Health of Madagascar. 2020. Official Facebook page. [<https://www.facebook.com/minsanp>] Accessed 25 September 2020.

[11] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Facebook page. [<https://www.facebook.com/maep.Madagascar>] Accessed 25 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 no evidence that Madagascar has national legislation which include measures for risk identification and reduction for zoonotic disease spillover events from animals to humans. There is no document relating to zoonotic disease spillovers on the websites and Facebook pages of the Ministry of Public Health or the Ministry of Agriculture, Animal Husbandry and Fisheries.[1, 2, 3, 4]. The 2017 WHO Joint External Evaluation for Madagascar awarded a score of 2 for "P.4.3. Mechanisms established and functioning to combat infectious zoonoses and potential zoonoses (Mécanismes établis et fonctionnels pour riposter aux zoonoses infectieuses et aux zoonoses potentielles). " According to the JEE, the mechanisms to implement relevant policies are not sufficiently defined. The report mentions that "there is a decree to create a steering committee for the prevention of animal diseases" , but there is no evidence that it is in place today. [5] There is a pest unit at the Pasteur Institute of Madagascar, comprising the central pest laboratory (LCP) of the Ministry of Public Health and the unit for the rapid diagnosis and test for pest. The LCP also cooperates with the WHO pest unit and functions as a national laboratory of reference for the pest. [6] In cooperation with the Pasteur Institute of Madagascar, there are projects to identify pest vectors and to monitor zoonoses in hospitals and health centres. [7]

[1] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/>]. Accessed 19 August 2020.

[2] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Facebook page [<https://www.facebook.com/maep.Madagascar/>]. Accessed 19 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]. Accessed 19 August 2020.

[4] Ministry of Public Health. 2020. Official Facebook page. [<https://www.facebook.com/minsanp>]. Accessed 19 August 2020

[5] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[6] Pasteur Institute of Madagascar. 2020. Official Website. "Pest unit (Unité peste)". [<http://www.pasteur.mg/departement/unite-peste/>]. Accessed 19 August 2020.

[7] DP One Health OI. 2020. "Madagascar" [<https://www.onehealth-oi.org/terrains/madagascar>] Accessed 25 September 2020.

1.2.1c

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

Yes = 1, No = 0

Current Year Score: 1

Madagascar has laws and plans accounting for the surveillance and control of multiple zoonotic diseases of public health concern. According to the 2017 Joint External Evaluation for Madagascar, policies and legal provisions exist to address zoonoses, and a surveillance system is functioning, but standard operating procedures still need to be defined. The assessment does not cite specific documents.[1] A 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020' provides a plan for surveillance and control of lymphatic filariasis, schistosomiasis, soil-transmitted helminthiasis, taeniasis/cysticercosis, leprosy, rabies, dengue, plague, and tungiasis, four of which are recognised as zoonoses by the WHO.[2, 3] It outlines surveillance and disease prevention and treatment systems for each of the diseases and calls for them to be strengthened, with quantitative targets for disease reduction and qualitative targets including integrating surveillance of human and porcine cysticercosis.[2] There is also a national plan for combatting TB, according to the 'Health sector development plan 2015-2019', which draws on a network of 215 centres for diagnosis and treatment, but it is not available online.[4] Surveillance of notifiable animal diseases is also accounted for under animal health legislation. Animal owners and veterinarians are required to immediately report any notifiable diseases to the local authorities.[5] The list of notifiable diseases includes zoonoses such as anthrax, avian influenza, brucellosis, plague, rabies, Rift Valley fever, and TB.[6]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 27 September 2020.

[2] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)". [http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 27 September 2020.

[3] World Health Organisation (WHO). 2018. "Zoonoses." [<http://www.who.int/zoonoses/diseases/en/>]. Accessed 27 September 2020.

[4] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/6ba70-pdss_vf_oct15_opt.pdf]. Accessed 27 September 2020.

[5] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Élevage à Madagascar)". [<https://apimadagascar.files.wordpress.com/2014/05/textes-rc3a9cents-c3a9lvg-renvoi-mj-11-06-12.pdf>]. Accessed 27 September 2020.

[6] Ministry of Agriculture, Livestock and Fishing. 2005. "Decree no. 2005-187: Establishing the nomenclature of contagious animal diseases in Madagascar (Decret no. 2005-187: Etablissant le nomenclature des maladies des animaux réputés contagieuses à Madagascar)". [<http://extwprlegs1.fao.org/docs/pdf/mad147313.pdf>]. Accessed 27 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 no evidence that Madagascar has a dedicated cross-ministerial unit for zoonotic diseases. There is no mention of such a unit in the 2017 WHO Joint External Evaluation for Madagascar .[1] The 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020', which plans for some zoonoses, was prepared by the Epidemic and Neglected Diseases Control Service, under the Public Health Ministry. There is no evidence in the document that it is cross-ministerial.[2] The national plan for combatting TB is also run by the Public Health Ministry, according to the 'Health sector development plan 2015-2019'. The plan does not mention a cross-ministerial zoonoses unit,[3] nor does the website of the Ministry of Public Health.[4] In September 2018, the Ministry of Agriculture, Animal Husbandry and Fisheries published an article on animal disease surveillance training, organised by the Veterinary Services Directorate and the Indian Ocean Commission's One Health Network (DP One Health OI), which organises regional surveillance, including on zoonoses. It does not mention a cross-ministerial zoonoses unit,[5] nor does the Website of the Ministry of Agriculture, Animal Husbandry and Fisheries.[6] The DP One Health OI website does not mention the existence of a cross-ministerial unit in Madagascar.[7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 27 September 2020.

[2] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)". [http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 27 September 2020.

[3] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/6ba70-pdss_vf_oct15_opt.pdf]. Accessed 27 September 2020.

[4] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 27 September 2020.

[5] Ministry of Agriculture, Animal Husbandry and Fisheries. 26 September 2018. "Surveillance of animal diseases: Surveillance networks are essential (Surveillance des maladies animales : Les réseaux de surveillance indispensables)". [<http://www.maep.gov.mg/blog/2018/09/26/surveillance-des-maladies-animales-les-reseaux-de-surveillance-indispensables/>] Accessed 27 September 2020.

[6] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Organigramme" [<http://www.maep.gov.mg/page-d-exemple/organnigramme/>] Accessed 27 September 2020.

[7] DP One Health OI. 2020. "Madagascar" [<https://www.onehealth-oi.org/terrains/madagascar>] Accessed 25 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

Madagascar has a mandatory reporting mechanism for owners of livestock to conduct and report on disease surveillance, covering priority zoonoses, to a central government agency. According to the 2017 WHO Joint External Evaluation for Madagascar, there is an animal health surveillance system involving monthly reports from 161 veterinary services, of which 35 participate in a sentinel network performing active and passive surveillance. Their data is of good quality, they benefit from training and a list of notifiable diseases. They report on around a dozen zoonotic diseases and have good coordination

with human health authorities.[1] The central body dealing with this is the Head Office of Veterinary Services (Direction des Services Vétérinaires - DSV), comprising the Service for the monitoring and fighting against animal diseases (Service Surveillance et Lutte contre les maladies animales - SSLMA), the Public Service of Veterinaries and Veterinary Medicines (Service Santé publique Vétérinaire et Médicaments Vétérinaires - SSMV), the Service for Border Controls (Service Inspection aux frontières - SIF), and the Service of Veterinary Laboratories (Service des Laboratoires de Diagnostic Vétérinaire - SLDV).[2]

There is a 2018 decree, Decree No. 2018-591 regulating official controls of animals, foods of animal origin, food for animals and other animal-based products, that regulates central veterinary controls [3]. This decree is an addition to older law texts, such the 2006 Livestock Law, mandating reporting of notifiable diseases by animal owners. [4] Owners must report diseases immediately to the closest Veterinary Administration or a veterinary service, a representative of which is responsible for confirming the infection and reporting to both local and central authorities.[4] The government maintains a list of notifiable animal diseases, which includes zoonoses such as anthrax, avian influenza, brucellosis, plague, rabies, Rift Valley fever, and tuberculosis.[4]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Agriculture, Animal Husbandry and Fishery of Madagascar. 6 February 2019. "Decree No. 2019-071 defining the scope of the Ministre of Agriculture, Animal Husbandry and Fishery, as well as the Ministry's organizational structure (Decret N° 2019- 071 fixant les attributions du Ministre de l'Agriculture, de l'Elevage et de la Pêche ainsi que l'organisation générale de son Ministère)" [https://www.ipcc.int/static/media/files/reportingobligation/2019/04/28/DECRET_ORGANIGRAMME_MAEP_20191.pdf]. Accessed 20 August 2020.

[3] Ministry of Agriculture and Animal Husbandry. 28 June 2018. "Decree No. 2018-591 regulating official controls of animals, foods of animal origin, food for animals and other animal-based products (Decret N° 2018-591 régissant les contrôles officiels des animaux, des denrées alimentaires d'origine animale, des aliments pour animaux et autres produits d'origine animale)" [<http://www.maep.gov.mg/wp-content/uploads/pdf/DECRET%20CONTROLE%20DAOA.pdf>] Accessed 20 August 2020.

[4] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Elevage à Madagascar)". [<http://extwprlegs1.fao.org/docs/pdf/Mad142805.pdf>]. Accessed 19 August 2020

1.2.2b

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence that Madagascar has a data protection law safeguarding the confidentiality of information generated through animal surveillance. 'Law No. 2006-030: On Livestock' and 'Decree No. 2019-071 defining the scope of the Ministry of Agriculture, Animal Husbandry and Fishery, as well as the Ministry's organizational structure' do not provide for personal data protection.[1,2] However, there is a personal data protection law which safeguards people's individual identifying information such as names and ID numbers. 'Law No. 2014-038: On the protection of personal data' applies to all uses (automated or not) of personal data, contained or searchable in files, handled partially or entirely in Madagascar, except for the purpose of journalism, art or literature, or for exclusively personal use.[3] However, it does not specifically mention personal data gathered during surveillance activities. The 2017 WHO Joint External Evaluation for Madagascar does not

mention data protection.[4] There is no evidence of existing legislation and/or regulations that safeguard the confidentiality of information generated through surveillance activities for animals' owners on the websites of the Ministry of Agriculture, Animal Husbandry and Fisheries or the Ministry of Public Health. The website of the Office for Veterinary Services was not working at the time of research. [5,6,7]

[1] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Elevage à Madagascar)". [<http://extwprlegs1.fao.org/docs/pdf/Mad142805.pdf>]. Accessed 19 August 2020

[2] Ministry of Agriculture, Animal Husbandry and Fishery of Madagascar. 6 February 2019. "Decree No. 2019-071 defining the scope of the Ministre of Agriculture, Animal Husbandry and Fishery, as well as the Ministry's organizational structure (Decret N° 2019- 071 fixant les attributions du Ministre de l'Agriculture, de l'Elevage et de la Pêche ainsi que l'organisation générale de son Ministère)"

[https://www.ippc.int/static/media/files/reportingobligation/2019/04/28/DECRET_ORGANIGRAMME_MAEP_20191.pdf]. Accessed 20 August 2020.

[3] Government of Madagascar. 2015. "Law No. 2014-038: On the protection of personal data (Loi no. 2014-028: Sur la protection des données à caractère personnel)". [<https://www.afapdp.org/wp-content/uploads/2015/01/Madagascar-L-2014-038-du-09-01-15-sur-la-protection-des-donn%C3%A9es-%C3%A0-caract%C3%A8re-personnel.pdf>]. Accessed 20 August 2020.

[4] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[5] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]. Accessed 27 September 2020.

[6] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 27 September 2020.

[7] Office for Veterinary Services (DSV). 2020. Official website [<http://www.dsvmada.com/>]. Attempted to access 27 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 no evidence that any government entity in Madagascar conducts disease surveillance in wildlife. There is no mention of wildlife surveillance in the 2017 WHO Joint External Evaluation for Madagascar, nor in the 2016 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020', which plans for surveillance of certain zoonoses.[1,2]

There is no evidence from the websites of the Ministry of Agriculture, Animal Husbandry and Fisheries, Ministry of Public Health, and Ministry of the Environment and Sustainable Development that they conduct wildlife surveillance. [3,4,5,6,7]. The Indian Ocean Commission works on strengthening the SEGA One Health Network, tasked with monitoring epidemics, but there is no evidence that this includes wildlife monitoring. [8] A 2016 academic study of wild lemurs in Madagascar, screening for blood-borne pathogens, noted that "Relatively few studies ... have focused on pathogen discovery in lemurs and none has implemented modern next-generation disease surveillance methods". There is no reference in the study to similar work being done by government authorities, nor were the authorities involved in supporting this project.[9]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de

mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)".

[http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of Public Health. 2018. Official website. [<http://www.sante.gov.mg/home/n>]; and "Documents (Documents)" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official website. [<https://www.environnement.mg>] and "Documents (Documents)". [<https://www.environnement.mg/publication/>] Accessed 20 August 2020.

[6] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Facebook page [<https://www.facebook.com/maep.Madagascar>]. Accessed 20 August 2020.

[7] Ministry of the Environment and Sustainable Development. 2020. Official Facebook page. [<https://www.facebook.com/TontoloiananaFandrosoanaLovainjafy/>]. Accessed 20 August 2020

[8] Indian Ocean Commission. 2020. Official Website. [<https://www.commissionoceanindien.org/portfolio-items/sega-onehealth/?portfolioCats=27>] Accessed 20 August 2020.

[9] Larsen, P. et al. 2016. "Blood transcriptomes reveal novel parasitic zoonoses circulating in Madagascar's lemurs", in Biology Letters, 12[1], Jan 2016. [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4785921/>]. Accessed 20 August 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: 1.91

2018

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: 6.71

2018

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

Madagascar's legislation on animal disease surveillance, which covers zoonoses, includes a role for private veterinarians, but national plans on zoonoses do not specify mechanisms for working with the private sector. The 2017 WHO Joint External Evaluation for Madagascar notes that "the small workforce of veterinarians under the veterinary authority is reinforced by private practitioners, mandated to carry out supervisory activities related to surveillance, health inspection and prophylaxis".[1] This mandate comes from the 2006 Law on Livestock, which states that livestock owners must report suspected notifiable disease outbreaks to either the public veterinary authority or a private veterinary service. The public or private veterinarian must then confirm the disease and report it to the local and central authorities. The Law does not mention specific mechanisms for working with the private sector in controlling or responding to zoonoses. [2] The health ministry's 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020', which plans for control of several zoonoses, calls for links with private sector partners to be strengthened in the fight against NTD, but does not specify collaboration mechanisms.[3] There is no further evidence on the websites and Facebook pages of the Ministry of Public Health or the Ministry of Agriculture, Animal Husbandry and Fisheries.[4,5,6,7].

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Government of Madagascar. 2006. "Law No. 2006-030: On Livestock (Loi No. 2006-030: Relative à l'Élevage à Madagascar)". [<http://extwprlegs1.fao.org/docs/pdf/Mad142805.pdf>]. Accessed 19 August 2020.

[3] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)".

[http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 20 August 2020.

[4] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/>]. Accessed 20 April 2021.

[5] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Facebook page [<https://www.facebook.com/maep.Madagascar/>]. Accessed 20 April 2021.

[6] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]. Accessed 20 April 2021.

[7] Ministry of Public Health. 2020. Official Facebook page. [<https://www.facebook.com/minsanp>]. Accessed 20 April 2021.

1.3 BIOSECURITY

1.3.1 Whole-of- government biosecurity systems

1.3.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that Madagascar has a record of facilities in which especially dangerous pathogens and toxins are held including details on inventories. According to the 2017 WHO Joint External Evaluation for Madagascar, laboratories handling any pathogens are recorded owing to the requirement for ministerial authorisation. However, there is no evidence that records of the specific pathogens being used or stored in these establishments is maintained. Especially dangerous pathogens tend to converge towards two non-governmental laboratories: the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC). [1] There is no evidence of inventories or record keeping from the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries or the Ministry of National Defence. There is no website for the interior ministry.[2, 3, 4] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[5] The 2020 National Policy on Biosecurity is aimed at regulating the use of genetically modified organisms and does not refer to diseases or pathogens. [6] The Vertic database does not include recent legislation or documents from Madagascar referring to records of the facilities in which especially dangerous pathogens and toxins are stored or processed. [7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

[6] Ministry of the Environmen and Sustainable Development. 2020. "National Policy on Biosecurity in Madagascar (Politique nationale de biosécurité à Madagascar)" [<https://www.environnement.mg/wp-content/uploads/2020/02/Politique-Nationale-de-biosécurité-à-Madagascar.pdf>] Accessed 20 August 2020

[7] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 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 evidence that Madagascar 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 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosecurity and has not adopted a multi-sectoral approach involving health and security agencies. [1] There is no evidence that the situation has been rectified since 2017 on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of Defence, nor from a search for media reports.[2, 3, 4] Since 2020, Madagascar has a national policy on biosecurity, however, it is aimed at regulating the use of genetically modified organisms (GMOs) only and does not refer to diseases or pathogens. [5] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[6] The Vertic database does not include legislation or documents from Madagascar referring 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. [7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. "National Policy on Biosecurity in Madagascar (Politique nationale de biosécurité à Madagascar)" [<https://www.environnement.mg/wp-content/uploads/2020/02/Politique-Nationale-de-biosécurité-à-Madagascar.pdf>] Accessed 20 August 2020

[6] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

[7] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 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

Madagascar does not have legislation or regulations related to biosecurity, or an agency responsible for the subject. According to the 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosecurity, and has not adopted a multi-sectoral approach involving health and security agencies. The

assessment does not mention the existence of an entity charged with overseeing biosecurity, and notes a lack of uniform practice, ranging from strong practice at the non-governmental Pasteur Institute of Madagascar (which serves as a national reference laboratory) to inadequate practice at the main public hospital and veterinary laboratories.[1] There is no evidence that the situation has been rectified since 2017 on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of Defence, nor in the Vertic database. [2, 3, 4, 5] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[6]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2018. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[6] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.3.1d

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities. Madagascar does not have a record of inventories of dangerous pathogens and toxins. According to the 2017 WHO Joint External Evaluation for Madagascar, laboratories handling dangerous pathogens are recorded owing to the requirement for ministerial authorisation, but there is no record of the pathogens being used or stored in these establishments. [1] "As a result of the weak laboratory network and the way that biological sample circuits are organised, especially dangerous pathogens tend to converge towards two non-governmental laboratories: the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC)." [1] The assessment does not note any deliberate efforts to consolidate inventories of especially dangerous pathogens.[1] There is no evidence of efforts to consolidate inventories since 2017 on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of Defence, the Facebook page of the National Environment Office, or in the Vertic database.[2, 3, 4,5,6]. Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[6]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

- [3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.
- [4] Ministry of National Defence. 2018. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.
- [5] National Environment Office. 2020. Official Facebook page. [https://www.facebook.com/one.madagascar/?ref=page_internal] Accessed 20 August 2020
- [6] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.
- [7] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.3.1e

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

Yes = 1, No = 0

Current Year Score: 1

There is evidence that the Pasteur Institute of Madagascar (a national reference laboratory) can conduct PCR testing for Ebola and Covid-19, but there is no evidence of in-country capacity to conduct PCR testing for Anthrax.[1] According to the 2017 WHO Joint External Evaluation for Madagascar, the only institute in the country known to practise international biosecurity standards and to have a Biosafety Level 3 facility is the Pasteur Institute of Madagascar (PIM), a non-governmental institute which serves as national reference laboratory. PIM is one of two laboratories to which dangerous pathogens are channelled, the other being the Charles Mérieux Infectiology Centre.[2] There is no evidence from PIM's list of biomedical services and tests that it offers PCR-based diagnostic testing for anthrax/Ebola. [3,4] However, during the 2014 Ebola outbreak in West Africa, a representative from PIM attended training on Filovirus Real Time RT-PCR assay for Ebola virus detection.[5,6] In the same year, an external quality assessment study was carried out involving laboratories in Africa with the capacity to inactivate and handle suspect samples under biosafety level 3 conditions to perform PCR diagnostic on Ebola suspect individuals. PIM was one of the participating laboratories.[7] There is no evidence that the Charles Mérieux Infectiology Centre has the capacity to perform PCR testing for Ebola or anthrax. Its most advanced facilities are BSL2+.[8]

[1] Le Monde Afrique. 2020. Website. "COVID-19: The Pasteur Institute was shocked to be publicly discredited by the government of Madagascar (Covid-19 : « L'Institut Pasteur a été meurtri d'être publiquement mis en cause par l'Etat malgache »). [https://www.lemonde.fr/afrique/article/2020/05/15/covid-19-l-institut-pasteur-a-ete-meurtri-d-etre-publiquement-mis-en-cause-par-l-etat-malgache_6039802_3212.html] Accessed 21 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Pasteur Institute of Madagascar. 2020. "Centre of clinical biology (Centre de biologie clinique)".

[<http://www.pasteur.mg/departement/analyses-centre-de-biologie-clinique/>]. Accessed 21 August 2020.

[4] Pasteur Institute of Madagascar. 2020. "Catalogue of biomedical tests (Catalogue des analyses de biologie medicale)".

[http://www.pasteur.mg/wp-content/uploads/2018/08/CBC_MP_001_02_Catalogue_des_analyses_CBC_MAJ_200818_V3.pdf]. Accessed 20 August 2020

[5] World Health Organisation (WHO) Uganda. 2014. "Laboratory technicians receive training on real time ebola detection."

[<https://afro.who.int/news/laboratory-technicians-receive-training-real-time-ebola-detection>]. Accessed 21 August 2020.

[6] Pasteur Institute of Madagascar. 2014. "2014 activity report (Rapport d'activités 2014)". [<http://www.pasteur.mg/wp-content/uploads/2015/12/rapport-activit%C3%A9s-2014.pdf>]. Accessed 21 August 2020.

[7] Ellerbrok, H. et al. 2017. "External quality assessment study for ebolavirus PCR-diagnostic promotes international preparedness during the 2014 - 2016 Ebola outbreak in West Africa," in PLOS Neglected Tropical Diseases, 1 May 2017. [<https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0005570>]. Accessed 21 August 2020.

[8] Mérieux Foundation. 2020. Official Website "Rodolphe Mérieux Laboratory of Anatanarivo (Madagascar) (Laboratoire Rodolphe Mérieux D'antananarivo (Madagascar))" [<https://www.fondation-merieux.org/ce-que-nous-faisons/accroitre-access-diagnostic/mettre-en-place-infrastructures/laboratoire-rodolphe-merieux-antananarivo-madagascar/>]. Accessed 21 August 2020.

1.3.2 Biosecurity training and practices

1.3.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar requires biosecurity training using a standardised, required approach for personnel working with especially dangerous pathogens. According to the 2017 WHO Joint External Evaluation for Madagascar, "Health professionals benefit from an initial training in biosecurity and biosafety, but it seems that this training is insufficient. Continued training is up to employers and of variable value." It does not specify who mandates or provides this training, nor whether it addresses how to handle especially dangerous pathogens, though the implication is that it does not. It also notes the absence of a legal and regulatory framework on biosecurity and biosafety, and that biosecurity practices in most laboratories are weak.[1] There is no evidence of what the initial training entails on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, the Ministry of the Environment and Sustainable Development, or the Vertic database. [2, 3, 4, 5, 6] The Pasteur Institute of Madagascar, which plays a role in developing domestic research and laboratory capacity, does not provide any information about biosecurity training on its website, neither does the Infectious diseases centre Charles Mérieux Madagascar. [7,8] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter. [9]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official website. [<https://www.environnement.mg>] and "Documents (Documents)". [<https://www.environnement.mg/publication/>] Accessed 20 August 2020.

[6] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[7] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 20 August 2020.

[8] Infectious diseases centre Charles Mérieux Madagascar. 2020. Official Website. "Training (Formations)" [<https://www.cicm-madagascar.com/activites/formation.html>] Accessed 21 August 2020

[9] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [https://bwc-ecbm.unog.ch/state/Madagascar]. Accessed 20 August 2020

1.3.3 Personnel vetting: regulating access to sensitive locations

1.3.3a

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

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

Current Year Score: 0

Regulations in Madagascar do not require drug testing, background or psychological/mental fitness checks for personnel with access to biological materials with epidemic potential. The country lacks a legal and regulatory framework for biosecurity. The 2017 WHO Joint External Evaluation for Madagascar states that ministerial authorisation is required for laboratories to function (though fails to clarify whether this is for all laboratories or for those handling dangerous pathogens).[1] The Public Health Code mandates authorisation by a competent authority for all biomedical laboratories, and sets standards for becoming a pharmacist (which includes those wishing to run a private biomedical laboratory). These include requirements on residency and professional morality, but do not cover drug testing, background checks, or psychological/mental fitness checks.[2] There is a draft law on biosecurity of 2020, but it does not mention background checks or other tests for personnel dealing with materials with epidemic potential. [3] There is no evidence on background checks on the websites of the on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, or in the Vertic database. [4,5,6,7] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[8]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf]. Accessed 20 August 2020.

[2] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf]. Accessed 20 August 2020.

[3] Ministry of the Environment and Sustainable Development. 2020. Official Website. "Draft law on biosecurity management (Projet de loi relative au regime de la biosecurite)". [https://www.environnement.mg/wp-content/uploads/2020/02/Projet-de-Loi-sur-la-Biosécurité.doc] Accessed 21 August 2020.

[4] Ministry of Public Health. 2020. Official website. [http://www.sante.gov.mg/home/n]. Accessed 20 August 2020.

[5] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [http://www.mpae.gov.mg/]; and "Decrees and Acts (Decrets et Arretes)". [http://www.maep.gov.mg/decrets-et-arretes/]. Accessed 20 August 2020.

[6] Ministry of National Defence. 2020. Official website. [http://www.defense.gov.mg/]. Accessed 20 August 2020.

[7] Vertic. 2020. "Madagascar" [https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/] Accessed 27 September 2020.

[8] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [https://bwc-ecbm.unog.ch/state/Madagascar]. Accessed 20 August 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 evidence that Madagascar has publicly-available information on national regulations on the safe and secure transport of infectious substances, except for a reference to international standards in the case of air travel regulations. The 2017 WHO Joint External Evaluation for Madagascar states that international transport of samples is not a problem thanks to initiatives by the country's most competent laboratories, but international rules are not applied in domestic transport, whether land or air.[1] The civil aviation authority's 'Regulation on safe air transport of dangerous goods in Madagascar' makes frequent reference to the Technical Instructions in Doc 9284 issued by the International Civil Aviation Organisation (ICAO), including for information on how to mark packaging of Category B infectious substances. There is no other specific mention of Category A and B substances.[2] The civil aviation authority provides a number of guidance documents but none on secure transportation of infectious substances.[3] The transport ministry does not have a functioning website and there is no mention of transportation regulations on its Facebook page. [4] It is not addressed in the 2017 Code of the Road. [5] The 2000 Maritime Code contains general provisions on sea transport of dangerous goods but no specific instructions for secure transportation of infectious substances.[6] There is some evidence that the government intends to update the 2000 Maritime Code, but there is no evidence that it has done so. [7, 6]There is no guidance on the website of the Ministry of Public Health or in the 2011 Health Code.[8,9]. There is no relevant information on the websites of the Ministry of Agriculture and Livestock, the Ministry of National Defence, or the Ministry of Higher Education and Scientific Research. [10,11,12] The Ministry of the Interior and Decentralisation and the Ministry of Public Security do not have functioning websites. [13,14] A search of the country's official database of legal texts did not produce any other guidance on this topic.[15] There is no evidence of the existence of national regulations on the safe and secure transport of infectious substances in the Vertic database. [16] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[17]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Madagascar Civil Aviation. 2020. "Air transport regulations of Madagascar 4300: Regulation on the safe air transport of dangerous goods in Madagascar (Règlements Aéronautiques de Madagascar 4300: Règlement relatif à la sécurité du transport aérien des marchandises dangereuses à Madagascar)".

[http://www.acm.mg/IMG/pdf/ram_4300_ed_03_amdt_00.pdf]. Accessed 21 August 2020.

[3] Madagascar Civil Aviation. 2020. "Regulatory texts (Textes réglementaires)".

[<http://www.acm.mg/spip.php?page=accordeon>]. Accessed 21 August 2020.

[4] Ministry of Transport, Tourism and Meteorologie. 2020. Official website. [<http://www.mttm.gov.mg>]. Unable to access on 21 August 2020 ; and Facebook page [<https://www.facebook.com/MTTMMadagascar/>] Accessed on 21 August 2020.

[5] Government of Madagascar. 2004. "Law no. 2004-053 fixing the principles of the land transportation policy (Loi no. 2004-053 fixant les principes de la politique des transports terrestres)". [<http://www.justice.mg/wp-content/uploads/textes/1TEXTES%20NATIONAUX/DROIT%20PUBLIC/Transports/ttf/L2004-053.pdf>]. Accessed 20 August 2020.

[6] Maritime and Fluvial Agency. 2020. Official Website. [<https://www.apmf.mg>] and "Texts

(Textes)"[<https://www.apmf.mg/les-textes-regissant-le-droit-maritime>]. Accessed 21 August 2020.

[7] Newsmada.com. 2019. Website. "Maritime Code : Alignment with IMO conventions (Code Maritime : Aligement avec les conventions de l'OMI)". [<https://www.newsmada.com/2019/01/08/code-maritime-aligement-avec-les-conventions-de-lomi/>]. Accessed 21 August 2020.

[8] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[9] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 20 August 2020.

[10] Ministry of Agriculture and Livestock. 2020. Official website. [<http://www.mpae.gov.mg/>]. Accessed 20 August 2020.

[11] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[12] Ministry of Higher Education and Scientific Research. 2020. Official website. [<http://www.mesupres.gov.mg>] and "Texts and Acts (Textes et Arrêtés) » [<http://www.mesupres.gov.mg/?page=textearrete>] Accessed 21 August 2020.

[13] Ministry of the Interior and Decentralisation. 2020. Official website. [<http://www.mid.gov.mg/>]. Unable to access 21 August 2020.

[14] Ministry of Public Security. 2020. Official website. [<http://www.policenationale.gov.mg/>]. Unable to access 21 August 2020.

[15] Centre National LEGIS. 2020. Official legal text database. [http://www.cnlegis.gov.mg/page_find_direct_mots_texte/]. Accessed 21 August 2020.

[16] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[17] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 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

Though Madagascar has a regulation ensuring oversight of the cross-border transfer of dangerous materials, which requires senders to provide the recipient's name to the authorities, it is not clear that this equates to end-user screening and it is not specific to especially dangerous pathogens. The 2017 WHO Joint External Evaluation for Madagascar notes that Madagascar lacks biosecurity legislation, but the country's leading (non-governmental) laboratories have established systems meeting international standards for international transfer of biological samples. [1] The civil aviation authority's 2017 'Regulation on the safe air transport of dangerous goods in Madagascar' describes the procedure for obtaining an exemption allowing the transport of dangerous goods, defined as "Substances or articles that may pose a health, safety, property or environmental hazard that are listed in the Dangerous Goods List of the Technical Instructions or, if they are not listed, are classified in accordance with these Instructions" (referring to the Technical Instructions in Doc 9284 issued by the International Civil Aviation Organisation). It states that permission must be sought from the state of departure, states which will be flown over, destination state and state of the airline/flight operator. Applications for permission to transport dangerous goods must be sent to the civil aviation authority, including the name and address of the recipient. The application does not ask for information on the end-user if they differ from the recipient and there is no evidence that screening occurs. [2] There is no relevant information on the websites of the Ministry of Agriculture and Livestock, the Ministry of National Defence, or the Ministry of Higher Education and Scientific Research. [3,4,5] The Ministry of the Interior and Decentralisation and the

Ministry of Public Security do not have functioning websites. [6,7]. The Ministry of Transport, Tourism and Meteorologie does not have a functioning website and there is no mention of cross-border transfer of infectious substances on its Facebook page. [8] There is no evidence of the existence of national legislation and/or regulations to oversee the cross-border transfer and end-user screening of especially dangerous pathogens, toxins, and pathogens with pandemic potential in the Vertic database. [9] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter. [10]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 19 August 2020.

[2] Madagascar Civil Aviation. 2017. "Air transport regulations of Madagascar 4300: Regulation on the safe air transport of dangerous goods in Madagascar (Règlements Aéronautiques de Madagascar 4300: Règlement relatif à la sécurité du transport aérien des marchandises dangereuses à Madagascar)". [http://www.acm.mg/IMG/pdf/ram_4300_ed_03_amdt_00.pdf]. Accessed 20 August 2020.

[3] Ministry of Agriculture and Livestock. 2020. Official website. [<http://www.mpae.gov.mg/>]. Accessed 20 August 2020

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020

[5] Ministry of Higher Education and Scientific Research. 2020. Official website. [<http://www.mesupres.gov.mg>] and "Texts and Acts (Textes et Arrêtés) » [<http://www.mesupres.gov.mg/?page=textearrete>] Accessed 21 August 2020.

[6] Ministry of the Interior and Decentralisation. 2020. Official website. [<http://www.mid.gov.mg/>]. Unable to access 21 August 2020.

[7] Ministry of Public Security. 2020. Official website. [<http://www.policenationale.gov.mg/>]. Unable to access 21 August 2020.

[8] Ministry of Transport, Tourism and Meteorologie. 2020. Official website. [<http://www.mttm.gov.mg>]. Unable to access on 21 August 2020 ; and Facebook page [<https://www.facebook.com/MTTMMadagascar/>] Accessed 21 August 2020.

[9] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[10] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.4 BIOSAFETY

1.4.1 Whole-of-government biosafety systems

1.4.1a

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

Yes = 1 , No = 0

Current Year Score: 0

Madagascar lacks biosafety legislation and regulations. According to the 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosafety.[1] There is no evidence that the situation has not been rectified since 2017, either from the Ministry of Public Health, Ministry of Agriculture, Animal Husbandry and Fisheries, Ministry of National Defence, the National Environment Office, or from the VERTIC database.[2, 3, 4, 5, 6] Biosafety is addressed in general terms under the 1994 Code of workplace hygiene, safety and environment, which states that employers are required to provide adequate equipment and clothing to protect workers against any risks to health and life inherent in

the work, and that workers are required to comply with all the employer's safety measures.[7] The 2020 national biosafety policy and a 2012 decree on the establishment and the roles of the official biosafety authorities, focus only on genetically modified organisms (GMOs). [8,9] Their definition of biosafety is as follows: "Policies and procedures adopted in order to guarantee the application, without risk to the environment, of modern biotechnology in matters of medicine, agriculture, fishing, livestock rearing, industry and environment, and to prevent risks to health and to environmental safety." [8,9] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[10]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2018. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] National Environment Office. 2020. Official Facebook page. [https://www.facebook.com/one.madagascar/?ref=page_internal] Accessed 20 August 2020

[6] VERTIC. 2020. Website. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 21 August 2020.

[7] Government of Madagascar. 1994. "Law no. 94-027: Code of workplace hygiene, safety and environment (Loi no. 94-027: Code d'hygiène, de sécurité et de l'environnement du travail)". [https://www.vertic.org/media/National%20Legislation/Madagascar/MG_Loi_94_027_Code_hygiene_securite.pdf]. Accessed 21 August 2020. [8] Ministry of the Environment and Sustainable Development. 2020. "National Policy on Biosecurity in Madagascar (Politique nationale de biosecurité à Madagascar)" [<https://www.environnement.mg/wp-content/uploads/2020/02/Politique-Nationale-de-biosecurité-à-Madagascar.pdf>] Accessed 20 August 2020.

[9] Government of Madagascar. 2012. "Decree no. 2012-833: Establishment, functioning and attributions of the various organs of biosafety in Madagascar (Décret no. 2012-833: Portant mise en place, fonctionnement et attributions des divers organes de la biosécurité a Madagascar)". [<https://www.environnement.mg/publication/decret-n-2012-833-portant-mise-en-place-fonctionnement-et-attributions-des-divers-organes-de-la-biosecurite-a-madagascar/>]. Accessed 21 August 2020.

[10] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

Madagascar does not have biosafety legislation and regulations or an agency for biosafety. According to the 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosafety, and the assessment does not mention an authority responsible for developing such regulations.[1] There is no evidence that the situation has not been rectified since 2017, either from the Ministry of Public Health, Ministry of Agriculture, Animal Husbandry and Fisheries, Ministry of National Defence, the National Environment Office, or from the VERTIC database.[2, 3, 4, 5, 6]

Biosafety is addressed in general terms under the 1994 Code of workplace hygiene, safety and environment, which states

that employers are required to provide adequate equipment and clothing to protect workers against any risks to health and life inherent in the work, and that workers are required to comply with all the employer's safety measures.[7] The 2020 national biosafety policy and a 2012 decree on the establishment and the roles of the official biosafety authorities, focus only on genetically modified organisms (GMOs). [8,9]

Their definition of biosafety is as follows: "Policies and procedures adopted in order to guarantee the application, without risk to the environment, of modern biotechnology in matters of medicine, agriculture, fishing, livestock rearing, industry and environment, and to prevent risks to health and to environmental safety." [8,9]

The environment ministry is the national competent authority for biosafety. A cross-ministerial National Biosafety Committee is responsible for developing biosafety policies and laws.[9] It does not have an online presence. The environment ministry's website does not contain any information, policies or laws related to biosafety in the sense applied here.[10] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[11]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2018. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] National Environment Office. 2020. Official Facebook page. [https://www.facebook.com/one.madagascar/?ref=page_internal] Accessed 20 August 2020

[6] VERTIC. 2020. Website. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 21 August 2020.

[7] Government of Madagascar. 1994. "Law no. 94-027: Code of workplace hygiene, safety and environment (Loi no. 94-027: Code d'hygiène, de sécurité et de l'environnement du travail)".

[https://www.vertic.org/media/National%20Legislation/Madagascar/MG_Loi_94_027_Code_hygiene_securite.pdf]. Accessed 21 August 2020.

[8] Ministry of the Environment and Sustainable Development. 2020. "National Policy on Biosecurity in Madagascar (Politique nationale de biosecurité à Madagascar)" [<https://www.environnement.mg/wp-content/uploads/2020/02/Politique-Nationale-de-biosécurité-à-Madagascar.pdf>] Accessed 20 August 2020.

[9] Government of Madagascar. 2012. "Decree no. 2012-833: Establishment, functioning and attributions of the various organs of biosafety in Madagascar (Décret no. 2012-833: Portant mise en place, fonctionnement et attributions des divers organes de la biosécurité a Madagascar)". [<https://www.environnement.mg/publication/decret-n-2012-833-portant-mise-en-place-fonctionnement-et-attributions-des-divers-organes-de-la-biosecurite-a-madagascar/>]. Accessed 21 August 2020.

[10] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[11] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.4.2 Biosafety training and practices

1.4.2a

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Madagascar has biosafety training using a standardised, required approach for personnel working with especially dangerous pathogens. According to the 2017 WHO Joint External Evaluation for Madagascar, "Health professionals benefit from an initial training in biosecurity and biosafety, but it seems that this training is insufficient. Continued training is up to employers and of variable value." It does not specify who mandates or provides this training, nor whether it addresses how to handle especially dangerous pathogens, though the implication is that it does not. It also notes the absence of a legal and regulatory framework on biosecurity and biosafety, and that biosafety practices in most laboratories are weak.[1] There is no evidence of what the initial training entails, either from the Ministry of Public Health, Ministry of Agriculture, Animal Husbandry and Fisheries, Ministry of National Defence, Ministry of the Environment and Sustainable Development or National Environment Office, or from a search for media reports.[2, 3, 4, 5, 6] The Pasteur Institute of Madagascar, which is the only the only institute in the country known to practise international biosafety standards and plays a role in developing domestic research and laboratory capacity, does not provide any information about biosafety training on its website.[1, 7] There is no evidence that Madagascar has biosafety training using a standardised, required approach for personnel working with especially dangerous pathogens from the Vertic database. [8] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[9]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[6] National Environment Office. 2020. Official Facebook page.

[https://www.facebook.com/one.madagascar/?ref=page_internal] Accessed 20 August 2020

[7] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 20 August 2020.

[8] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[9] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.5 DUAL-USE RESEARCH AND CULTURE OF RESPONSIBLE SCIENCE

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

1.5.1a

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Madagascar has conducted an assessment to determine whether ongoing research is occurring on especially dangerous pathogens, toxins, pathogens with pandemic potential, or other dual use research. According to the 2017 WHO Joint External Evaluation for Madagascar, laboratories handling any pathogens are recorded owing to the requirement for ministerial authorisation, but there is no record of the pathogens being used or stored in these establishments. "As a result of the weak laboratory network and the way that biological sample circuits are organised, especially dangerous pathogens tend to converge towards two non-governmental laboratories: the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC) ». [1] The assessment puts the weak biosecurity system down to the lack of national legislation and regulations.[1] There is no evidence that the situation has been rectified since 2017, either from the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, the Ministry of the Environment and Sustainable Development, the Ministry of Higher Education and Scientific Research, from PIM or CMIC, from the Vertic database, or from a search for media reports. [2, 3, 4, 5, 6, 7, 8, 9] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[10]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 18 September 2018.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[6] Ministry of Higher Education and Scientific Research. 2020. Official Website. [<http://www.mesupres.gov.mg>] Accessed 21 August 2020.

[7] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 21 August 2020.

[8] Mérieux Foundation. 2020. "Rodolphe Mérieux Laboratory of Antananarivo (Madagascar)". [<https://www.fondation-merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/>]; and "Madagascar". [<https://www.fondation-merieux.org/en/where-we-work/madagascar/>]. Accessed 20 August 2020.

[9] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[10] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar."

[<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 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 evidence that Madagascar has legislation or regulations related to dual-use research. According to the 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosecurity, and has not adopted a multi-sectoral approach involving health and security agencies. It does not mention a policy on dual-use research.[1] There is no evidence that the situation has been rectified since 2017, either from the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, the Ministry of the Environment and Sustainable Development, the Ministry of Higher Education and Scientific Research, from the Vertic database, or from a search for media reports. [2, 3, 4, 5, 6, 7] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[8]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[6] Ministry of Higher Education and Scientific Research. 2020. Official Website. [<http://www.mesupres.gov.mg>] Accessed 21 August 2020.

[7] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[8] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.5.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has an agency responsible for oversight of dual-use research, or any regulations on this to enforce. According to the 2017 WHO Joint External Evaluation for Madagascar, the country lacks a national legal and regulatory framework for biosecurity, and has not adopted a multi-sectoral approach involving health and security agencies. It does not mention an entity responsible for oversight of dual-use research.[1] There is no evidence that the situation has

been rectified since 2017, either from the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, the Ministry of the Environment and Sustainable Development, the Ministry of Higher Education and Scientific Research, from the Vertic database, or from a search for media reports. [2, 3, 4, 5, 6, 7] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[8]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 18 September 2018.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[5] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[6] Ministry of Higher Education and Scientific Research. 2020. Official Website. [<http://www.mesupres.gov.mg>] Accessed 21 August 2020.

[7] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[8] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 2020.

1.5.2 Screening guidance for providers of genetic material

1.5.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has national legislation or a regulation, policy, or other guidance, requiring the screening of synthesized DNA before it is sold. Madagascar has signed up to the Cartagena Protocol and has a number of biosafety regulations and policies which address risks related to genetically-modified organisms (GMOs).[1] In 2020, a national biosafety policy and a law project was issued. They do not specifically mention screening of modified DNA for sale.[2, 3] The 2011 Public Health Code requires an environmental impact study to be carried out before the introduction of any GMO organisms into the country.[4] No further information on screening of synthesized DNA can be found on the websites of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, the Ministry of National Defence, the Ministry of the Environment and Sustainable Development, the Ministry of Higher Education and Scientific Research, from the Vertic database, or from a search for media reports.[5, 6, 7, 8, 9, 10] Although Madagascar is party to the Biological Weapons Convention and submitted Confidence Building Measures in 2012, 2017 and 2019, public access to the reports is restricted and it is unknown if they contain information on this matter.[11]

[1] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/index.php?s=biosecurite>] Accessed 20 August 2020.

[2] Ministry of the Environment and Sustainable Development. 2020. "National biosecurity policy of Madagascar (Politique

Nationale de biosécurité à Madagascar)". [<https://www.environnement.mg/publication/politique-nationale-de-biosecurite-a-madagascar/>] Accessed 21 August 2020

[3] Ministry of the Environment and Sustainable Development. 2020. "Law project on biosafety/biosecurity management (Projet de loi relative au regime de la biosecurité) » [<https://www.environnement.mg/publication/projet-de-decret-de-nomination-des-laboratoires-de-reference-en-matiere-de-detection-dogm/>] Accessed 21 August 2020

[4] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 20 August 2020.

[5] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[6] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[7] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 20 August 2020.

[8] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[9] Ministry of Higher Education and Scientific Research. 2020. Official Website. [<http://www.mesupres.gov.mg>] Accessed 21 August 2020.

[10] Vertic. 2020. "Madagascar" [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/m/>] Accessed 27 September 2020.

[11] The United Nations Office at Geneva (UNOG). N.d. "BWC Electronic Confidence Building Measures Portal: Madagascar." [<https://bwc-ecbm.unog.ch/state/Madagascar>]. Accessed 20 August 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: 0

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: 1

There is evidence that Madagascar's national laboratory system, with the formal participation of the non-governmental Pasteur Institute of Madagascar (PIM), has the capacity to perform at least 5 of the 10 WHO-defined core diagnostic tests: PCR for influenza, microscopy tests for mycobacterium tuberculosis (TB), serology for HIV, rapid diagnostic testing for malaria, and at least one other test (possibly virus culture for polio) although this is not specified. According to the 2017 WHO Joint External Evaluation (JEE) for Madagascar, Madagascar has a public health laboratory system with national and regional laboratories, in which PIM formally participates at the national level. Madagascar receives a score of 4 for indicator D.1.1 in the assessment, which indicates that the laboratory system is capable of conducting five or more of the ten core tests.[1] There is evidence from sources other than the JEE for capacity to perform at least 4 core tests. PIM's Virology Unit is recognised by the World Health Organisation (WHO) as the national reference laboratory for influenza and polio.[2] Details from PIM indicate that it has the capacity to perform PCR tests for influenza and COVID-19 and virology diagnosis for polio (test unspecified).[3,4,5] PIM's Clinical Biology Centre (CBC) is the national reference centre for salmonella, jointly with its Food and Environmental Hygiene Laboratory.[6] The centre offers serology tests for S. Typhi but not bacterial cultures, according to its list of services.[7] PIM's Mycobacteria Unit is the national reference centre for TB. It has biosafety level 3 facilities and performs microscopy tests for mycobacterium tuberculosis.[8] The national and regional reference laboratories for HIV are under the health ministry. They conduct screening for HIV using blood samples.[9,10] No information is available on the exact test(s) used, either from the 2013-2017 plan for combatting AIDS, from the National Committee for Combatting HIV/AIDS, or from the health ministry nor do the reference laboratories have an online presence. [9,10,11] PIM also offers an HIV screening service, using a chemiluminescent microparticle immunoassay test, a form of serology. [6] The National Reference Centre for Malaria, under the health ministry, performs rapid diagnostic testing for malaria and rapid testing is available widely throughout the country.[1,12,13] There is no evidence that Madagascar has defined country-specific core tests, either from the health ministry's website or from a search for WHO reports and media articles.[13]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Pasteur Institute of Madagascar. 2018. "Virologie unit (unité de virologie)". [<http://www.pasteur.mg/departement/unite-virologie/>]. Accessed 21 August 2020.

[3] World Health Organisation (WHO). 2009. "Countries able to perform PCR to diagnose influenza A (H1N1) virus infection in humans". [http://www.who.int/csr/resources/publications/swineflu/labspcrcapacitydetectinfluenzaa_20090504.pdf]. Accessed 21 August 2020.

- [4] Le Monde Afrique. 2020. Website. "COVID-19: The Pasteur Institute was shocked to be publicly discredited by the government of Madagascar (Covid-19 : « L'Institut Pasteur a été meurtri d'être publiquement mis en cause par l'Etat malgache »). [https://www.lemonde.fr/afrique/article/2020/05/15/covid-19-l-institut-pasteur-a-ete-meurtri-d-etre-publiquement-mis-en-cause-par-l-etat-malgache_6039802_3212.html] Accessed 21 August 2020.
- [5] Pasteur Institute of Madagascar. 2014. "Emergence of Poliovirus: Pasteur Institute of Madagascar actively involved in the fight (Emergence de Poliovirus : l'Institut Pasteur de Madagascar, activement impliqué dans la lutte)". [<http://www.pasteur.mg/emergence-de-poliovirus-linstitut-pasteur-de-madagascar-activement-implique-dans-la-lutte/>] Accessed 21 August 2020.
- [6] Pasteur Institute of Madagascar. 2018. "Clinical biology centre (Centre de biologie clinique)". [<http://www.pasteur.mg/departement/analyses-centre-de-biologie-clinique/>]. Accessed 21 August 2020.
- [7] Pasteur Institute of Madagascar. 2018. "Catalogue of biomedical tests (Catalogue des analyses de biologie medecale)". [http://www.pasteur.mg/wp-content/uploads/2018/08/CBC_MP_001_02_Catalogue_des_analyses_CBC_MAJ_200818_V3.pdf]. Accessed 20 August 2020.
- [8] Pasteur Institute of Madagascar. 2020. "Mycobacteria Unit (Unité des Mycobactéries)". [<http://www.pasteur.mg/departement/unite-mycobacteries/>]. Accessed 21 August 2020.
- [9] Government of Madagascar. 2013. "National strategic plan for responding to sexually-transmitted infections and AIDS in Madagascar 2013-2017 (Plan stratégique national de réponse aux infections sexuellement transmissibles et au SIDA a Madagascar 2013-2017). [https://www.childrenandaids.org/sites/default/files/2018-05/Madagascar_Nat%20Strat%20Plan%20for%20STIs%20and%20AIDS_2013-2017%20fr.pdf]. Accessed 21 August 2020.
- [10] Executive Secretariat, Madagascar National Committee for Combatting HIV/AIDS. N.d. "Biological and behavioural surveillance (Surveillance biologique et comportementale)". [https://www.aidsmada.mg/index.php?option=com_content&view=article&id=25&Itemid=132]. Accessed 21 August 2020.
- [11] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.
- [12] Government of Madagascar. 2013. "Madagascar strategic plan for combatting malaria 2013-2017 (Plan stratégique de lutte contre le paludisme Madagascar 2013-2017)". [<https://tpeeradicationpaludismesite.files.wordpress.com/2017/01/05-madagascar2013-2017.pdf>]. Accessed 21 August 2020.
- [13] World Health Organisation (WHO). 2013. "Fighting malaria: Madagascar presents progress results and opens the National Centre for Combatting Malaria (Lutte contre le paludisme: Madagascar présente les résultats des progrès accomplis et inaugure le Centre National de Lutte contre le Paludisme)". Health in Madagascar, bulletin no. 46, Jun 2013. [<https://www.afro.who.int/node/3950>]. Accessed 21 August 2020.

2.1.1b

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

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

Current Year Score: 0

There is no evidence that Madagascar has a national plan for conducting testing during a public health emergency which includes considerations for testing for novel pathogens, or defining goals for testing. According to the 2017 WHO Joint External Evaluation for Madagascar, Madagascar had reacted to several crises in the past 5 years in a coordinated manner, based on existing contingency plans. [1] On the website of the 'Center for the prevention and management of emergencies (cellule de prévention et gestion des urgences CPGU)' there are several laws and decrees on emergency reactions [2], namely 'Law No. 2015-031 on national policy for the management of risks and catastrophes', the 'National Strategy for the Management of risks and catastrophes 2016-2030', 'Decree No. 2019-1954 on the modalities of application of the law no.

2015-031 on national policy for the management of risks and catastrophes' and 'Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC)'. [3, 4, 5, 6]. None of these mention testing for novel pathogens, scaling capacity, or goals for testing. [3, 4, 5, 6] As a response to the on-going public health crisis due to COVID-19, the government of Madagascar published the 'Multi-sectorial emergency plan Madagascar' in July 2020. [7] This plan does not mention testing for novel pathogens, or goals for testing, but does mention upscaling testing capacities, at least for COVID-19. [7]. There is no evidence of a plan including considerations for testing for novel pathogens on the website of the Ministry of Public Health [8], or on the websites of the National Office for the management of risks and catastrophes (BNGRC) [9] or the Office for the prevention and management of emergencies (CPGU) [10].

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacités RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Centre for the prevention and management of emergencies (CPGU). 2020. Official Website.

[<http://www.primature.gov.mg/cpgu/>]; and "Laws and decrees (Lois et décrets)"

[<http://www.primature.gov.mg/cpgu/index.php/loi-et-decret/>] Accessed 22 August.

[3] Government of Madagascar. 2016. "Law No. 2015-031 on national policy for the management of risks and catastrophes (Loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)"

[http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/PNGRC_2015-031_VERSION_FRANCAISE.pdf] Accessed 22 August 2020.

[4] Government of Madagascar. 2016. "National Strategy for the Management of risks and catastrophes 2016-2030 (Stratégie Nationale de Gestion des Risques et des Catastrophes 2016-2030)". [http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/SNGRC_finale.pdf] Accessed 22 August 2020

[5] Government of Madagascar. 2019. "Decree No. 2019-1954 on the modalities of application of the law no. 2015-031 on national policy for the management of risks and catastrophes (Decret N° 2019-1954 Fiant les modalités d'application de la loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)". Accessed 22 August 2020

[6] Government of Madagascar. 2019. "Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC) (Decret N° 2019-1958 fixant l'organisation, le fonctionnement et les attributions du Bureau National de gestion des risques et des catastrophes (BNGRC))".

[<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N-2019-1958-BNGRC.pdf>] Accessed 22 August 2020.

[7] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 24 September 2020.

[8] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 1 October 2020.

[9] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

[10] Office for the prevention and management of emergencies (CPGU). 2020. Official Website.

[<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.

2.1.2 Laboratory quality systems

2.1.2a

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

Yes = 1 , No = 0

Current Year Score: 1

Madagascar's national reference laboratories in the Pasteur Institute of Madagascar (PIM) are accredited in part and PIM's reference laboratory for salmonella is accredited. PIM's Virology Unit is recognised by the World Health Organisation (WHO) as the national reference laboratory for influenza and polio.[1, 2] According to PIM's 2018 activity report, it was accredited for French Standard NF EN ISO 15189 V2012 on biomedical laboratory testing in December 2018. [2] PIM's Clinical Biology Centre (CBC) is the national reference centre for salmonella, together with PIM's Food and Environmental Hygiene Laboratory (LHAE).[4, 5] The CBC is internally audited for compliance with NF EN ISO 15189 V2012 and COFRAC SH REF 02.[2] (The latter provides an authorised explanation for a French legal context of the application of NF EN ISO 15189 V2012 and NF EN ISO 22870 V2006, on conducting anatomical and pathological cytology testing).[6] The CBC was accredited by COFRAC for NF EN ISO 15189 in December 2018. [2] The FEHL has achieved accreditation for NF EN ISO/CEI 17025, on competence of testing and calibration laboratories.[2] PIM's Mycobacteria Unit is the national reference centre for tuberculosis.[9] There is no evidence that it has accreditation.[2, 9] The national reference laboratories for Malaria and HIV/AIDS are under the health ministry.[10, 11, 12] They have no online presence and no evidence of accreditation can be found from the health ministry, from the National Committee for Combatting HIV/AIDS, or a wider online search.[12, 13] The domestic standards agency is the Madagascar Standards Office.[14] Its website was not functioning at the time of research.[15]

[1] Pasteur Institute of Madagascar. 2018. "Virologie unit (unité de virologie)". [<http://www.pasteur.mg/departement/unite-virologie/>]. Accessed 22 August 2020.

[2] Pasteur Institute of Madagascar. 2020. "Report of activities 2018 (Rapport d'activités 2018)". [<http://www.pasteur.mg/publication/rapport-dactivites-2018/>]. Accessed 22 August 2020

[3] AFNOR. 2018. "NF EN ISO 15189 December 2012 (NF EN ISO 15189 Décembre 2012)". [<https://www.boutique.afnor.org/norme/nf-en-iso-15189/laboratoires-de-biologie-medicale-exigences-concernant-la-qualite-et-la-competence/article/678634/fa157270>]. Accessed 22 August 2020.

[4] Pasteur Institute of Madagascar. 2018. "Clinical biology centre (Centre de biologie clinique)". [<http://www.pasteur.mg/departement/analyses-centre-de-biologie-clinique/>]. Accessed 22 August 2020.

[5] Pasteur Institute of Madagascar. 2018. "(Food and Environmental Hygiene Laboratory (FEHL) Laboratoire d'Hygiène des Aliments et de l'Environnement (LHAE))". [<http://www.pasteur.mg/departement/lhae/>]. Accessed 22 August 2020

[6] Cofrac. N.d. "Requirements for accreditation according to the standard NF EN ISO 15189 (Exigences pour l'accréditation selon la norme NF EN ISO 15189)". [<https://www.cofrac.fr/documentation/SH-REF-02>]. Accessed 22 August 2020.

[7] Pasteur Institute of Madagascar, Centre of Clinical Biology. 2016. "Declaration of the quality policy of the laboratory (Déclaration de la politique qualité du laboratoire)". [<http://www.pasteur.mg/wp-content/uploads/2015/03/Politique-Qualit%C3%A9-CBC.pdf>]. Accessed 22 August 2020

[8] COFRAC. 2018. "Testing and calibration laboratories (ISO CEI 17025) (Laboratoires d'étalonnages et d'essais (ISO CEI 17025))". [https://www.cofrac.fr/fr/documentation/index.php?fol_id=46]. Accessed 22 August 2020.

[9] Pasteur Institute of Madagascar. 2018. "Mycobacteria Unit (Unité des Mycobactéries)". [<http://www.pasteur.mg/departement/unite-mycobacteries/>]. Accessed 22 August 2020..

[10] Government of Madagascar. 2013. "Madagascar strategic plan for combatting malaria 2013-2017 (Plan stratégique de lutte contre le paludisme Madagascar 2013-2017)". [<https://tpeeradicationpaludismesite.files.wordpress.com/2017/01/05-madagascar2013-2017.pdf>]. Accessed 22 August 2020.

[11] Government of Madagascar. 2013. "National strategic plan for responding to sexually-transmitted infections and AIDS in Madagascar 2013-2017 (Plan stratégique national de réponse aux infections sexuellement transmissibles et au SIDA a Madagascar 2013-2017)". [https://www.childrenandaids.org/sites/default/files/2018-05/Madagascar_Nat%20Strat%20Plan%20for%20STIs%20and%20AIDS_2013-2017%20fr.pdf]. Accessed 31 October 2018.

[12] Executive Secretariat, Madagascar National Committee for Combatting HIV/AIDS. N.d. "Biological and behavioural surveillance (Surveillance biologique et comportementale)".

- [https://www.aidsmada.mg/index.php?option=com_content&view=article&id=25&Itemid=132]. Accessed 22 August 2020.
- [13] Ministry of Public Health. 2018. Official website. [http://www.sante.gov.mg/home/n]. Accessed 22 August 2020.
- [14] Ministry of Commerce and Consumption. 2018. "Madagascar Standards Office (Bureau des Normes de Madagascar)". [http://www.commerce.gov.mg/le-ministere/les-organismes-rattaches/bureau-des-normes-des-madagascar-bnm/]. Accessed 31 October 2018.
- [15] Madagascar Standards Office. 2020. Official website. [www.bng.mg]. Attempted to access on 22 August 2020.

2.1.2b

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

Yes = 1, No = 0

Current Year Score: 1

Madagascar's reference laboratories in the Pasteur Institute of Madagascar (PIM) are subject to external quality assurance review, as are public (sub-national) regional reference laboratories for HIV. PIM's Virology Unit is recognised by the World Health Organisation (WHO) as the national reference laboratory for influenza and polio, which entails external checks by the WHO.[1, 2, 3, 4] PIM's Clinical Biology Centre (CBC) is the national reference centre for salmonella. It is subject to regular external quality checks.[5] PIM's Mycobacteria Unit is the national reference centre for tuberculosis. Its service falls under the CBC, so it is assumed that the CBC's quality checks apply.[6] The national reference laboratories for Malaria and HIV/AIDS are under the Ministry of Public Health.[7, 8, 9] PIM provides a quality control service for the Ministry of Public Health of rapid testing at malaria surveillance sites.[10] No specific information is available regarding quality control of reference laboratories for malaria.[7, 11]. There is a quality control system for public health laboratories conducting HIV screening, under which all positive blood samples from regional reference laboratories are sent to the national reference laboratory for external quality control. There is no evidence that the national reference laboratory for HIV is subject to external quality control.[12]

- [1] Pasteur Institute of Madagascar. 2018. "Virologie unit (unité de virologie)". [http://www.pasteur.mg/departement/unite-virologie/]. Accessed 22 August 2020.
- [2] World Health Organisation (WHO). "WHO External Quality Assessment Project for the detection of influenza viruses by PCR". [https://www.who.int/influenza/gisrs_laboratory/external_quality_assessment_project/en/] Accessed 22 August 2020.
- [3] Southern African Development Community (SADC). 2009. "Assessment report on reference laboratories in the SADC Region." [https://www.sadc.int/files/4214/1171/6731/Assessment_Report_onReference_Laboratories_in_theSADC_Region.pdf] Accessed 22 August 2020. [4] Diop, O. et al. 2017. "The Global Polio Laboratory Network as a platform for the viral vaccine-preventable and emerging diseases laboratory networks", in The Journal of Infectious Diseases, 216(suppl_1), 1 Jul 2017. [https://academic.oup.com/jid/article/216/suppl_1/S299/3935070]. Accessed 22 August 2020.
- [5] Pasteur Institute of Madagascar. 2020. "Clinical biology centre (Centre de biologie clinique)". [http://www.pasteur.mg/departement/analyses-centre-de-biologie-clinique/]. Accessed 22 August 2020.
- [6] Pasteur Institute of Madagascar. 2020. "Mycobacteria Unit (Unité des Mycobactéries)". [http://www.pasteur.mg/departement/unite-mycobacteries/]. Accessed 22 August 2020.
- [7] Government of Madagascar. 2013. "Madagascar strategic plan for combatting malaria 2013-2017 (Plan stratégique de lutte contre le paludisme Madagascar 2013-2017)". [https://tpeeradicationpaludismesite.files.wordpress.com/2017/01/05-madagascar2013-2017.pdf]. Accessed 22 August 2020.
- [8] Government of Madagascar. 2013. "National strategic plan for responding to sexually-transmitted infections and AIDS in Madagascar 2013-2017 (Plan stratégique national de réponse aux infections sexuellement transmissibles et au SIDA a Madagascar 2013-2017)". [https://www.childrenandaids.org/sites/default/files/2018-05/Madagascar_Nat%20Strat%20Plan%20for%20STIs%20and%20AIDS_2013-2017%20fr.pdf]. Accessed 22 August 2020.

- [9] Executive Secretariat, Madagascar National Committee for Combatting HIV/AIDS. N.d. "Biological and behavioural surveillance (Surveillance biologique et comportementale)". [https://www.aidsmada.mg/index.php?option=com_content&view=article&id=25&Itemid=132]. Accessed 22 August 2020.
- [10] Pasteur Institute of Madagascar. 2018. "Malaria Research Unit (Unité de Recherche sur le Paludisme)". [<http://www.pasteur.mg/departement/unite-paludisme/>]. Accessed 22 August 2020.
- [11] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.
- [12] Ministry of Public Health. 2011. "HIV counselling and screening in Madagascar: Standards and procedures". [https://www.jica.go.jp/madagascar/french/office/others/pdf/publications02_03.pdf]. Accessed 22 August 2020.

2.2 LABORATORY SUPPLY CHAINS

2.2.1 Specimen referral and transport system

2.2.1a

Is there a nationwide specimen transport system?

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has a nationwide specimen transport system. According to the 2017 WHO Joint External Evaluation (JEE) for Madagascar, international transport of samples is not a problem thanks to initiatives by the country's most competent laboratories, but international rules are not applied in domestic transport, whether land or air. The country lacks a national network of public health laboratories and a secure specimen transfer and transport system. The JEE report states: "The case of epidemiological surveillance of plague is emblematic in this respect. The current system is efficient, rustic and inexpensive, but it does not comply with international rules." [1] There is no evidence that a secure specimen transport system has been put in place since the JEE was carried out, either from the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries, or from media reports. [2,3] The national reference laboratories do not have an online presence.

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 21 August 2020.

[2] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/> Accessed 21 August 2020.

[3] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

2.2.2 Laboratory cooperation and coordination

2.2.2a

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

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

Current Year Score: 0

There is no evidence that Madagascar has a plan to rapidly authorize or license laboratories to supplement the capacity of the national public health laboratory system to scale-up testing during an outbreak. The 2017 WHO Joint External Evaluation for Madagascar recommends "the development of conventions or accords with providers or laboratories in public health emergency situations". [1] There is no evidence that accords or plans of this kind have been developed since. There is no mention of such plans in 'Law No. 2015-031 on national policy for the management of risks and catastrophes' [2], nor in the 'National Strategy for the Management of risks and catastrophes 2016-2030' [3], nor in 'Decree No. 2019-1954 on the modalities of application of the law no. 2015-031 on national policy for the management of risks and catastrophes' [4], 'Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC)'[5] or in 'Decree No. 2019 - 1959 on the organisation, scope and mode of functioning of the Center for the prevention and support in the management of emergencies to the Prime Minister's Office' [6]. The 2020 COVID-19 crisis has seen the deployment of a mobile laboratory by the Pasteur Institute of Madagascar, in support of the government. There is no evidence that this deployment was based on existing emergency plans. [7] There is no evidence of such plans on the websites of the Ministry of Public Health or of the Ministry of Agriculture, Animal Husbandry and Fisheries. [8, 9]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Government of Madagascar. 2016. "Law No. 2015-031 on national policy for the management of risks and catastrophes (Loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)" [http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/PNGRC_2015-031_VERSION_FRANCAISE.pdf] Accessed 22 August 2020.

[3] Government of Madagascar. 2016. "National Strategy for the Management of risks and catastrophes 2016-2030 (Stratégie Nationale de Gestion des Risques et des Catastrophes 2016-2030)". [http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/SNGRC_finale.pdf] Accessed 22 August 2020

[4] Government of Madagascar. 2019. "Decree No. 2019-1954 on the modalities of application of the law no. 2015-031 on national policy for the management of risks and catastrophes (Decret N° 2019-1954 Fiant les modalités d'application de la loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)". [<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N-2019-1954-PNGRC-VF.pdf>] Accessed 1 October 2020.

[5] Government of Madagascar. 2019. "Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC) (Decret N° 2019-1958 fixant l'organisation, le fonctionnement et les attributions du Bureau National de gestion des risques et des catastrophes (BNGRC))". [<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N-2019-1958-BNGRC.pdf>] Accessed 22 August 2020.

[6] Government of Madagascar. 2019. "Decree No. 2019 - 1949 on the organisation, scope and mode of functioning of the Center for the prevention and support in the management of emergencies to the Prime Minister's Office (Decret N° 2019 - 1949 fixant l'organisation, les attributions et le fonctionnement de la cellule de prévention et d'appui à la gestion des urgences à la Primature (CPGU))". [<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N2019-1949-CPGU-VF.pdf>] Accessed 22 August 2020

[7] Pasteur Institute of Madagascar. 2020. Website. "The deployment of a mobile laboratory to Tomasina - Biologic testing of COVID-19 " Déploiement du laboratoire mobile à Tomasina - Diagnostic biologique du COVID-19)" [<http://www.pasteur.mg/deploiement-du-laboratoire-mobile-a-tomasina-diagnostic-biologique-du-covid-19/>] Accessed 22 August 2020.

[8] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 21 August 2020.

[9] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

2.3 REAL-TIME SURVEILLANCE AND REPORTING

2.3.1 Indicator and event-based surveillance and reporting systems

2.3.1a

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

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

Current Year Score: 1

There is evidence that Madagascar is conducting ongoing event-based surveillance (EBS) for infectious diseases, but not that data is analysed on a daily basis. The national emergency operations centre for health-related emergencies, the National Operational and Strategic Centre for Epidemiological Surveillance (CNOSSE), receives some EBS information. CNOSSE sits under the Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE), part of the Ministry of Public Health.[1] According to the 2017 WHO Joint External Evaluation for Madagascar, public health events are reported to the DVSSE at the national level by SMS and tablet for 17 out of 114 health districts and from sentinel sites. It notes that EBS needs strengthening, and more training on EBS is needed for community-based healthcare personnel.[2] A review of the EBS system by the head of epidemiological surveillance in September 2017 notes that EBS is conducted informally without a well-defined structure, and is relatively new. EBS information is gathered through weekly paper-based surveillance reports, community-based surveillance drawing on a network of agents, and information gathered from the media and rumours. Weaknesses include poor staff skills in managing and exploiting data, leaving many events unexplored; lack of supervision; and delays/non-reporting related to poor telephone connectivity.[3] There is no evidence that the information gathered through EBS is analysed on a daily basis from the sources cited above, the Ministry of Public Health, the Ministry of Agriculture, the Pasteur Institute of Madagascar (which serves as a national laboratory and operates disease surveillance systems for several infectious diseases), the the Center for the prevention and support in the management of emergencies to the Prime Minister's Office (CPGU), recent World Health Organisation reports discussing event-based surveillance in Madagascar, or from a wider online search.[1, 2, 3, 4, 5, 6, 7, 8, 9]

[1] World Health Organisation (WHO) Madagascar. 2017. "Launch of the National Operational and Strategic Centre for Epidemiological Surveillance (NOSCES) (Inauguration du Centre National Opérationnel et Stratégique de Surveillance Epidémiologique (CNOSSE))". [<https://afro.who.int/fr/news/inauguration-du-centre-national-operationnel-et-strategique-de-surveillance-epidemiologique>]. Accessed 22 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] World Health Organisation, Africa Regional Office. 2017. "Meeting of the Special Working Group on Integrated Disease Surveillance and Response (IDSR), Entebbe (Réunion du groupe de travail special sur la surveillance integree des maladies et riposte (SIMR), Entebbe)". [<https://www.afro.who.int/fr/publications/integrated-disease-surveillance-and-response-idsr-task-force-meeting-entebbe-uganda>]. Accessed 22 August 2020.

[4] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 21 August 2020.

- [5] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.
- [6] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 22 August 2020.
- [7] Center for the prevention and support in the management of emergencies to the Prime Minister's Office (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>] Accessed 22 August 2020.
- [8] World Health Organisation (WHO). 2017. "Annual report: WHO Madagascar (Rapport annuel: OMS Madagascar)". [<http://apps.who.int/iris/bitstream/handle/10665/272374/MadagascarRap2017.pdf>]. Accessed 22 August 2020.
- [9] World Health Organisation (WHO). 2018. "Madagascar: Cooperation strategy - an overview (Madagascar: Stratégie de coopération - un aperçu)". [http://apps.who.int/iris/bitstream/handle/10665/136934/ccsbrief_mdg_fr.pdf?sequence=1]. Accessed 22 August 2020.

2.3.1b

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

Yes = 1 , No = 0

Current Year Score: 1

Madagascar has reported one potential public health emergency of international concern (PHEIC) to the World Health Organisation (WHO) within the last two years. In January 2019, Madagascar reported an unusually large measles outbreak from October 2018 to January 2019. [1] Madagascar, although affected by the international COVID-19 crisis, has not reported in 2020. [2, 3] There is no evidence that Madagascar has reported other potential PHEICs in the past two years from the website of the Ministry of Public Health or from a wider online search. [2]

[1] World Health Organisation (WHO). 2020. "Madagascar: Disease outbreak news."

[<https://www.who.int/csr/don/archive/country/mdg/en/>]. Accessed 22 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] World Health Organization. 2020. "COVID-19 Situation update for the WHO African region. 19 August 2020".

[https://apps.who.int/iris/bitstream/handle/10665/333902/SITREP_COVID-19_WHOAFRO_20200819-eng.pdf] Accessed 22 August 2020.

2.3.2 Interoperable, interconnected, electronic real-time reporting systems

2.3.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that Madagascar has an electronic reporting surveillance system at national and sub-national levels. The surveillance and response system is overseen by the Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE), under the Ministry of Public Health, which is also home to the country's public health emergency operations centre.[1] According to the 2017 WHO Joint External Evaluation for Madagascar, disease surveillance indicators and events are reported to the DVSSE at the national level by smartphone or tablet for 17 out of 114 health districts, and the electronic reporting system is gradually being rolled out to the remaining districts. In those districts which are not yet connected into the electronic system, participants submit reports to the district level by SMS or paper, and district level passes these to the centre.[2] The electronic reporting system is available in overview form to the public, and in detail to all

levels of the public health ministry, who can log in and generate reports and alerts.[3]

[1] World Health Organisation (WHO) Madagascar. 2017. "Launch of the National Operational and Strategic Centre for Epidemiological Surveillance (NOSCES) (Inauguration du Centre National Opérationnel et Stratégique de Surveillance Epidémiologique (CNOSSE))". [<https://afro.who.int/fr/news/inauguration-du-centre-national-operationnel-et-strategique-de-surveillance-epidemiologique>]. Accessed 22 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Ministry of Public Health, Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE). 2018. "Madagascar Electronic Integrated Epidemiological Surveillance (Madagascar Surveillance Epidémiologique Intégrée à base Electronique)". [<https://madagascar.emro.info/fr/>]. Accessed 22 August 2020.

2.3.2b

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

Yes = 1 , No = 0

Current Year Score: 0

Madagascar's electronic surveillance reporting system collects some real-time laboratory data, but only for sentinel sites, not throughout the surveillance system; and the laboratory data is not integrated into the same system as clinical surveillance. The surveillance and response system is overseen by the Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE), under the Ministry of Public Health, which is also home to the country's public health emergency operations centre.[1] According to the 2017 WHO Joint External Evaluation (JEE) for Madagascar, disease surveillance indicators and events are reported to the DVSSE at the national level by smartphone or tablet for 17 out of 114 health districts, and the electronic reporting system is gradually being rolled out to the remaining districts. In those districts which are not yet connected into the electronic system, participants submit reports to the district level by SMS or paper, and district level passes these to the centre.[2] The system collects real-time data, but according to the JEE assessment, there is "weak use of laboratory data for surveillance, except in the case of sentinel surveillance with the existence of biological surveillance sites".[2,3] It recommends "establishing a centralised mechanism to integrate the data issuing from the notification of clinical cases and the data issuing from medical analysis laboratories or reference laboratories." [2]

[1] World Health Organisation (WHO) Madagascar. 2017. "Launch of the National Operational and Strategic Centre for Epidemiological Surveillance (NOSCES) (Inauguration du Centre National Opérationnel et Stratégique de Surveillance Epidémiologique (CNOSSE))". [<https://afro.who.int/fr/news/inauguration-du-centre-national-operationnel-et-strategique-de-surveillance-epidemiologique>]. Accessed 22 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Ministry of Public Health, Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE). 2018. "Madagascar Electronic Integrated Epidemiological Surveillance (Madagascar Surveillance Epidémiologique Intégrée à base Electronique)". [<https://madagascar.emro.info/fr/>]. Accessed 22 August 2020.

2.4 SURVEILLANCE DATA ACCESSIBILITY AND TRANSPARENCY

2.4.1 Coverage and use of electronic health records

2.4.1a

Are electronic health records commonly in use?

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

Current Year Score: 0

Electronic health records are not commonly in use in Madagascar. Madagascar is rolling out a health information system (HIS), but neither the 'Strategic Plan for the Reinforcement of the Health Information System 2018-2022', nor the 'Health sector development plan 2015-2019' mentions the existence of, or plans for, electronic health records for patients. [1,2] The HIS involves the submission of both routine health indicators and disease surveillance information via standardised forms to the regional and then central level.[1,2] There is no evidence of the existence of electronic health records on the website of the Ministry of Public Health, nor on the websites of the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC). [3,4,5]

[1] Ministry of Public Health. 2018. "Strategic Plan for the Reinforcement of the Health Information System 2018-2022 (Plan Stratégique de Renforcement du Système d'Information Sanitaire 2018-2022)". Measure Evaluation.

[<https://www.measureevaluation.org/resources/publications/sr-17-146>]. Accessed 22 August 2020.

[2] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)".

[https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/madagascar/pdss_2015.pdf]. Accessed 22 August 2020.

[3] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/> Accessed 21 August 2020.

[4] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 21 August 2020.

[5] Mérieux Foundation. 2020. "Rodolphe Mérieux Laboratory of Antananarivo (Madagascar)". [<https://www.fondation-merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/>]; and "Madagascar". [<https://www.fondation-merieux.org/en/where-we-work/madagascar/>]. Accessed 20 August 2020.

2.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

Electronic health records are not commonly in use in Madagascar and the public health system does not have access to any such records.

Madagascar is rolling out a health information system (HIS), but neither the 'Strategic Plan for the Reinforcement of the Health Information System 2018-2022', nor the 'Health sector development plan 2015-2019' mentions the existence of, or plans for, electronic health records for patients. [1,2]

The HIS involves the submission of both routine health indicators and disease surveillance information via standardised forms to the regional and then central level.[1,2] There is no evidence of the existence of electronic health records on the website of the Ministry of Public Health, nor on the websites of the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC). [3,4,5]

[1] Ministry of Public Health. 2018. "Strategic Plan for the Reinforcement of the Health Information System 2018-2022 (Plan Stratégique de Renforcement du Système d'Information Sanitaire 2018-2022)". Measure Evaluation.

[<https://www.measureevaluation.org/resources/publications/sr-17-146>]. Accessed 22 August 2020.

[2] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)".

[https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/madagascar/pdss_2015.pdf]. Accessed 22 August 2020.

[3] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » [<http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 21 August 2020.

[4] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 21 August 2020.

[5] Mérieux Foundation. 2020. "Rodolphe Mérieux Laboratory of Antananarivo (Madagascar)". [<https://www.fondation-merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/>]; and "Madagascar". [<https://www.fondation-merieux.org/en/where-we-work/madagascar/>]. Accessed 20 August 2020.

2.4.1c

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

Yes = 1 , No = 0

Current Year Score: 0

Electronic health records are not commonly in use in Madagascar and the country has yet to introduce data standards for its various health information systems (HIS), so there is no evidence of data standards to ensure data is comparable. Madagascar is rolling out a HIS, but neither the plan for the HIS' development in 2018-2022 nor the 'Health sector development plan 2015-2019' mentions the existence of, or plans for, electronic health records. The HIS involves the submission of both routine health indicators and disease surveillance information via standardised forms to the regional and then central level. [1, 2] Implementing international (World Health Organisation) standards for HIS and integrating the various health information systems are objectives in the current HIS development plan. [1] There is no evidence of the existence of electronic health records on the website of the Ministry of Public Health , nor on the websites of the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC). [3,4,5]

[1] Ministry of Public Health. 2018. "Strategic Plan for the Reinforcement of the Health Information System 2018-2022 (Plan Stratégique de Renforcement du Système d'Information Sanitaire 2018-2022)". Measure Evaluation.

[<https://www.measureevaluation.org/resources/publications/sr-17-146>]. Accessed 22 August 2020.

[2] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)".

[https://extranet.who.int/countryplanningcycles/sites/default/files/planning_cycle_repository/madagascar/pdss_2015.pdf]. Accessed 22 August 2020.

[3] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » [<http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 21 August 2020.

[4] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 21 August 2020.

[5] Mérieux Foundation. 2020. "Rodolphe Mérieux Laboratory of Antananarivo (Madagascar)". [<https://www.fondation-merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/>].

merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/]; and "Madagascar". [<https://www.fondation-merieux.org/en/where-we-work/madagascar/>]. Accessed 20 August 2020.

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

2.4.2a

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence of a mechanism for regular sharing of disease surveillance data between human, animal and environmental health authorities. The 2017 WHO Joint External Evaluation for Madagascar notes good collaboration between the veterinary services and human health authorities over surveillance of zoonoses, and states that a One Health committee is being created. It does not mention a specific mechanism for sharing information, nor does it mention collaboration with the environmental authorities. It recommends that Madagascar ensure the sharing of real-time information, especially laboratory data, according to a One Health approach.[1] The 2016 'Masterplan for combatting neglected tropical diseases (NTD) 2016-2020', which plans for surveillance of several diseases including zoonoses, does not mention a mechanism for regular surveillance information sharing. [2] The health ministry's 'Strategic plan for the reinforcement of the Health Information System 2018-2022' does not mention mechanisms for data sharing between human, animal and environmental health authorities. [3] A National Operations and Strategy Centre for Epidemiological Surveillance (CNOSSE) was created in late 2016 by the Public Health Ministry, the WHO, the Global Fund and the African Development Bank. There is no evidence that the animal or environmental health authorities participate in CNOSSE. [4] According to the electronic surveillance reporting platform of the Ministry of Public Health, surveillance data and reports are available to all levels of the health ministry. It does not mention that access is provided to the Ministry of Agriculture, Animal Husbandry and Fisheries or the Ministry of the Environment and Sustainable Development. [5] There is no evidence of a mechanism for regular sharing of disease surveillance data between human, animal and environmental health authorities on the website of the Ministry of Public Health, the Ministry of Agriculture, Animal Husbandry and Fisheries or the Ministry of the Environment and Sustainable Development, nor on the website of the Indian Ocean's Commission One Health network, or on the websites of the Pasteur Institute of Madagascar (PIM) and the Charles Mérieux Infectiology Centre (CMIC). [6,7,8,9,10,11]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2016. "Masterplan for combatting neglected tropical diseases (NTD) 2016-2020 (Plan directeur de lutte contre les maladies tropicales négligées (MTN) 2016-2020)". [http://espen.afro.who.int/system/files/content/resources/MADAGASCAR_NTD_Master_Plan_2016_2020.pdf]. Accessed 22 August 2020.

[3] Ministry of Public Health. 2018. "Strategic plan for the reinforcement of the Health Information System 2018-2022 (Plan stratégique de renforcement du Système d'Information Sanitaire 2018-2022)". Measure Evaluation. [<https://www.measureevaluation.org/resources/publications/sr-17-146>]. Accessed 22 August 2020.

[4] World Health Organization Madagascar. 2020. Official Website. "Health watch and epidemiological surveillance: National

operations centre established (Veille sanitaire et surveillance épidémiologique: Le centre national opérationnel mis en place)." [<https://www.afro.who.int/fr/news/inauguration-du-centre-national-operationnel-et-strategique-de-surveillance-epidemiologique>]. Accessed 22 August 2020.

[5] Ministry of Public Health, Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE). 2018. "Madagascar Electronic Integrated Epidemiological Surveillance (Madagascar Surveillance Epidémiologique Intégrée à base Electronique)". [<https://madagascar.emro.info/fr/>]. Accessed 22 August 2020.

[6] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » [<http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 21 August 2020.

[7] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[8] Ministry of the Environment and Sustainable Development. 2020. Official Website. [<https://www.environnement.mg/>] Accessed 20 August 2020.

[9] DP One Health OI. 2020. "Madagascar" [<https://www.onehealth-oi.org/terrains/madagascar>] Accessed 25 September 2020.

[10] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 21 August 2020.

[11] Mérieux Foundation. 2020. "Rodolphe Mérieux Laboratory of Antananarivo (Madagascar)". [<https://www.fondation-merieux.org/en/what-we-do/increasing-access-to-diagnostics/developing-infrastructure/rodolphe-merieux-laboratory-of-antananarivo-madagascar/>]; and "Madagascar". [<https://www.fondation-merieux.org/en/where-we-work/madagascar/>]. Accessed 20 August 2020.

2.4.3 Transparency of surveillance data

2.4.3a

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

Yes = 1, No = 0

Current Year Score: 0

Madagascar makes de-identified health surveillance data on disease outbreaks publicly available via reports on the website of its Ministry of Public Health, however, outside of COVID-19, this only happens on an occasional basis. [1] Before 2020, the Ministry of Public Health used to publish a 'Monthly bulletin of epidemiological surveillance in Madagascar' on its website. Despite being called a monthly bulletin, the latest one available covers the period from January to July 2018. It mentions infection numbers and morbidity rates of diseases such as Acute Respiratory Infections and Influenza.[2] During outbreaks such as the 2017 plague outbreak, the ministry also published updates with de-identified surveillance data on the disease in question.[3] There is no further evidence.

[1] Ministry of Public Health. 2020. "COVID-19 - The situation on 21/08/ 2020 (Covid-19: Situation du 21.08.2020)" [<http://www.sante.gov.mg/ministere-sante-publique/2020/08/21/covid-19-situation-du-21-08-2020/>] and "Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>]. Accessed 23 August 2020.

[2] Ministry of Public Health. 2018. "Monthly bulletin of epidemiological surveillance in Madagascar (Bulletin mensuel de surveillance épidémiologique de Madagascar)".

[http://www.sante.gov.mg/home/uploads/____folderforallfiles/BMSEM_N%C2%B03_%202018.pdf]. Accessed 29 September 2020.

[3] Ministry of Public Health, CERVO. 2017. "Flash bulletin: Centre for Study and Reflection on Monitoring and Surveillance (Bulletin flash: Centre d'Etudes de Réflexion de Veille et d'Orientation. Madagascar - Peste)".

[[http://www.sante.gov.mg/home/uploads/____folderforallfiles/Bulletin%20Flash%20-30-10-2017-20h00_vf2\[1\].pdf](http://www.sante.gov.mg/home/uploads/____folderforallfiles/Bulletin%20Flash%20-30-10-2017-20h00_vf2[1].pdf)].

Accessed 29 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: 1

Madagascar makes de-identified health surveillance data on disease outbreaks publicly available via reports on the website of the Ministry of Public Health. During the Corona-crisis, the Ministry of Public Health publishes regular updates with statistics on the national status on its website. These include case count, mortality rate, number of cases being treated, number of severe cases, and number of recovered patients. [1]

[1] Ministry of Public Health. 2020. "COVID-19 - The situation on 21/08/ 2020 (Covid-19: Situation du 21.08.2020)" [<http://www.sante.gov.mg/ministere-sante-publique/2020/08/21/covid-19-situation-du-21-08-2020/>] and "Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>]. Accessed 23 August 2020.

2.4.4 Ethical considerations during surveillance

2.4.4a

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

Yes = 1 , No = 0

Current Year Score: 1

Madagascar has laws safeguarding the confidentiality of information generated through health surveillance. 'Decree no. 2012-0632: Code of medical ethics' of 2012 states that "any database of medical information must be placed, out of respect for professional ethics, under the responsibility of a doctor designated by name. In the case of electronic databases, the doctor must take precautions to avoid endangering or infringing the right of the patient to safety and protection of their private life. Medical databases cannot have any link to other databases." [1] 'Law No. 2011-02: Health Code' of 2011 mentions the need to observe confidentiality measures when conducting surveillance for HIV/AIDS. [2] 'Law No. 2014-038: On the protection of personal data' of 2014 safeguards people's individual identifying information such as names and ID numbers. This applies to all uses (automated or not) of personal data, contained or searchable in files, handled partially or entirely in Madagascar, except for the purpose of journalism, art or literature, or for exclusively personal use. [3] It therefore applies to personal data gathered during surveillance activities.

[1] Ministry of Public Health. 2012. Official Facebook page. "Decree no. 2012-0632: Code of medical ethics (Decret No. 2012-0632: Code de déontologie médicale)". [<https://www.facebook.com/minsanp/posts/ministere-de-la-sante-publique-decret-n-2012-0632portant-code-de-deontologie-med/404583236272933/>]. Accessed 23 August 2020.

[2] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/9d06b-loi-n-2011-002-du-15-juillet-2011-portant-code-de-la-sante.pdf]. Accessed 23 August 2020.

[3] Government of Madagascar. 2015. "Law No. 2014-038: On the protection of personal data (Loi no. 2014-028: Sur la protection des données à caractère personnel)". [<https://www.afapdp.org/wp-content/uploads/2015/01/Madagascar-L-2014-038-du-09-01-15-sur-la-protection-des-donn%C3%A9es-%C3%A0-caract%C3%A8re-personnel.pdf>]. Accessed 23 August 2020.

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

Madagascar's laws safeguarding the confidentiality of information generated through health surveillance mention cybersecurity. 'Decree no. 2012-0632: Code of medical ethics' of 2012 states that "any database of medical information must be placed, out of respect for professional ethics, under the responsibility of a doctor designated by name. In the case of electronic databases, the doctor must take precautions to avoid endangering or infringing the right of the patient to safety and protection of their private life. Medical databases cannot have any link to other databases." [1] While the wording on electronic databases implies the need for cybersecurity measures, there is no section dealing directly with cybersecurity. [1] 'Law No. 2011-02: Health Code' of 2011 mentions the need to observe confidentiality measures when conducting surveillance for HIV/AIDS, but does not mention cybersecurity. [2] 'Law No. 2014-038: On the protection of personal data' of 2014 safeguards people's individual identifying information such as names and ID numbers. This applies to all uses (automated or not) of personal data, contained or searchable in files, handled partially or entirely in Madagascar, except for the purpose of journalism, art or literature, or for exclusively personal use. It addresses cybersecurity, stating that the data controller "shall take all necessary precautions, in view of the nature of the data and the risks involved, to preserve the security of the data. They must protect the processing and the data against in particular the accidental or illicit destruction, the accidental loss, the tampering, broadcast or unauthorized access." [3]

[1] Ministry of Public Health. 2012. Official Facebook page. "Decree no. 2012-0632: Code of medical ethics (Decret No. 2012-0632: Code de déontologie médicale)". [<https://www.facebook.com/minsanp/posts/ministere-de-la-sante-publique-decret-n-2012-0632portant-code-de-deontologie-med/404583236272933/>]. Accessed 23 August 2020.

[2] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/9d06b-loi-n-2011-002-du-15-juillet-2011-portant-code-de-la-sante.pdf]. Accessed 23 August 2020.

[3] Government of Madagascar. 2015. "Law No. 2014-038: On the protection of personal data (Loi no. 2014-028: Sur la protection des données à caractère personnel)". [<https://www.afapdp.org/wp-content/uploads/2015/01/Madagascar-L-2014-038-du-09-01-15-sur-la-protection-des-donn%C3%A9es-%C3%A0-caract%C3%A8re-personnel.pdf>]. Accessed 23 August 2020.

2.4.5 International data sharing

2.4.5a

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

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

Current Year Score: 2

Madagascar has made a commitment to share human and animal surveillance data with other countries in the Indian Ocean Commission (IOC) sub-region in general and specifically during a public health emergency for more than one disease. It is one of the member countries of the SEGA One Health Network, which "enables the sharing of epidemiological information provided by the member states' surveillance departments". [1] The SEGA project is currently in its 3rd phase, with a renewed commitment by all member countries in 2019. [1] In March 2018, Madagascar hosted a conference of the African Network of Influenza Surveillance and Epidemiology (ANISE) under the patronage of the health ministry, demonstrating the country's commitment to sharing influenza surveillance data regionally and globally. [2]

[1] French Development Agency AFD. 2019. « Indian ocean: exemplary regional cooperation to mitigate the risk of an epidemic "Official Website. SEGA One Health Network. 2017. [https://www.afd.fr/en/actualites/indian-ocean-exemplary-regional-cooperation-mitigate-risk-epidemic]. Accessed 23 August 2020.

[2] Pasteur Institute of Madagascar. 2018. "6th conference of the African Network of Influenza Surveillance and Epidemiology (ANISE): A veritable success (6ème conférence du Réseau Africain de Surveillance et d'Epidémiologie de la Grippe (ANISE) : un véritable succès)". [http://www.pasteur.mg/6eme-conference-du-reseau-africain-de-surveillance-et-depidemiologie-de-la-grippe-anise-un-veritable-succes/]. Accessed 23 August 2020.

2.5 CASE-BASED INVESTIGATION

2.5.1 Case investigation and contact tracing

2.5.1a

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

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

Current Year Score: 0

There is no evidence that Madagascar has a system 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 an active or future public health emergency. The 2017 WHO Joint External Evaluation of IHR core capacities of Madagascar states that "The operational centers (CERVO for natural catastrophes and CNOSSE for epidemics) have been activated several times and have proven reliable. (...) But the intervention capacities are extremely restricted compared to the size of national territory and difficult access to many regions. Amongst other things, there is no emergency fund that can quickly be mobilized, which slows down the interventions. The absence of standard operating procedures (SOP) can slow down the implementation of control measures in emergency situations. The ORSEC plan allows for interventions in the hinterland. But due to the lack of operational capacities in the regions, the central teams intervene, which causes important delays in interventions and explains the slow responses. This is also a potential source for problems when there are crises in several regions." [1] The report does not mention training or metrics standardization to conduct contact tracing [1]. The authority tasked with the implementation of the 'National Strategy for the Management of risks and catastrophes 2016-2030' [2] is the National Office for the management of risks and catastrophes (BNGRC) [3]. The National Strategy does not mention training to conduct contact tracing. [2] The 'Strategic Plan to strengthen the Health Information System (SIS) 2018-2022' mentions a Training for Trainer programme to disseminate information on the correct collection of patient data. [4] The World Health Organization (WHO) report 2018 mentions that a training on the Integrated Disease and Response Surveillance system (SIMR) took place in June 2018, during which 45 government representatives and staff of the Pasteur Institute Madagascar were trained by WHO experts. [5] It is not clear, however, that training to conduct contact tracing in case of a health crisis is implemented

systematically, or based on a national system. There is no evidence of such a system on the website of the Ministry of Public Health, the Office of the Prime Minister, the National Office for the Management of Risks and Catastrophes (BRGRC), the Pasteur Institute Madagascar or the Charles Mérieux Infectiology Centre (CMIC). [6,7,8,9,10]

- [1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 29 September 2020.
- [2] Government of Madagascar. 2016. "National Strategy for the Management of risks and catastrophes 2016-2030 (Stratégie Nationale de Gestion des Risques et des Catastrophes 2016-2030)". [http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/SNGRC_finale.pdf] Accessed 22 August 2020
- [3] Government of Madagascar. 2019. "Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC) (Decret N° 2019-1958 fixant l'organisation, le fonctionnement et les attributions du Bureau National de gestion des risques et des catastrophes (BNGRC))". [<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N-2019-1958-BNGRC.pdf>] Accessed 22 August 2020.
- [4] Government of Madagascar. 2017. "Strategic Plan to strengthen the Health Information System 2018-2022 (Plan Stratégique de Renforcement du Système d'Information Sanitaire 2018-2022", p. 27. [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/d8f62-plan-strategique-de-renforcement-du-sis_madagascar_2018_2022.pdf] Accessed 23 August 2020
- [5] World Health Organisation (WHO). 2018. "Annual report: WHO Madagascar 2018 (Rapport annuel 2018: OMS Madagascar)". [https://reliefweb.int/sites/reliefweb.int/files/resources/Rapport2018_LR_0.pdf]. Accessed 23 August 2020.
- [6] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 29 September 2020.
- [7] Office of the Prime Minister of Madagascar. 2020. Official website. [<http://www.primature.gov.mg/>] Accessed 29 September 2020.
- [8] National Office for the Management of Risks and Catastrophes (BRGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>] Accessed 29 September 2020
- [9] Pasteur Institute Madagascar. 2020. "Coronavirus disease 2019 (COVID-19) - Activities of the Pasteur Institute Madagascar (Coronavirus disease 2019 (COVID-19) - Activités de l'Institut Pasteur de Madagascar)" [<http://www.pasteur.mg/coronavirus-disease-2019-activites-institut-pasteur-de-madagascar/>] Accessed 23 August 2020
- [10] Infectious diseases centre Charles Mérieux Madagascar. 2020. Official Website. "Training (Formations)" [<https://www.cicm-madagascar.com/activites/formation.html>] Accessed 29 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: 0

There is no evidence that Madagascar provides wraparound services to enable infected people and their contacts to self-isolate or quarantine as recommended, particularly economic support (paycheck, job security) and medical attention. There is no mention of wraparound services in the 2017 WHO Joint External Evaluation for Madagascar [1], nor in the 2019 'Decree No. 2019-1954 on the modalities of application of the law no. 2015-031 on national policy for the management of risks and catastrophes' [2], the 2019 'Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National

Office for the management of risks and catastrophes' [3], the 2019 'Decree No. 2019 - 1959 on the organisation, scope and mode of functioning of the Center for the prevention and support in the management of emergencies to the Prime Minister's Office' [4], the 2016 'National Strategy for the Management of risks and catastrophes 2016-2030 [5], or the 2011 'Law No. 2011-02: Health Code' [6]. There is no evidence of existing wraparound services on the website of the Public Health Ministry, nor the Pasteur Institute Madagascar [8,9].

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)".

[2] Government of Madagascar. 2019. "Decree No. 2019-1954 on the modalities of application of the law no. 2015-031 on national policy for the management of risks and catastrophes (Decret N° 2019-1954 Fiant les modalités d'application de la loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)".

[3] Government of Madagascar. 2019. "Decree No. 2019 - 1958 on the organisation, mode of functioning and scope of the National Office for the management of risks and catastrophes (BNGRC) (Decret N° 2019-1958 fixant l'organisation, le fonctionnement et les attributions du Bureau National de gestion des risques et des catastrophes (BNGRC))".

[<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N-2019-1958-BNGRC.pdf>] Accessed 22 August 2020.

[4] Government of Madagascar. 2019. "Decree No. 2019 - 1949 on the organisation, scope and mode of functioning of the Center for the prevention and support in the management of emergencies to the Prime Minister's Office (Decret N° 2019 - 1949 fixant l'organisation, les attributions et le fonctionnement de la cellule de prévention et d'appui à la gestion des urgences à la Primature (CPGU))". [<http://www.primature.gov.mg/cpgu/wp-content/uploads/2019/11/Décret-N2019-1949-CPGU-VF.pdf>] Accessed 22 August 2020

[5] Government of Madagascar. 2016. "Law No. 2015-031 on national policy for the management of risks and catastrophes (Loi n° 2015-031 relative à la politique nationale de gestion des risques et des catastrophes)"

[http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/PNGRC_2015-031_VERSION_FRANCAISE.pdf] Accessed 22 August 2020.

[6] Government of Madagascar. 2016. "National Strategy for the Management of risks and catastrophes 2016-2030 (Stratégie Nationale de Gestion des Risques et des Catastrophes 2016-2030)". [http://www.primature.gov.mg/cpgu/wp-content/uploads/2017/01/SNGRC_finale.pdf] Accessed 22 August 2020

[7] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)".

[http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/9d06b-loi-n-2011-002-du-15-juillet-2011-portant-code-de-la-sante.pdf]. Accessed 23 August 2020.

[8] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>]; and

"Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>] Accessed 24 August 2020

[9] Pasteur Institute Madagascar. 2020. Official Website [<http://www.pasteur.mg>] Accessed 24 August 2020.

2.5.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar makes de-identified data on contact tracing concerning COVID-19 cases publicly available. There is no data on traced cases on the website of Madagascar's Electronic Integrated Epidemiological Surveillance

system, nor on the websites of the Health Ministry or the Pasteur Institute Madagascar [1,2,3].

[1] Ministry of Public Health, Directorate of Health Monitoring and Epidemiological Surveillance (DVSSSE). 2018. "Madagascar Electronic Integrated Epidemiological Surveillance (Madagascar Surveillance Epidémiologique Intégrée à base Electronique)". [<https://madagascar.emro.info/fr/>]. Accessed 22 August 2020.

[2] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>]; Accessed 24 August 2020

[3] Pasteur Institute Madagascar. 2020. Official Website [<http://www.pasteur.mg>] Accessed 24 August 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 evidence that Madagascar has 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 an active or a future public health emergency. The 2017 WHO Joint External Evaluation for Madagascar recommends that Madagascar adopt "an official cooperation agreement between the Ministries in charge of national security and the public health Ministry." [1] There is no evidence that such an agreement has been signed since. It is not mentioned in the 2020 Customs Code, nor on the websites of the Ministry of Public Health or the Ministry of National Defense. [2,3,4] A cooperation agreement is also not mentioned on the websites of the Pasteur Institute Madagascar, nor in the national contingency plan 2015-2016. [5, 6]. The current contingency plan is not available on the internet.

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)".

[2] Customs Office. 2020. "Customs Code 2020 (Code des Douanes 2020)". [http://www.douanes.gov.mg/sites/default/files/upload/page/code_des_douanes_lfr_2020.pdf] Accessed 24 August 2020.

[3] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>]. Accessed 24 August 2020

[4] Ministry of National Defense. 2020. Official Website. [<http://www.defense.gov.mg>]. Accessed 24 August 2020

[5] Pasteur Institute Madagascar. 2020. Official Website [<http://www.pasteur.mg>] Accessed 24 August 2020.

[6] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjso7eU4LPrAhXSzYUKHRTJDrQQFJADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmIsZS03MDI%3D%26public%3DcHVibGJLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQQzqVpci4mPuup] Accessed 24 August 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

Epidemiologists from Madagascar are able to attend in-country field epidemiology training programmes (FETP), but there is no evidence of resources available to send citizens to another country to participate in applied epidemiology training programmes. Funded programmes are provided through the Indian Ocean Commission's SEGA One Health Network. The training takes place in the home country of the students. It is based on the US' Epidemiology Intelligence Service (EIS) and the European Programme for Intervention Epidemiology Training (EPIET). It includes theory workshops, hands-on training and 3-month internships in regional centres. The training is affiliated with TEPHINET (Training programs in epidemiology and public health network).[1] The Pasteur Institute of Madagascar offers placements to students on SEGA's field epidemiology training programme (FETP).[2] According to the 2017 WHO Joint External Evaluation for Madagascar, the University of Mahajanga also offers an FETP course but it suffers from problems related to recognising experience gained. For instance, it does not recognise training and placements assured by the Pasteur Institute of Madagascar.[3] There is no evidence of resources available to send citizens to another country to participate in applied epidemiology training programmes, from the Ministry of Public Health or the US Centers for Disease Control and Prevention (CDC).[4,5] Madagascar is not involved in the African Network of Field Epidemiology (AFENET).[6]

[1] Indian Ocean Commission. 2018. "Training in field epidemiology for health professionals (Formation en épidémiologie de terrain pour les professionnels de santé)". [<https://www.commissionoceanindien.org/formation-en-epidemiologie-de-terrain-pour-les-professionnels-de-sante/>]. Accessed 24 August 2020.

[2] Pasteur Institute of Madagascar. 2017. "Report of activities in 2016 (Rapport d'activités 2016)". [<http://www.pasteur.mg/wp-content/uploads/2017/06/Rapport-d-activites-IPM-2016.pdf>]. Accessed 2 November 2018.

[3] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[4] Ministry of Public Health. 2018. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 24 August 2020.

[5] US Centers for Disease Control and Prevention (CDC). 2019. "CDC in Madagascar." [<https://www.cdc.gov/globalhealth/countries/madagascar/>]. Accessed 24 August 2020.

[6] African Network of Field Epidemiology (AFENET). 2019. Official website. [<http://www.afenet.net/>]. Accessed 24 August 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

One of Madagascar's field epidemiology training programmes (FETP)—that provided through the Indian Ocean Commission's SEGA One Health Network—is inclusive of both animal and human health professionals, but there is no information on whether the other FETP—provided by the University of Mahajanga—includes candidates from both sectors. Between 2011 and 2017, 14 epidemiologists from Madagascar attended the SEGA FETP and a new programme is running since 2017, funded by France's development agency. The latest round of training was the first to include two veterinary professionals. The training takes place in the home country of the students and is based on the US' Epidemiology Intelligence Service (EIS) and the European Programme for Intervention Epidemiology Training (EPIET). It includes theory workshops, hands-on training and 3-month internships in regional centres. The training is affiliated with TEPHINET (Training programs in epidemiology and public health network).[1] According to the 2017 WHO Joint External Evaluation for Madagascar, the University of Mahajanga also offers an FETP course.[3] The university's website does not provide further information on this.[4]

[1] Indian Ocean Commission. 2018. "Training in field epidemiology for health professionals (Formation en épidémiologie de terrain pour les professionnels de santé)". [<https://www.commissionoceanindien.org/formation-en-epidemiologie-de-terrain-pour-les-professionnels-de-sante/>]; and "(The Indian Ocean Commission COI and the French Development Agency AFD renew their cooperation for public health in the Indian Ocean region (La COI et l'AFD renouvellent leur partenariat en faveur de la santé publique en Indianocéanie)" [<https://www.commissionoceanindien.org/la-coi-et-lafd-renouvellent-leur-partenariat-en-faveur-de-la-sante-publique-en-indianoceanie-15-dec-17-maurice/>]. Accessed 24 August 2020.

[2] Pasteur Institute of Madagascar. 2017. "Report of activities in 2016 (Rapport d'activités 2016)".

[<http://www.pasteur.mg/wp-content/uploads/2017/06/Rapport-d-activites-IPM-2016.pdf>]. Accessed 24 August 2020.

[3] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 24 August 2020.

[4] University of Mahajanga. 2020. Official website. [<http://www.univ-mahajanga.edu.mg/>]. Accessed 24 August 2020.

2.6.2 Epidemiology workforce capacity

2.6.2a

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

Yes = 1 , No = 0

Current Year Score: 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: 1

Madagascar has a disease-specific plan, but there is no evidence of an overarching plan. The Ministry of Public Health was updating the national contingency plan for preparing for and responding to major pandemics and epidemics in 2019, but this plan was not published. The last available version is for 2015-2016. [1,2,3] The 'Contingency Plan 2015-2016' identifies the most serious threats as influenza viruses of pandemic potential, malaria, cholera, arboviruses, plague and MERS-CoV. It includes sections on i) planning and coordination, ii) surveillance and evaluation, iii) reducing the spread of disease, iv) communication and v) preservation of essential services. The planning section outlines national multi-sector coordination mechanisms during response operations, providing an organigram and descriptions of responsibilities. The plan provides tables assigning response measures to different entities in several scenarios (not disease-specific but by outbreak type, eg national zoonosis outbreak; external threat), and also has a table assigning specific response actions for individual diseases/disease groups [4]. However, the 2017 WHO Joint External Evaluation for Madagascar described the plan as imperfect and hard to apply in an emergency situation as they lack standard operating procedures.[5] In July 2020, the government published the 'Multi-sectorial emergency plan Madagascar'. [6] This plan is a response to the public health crisis caused by COVID-19 and does not address any other disease with epidemic or pandemic potential. [6]

[1] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 24 August 2020

[2] Newsmada. « Office of risk and catastrophe management (BNGRC) : Updating the national contingency plan (Bngrc : Mise à jour du Plan de contingence national) » [<https://www.newsmada.com/2019/07/25/bngrc-mise-a-jour-du-plan-de-contingence-national/>]. Accessed 24 August 2020

[3] Reliefweb "Emergency Appeal for COVID-19 Madagascar (Appel d'urgence pour covid-19 Madagascar)". [https://reliefweb.int/sites/reliefweb.int/files/resources/MDG_COVID-19_Emergency_Appeal_2020_FR.pdf]. Accessed 24 August 2020.

[4] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjso7eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGjLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzVpci4mPuup]- filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[5] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 24 August 2020.

[6] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 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 Madagascar has an overarching plan and hence no evidence that a plan has been updated in the past 3 years. While Madagascar has a disease-specific response plan, the 2020 'Multi-sectorial emergency plan Madagascar', this plan does not address planning for multiple communicable diseases with pandemic potential. [1] The previous plan was published in 2015 and had not been updated until 2020. The 'Contingency Plan 2015-2016' identifies the most serious threats as influenza viruses of pandemic potential, malaria, cholera, arboviruses, plague and MERS-CoV and includes a detailed section on planning for and responding to this group of diseases.[2]

[1] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[2] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjso7eU4LPraAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DchVibGjLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzVpci4mPuup]- filter based on keyword "contingence" to find the health and general contingency plans. Note absence of a more recent plan. Accessed 24 August 2020.

3.1.1c

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

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

Current Year Score: 0

There is no evidence that Madagascar has an overarching plan and hence no evidence that a plan includes vulnerable populations. Madagascar has a disease-specific response plan, but it does not address planning for multiple communicable diseases with pandemic potential and can therefore not be considered an overarching plan. The 2020 'Multi-sectorial emergency plan Madagascar' does include considerations for vulnerable populations. [1] The last available over-arching plan is the 'Contingency Plan 2015-2016'. It does not include considerations for paediatric or other vulnerable populations in its preparation and response plans, despite noting that children, pregnant women and elderly people are more at risk of certain diseases. [2]

[1] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[2] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjso7eU4LPraAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DchVibGjLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzVpci4mPuup]- filter based on keyword "contingence" to find the health and general contingency plans. Note absence of a more recent plan. Accessed 24 August 2020.

mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQZqVpci4mPuup]- filter based on keyword "contingence" to find the health and general contingency plans. Note absence of a more recent plan. Accessed 24 August 2020.

3.1.1d

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

Yes = 1, No = 0

Current Year Score: 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 Madagascar has specific mechanisms for engaging with the private sector to assist with outbreak emergency preparedness and response. While initiatives such as the "Private Sector Humanitarian Platform Madagascar" [1] exist, it is not clear if the Platform is currently actively cooperating with the government of Madagascar and if there is a mechanism for cooperation. The 2020 'Multi-sectorial emergency plan Madagascar' only focuses on COVID-19 and does not include an overarching strategy, nor does it mention private sector involvement in assisting with outbreak emergency preparedness and response. [2] The previous available version of the country's contingency plan is the 'Contingency Plan 2015-2016'. At the strategic level, a Pandemic and Major Epidemic Steering Committee (CPLPEM) was created, with representatives from the ministries of health and the interior, from key health sector NGOs, and from "essential private sectors". These private sectors include finance, defence, energy, food, transport, telecommunication, water, livestock, commerce and communication. [3] There is no evidence that the CPLPEM, the Private Sector Humanitarian Platform Madagascar, or other private sector initiatives currently play a role in outbreak emergency preparedness and response, or that a mechanism for cooperation with the private sector exists, as these are not mentioned on the website of the National Office for the Management of Risks and Catastrophes (BNGRC), the Public Health Ministry, or the Office of the Prime Minister or the Private Sector Humanitarian Platform Madagascar. [4,5,6,1]. The CPLPEM does not have a website. [7]

[1] Private Sector Humanitarian Platform Madagascar. 2020. Official Website. [<http://pshp-mada.org>] Accessed 29 September 2020.

[2] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[3] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp->

mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGjLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQZqVpci4mPuup]- filter based on keyword "contingence" to find the health and general contingency plans. Note absence of a more recent plan. Accessed 29 September 2020.

[4] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 29 September 2020.

[5] National Office for the Management of Risks and Catastrophes (BRGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>] Accessed 29 September 2020

[6] Office of the Prime Minister of Madagascar. 2020. Official Website [<http://www.primature.gov.mg/>]. Accessed 29 September 2020.

[7] Websearch for « CPLPEM Madagascar », "comité pandémie Madagascar" , 29 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: 1

Madagascar has a plan to implement non-pharmaceutical interventions (NPIs) during an epidemic or pandemic for one disease. The 2020 'Multi-sectorial emergency plan Madagascar' focuses on COVID-19 only and describes planned non-pharmaceutical interventions (NPIs) . [1] The previous available version of the country's contingency plan is the 'Contingency Plan 2015-2016'. This contingency plan refers to NPIs in the "beginning of a potentially serious epidemic", when other measures such as "limiting affected zones geographically", under scenario 2, have failed. [2] There is no evidence of the existence of any other policy, plan, and/or guidelines on NPIs on the websites of the National Office for the Management of Risks and Catastrophes (BNGRC), the Public Health Ministry, or the Office of the Prime Minister, nor from a wider online search. [3,4,5]

[1] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[2] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [

[3] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/>] Accessed 29 September 2020.

[4] National Office for the Management of Risks and Catastrophes (BRGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>] Accessed 29 September 2020

[5] Office of the Prime Minister of Madagascar. 2020. Official Website [<http://www.primature.gov.mg/>]. Accessed 29 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 evidence that Madagascar has activated its national emergency response plan for dealing with an infectious disease outbreak in 2020, however there is no evidence that the country has completed a national-level biological threat-focused exercise in the past year. The 'Multi-sectorial emergency plan Madagascar' was published in July 2020 as a response to the COVID-19 crisis. [1] In August 2020, the President announced the extension of the state of health emergency. This announcement, in the form of 'Decree No. 2020-1020 of 22 August 2020, extending the duration of the state of health emergency on national territory', refers back to 'Law No. 2011-02: Health Code' and 'Law No. 91-011 of 18 July 1991 on exceptional situations'. [2] Madagascar has since asked for, and received, financial support from the international community to help implement the emergency plan. [3, 4] There is no evidence that the country has completed a national-level biological threat-focused exercise in the past year, not on the website of the World Health Organization, nor on the website of the Public Health Ministry, the National Office for risk and catastrophe management (BNGRC) or the Office for the prevention and management of emergencies (CPGU). [5,6,7]

[1] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[2] Government of Madagascar. 2020. "Decree No. 2020-1020 of 22 August 2020, extending the duration of the state of health emergency on national territory (DECRET N° 2020-1020 du 22 août 2020 prolongeant la durée de l'état d'urgence sanitaire sur tout le territoire de la République)". [<http://www.presidence.gov.mg/actualites/decret/958-decret-n-2020-1020-du-22-aout-2020-prolongeant-la-duree-de-l-etat-d-urgence-sanitaire-sur-tout-le-territoire-de-la-republique.html>] Accessed 23 August 2020.

[3] The World Bank. 2020. Official Website. "Madagascar: \$50 Million in Additional Funding for Greater Antananarivo Integrated Development and Resilience Project (Madagascar : 50 millions de dollars de financement supplémentaire pour le Projet de Développement Intégré et Résilience du Grand Antananarivo)". [<https://www.banquemondiale.org/fr/news/press-release/2020/12/10/madagascar-50-million-additional-financing-for-an-integrated-urban-development-and-resilience-project-in-greater-antananarivo>] Accessed on 26/03/2021

[4] Cardno and Particip GmbH within EuropeAid Framework Contract/138778/DH/SER/Multi, Contract No. 413990. August 2020. "JOINT ANALYSIS Technical assistance to the EU Joint Programming Strategy and the aid effectiveness program in Madagascar (ANALYSE CONJOINTE -Assistance technique a la stratégie de programmation conjointe de l'UE et au programme pour l'efficacité de l'aide à Madagascar)". [file:///C:/Users/sebastien/Downloads/413990-%20Analyse%20Conjointe%2020202020.pdf] Accessed on 26/03/2021

[5] World Health Organization. 2020. "Simulation Exercise". [<https://extranet.who.int/sph/simulation-exercise>] Accessed 24 August 2020.

[6] National Office for risk and catastrophe management (BNGR). 2020. Official Website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020

[7] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 24 August 2020.

3.2.1b

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

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

Current Year Score: 0

There is no evidence that Madagascar has identified a list of gaps and best practices in response to a disease or biological threat and developed a plan to improve its response capabilities in the past year. An 'After Action Review' of its application of the International Health Regulations (2005) was conducted in July 2018. [1,2] According to the Ministry of Public Health, the government started updating its National Contingency Plan in order to integrate best practices into this new document following this review.[1] The government published the 'Multi-sectorial emergency plan Madagascar' in July 2020, but this plan only deals with COVID-19 and not with other diseases or biological threats. [3] There has not been another After Action Review after 2018. [4]

[1] Ministry of Public Health. 2018. Official Facebook page. "Update of the national contingency plan to prepare for the response to pandemics and major epidemics 2018-2020 (Mise à jour du plan national de contingence pour la préparation et la riposte aux pandémies et épidémies majeures 2018-2020)."

[<https://www.facebook.com/minsanp/posts/2062361937161713>] Accessed 25 August 2020.

[2] World Health Organization / Public Health Ministry of Madagascar. 2018. « After Action Review of the emergency response to the flaring pneumonic plague epidemic, 2-6 July 2018 - Antananarivo (Revue après action de la réponse d'urgence à la flambée épidémique de peste pulmonaire, 2 au 6 juillet 2018 - Antananarivo) »

[<https://extranet.who.int/sph/docs/file/2121>] Accessed 25 August 2020

[3] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[4] World Health Organization. 2020. "After Action Review" [<https://extranet.who.int/sph/after-action-review>]. Accessed 25 August 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 evidence that the country has completed a national-level biological threat-focused exercise in the past year, not on the website of the World Health Organization, nor on the website of the Public Health Ministry, the National Office for risk

and catastrophe management (BNGRC) or the Office for the prevention and management of emergencies (CPGU). [5,6,7]

[1] World Health Organization. 2020. "Simulation Exercise". [<https://extranet.who.int/sph/simulation-exercise>] Accessed 24 August 2020.

[2] Ministry of Public Health. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and « Documents » <http://www.sante.gov.mg/ministere-sante-publique/documents/> Accessed 29 September 2020.

[3] National Office for risk and catastrophe management (BNGRC). 2020. Official Website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020

[4] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 24 August 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

Madagascar has an emergency operations centre (EOC) for health-related emergencies. In 2016, the National Operational and Strategic Centre for Epidemiological Surveillance (CNOSSE) was launched by the Directorate of Health Monitoring and Epidemiological Surveillance (DVSSE), under the health ministry. It provides leadership, information, technical expertise and basic services regarding emergency response to health threats. As control centre for the country's electronic disease surveillance, it will organize rapid and coordinated interventions. During the 2017 plague outbreak, it held daily meetings of the crisis staff to manage the response.[1] Madagascar also has an EOC for natural disasters, CERVO, which is under the National Office of Risk and Disaster Management (BNGRC).[2,3]. According to the 2017 WHO Joint External Evaluation for Madagascar, both CNOSSE and CERVO have been activated several times and have demonstrated their reliability. They have adequate equipment and provide 24-hour coverage.[2] Madagascar also has an Office for the prevention and management of emergencies (CPGU), which reports to the Prime Minister. [4]

[1] World Health Organisation (WHO) Madagascar. 2017. "Launch of the National Operational and Strategic Centre for Epidemiological Surveillance (CNOSSE) (Inauguration du Centre National Opérationnel et Stratégique de Surveillance Epidémiologique (CNOSSE))". [<https://afro.who.int/fr/news/inauguration-du-centre-national-operationnel-et-strategique-de-surveillance-epidemiologique>]. Accessed 25 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFJADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[4] Office for the prevention and management of emergencies (CPGU). 2020. Official Website.

[<http://www.primature.gov.mg/cpgu/>]. Accessed 24 August 2020.

3.3.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that either Madagascar's public health emergency operations centre (PHEOC) or its general emergency operations centre (EOC) is required to conduct a drill at least once a year. The PHEOC is the National Operational and Strategic Centre for Epidemiological Surveillance (CNOSSE) and the general EOC is the Centre for Study and Reflection of Surveillance and Direction (CERVO).[1] There is no evidence that CNOSSE or CERVO have a requirement for drills, or have conducted a drill, from the 2017 WHO Joint External Evaluation for Madagascar [1], on the websites of the Public Health Ministry [2], the World Health Organisation (WHO) in Madagascar [3], the official Facebook page of the World Health Organisation (WHO) in Madagascar [4], the 2017 Annual Report of the World Health Organisation (WHO) in Madagascar [5], or on the website of the Bureau of Risk and Disaster Management (BNGRC) [6]. The latest overarching contingency plan for disease outbreak emergencies pre-dates CNOSSE's creation and does not mention a requirement for drills for CERVO.[7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020.

[3] World Health Organisation (WHO) Madagascar. 2020. "Madagascar news." [<https://afro.who.int/countries/news?country=38>]. Accessed 25 August 2020.

[4] World Health Organisation (WHO). 2020. Official Facebook page. (Searched for keywords "drill (exercice)" and "CNOSSE"). [https://www.facebook.com/OMSMadagascar/?hc_ref=ARTUT_9ctvjvsYl8Ovq-bY-261p6furClj_tyCL-sUnmQjadmmN1g-Jhbe2cLEbB3TQ&__tn__=kC-R]. Accessed 25 August 2020.

[5] World Health Organisation (WHO). 2017. "Annual report: WHO Madagascar (Rapport annuel: OMS Madagascar)". [<https://www.afro.who.int/fr/publications/rapport-annuel-du-bureau-pays-de-loms-madagascar-2017>]. Accessed 25 August 2020.

[6] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020.

[7] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPraHXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmIsZS03MDI%3D%26public%3DcHVibGJlTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

3.3.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that either Madagascar's public health emergency operations centre (PHEOC) or its general emergency operations centre (EOC) can conduct, or have conducted within the last year, a coordinated emergency response/exercise activated within 120 minutes of the emergency/scenario's identification. The PHEOC is the National Operational and Strategic Centre for Epidemiological Surveillance (CNOSSE) and the general EOC is the Centre for Study and Reflection of Surveillance and Direction (CERVO). [1] The after-action review of the emergency response to the plague outbreak in 2017 does not provide evidence that this happened. [1] The 2017 WHO Joint External Evaluation for Madagascar does not note this experience or capacity. [2] The latest contingency plan for disease outbreak emergencies pre-date CNOSSE's creation and does not mention requirements with regard to disease outbreak emergency response times for CERVO. [3] There is no relevant evidence on the website of the Ministry of Public Health, of the World Health Organization (WHO) in Madagascar, in the 2017 WHO in Madagascar's annual report or on the official Facebook page of the World Health Organisation (WHO) in Madagascar; nor on the website of the Bureau of Risk and Disaster Management (BNGRC). [4,5,6,7] The President of Madagascar declared the State of Emergency in March 2020 as a response to the Corona-Crisis, but there is no evidence that he did so within 120 minutes of the identification of the threat, or that this response was coordinated. [8]

[1] World Health Organisation. 2018. "After Action Review of the emergency response to the epidemic outbreak of pulmonary plague (Revue Après Action de la réponse d'urgence à la flambée épidémique de peste pulmonaire)".

[https://extranet.who.int/sph/sites/default/files/document-library/document/RT%20Madagascar20_09_2018.pdf]. 25 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf]. Accessed 20 August 2020.

[3] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFJADegQIAXAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DchVibGjLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[4] Ministry of Public Health. 2020. Official website. [http://www.sante.gov.mg/home/n]. Accessed 24 August 2020.

[5] World Health Organisation (WHO) Madagascar. 2020. "Madagascar news."

[https://afro.who.int/countries/news?country=38]. Accessed 25 August 2020.

[6] World Health Organisation (WHO). 2017. "Annual report: WHO Madagascar (Rapport annuel: OMS Madagascar)".

[https://www.afro.who.int/fr/publications/rapport-annuel-du-bureau-pays-de-loms-madagascar-2017]. Accessed 25 August 2020.

[6] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website.

[http://www.bngrc-mid.gov.mg/bngrc/index.html]. Accessed 24 August 2020.

[7] World Health Organisation (WHO). 2020. Official Facebook page. (Searched for keywords "drill (exercice)" and "CNOSSE").

[https://www.facebook.com/OMSMadagascar/?hc_ref=ARTUT_9ctvjvsYl8Ovq-bY-261p6furCLj_tyCL-sUnmQjadmmN1g-Jhbe2cLEbB3TQ&__tn__=kC-R]. Accessed 25 August 2020.

[8] Office of the President of the Republic. 2020. « Decree No. 2020-359 of 21 March 2020 declaring the state of health

emergency on the territory of the Republic (DECRET N°2020 -359 du 21 Mars 2020. Proclamant l'état d'urgence sanitaire sur tout le territoire de la République) » [http://www.presidence.gov.mg/actualites/decret/756-decret-n-2020-359-du-21-mars-2020-proclamant-l-etat-d-urgence-sanitaire-sur-tout-le-territoire-de-la-republique.html] Accessed 25 August 2020

3.4 LINKING PUBLIC HEALTH AND SECURITY AUTHORITIES

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

3.4.1a

Does the country meet one of the following criteria?

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

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

Current Year Score: 0

There is no evidence that Madagascar has either carried out an exercise to respond to a deliberate biological event, of that it has guidelines or agreements between the health and security authorities on how to respond to such an event. There is no evidence of an exercise to respond to a biological attack, or of guidelines or agreements between the health and security authorities on how to respond to such an event on the website of the Ministry of Public Health [1], on the website of the World Health Organisation (WHO) in Madagascar, in the WHO in Madagascar's 2017 annual report, on the official Facebook page of the World Health Organisation (WHO) in Madagascar [2,3,4], the website of the Bureau of Risk and Disaster Management (BNGRC) [5] or the Office for the prevention and management of emergencies (CPGU) [6].

According to the 2017 WHO Joint External Evaluation for Madagascar, the main planning document for responding to health emergencies is the National contingency plan for preparing for and responding to major pandemics and epidemics 2014-2016, and the Multi-risk contingency plan of the government and of the Permanent Inter-Agency Committee 2015-2016, which according to the JEE lack standard operating procedures.[7, 8]

The Contingency Plan 2015-2016 does not addresses the risk of or a response to deliberate biological events.[8]

[1] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 24 August 2020.

[2] World Health Organisation (WHO) Madagascar. 2020. "Madagascar news." [<https://afro.who.int/countries/news?country=38>]. Accessed 25 August 2020.

[3] World Health Organisation (WHO). 2017. "Annual report: WHO Madagascar (Rapport annuel: OMS Madagascar)". [<https://www.afro.who.int/fr/publications/rapport-annuel-du-bureau-pays-de-loms-madagascar-2017>]. Accessed 25 August 2020.

[4] World Health Organisation (WHO). 2020. Official Facebook page. (Searched for keywords "drill (exercice)" and "CNOSSE"). [https://www.facebook.com/OMSMadagascar/?hc_ref=ARTUT_9ctvjvsYl8Ovq-bY-261p6furClj_tyCL-sUnmQjadmmN1g-Jhbe2cLEbB3TQ&__tn__=kC-R]. Accessed 25 August 2020.

[5] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020.

[6] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 24 August 2020.

[7] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>].

Accessed 24 August 2020.

[8] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp->

mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

3.5 RISK COMMUNICATIONS

3.5.1 Public communication

3.5.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar currently has legislation, regulation, or strategy documents detailing a risk communication plan that is specifically intended for use during a public health emergency and hence no evidence of a plan including considerations of how messages will reach populations and sectors with different communications needs.

The 2017 WHO Joint External Evaluation for Madagascar notes the existence of a « communication strategy with well-defined objectives for each of the three scenarios figuring in the 'Contingency Plan 2015-2016' ». [1] In Madagascar's 'Contingency Plan 2015-2016', there is a section on communication in an emergency situation and a communication plan is mentioned in the list of annexes, but it does not figure among the annexes to the plan. [2] The 2020 'Multi-sectorial emergency plan Madagascar' only deals with COVID-19 and does not include an overarching strategy for public health emergencies, nor a detailed communication plan. [3]. There is no risk communication plan on the websites of the Public Health Ministry [4], the National Office for risk and catastrophe management (BNGRC) [5], the Office for the prevention and management of emergencies (CPGU) [6], the Ministry of Communication and Culture [7], the Office of the President [8], or the Office of the Prime Minister [9], or from a wider online search.

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp->

mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[3] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

- [4] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 1 October 2020.
- [5] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.
- [6] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.
- [7] Ministry of Communication and Culture. 2020. Official website. [<https://www.mcc-gov.mg>]. Accessed 1 October 2020.
- [8] Office of the President of Madagascar. 2020. Official Website. [<http://www.presidence.gov.mg>]. Accessed 1 October 2020.
- [9] Office of the Prime Minister of Madagascar. 2020. Official Website [<http://www.primature.gov.mg/>]. Accessed 1 October 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 evidence that Madagascar has legislation, regulation, or strategy documents detailing a risk communication plan that is specifically intended for use during a public health emergency. The 2017 WHO Joint External Evaluation for Madagascar notes the existence of a « communication strategy with well-defined objectives for each of the three scenarios figuring in the 'Contingency Plan 2015-2016' ». [1] In Madagascar's 'Contingency Plan 2015-2016', there is a section on communication in an emergency situation and a communication plan is mentioned in the list of annexes, but it does not figure among the annexes to the plan. [2] The 2020 'Multi-sectorial emergency plan Madagascar' only deals with COVID-19 and does not include an overarching strategy for public health emergencies, nor a detailed communication plan. [3]. There is no risk communication plan on the websites of the Public Health Ministry [4], the National Office for risk and catastrophe management (BNGRC) [5], the Office for the prevention and management of emergencies (CPGU) [6], the Ministry of Communication and Culture [7], the Office of the President [8], or the Office of the Prime Minister [9], or from a wider online search.

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjso7eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGJlTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQQzqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[3] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.

[4] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 1 October 2020.

- [5] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.
- [6] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.
- [7] Ministry of Communication and Culture. 2020. Official website. [<https://www.mcc.gov.mg>]. Accessed 1 October 2020.
- [8] Office of the President of Madagascar. 2020. Official Website. [<http://www.presidence.gov.mg>]. Accessed 1 October 2020.
- [9] Office of the Prime Minister of Madagascar. 2020. Official Website [<http://www.primature.gov.mg/>]. Accessed 1 October 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

Madagascar has no publicly available risk communication plan. While Madagascar's 'contingency plan 2015-2016' includes a table of responsibilities and assigns various posts within the Bureau of Risk and Disaster Management (BNGRC) as supervisors for external communication, it does not designate one specific individual to the task. A communication plan is mentioned in the list of annexes, but it does not figure among the annexes to the plan. [1] The 2020 'Multi-sectorial emergency plan Madagascar' only deals with COVID-19 and does not include an overarching strategy for public health emergencies, nor a detailed communication plan. [2]. There is no risk communication plan on the websites of the Public Health Ministry [3], the National Office for risk and catastrophe management (BNGRC) [4], the Office for the prevention and management of emergencies (CPGU) [5], the Ministry of Communication and Culture [6], the Office of the President [7], or the Office of the Prime Minister [8], or from a wider online search.

- [1] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmIsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQQzqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.
- [2] Office of the Prime Minister of Madagascar. 1 July 2020. "Multi-sectorial emergency plan Madagascar (Plan multisectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 29 September 2020.
- [3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 1 October 2020.
- [4] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.
- [5] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.
- [6] Ministry of Communication and Culture. 2020. Official website. [<https://www.mcc.gov.mg>]. Accessed 1 October 2020.
- [7] Office of the President of Madagascar. 2020. Official Website. [<http://www.presidence.gov.mg>]. Accessed 1 October 2020.
- [8] Office of the Prime Minister of Madagascar. 2020. Official Website [<http://www.primature.gov.mg/>]. Accessed 1 October 2020.

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 both the Ministry of Public Health and the Bureau of Risk and Disaster Management (BNGRC) use their own websites and social media platforms to inform the public about health emergencies and other health concerns in Madagascar. In July 2020, the Ministry of Public Health was publishing news on the Corona-crisis on its website on a daily basis [1]. It also posts news on its Facebook page outside of the Corona-Crisis, for instance, on the plague. [2] The BNGRC also uses its Facebook page, so does the President of Madagascar, with most communications in local language. [3,4] There is evidence that the President communicates regularly about health emergencies in Madagascar on social media. [5] According to a media report, the government of Madagascar not only uses Facebook, it also has entered into a cooperation with the company Facebook itself, in order to control false information on COVID-19. [6]

[1] Public Health Ministry. 2020. Official Website. "Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>] and "News (Actualités)" [<http://www.sante.gov.mg/ministere-sante-publique/category/actualites/#rss>]. Accessed 25 August 2020.

[2] Public Health Ministry. Official Facebook page. Post from 2 October 2017. [<https://www.facebook.com/minsanp/videos/1612028578861720>] Accessed 1 October 2020

[3] Bureau of Risk and Disaster Management (BNGRC). 2020. Official Facebook page. [<https://www.facebook.com/BNGRCMID>] Accessed 25 August 2020.

[4] Office of the President of Madagascar. 2020. Official Facebook page. [<https://www.facebook.com/compresidencemadagascar>]. Accessed 25 August 2020

[5] Office of the President of Madagascar. Official Facebook page. Post from 25 October 2017 [<https://www.facebook.com/compresidencemadagascar/posts/1527084584037386>] Accessed 1 October 2020.

[6] La Verité. 2020. "Tracking rumors and false information. The cooperation between the State of Madagascar and Facebook effective (Traque des rumeurs et fausses informations - La coopération entre Etat-malagasy et société Facebook effective)". [<https://laverite.mg/politique/item/9927-traque-des-rumeurs-et-fausses-informations-la-cooperation-entre-etat-malagasy%20et-societe-facebook%20effective%20.html>] Accessed 25 August 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: 0

There is evidence that the President of Madagascar has shared misinformation on infectious diseases.

During the Corona-Crisis in 2020, the President has marketed and promoted a natural medicine, affirming it can cure Corona, though no medical tests have been conducted to confirm its effectiveness. [1].

In July 2020, the Health Minister addressed a letter to the international community, asking for help to deal with the crisis, "for which he was rebuked by the presidency". The President of Madagascar continues to promote his cure, despite soaring infection numbers. [1,2]

[1] Courrier International. 2020. Website. "Covid-19. Despite the 'Magic potion' of the President of Madagascar, the Health Minister is concerned about the epidemic" (Covid-19. Malgré le "remède miracle" du président malgache, le ministre de la Santé alerte sur l'épidémie).[https://www.courrierinternational.com/article/covid-19-malgre-le-remede-miracle-du-president-malgache-le-ministre-de-la-sante-alerte-sur].Accessed 25 August 2020.

[2] BBC News. 2020. Website. "Madagascar president's herbal tonic fails to halt Covid-19 spike" [https://www.bbc.com/news/world-africa-53756752] Accessed 25 August 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: 9.8

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: 40.57

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: 9.0

2019

Gallup; Economist Impact calculation

3.6.4 Female access to the Internet

3.6.4a

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

Input number

Current Year Score: 5.0

2019

Gallup; Economist Impact calculation

3.7 TRADE AND TRAVEL RESTRICTIONS

3.7.1 Trade restrictions

3.7.1a

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

Yes = 0, No = 1

Current Year Score: 1

There is no evidence that Madagascar issued a restriction, without international/bilateral support, on the export/import of medical goods due to an infectious disease outbreak in the past year.

On the website of the World Customs Organization, there is a "List of national legislation* of countries that adopted temporary export restrictions on certain categories of critical medical supplies in response to COVID-19" [1]. Madagascar is not part of the list. [1]

There is also no evidence on import/export restrictions on the websites of the Madagascar Customs Office, the Public Health Ministry, the Ministry of Agriculture, the Ministry of Foreign Affairs, nor its Facebook page [2,3,4,5,6]. There are no articles reporting import/export restrictions in Madagascar.

[1] World Customs Organization. 2020. Official Website. "List of national legislation* of countries that adopted temporary export restrictions on certain categories of critical medical supplies in response to COVID-19" [<http://www.wcoomd.org/en/topics/facilitation/activities-and-programmes/natural-disaster/list-of-countries-coronavirus.aspx>]. Accessed 27 August 2020.

[2] Madagascar Customs Office. 2020. Official Website. [<http://www.douanes.gov.mg>]. Accessed 27 August 2020

[3] Public Health Ministry. 2020. Official Website. "Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>] and "News (Actualités)" [<http://www.sante.gov.mg/ministere-sante-publique/category/actualites/#rss>]

[4] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[5] Ministry of Foreign Affaires. 2020. Official Website. [<https://www.diplomatie.gov.mg>] Accessed 27 August 2020

[6] Ministry of Foreign Affaires. 2020. Official Facebook page. [<https://www.facebook.com/diplomatie.gov.mg/>] Accessed 27 August 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 evidence that Madagascar issued a restriction, without international/bilateral support, on the export/import of non-medical goods due to an infectious disease outbreak in the past year.

On the website of the International Trade Centre (ITC), there is a map of "COVID-19 Temporary Trade Measures" [1]. Madagascar is marked as having no temporary import/export restrictions in place. [1]

There is also no evidence on import/export restrictions on the websites of the Madagascar Customs Office, the Public Health Ministry, the Ministry of Agriculture, the Ministry of Foreign Affaires, nor its Facebook page [2,3,4,5,6]. There are no articles reporting import/export restrictions in Madagascar.

[1] International Trade Centre (ITC). 2020. Official Website. "COVID-19 Temporary Trade Measures" [<https://www.macmap.org/covid19>]. Accessed 27 August 2020.

[2] Madagascar Customs Office. 2020. Official Website. [<http://www.douanes.gov.mg>]. Accessed 27 August 2020

[3] Public Health Ministry. 2020. Official Website. "Coronavirus" [<http://www.sante.gov.mg/ministere-sante-publique/category/coronavirus/>] and "News (Actualités)" [<http://www.sante.gov.mg/ministere-sante-publique/category/actualites/#rss>]

[4] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[5] Ministry of Foreign Affaires. 2020. Official Website. [<https://www.diplomatie.gov.mg>] Accessed 27 August 2020

[6] Ministry of Foreign Affaires. 2020. Official Facebook page. [<https://www.facebook.com/diplomatie.gov.mg/>] Accessed 27 August 2020

[7] Google search for "restriction, import, export, Madagascar". 27 August 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 Madagascar implemented a ban on travelers arriving from a specific country or countries due to an infectious disease outbreak without international/bilateral support. According to the "recommendations for international

traffic" of the World Health Organization in relation to the 2020 COVID-crisis, "restricting the movement of people and goods during public health emergencies is ineffective in most situations and may divert resources from other interventions. Furthermore, restrictions may interrupt needed aid and technical support, may disrupt businesses, and may have negative social and economic effects on the affected countries. However, in certain circumstances, measures that restrict the movement of people may prove temporarily useful, such as in settings with few international connections and limited response capacities." [1] Madagascar currently has a ban on travelers arriving from specific countries, they include Italy, South Korea and Iran. If passengers from these countries or from China arrive, they face a 14-day quarantine. [2]

[1] World Health Organization (WHO). 2020. Official Website. "Updated WHO recommendations for international traffic in relation to COVID-19 outbreak". [<https://www.who.int/news-room/articles-detail/updated-who-recommendations-for-international-traffic-in-relation-to-covid-19-outbreak>] Accessed 27 August 2020.

[2] U.S. Embassy in Madagascar and Comoros. 2020. Official Website. "COVID-19 Information". [<https://mg.usembassy.gov/u-s-citizen-services/security-and-travel-information/covid-19-information/>]. Accessed 27 August 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: 18.12

2014

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 14.6

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

Madagascar has a public health workforce strategy, but it has not been updated in the past five years. The 'Health sector development plan 2015-2019' contains a section on human resources, which does not constitute a workforce strategy. It notes that a national human resources for health (HRH) development plan is being drafted. Efforts with regard to HRH up to 2015 included the development of a management manual, the establishment of an observatory service for HRH, and the development of HRH management software.[1] According to the 2017 WHO Joint External Evaluation for Madagascar, the plan includes strategies for training, recruitment and retention. It is being implemented but as of 2017 was far from achieving its objectives, with a healthcare workforce shortage of 7,500.[2] The plan is not available online, either from the Ministry of Public Health, the Ministry of Education, the Ministry of Labour, or from a wider search.[3,4,5].

[1] Ministry of Public Health. 2015. "Health Sector Development Plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/6ba70-pdss_vf_oct15_opt.pdf]. Accessed 27 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Ministry of Public Health. 2018. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

[4] Ministry of Labour, Employment, Public Function and Social Laws. 2020. Official Website. [<http://www.mfptls.gov.mg>]. Accessed 27 August 2020.

[5] Ministry of National Education. 2020. Official website. [<http://www.education.gov.mg/>]. Accessed 27 August 2020.

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 20

2010

WHO/World Bank; national sources

4.1.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence to confirm that Madagascar has facilities with the capacity to isolate and treat patients with highly communicable diseases. The latest national contingency plan for preparing for and responding to major pandemics and epidemics, valid for 2015-16, stated the need to develop and equip 11 isolation rooms/centres. It did not identify which health facilities would house them.[1] During the 2017 plague outbreak, updates by the Bureau of Risk and Disaster Management (BNGRC) suggested that this need had not yet been fully met, noting an urgent need for materials to supply isolation centres.[2] However, a report by the European Centre for Disease Prevention and Control during the outbreak noted that "Five isolation and treatment centres [had] been established in the capital Antananarivo." [3] The after action review of the response to the 2017 plague outbreak did not reference a specific facility, but did note that an example of good practice during the response was the isolation of patients in plague triage and treatment centres.[4] The main public hospitals in Madagascar, known as University Hospital Centres (CHU), [5] do not have websites. There is no evidence in the 2017 WHO Joint External Evaluation for Madagascar or from the health ministry that permanent isolation facilities exist or what capacity existing facilities may have. [6,7] Online searching based on CHU and isolation/biocontainment facilities does not produce any relevant evidence. The Pasteur Institute of Madagascar houses a rabies treatment centre, but there is no evidence on PIM's website that it has patient isolation facilities. [8]

[1] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjso7eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[2] Bureau of Risk and Disaster Management (BNGRC). 2017. "Madagascar: Plague epidemic - Joint situation report no. 3, 23 October 2017 (Madagascar: Epidémie de peste - Rapport de situation conjoint no. 3, en date du 23 Octobre 2017)". [https://reliefweb.int/sites/reliefweb.int/files/resources/madagascar_epidemie_peste_rapport_de_situation_conjoint_n3_fr_final_23oct2017.pdf]. Accessed 27 August 2020.

[3] European Centre for Disease Prevention and Control. 2017. "Outbreak of pneumonic plague in Madagascar: recent introduction in the Seychelles." Rapid risk assessment, 13 October 2017. [<https://ecdc.europa.eu/sites/portal/files/documents/plague-madagascar-seychelles-rapid-risk-assessment-october-2017.pdf>]. Accessed 27 August 2020.

[4] World Health Organisation. 2018. "After Action Review of the emergency response to the epidemic outbreak of pulmonary plague (Revue Après Action de la réponse d'urgence à la flambée épidémique de peste pulmonaire)". [https://extranet.who.int/sph/sites/default/files/document-library/document/RT%20Madagascar20_09_2018.pdf]. Accessed 27 August 2020.

[5] Ministry of Public Health. 2011. "Law no. 2011 - 002: Health Code (Loi no. 2011 - 002: Code de la Santé)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/9d06b-loi-n-2011-002-du-15-juillet-2011-portant-code-de-la-sante.pdf]. Accessed 27 August 2020.

[6] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[7] Ministry of Public Health. 2018. Official website. [<http://www.sante.gov.mg/>]. Accessed 27 August 2020.

[8] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg/>]. Accessed 27 August 2020.

4.1.2c

Does the country meet one of the following criteria?

- Is there evidence that the country has demonstrated capacity to expand isolation capacity in response to an infectious

disease outbreak in the past two years?

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Madagascar has demonstrated capacity to expand isolation capacity or developed a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years. The latest national contingency plan for preparing for and responding to major pandemics and epidemics, valid for 2015-16, stated the need to develop and equip 11 isolation rooms/centres. It did not identify which health facilities would house them.[1] During the 2017 plague outbreak, updates by the Bureau of Risk and Disaster Management (BNGRC) suggested that this need had not yet been fully met, noting an urgent need for materials to supply isolation centres.[2] However, a report by the European Centre for Disease Prevention and Control during the outbreak noted that “Five isolation and treatment centres [had] been established in the capital Antananarivo.”[3] The after action review of the response to the 2017 plague outbreak did not reference a specific facility, but did note that an example of good practice during the response was the isolation of patients in plague triage and treatment centres.[4] The main public hospitals in Madagascar, known as University Hospital Centres (CHU),[5] do not have websites. There is no evidence in the 2017 WHO Joint External Evaluation for Madagascar or from the health ministry that isolation capacity was expanded in response to an infectious disease outbreak. [6,7] Online searching based on CHU and isolation/biocontainment facilities does not produce any relevant evidence. The Pasteur Institute of Madagascar houses a rabies treatment centre, but there is no evidence on PIM’s website that it has patient isolation facilities.[8]

[1] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)“
[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGJlLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQZqVpci4mPuup] – filter based on keyword “contingence” to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

[2] Bureau of Risk and Disaster Management (BNGRC). 2017. “Madagascar: Plague epidemic – Joint situation report no. 3, 23 October 2017 (Madagascar: Epidémie de peste - Rapport de situation conjoint no. 3, en date du 23 Octobre 2017)”.
[https://reliefweb.int/sites/reliefweb.int/files/resources/madagascar_epidemie_peste_rapport_de_situation_conjoint_n3_fr_final_23oct2017.pdf]. Accessed 27 August 2020.

[3] European Centre for Disease Prevention and Control. 2017. “Outbreak of pneumonic plague in Madagascar: recent introduction in the Seychelles.” Rapid risk assessment, 13 October 2017.
[https://ecdc.europa.eu/sites/portal/files/documents/plague-madagascar-seychelles-rapid-risk-assessment-october-2017.pdf]. Accessed 27 August 2020.

[4] World Health Organisation. 2018. “After Action Review of the emergency response to the epidemic outbreak of pulmonary plague (Revue Après Action de la réponse d’urgence à la flambée épidémique de peste pulmonaire)”.
[https://extranet.who.int/sph/sites/default/files/document-library/document/RT%20Madagascar20_09_2018.pdf]. Accessed 27 August 2020.

[5] Ministry of Public Health. 2011. “Law no. 2011 – 002: Health Code (Loi no. 2011 – 002: Code de la Santé)”.
[http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/9d06b-loi-n-2011-002-du-15-juillet-2011-portant-code-de-la-sante.pdf]. Accessed 27 August 2020.

[6] World Health Organisation (WHO). 2017. “Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)”. [https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf]. Accessed 20 August 2020.

[7] Ministry of Public Health. 2018. Official website. [http://www.sante.gov.mg/]. Accessed 27 August 2020.

[8] Pasteur Institute of Madagascar. 2020. Official website. [<http://www.pasteur.mg>]. Accessed 27 August 2020.

4.2 SUPPLY CHAIN FOR HEALTH SYSTEM AND HEALTHCARE WORKERS

4.2.1 Routine health care and laboratory system supply

4.2.1a

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

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

Current Year Score: 0

There is insufficient evidence that Madagascar has a national procurement protocol which can be utilized by both the Ministries of Health and Agriculture for the acquisition of laboratory supplies and medical supplies for routine needs. While Madagascar has a 2017 'Protocol for the logistics of medical supplies' [1], there is no evidence of a protocol for laboratory supplies. Also, the Protocol does not mention the Ministry of Agriculture, Animal Husbandry and Fisheries. [1] According to the 2017 WHO Joint External Evaluation for Madagascar, there is a central purchasing agency for essential inputs, called Salama. [2,3] Salama is the 'central procurement agency for essential drugs and medical supplies' in Madagascar. It is under the supervision of the Ministry of Public Health and has a role in purchasing laboratory and medical supplies. [4] The 2017 protocol for the logistics of medical supplies cites, alongside the central procurement agency for essential drugs (Salama) also the 'Procurement Unit for solid solute (UASM)'. [1] The UASM does not have an official website. [5] It is mentioned on the website of the Ministry of Public Health in the organigramme [6] and in an article in Malagasy [7]. There is no evidence of a protocol for laboratory supplies on the website of the Ministry of Public Health or on the website of the Ministry of Agriculture, Animal Husbandry and Fisheries, or on the website of the central procurement agency Salama. [3, 8, 9].

[1] Ministry of Public Health. July 2017. "Protocol for the logistics of medical supplies (Manuel de procédures en gestion logistique des intrants de santé)". [<http://www.sante.gov.mg/ministere-sante-publique/wp-content/uploads/2019/03/Manuel-de-Procedure-GIS.pdf>]. Accessed 28 August 2020.

[2] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[3] Salama. 2020. Official website. [<http://www.ticsalama.mg/Home/index.php>] Accessed 28 August 2020

[4] SALAMA. 2020. "Acquisition" [<http://www.ticsalama.mg/Home/Acquisition.php>] Accessed 28 August 2020.

[5] Online search for « UASM Madagascar », and « unité d'approvisionnement de soluté massif Madgascar". 1 October 2020

[6] Ministry of Public Health. 2020. Official Website. « Organigramme » [<http://www.sante.gov.mg/ministere-sante-publique/organigramme/>] Accessed 1 October 2020.

[7] Ministry of Public Health. 2019. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/2019/05/02/fifamindrana-fitantanana-eto-anivonny-ministeranny-fahasalamam-bahoaka/>] Accessed 1 October 2020.

[8] Ministry of Public Health of Madagascar. 2020. Official Website. [<http://www.sante.gov.mg/ministere-sante-publique/>] and "Documents" [<http://www.sante.gov.mg/ministere-sante-publique/documents/>]. Accessed 25 September 2020.

[9] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official Website. [<http://www.maep.gov.mg>] Accessed 25

September 2020.

4.2.2 Stockpiling for emergencies

4.2.2a

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

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

Current Year Score: 1

Madagascar has stocks of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE) for national use during a public health emergency, but there is limited evidence about what the stockpile contains. According to the World Health Organisation's 2017 Joint external evaluation, the government has set up an 'Infrastructure, Logistics and Legacy Service (SILOP)' responsible for receiving and storing medical equipment, and a 'Response Service for Emergencies, Epidemics and Disasters (SURECA)', which has established medical supplies stocks for use in any emergency in all 22 regions. The Customs Code (Article 240) facilitates procedures for the reception of medical supplies and their exemption from taxes in case of emergency. [1] The 'central procurement agency for essential drugs and medical supplies' in Madagascar is called SALAMA.[2] There is a section on stockpiling on its website, but no details of accessing/providing medical supplies in an emergency situation are available. [3] SURECA figures in the Organigram of the Ministry of Public Health [4], but does not have its own website [5].

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] SALAMA. 2020. Official website. [<http://www.ticsalama.mg/Home/index.php>]. Accessed 28 August 2020

[3] SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)".

[<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[4] Ministry of Public Health. 2020. Official Website. « Organigramme » [<http://www.sante.gov.mg/ministere-sante-publique/organigramme/>] Accessed 1 October 2020.

[5] Online search for « Service des Urgences et des Ripostes aux Epidémies et Catastrophes madagascar » and « SURECA Madagascar ». 1 October 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

Madagascar has stocks of medical supplies for use in a public health emergency, but there is no evidence that Madagascar has stocks of laboratory supplies.

The government has set up an Infrastructure, Logistics and Legacy Service (SILOP) responsible for receiving and storing medical equipment, and a Response Service for Emergencies, Epidemics and Disasters (SURECA), but it is not clear if they have stocks of laboratory supplies. [1] SALAMA is the 'central procurement agency for essential drugs and medical supplies' in

Madagascar. [2] There is a section on stockpiling on its website, but no details of accessing/providing laboratory supplies in an emergency situation are available. [3]

There is no evidence of the existence of stocks of laboratory supplies on the websites of the Ministries of Public Health [4], the Ministry of National Defence [5], the Bureau of Risk and Disaster Management (BNGRC) [6], the Office for the prevention and management of emergencies (CPGU) [7]. There is no evidence on the website of the Madagascar Drug Agency. [8]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Central procurement agency for essential drugs and medical supplies SALAMA. 2020. Official website. [<http://www.ticsalama.mg/Home/index.php>]. Accessed 28 August 2020

[3] Central procurement agency for essential drugs and medical supplies SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)". [<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[4] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

[5] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 1 October 2020.

[6] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

[7] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.

[8] Madagascar Drug Agency. 2020. Official Website. "Roles and Missions (Rôles et missions)" [http://www.agmed.mg/index_fichiers/Role_missions.htm] Accessed 28 August 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 Madagascar conducts or requires an annual review of the national stockpile to ensure the supply is sufficient for a public health emergency. According to the World Health Organisation's 2017 Joint external evaluation, laboratories have problems supplying reagents and consumables. It does not mention an annual review of the national stockpile. [1] There is no evidence of an annual review of the stockpile on the website of the 'central procurement agency for essential drugs and medical supplies' SALAMA [2,3]. The 'Response Service for Emergencies, Epidemics and Disasters (SURECA)' under the Ministry of Public Health does not have its own website [4,5]. There is no evidence on the websites of the Ministry of Public Health [6], or the Ministry of National Defense [7].

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] SALAMA. 2020. Official website. [<http://www.ticsalama.mg/Home/index.php>]. Accessed 28 August 2020

[3] SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)". [<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[4] Ministry of Public Health. 2020. Official Website. « Organigramme » [<http://www.sante.gov.mg/ministere-sante->

publique/organigramme/] Accessed 1 October 2020.

[5] Online search for « Service des Urgences et des Ripostes aux Epidémies et Catastrophes madagascar » and « SURECA Madagascar ». 1 October 2020.

[6] Ministry of Public Health. 2021. Official website. [<http://www.sante.gov.mg/ministere-sante-publique/>] Accessed 01/04/2021

[7] Ministry of National Defense of Madagascar. 2021. Official website. [<http://www.defense.gov.mg/>] Accessed 01/04/2021

4.2.3 Manufacturing and procurement for emergencies

4.2.3a

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 0

There is no evidence of a plan/agreement to procure or to leverage domestic manufacturing capacity to produce medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during a public health emergency in Madagascar. According to the WHO 2017 Joint External Evaluation for Madagascar, the government has set up an Infrastructure, Logistics and Legacy Service (SILOP) responsible for receiving and storing medical equipment, and a Response Service for Emergencies, Epidemics and Disasters (SURECA) which has established MCM stocks for use in any emergency in all 22 region [1], but there is no evidence of a plan/mechanism to produce or procure medical supplies, as SURECA does not have a website. The 2017 JEE assessment notes that medical stocks are insufficient in light of potential emergencies. It recommends as a priority that Madagascar establish storehouses for medical countermeasures, determine a supply network based on risk analysis, and put in place standard operating procedures for stock management. [1] The central purchasing agency for drugs and medical supplies is SALAMA. There is a section on stockpiling on its website, but no details of producing or procuring medical supplies in an emergency situation are available. [2] There is no evidence that Madagascar has plans or means to procure or produce medical supplies on the website of the Ministry of Public Health [3], nor on the website of the Madagascar Drug Agency [4]. The latest available Contingency Plan is valid until 2016. It does not mention the production or procurement of medical supplies in emergency situations. [5]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Central procurement agency for essential drugs and medical supplies SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)". [<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

[4] Madagascar Drug Agency. 2020. Official Website. "Roles and Missions (Rôles et missions)" [http://www.agmed.mg/index_fichiers/Role_missions.htm] Accessed 28 August 2020.

[5] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPraAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGJLTcwMg%3D%3D&usg=AOvVaw3BJI46KNm]

QZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

4.2.3b

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 0

There is no evidence that Madagascar has a plan/agreement to leverage domestic manufacturing capacity to produce or procure laboratory supplies for national use during a public health emergency .

The government has set up an Infrastructure, Logistics and Legacy Service (SILOP) responsible for receiving and storing medical equipment, and a Response Service for Emergencies, Epidemics and Disasters (SURECA), [1] but it is not clear if they have ways to procure or produce laboratory supplies, as SURECA does not have a website. SALAMA is the 'central procurement agency for essential drugs and medical supplies' in Madagascar. There is a section on stockpiling on its website, but no details of producing or procuring laboratory supplies in an emergency situation are available. [2]

There is no evidence that Madagascar has plan/agreement to leverage domestic manufacturing capacity to produce or procure laboratory supplies for national use during a public health emergency on the websites of the Ministries of Public Health [3], the Ministry of National Defence [4], the Bureau of Risk and Disaster Management (BNGRC) [5], the Office for the prevention and management of emergencies (CPGU) [6]. There is no evidence on the website of the Madagascar Drug Agency. [7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Central procurement agency for essential drugs and medical supplies SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)". [<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

[4] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 1 October 2020.

[5] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

[6] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.

[7] Madagascar Drug Agency. 2020. Official Website. "Roles and Missions (Rôles et missions)" [http://www.agmed.mg/index_fichiers/Role_missions.htm] Accessed 28 August 2020.

4.3 MEDICAL COUNTERMEASURES AND PERSONNEL DEPLOYMENT

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

4.3.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has a plan, programme, or guidelines in place for dispensing medical countermeasures (MCM) for national use during a public health emergency. The 2017 WHO Joint External Evaluation for Madagascar does not mention the existence of a plan, and recommends that the government develop a national plan with procedures for sending out MCM in an emergency. It notes that the government has set up a Response Service for Emergencies, Epidemics and Disasters (SURECA), which has established MCM stocks for use in any emergency in all 22 regions. [1] A report on a cyclone response in 2014 showed that SURECA plays a role in distributing MCM, but no plan can be found on the procedure, as SURECA does not have a website. [2] There is no evidence of a plan, programme, or guidelines in place for dispensing medical countermeasures during a public health emergency on the websites of the Ministries of Public Health [3], the Bureau of Risk and Disaster Management (BNGRC) [4], the Office for the prevention and management of emergencies (CPGU) [5]. There is no evidence on the website of the Madagascar Drug Agency, or in the 'Contingency Plan 2015-2016'[6,7]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Centre d'Etude de Reflexion de Veille et d'Orientation (CERVO). 2014. "Situation update: Intense tropical cyclone Hellen (Point de situation: Cyclone tropical intense Hellen)". [<https://reliefweb.int/sites/reliefweb.int/files/resources/PShellen7.pdf>]. Accessed 28 August 2020.

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

[4] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

[5] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 2020.

[6] Madagascar Drug Agency. 2020. Official Website. "Roles and Missions (Rôles et missions)" [http://www.agmed.mg/index_fichiers/Role_missions.htm] Accessed 28 August 2020.

[7] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjso7eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp->

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

Madagascar does not have a public plan in place defining procedures for the participation of health personnel from other countries in domestic public health emergency response, though it does have an arrangement for receiving foreign health personnel in a public health emergency through its membership in the Indian Ocean Commission (IOC)'s SEGA One Health Network. According to the 2017 WHO Joint External Evaluation for Madagascar, Madagascar's membership of SEGA enables it to send and receive health personnel to and from other countries in the region to respond to health emergencies. It recommends developing a plan defining procedures and decision-making with regard to sending and receiving health personnel during public health emergencies.[1] There is no evidence of such a plan from the Public Health Ministry or the Bureau of Risk and Disaster Management under the Ministry of the Interior and Decentralisation, which is charged with emergency response.[2,3]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/>]. Accessed 27 August 2020.

[3] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020.

4.4 HEALTHCARE ACCESS

4.4.1 Access to healthcare

4.4.1a

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

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

Current Year Score: 2

2020

World Policy Analysis Center

4.4.1b

Access to skilled birth attendants (% of population)

Input number

Current Year Score: 44.3

2013

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: 21.1

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 evidence that the government of Madagascar has issued legislation or a policy committing to provide prioritised healthcare services to workers who become sick as a result of responding to a public health emergency. Madagascar's latest available contingency plan 2015-2016 commits to providing chemoprophylaxis to up to 10% of essential staff working on disease response, and to those having had direct contact with actual or suspected cases. It also calls for prioritised vaccinations to be provided to essential staff exposed to diseases. It does not state that healthcare workers who become sick during response will receive prioritised treatment. [1] There is no evidence of such a commitment in the 2017 WHO Joint External Evaluation for Madagascar, or on the websites of the health ministry or the Bureau of Risk and Disaster Management. [2, 3, 4]

[3] Central procurement agency for essential drugs and medical supplies SALAMA. 2020. Official website. "Activities - Stockpile (Activités - Stockage)". [<http://www.ticsalama.mg/Home/Stock.php>]. Accessed 28 August 2020.

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

4.5 COMMUNICATIONS WITH HEALTHCARE WORKERS DURING A PUBLIC HEALTH EMERGENCY

4.5.1 Communication with healthcare workers

4.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has a system in place for public health officials and healthcare workers to communicate during a public health emergency. The 2017 WHO Joint External Evaluation for Madagascar (JEE) states that with regard to responding to public health emergencies, Madagascar has coordination frameworks for internal communication and communication with partners, but these need reinforcing. Communication plans have been developed and were tested during Cyclone ENAWO in 2017. The national communication network is known as URGENCE, and exists at all levels of the health pyramid, though the JEE report does not explicitly state that this covers communication between healthcare workers and public health officials. In epidemic and pandemic responses, "the health sector group has a multisectoral communication commission in which SURECA [the Response Services for Emergencies, Epidemics and Disasters, under the health ministry], BNGRC [Bureau of Risk and Disaster Management, under the interior ministry and which houses an emergency operations centre], DSV [Directorate of Veterinary Services], the Malagasy Red Cross, WHO, UNICEF, ACSQDA [the food safety agency], IPM [Pasteur Institute of Madagascar, a non-governmental medical research institute] and USAID participate, for which leadership is provided by the Ministry of Health." There is also a humanitarian platform for the private sector, used to coordinate private sector involvement in emergency response. The evidence implies that these may be mechanisms which could enable communication between public health officials and healthcare workers in the private and third sectors, but there is no explicit evidence stating this.[1] There is no evidence that URGENCE or another mechanism specifically enables public health officials and healthcare workers to communicate during an emergency from the websites of the Ministry of Public Health or the BNGRC, from the last available contingency plan, or from a wider online search.[2, 3, 4]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/>]. Accessed 24 August 2020.

[3] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020.

[4] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjso7eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DmIsZS03MDI%3D%26public%3DcHVibGJLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQQzqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 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 evidence that Madagascar has a system in place for public health officials and healthcare workers to communicate during a public health emergency. The 2017 WHO Joint External Evaluation for Madagascar (JEE) states that with regard to responding to public health emergencies, Madagascar has coordination frameworks for internal communication and communication with partners, but these need reinforcing. Communication plans have been developed and were tested during Cyclone ENAWO in 2017. The national communication network is known as URGENCE, and exists at all levels of the health pyramid, though the JEE report does not explicitly state that this covers communication between healthcare workers and public health officials. In epidemic and pandemic responses, "the health sector group has a multisectoral communication commission in which SURECA [the Response Services for Emergencies, Epidemics and Disasters, under the health ministry], BNGRC [Bureau of Risk and Disaster Management, under the interior ministry and which houses an emergency operations centre], DSV [Directorate of Veterinary Services], the Malagasy Red Cross, WHO, UNICEF, ACSQDA [the food safety agency], IPM [Pasteur Institute of Madagascar, a non-governmental medical research institute] and USAID participate, for which leadership is provided by the Ministry of Health." There is also a humanitarian platform for the private sector, used to coordinate private sector involvement in emergency response. The evidence implies that these may be mechanisms which could enable communication between public health officials and healthcare workers in the private and third sectors, but there is no explicit evidence stating this.[1] There is no evidence that URGENCE or another mechanism specifically enables public health officials and healthcare workers to communicate during an emergency from the websites of the Ministry of Public Health or the BNGRC, from the last available national contingency plan, or from a wider online search.[2, 3, 4]

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 20 August 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/>]. Accessed 24 August 2020.

[3] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management. 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 24 August 2020.

[4] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjso7eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 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 no evidence that the public health system is tracking the overall number of healthcare associated infections (HCAI) in Madagascar, though individual national-level hospitals have been instructed to monitor them. The 2017 WHO Joint External Evaluation for Madagascar states that there is no specific plan for the prevention and control of HCAI, though they are the subject of an internal technical note to (national-level) university hospitals (CHU), which have HCAI committees.[1] This appears to refer to a technical guide on handling medical waste.[2] Madagascar has a 2014-2018 plan on handling medical waste. Both call for increased monitoring of medical waste management and HCAI, though lack details on HCAI indicators and surveillance systems.[3] The JEE assessment recommends extending HCAI control work to all healthcare facilities, implementing national-level regulations and improving the capacity of laboratories to provide reliable results and manage databases.[1] There is no evidence from the JEE assessment, the health sector development plan for 2015-2019, or the website of the Ministry of Public Health that the health ministry is tracking the number of infections at a regional or national level.[1,4,5] The national laboratories under the Ministry of Public Health do not have websites.

[1] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 18 September 2018.

[2] Ralitera, M. 10 September 2016. "Health: When the hospital transmits infections (Santé: Quand l'hôpital transmet les infections)". L'Express de Madagascar. [<https://lexpress.mg/10/09/2016/sante-quand-lhopital-transmet-les-infections/>] Accessed 28 August 2020.

[3] Ministry of Public Health, Health and Environment Service. 2014. "National plan on management of medical waste in Madagascar 2014-2018 (Plan national de gestion des déchets médicaux à Madagascar 2014-2018)". http://www.sante.gov.mg/home/uploads/___folderforallfiles/Plan_National_Gestion_Dejets_Medicaux_Madagascar.pdf Accessed 28 August 2020.

[4] Ministry of Public Health. 2015. "Health sector development plan 2015-2019 (Plan de développement du secteur de la santé 2015-2019)". [http://www.sante.gov.mg/organigrammes/assets/uploads/files/documents_officiels/6ba70-pdss_vf_oct15_opt.pdf]. Accessed 28 August 2020.

[5] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 20 August 2020

4.7 CAPACITY TO TEST AND APPROVE NEW MEDICAL COUNTERMEASURES

4.7.1 Regulatory process for conducting clinical trials of unregistered interventions

4.7.1a

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

Yes = 1 , No = 0

Current Year Score: 1

Madagascar has a requirement for ethical review before beginning a clinical trial. The 2011 Health Code, Article 122, states that all clinical trials must receive prior approval by the health minister, on the advice of an ethics committee under the health ministry. [1] A notice was issued in 2016 establishing a Committee of Biomedical Research Ethics to implement this law. The notice states: "Any biomedical research involving humans must be approved by the Ethics Committee." [2]

[5] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 22 August 2020.

4.7.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Madagascar has an expedited process for approving clinical trials for unregistered medical countermeasures (MCM) to treat ongoing pandemics. The 2011 Health Code, Article 122, states that all clinical trials must receive prior approval by the health minister, on the advice of an ethics committee under the health ministry. A notice was issued in 2016 establishing a Committee of Biomedical Research Ethics to implement this law. Neither document mentions an expedited process for approving clinical trials for MCM for use in an emergency. [1,2] The committee does not have an online presence and there is no information from the health ministry or the Medicines Agency regarding expedited approvals. [3,4] There is no evidence of an expedited approvals process from the national contingency plan. [5]

[1] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)". [<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 30 August 2020.

[2] Ministry of Public Health. 2016. "Notice no. 7805/2016: Fixing the creation, composition, attributions and functioning of a Committee of Biomedical Research Ethics under the Ministry of Public Health (Arrêté no. 7805/2016: Fixant la création, la composition, les attributions et le fonctionnement d'un Comité d'Ethique de la Recherche Biomédicale auprès du Ministère de la Santé Publique)". CNLegis database. Notice can be found by searching on "Comité d'Ethique Recherche Biomédicale". There is no static link. [http://www.cnlegis.gov.mg/page_find_direct_mots_texte/]. Accessed 30 August 2020.

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 01/09/2020

[4] Medicines Agency of Madagascar. 2020. Official website. [<http://www.agmed.mg/>]. Accessed 1/ 09/2020.

[5] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRTJDrQQFjAD>]

egQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGljLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

4.7.2 Regulatory process for approving medical countermeasures

4.7.2a

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

Yes = 1 , No = 0

Current Year Score: 1

The Madagascar Medicines Agency, along with the National Registration Commission, is responsible for approving new medical countermeasures for humans. Article 198 of the 2011 Health Code states that the Madagascar Medicines Agency is charged with registering medications for human use by granting market authorisation for new and imported medicines. It also enforces laws and regulations on clinical trials, manufacture, import and placing on the market of medicines and other pharmaceutical products, and is responsible for pharmacovigilance and quality control of medicines. [1] Notice no. 28385/2015 states that the Madagascar Medicines Agency is also responsible for approving all medicines and medical consumables (including reagents, syringes, rapid tests, etc) sent by overseas donors for use in emergencies or in the framework of development aid, in order to gain customs clearance. [2] According to the website of the Madagascar Medicines Agency, its remit covers medications and parapharmaceutical products. It reviews applications for market authorisation for conformity with regulations and passes them to the National Registration Commission; then passes the Commission's conclusions to the director of the Medicines Agency for a final decision. [3]

[6] Ministry of National Defence. 2020. Official website. [<http://www.defense.gov.mg/>]. Accessed 1 October 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 evidence that Madagascar has an expedited process for approving new medical countermeasures for humans during public health emergencies. Article 198 of the 2011 Health Code states that the Madagascar Medicines Agency is charged with registering medications for human use by granting market authorisation for new and imported medicines. The Health Code does not mention an expedited process. [1] Notice no. 28385/2015 states that the Madagascar Medicines Agency is also responsible for approving all medicines sent by overseas donors for use in emergencies or in the framework of development aid, in order to gain customs clearance. It does not mention an expedited process. [2] No information on an expedited approvals process is available from the websites of the Madagascar Medicines Agency or health ministry, or from the national contingency plan for pandemics and epidemics, or the national multi-risk contingency plan. [3, 4, 5]

[1] Government of Madagascar. 2011. "Law No. 2011-02: Health Code (Loi No. 2011-02: portant Code de la Santé)".

[<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/97799/116199/F1071917999/MDG-97799.pdf>]. Accessed 1 Sept 2020.

[2] Government of Madagascar. 2015. "Notice no. 28385/2015: Determining the conditions for managing donations of health inputs for all public or private health facilities and institutions (Arreté no. 28385/2015: Déterminant les conditions de gestion

des dons en intrants de santé pour toutes les formations sanitaires publiques ou privées ainsi que les institutions)". CNLegis database. Notice can be found by searching on keywords "intrants", "dons" and "santé". There is no static link.

[http://www.cnlegis.gov.mg/page_find_direct_mots_texte/]. Accessed 1 Sept 2020.

[3] Ministry of Public Health. 2020. Official website. [http://www.sante.gov.mg/home/n]. Accessed 1 Sept 2020

[4] Madagascar Medicines Agency. 2020. Official website. [http://www.agmed.mg/]. Accessed 1 Sept 2020.

[5] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)"

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjs07eU4LPrAhXSzYUKHRTJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-

mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DcHVibGJLTcwMg%3D%3D&usg=AOvVaw3BJI46KNmQZqVpci4mPuup] - filter based on keyword "contingence" to find the health and general contingency plans. Note absence of more recent plan. Accessed 24 August 2020.

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

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

5.1.1 Official IHR reporting

5.1.1a

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

Yes = 1, No = 0

Current Year Score: 1

2020

World Health Organization

5.1.2 Integration of health into disaster risk reduction

5.1.2a

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

Yes = 1, No = 0

Current Year Score: 0

Pandemics are not integrated into Madagascar's national disaster risk reduction (DRR) strategy, and there is no standalone national disaster risk reduction strategy for pandemics. The DRR policy (Law no. 2015-031) does not specifically address pandemics.[1]The 'National Strategy for the Management of Risks and Disasters 2016-2020' states that DRR should be

integrated into the health sector, and all policies and plans (across all sectors) should be revised to incorporate DRR.[2] The Bureau of Risk and Disaster Management (BNGRC) is in charge of DRR. It has not published a DRR strategy for pandemics.[3] No DRR strategy for pandemics is available from the health ministry.[4] DRR has not been integrated into the 2015-2019 plan for the development of the health sector, though it discusses the need to improve disaster response capacity.[5]

[7] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

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

5.2.1 Cross-border agreements

5.2.1a

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

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

Current Year Score: 2

Madagascar has an agreement with neighbouring countries with regard to public health emergencies through its membership in the Indian Ocean Commission (IOC)'s SEGA One Health Network. [1] Amongst other cooperation mechanisms, the network has set up an online-database (E-surveillance) which serves as a reporting tool on human and animal health for each of the member countries. This tool includes an alert system in the case of health emergencies, catastrophes or stock shortage. [2]According to the WHO 2017 Joint External Evaluation, Madagascar's membership of SEGA also provides a framework for it to send and receive health personnel to and from other countries in the region to respond to public health emergencies. [3]

[1] DP One Health OI. 2020. Official Website. "About us (Qui sommes nous)" [<https://www.onehealth-oi.org/a-propos-du-reseau/qui-sommes-nous>] and "Risk Modeling (Modelisation des risques)" [<https://www.onehealth-oi.org/thematiques/modelisation-des-risques>]

[2] Indian Ocean Commission /French Development Agency AFD. October 2019. « The SEGA One Health network in the Indian Ocean : from concept to action (Le réseau SEGA One Health dans l'Océan Indien: du concept à l'action) [http://gispe.org/Actus2019_session1_5_Rasamoelina_surveillance.pdf]

[3] World Health Organisation (WHO). 2017. "Joint external evaluation of IHR core capacities of Madagascar: Mission report 10-14 July 2017 (Evaluation externe conjointe des principales capacité RSI de la République de Madagascar: Rapport de mission 10-14 Juillet 2017)". [<https://extranet.who.int/sph/sites/default/files/jeeta/WHO-WHE-CPI-REP-2017.66-fre.pdf>]. Accessed 1 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: 2

Madagascar has an agreement with neighbouring countries with regard to animal health emergencies through its membership in the Indian Ocean Commission (IOC)'s SEGA One Health Network. [1] The project, co-financed by the French Development Agency (AFD), is currently in its third phase. As stated by AFD, "from 2013 to 2017, the network went through a capacity-building period, adding surveillance for communicable diseases, both human and animal ("One Health" concept in accordance with WHO rules)." During this second phase, the health monitoring unit also became a permanent technical department of the IOC." [2] Amongst other cooperation mechanisms, the network has set up an online-database (E-surveillance) which serves as a reporting tool on animal health for each of the member countries. For animal health, data is entered into an online database and an application for smartphones is also available to facilitate access to shared data. [3]

[8] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [http://www.primature.gov.mg/cpgu/]. Accessed 1 October 2020.

5.3 INTERNATIONAL COMMITMENTS

5.3.1 Participation in international agreements

5.3.1a

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

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

Current Year Score: 2

2021

Biological Weapons Convention

5.3.1b

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

Yes = 1 , No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1c

Has the state provided the required United Nations Security Council Resolution (UNSCR) 1540 report to the Security Council Committee established pursuant to resolution 1540 (1540 Committee)?

Yes = 1 , No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1d

Extent of United Nations Security Council Resolution (UNSCR) 1540 implementation related to legal frameworks and enforcement for countering biological weapons:

Very good (60+ points) = 4, Good (45–59 points) = 3, Moderate (30–44 points) = 2, Weak (15–29 points) = 1, Very weak (0–14 points) or no matrix exists/country is not party to the BWC = 0

Current Year Score: 1

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 no evidence that Madagascar has allocated national funds to improve capacity to address epidemic threats within the past three years. The 2020 'Multi-sector emergency plan Madagascar' does not mention the existence of an emergency

or contingency fund. [1]. It mentions the existence of a specific contingency plan to deal with COVID-19, however, this plan is not available online [2,3]. The 2015 'Contingency Plan 2015-2016' mentions an emergency fund [4], but it is not clear whether it actually exists. A media report implies that it may not contain any funds, if it does exist. [5]. The websites of the President or the Public Health Ministry do not mention the allocation of funds to deal with epidemic threats. [2,3], nor the websites of the Bureau of Risk and Disaster Management (BNGRC) [6] or the Office for the prevention and management of emergencies (CPGU) [7].

[1] Government of Madagascar 2020. "Multi-sector emergency plan Madagascar (Plan multi-sectoriel d'urgence Madagascar)". [<http://www.primature.gov.mg/wp-content/uploads/2020/07/Plan-Multisectoriel-DUrgence-PMDU-Version-finale-14.07.20-2.pdf>] Accessed 3 September 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 3 September 2020.

[3] Office of the President of Madagascar. 2020. Official Website. [<http://www.presidence.gov.mg>]. Accessed 3 September 2020.

[4] Government of Madagascar. 2015. Contingency Plan 2015-2016 (Plan de Contingence 2015-2016)" [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjso7eU4LPrAhXSzYUKHRtJDrQQFjADegQIAxAB&url=http%3A%2F%2Fpshp-mada.org%2F%3Fsecure_download%3DZmlsZS03MDI%3D%26public%3DchVibGjLTcwMg%3D%3D&usg=AOvVaw3BJl46KNmQZqVpci4mPuup] Accessed 3 September 2020.

[5] Midi Madagasikara. 2020. "National contingency fund: operationalisation planned for this year (Fonds de contingence national : Opérationnalisation prévue cette année)". [<http://www.midi-madagasikara.mg/societe/2020/03/13/fonds-de-contingence-national-operationnalisation-prevue-cette-annee/>] Accessed 3 September 2020.

[6] Ministry of the Interior and Decentralisation, Bureau of Risk and Disaster Management (BNGRC). 2020. Official website. [<http://www.bngrc-mid.gov.mg/bngrc/index.html>]. Accessed 1 October 2020.

[7] Office for the prevention and management of emergencies (CPGU). 2020. Official Website. [<http://www.primature.gov.mg/cpgu/>]. Accessed 1 October 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

Madagascar is eligible for the World Bank pandemic financing facility. It is on the list of countries eligible for International Development Association (IDA) funding, and is therefore eligible for the World Bank's Pandemic Emergency Financing Facility. [1] This provides surge financing to low-income countries affected by a large-scale disease outbreak to prevent it from reaching pandemic proportions. [2] Madagascar also has a contingency fund which can be accessed in case of disasters, including pandemics, but it is hard to mobilise owing to the lack of a manual for its management. [3] The 2017 WHO Joint External Evaluation for Madagascar notes a need for specific and easily-mobilised funding to respond to public health emergencies. [4] The 2018 after-action review of the 2017 plague outbreak noted as an action: "Enter a budget line at the ministry of health for epidemic contingency funds", with a target date for completing the action of December 2018. [5] There is no evidence that this fund has been put in place, either from the website of the health ministry or of the Bureau of Risk and Disaster Management. [6, 7]

[8] Madagascar Drug Agency. 2020. Official Website. "Roles and Missions (Rôles et missions)"

[http://www.agmed.mg/index_fichiers/Role_missions.htm] Accessed 28 August 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 no evidence that in the past three years, senior leaders in Madagascar have made a public commitment either to support other countries to improve capacity to address epidemic threats by providing financing or support; or to improve its own domestic capacity to address epidemic threats by expanding financing or requesting support to improve capacity. There is no evidence of relevant statements on the websites of the Ministry of Public Health, the Ministry of Foreign Affairs, from

the World Health Organisation (WHO)'s Madagascar pages, or the press centre of the United Nations in Madagascar.[1, 2, 3, 4, 5]

[1] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/home/n>]. Accessed 1 September 2020.

[2] Ministry of Foreign Affairs. 2020. Official website. [<http://www.diplomatie.gov.mg/>]. Accessed 1 September 2020.

[3] World Health Organisation (WHO). 2020. "Madagascar." [<https://www.who.int/countries/mdg/fr/>]. Accessed 1 September 2020.

[4] World Health Organisation (WHO) Madagascar. 2020. "Madagascar." [<https://www.afro.who.int/fr/countries/Madagascar>]. Accessed 1 September 2020.

[5] The United Nations in Madagascar. 2019. "Press centre (Centre de presse)". [http://mg.one.un.org/content/unct/madagascar/fr/home/presscenter.html?par_list_start=0]. Accessed 1 September 2020.

5.5.4b

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

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

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

Current Year Score: 1

There is evidence that Madagascar has requested support from donors to improve the country's domestic capacity to address epidemic threats in the past two years but there is no evidence that Madagascar has provided other countries with financial or technical support to address epidemic threats on the websites and Facebook pages of the President, the Ministry of Public Health, the website of the One Health-related research and training partnership mechanism of the Indian Ocean 'DP One Health OI', which Madagascar is part of. [1,2,3].

Madagascar is part of the 'regional network for epidemic surveillance and alert management (SEGA)', which is currently in its 3rd phase. Its objective is to "improve capacity for monitoring, reducing risk, and responding to epidemic diseases" [4]. This project is mainly funded by the French Development Agency (AFD). AFD renewed its technical and financial cooperation with €8 million in funding in 2019. [4]

According to the Georgetown Infectious Disease Atlas (GIDA) Global Health Security Tracking site, between 2014 and 2020 Madagascar has received funding from international donors to improve its capacity in reporting, laboratory system, real time surveillance, emergency response operations, antimicrobial resistance, zoonotic diseases and, to a lesser extent, medical countermeasures. [5]

[1] Office of the President of Madagascar. 2020. Official Facebook page. [<https://www.facebook.com/compresidencemadagascar>]. Accessed 2 September 2020.

[2] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/>]. Accessed 2 September 2020.

[3] DP One Health OI. 2020. Official website. [<https://www.onehealth-oi.org>] and "News (Actualités)" [<https://www.onehealth-oi.org/actualites>]. Accessed 2 September 2020.

[4] French Development Agency (AFD). 2020. "Indian ocean: exemplary regional cooperation to mitigate the risk of an epidemic" [<https://www.afd.fr/en/actualites/indian-ocean-exemplary-regional-cooperation-mitigate-risk-epidemic>] Accessed 18 October 2020.

[5] Georgetown Infectious Disease Atlas (GIDA) Global Health Security Tracking. 2020. "Recipient Profile. Madagascar"

[<https://tracking.ghscosting.org/details/145/recipient>] Accessed 18 October 2020.

5.5.4c

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

Yes = 1 , No = 0

Current Year Score: 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

While Madagascar has made a commitment to share epidemiological data with other countries that goes beyond influenza, there is no evidence that it this entails sharing of genetic data, clinical specimens, and/or isolated specimens (biological materials) along with the associated epidemiological data. Madagascar has committed to sharing epidemiological data with other countries in the Indian Ocean Commission (IOC) sub-region through the 'Epidemiological Surveillance and Alert management (Surveillance Epidémiologique et Gestion des Alertes) SEGA' One Health network [1,2]. There is, however, no evidence of a plan or policy for sharing genetic data, clinical specimens, and/or isolated specimens (biological materials) along with epidemiological data with international organizations and/or other countries, on the websites of the Ministry of Public Health [3], the Ministry of Agriculture and Livestock [4], the website of the One-Health related research and training partnership mechanism of the Indian Ocean 'DP One Health OI' [1] or the website of the Pasteur Institute Madagascar [5].

[1] DP One Health OI. 2020. Official Website. "About us (Qui sommes nous)" [<https://www.onehealth-oi.org/a-propos-du-reseau/qui-sommes-nous>] and "Risk Modeling (Modelisation des risques)" [<https://www.onehealth-oi.org/thematiques/modelisation-des-risques>]

[2] French Development Agency (AFD). 2019. "Indian ocean: exemplary regional cooperation to mitigate the risk of an epidemic". [<https://www.afd.fr/en/actualites/indian-ocean-exemplary-regional-cooperation-mitigate-risk-epidemic>]. Accessed 1 September 2020

[3] Ministry of Public Health. 2020. Official website. [<http://www.sante.gov.mg/>]. Accessed 2 September 2020.

[4] Ministry of Agriculture, Animal Husbandry and Fisheries. 2020. Official website. [<http://www.mpae.gov.mg/>]; and "Decrees and Acts (Decrets et Arretes)". [<http://www.maep.gov.mg/decrets-et-arretes/>]. Accessed 20 August 2020.

[5] Pasteur Institute Madagascar. 2020. Official Website [<http://www.pasteur.mg>] Accessed 24 August 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 Madagascar has not shared samples in accordance with the PIP framework in the past year. The World Health Organisation (WHO) has not reported any non-compliance in the past year by Madagascar, nor did a search for media articles on this produce any results. [1]

[1] World Health Organisation. 2020. "Virus sharing." [http://www.who.int/influenza/pip/virus_sharing/en/] and "IVTM 2.0" [<https://extranet.who.int/ivtm2>] Accessed 2 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 evidence that Madagascar has not shared pandemic pathogen samples during an outbreak in the past two years. There is no media reporting in the past two years to suggest that Madagascar has failed to share pathogen samples during an outbreak. In 2019, Madagascar reported a measles outbreak to the WHO. [1] While there is no mention of Madagascar reporting COVID-19 to the WHO in 2020 on the 'Disease Outbreak' page of the WHO [1], its country page 'Madagascar' features national COVID-19 statistics. [2]

[1] World Health Organisation. 2020. "Disease Outbreak News". 2017, 2018, 2019, and 2020 pages. [<https://www.who.int/csr/don/archive/year/en/>]. Accessed 2 September 2020.

[2] World Health Organisation. 2020. "Madagascar" [<https://www.who.int/countries/mdg/>] Accessed 2 October 2020.

Category 6: Overall risk environment and vulnerability to biological threats

6.1 POLITICAL AND SECURITY RISK

6.1.1 Government effectiveness

6.1.1a

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

Input number

Current Year Score: 2

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: 0

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: 25

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: 2

2021

Economist Intelligence

6.1.3 Risk of social unrest

6.1.3a

What is the risk of disruptive social unrest?

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

Current Year Score: 1

2021

Economist Intelligence

6.1.4 Illicit activities by non-state actors

6.1.4a

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

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

Current Year Score: 3

2021

Economist Intelligence

6.1.4b

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

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

Current Year Score: 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: 0

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: 74.8

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: 0.41

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: 38.7

2012

World Bank; Economist Impact

6.2.3b

Share of employment in the informal sector

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

Current Year Score: 2

According to ILOSTAT, employment rates in the informal sector were 91,9% for women and 87.2% for men in 2015, which is the last available data on this website. [1]

The Worldbank data also dates from 2015, indicating 84% for the non-agricultural informal sector. [2]

According to a Facebook post by the Ministry of Employment of Madagascar, informal employment amongst young people was 70% in 2019, without specifying an age range [3].

The Facebook page of the National Office for Employment and Training does not mention any statistics on the informal sector and its website was not working at the time of research. [4,5]

[1] ILOSTAT. 2020. "Informal employment and informal sector as a percent of employment by sex -- Harmonized series (% Annual)". [https://www.ilo.org/shinyapps/bulkexplorer25/?lang=en&segment=indicator&id=IFL_4IEM_SEX_ECO_IFL_RT_A]. Accessed 3 September 2020.

[2] The Worldbank. 2020. "Informal employment (% of total non-agricultural employment)". [<https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS>]. Accessed 3 September 2020.

[3] Ministry of Labour, Employment, Public Function and Social Laws. Official Facebook page. Post on 16 September 2019. [<https://www.facebook.com/mtefpls/posts/893009414410384>]. Accessed 3 September 2020.

[4] National Office for Employment and Training (ONEF) Madagascar. 2020. Official Facebook page. [https://www.facebook.com/Office-National-de-Emploi-et-de-la-Formation-ONEF-Madagascar-1196806163796223/?ref=page_internal&path=%2FOffice-National-de-Emploi-et-de-la-Formation-ONEF-Madagascar-1196806163796223%2F]. Accessed 3 September 2020.

[5] National Office for Employment and Training (ONEF) Madagascar. 2020. Official Website. [<http://onef.dgpe.mg/>]. Attempted to access 3 September 2020.

6.2.3c

Coverage of social insurance programs (% of population)

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

Current Year Score: 0

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: 0

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: 0

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: 1

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: 1

2021

Economist Intelligence

6.4 ENVIRONMENTAL RISKS

6.4.1 Urbanization

6.4.1a

Urban population (% of total population)

Input number

Current Year Score: 37.86

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: -0.35

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: 0

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: 66.68

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: 665.2

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 3.04

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 28.9

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 5.3

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: 54.4

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 10.51

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: 28.25

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: 0

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: 1

2018

Wellcome Trust Global Monitor 2018