

Luxembourg

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

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

1.1 ANTIMICROBIAL RESISTANCE (AMR)

1.1.1 AMR surveillance, detection, and reporting

1.1.1a

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

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

Current Year Score: 2

Luxembourg has a national AMR plan that includes surveillance, detection and reporting of priority AMR pathogens. Luxembourg has a plan called the "National Antibiotic Plan 2018-2022 (NAP)", which aims to reduce the emergence, development and transmission of antibiotic resistance. [1, 2] The plan's objectives include: putting in place a sustainable governance mechanism; improving awareness; understanding the antimicrobial resistance of the population and health professionals through appropriate communication and education; promoting the correct use of antibiotics in human and animal health; setting up a national antibiotic surveillance system (consumption of antibiotics, presence of antibiotics, antibiotic residues and resistant bacteria and antimicrobial resistance); and strengthening the surveillance of infections associated with antibiotics, and develop a national antimicrobial resistance research strategy alongside reporting [1]. The plan is implemented by the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection and the Ministry of Environment, Climate and Sustainable Development. [1]

[1] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022". ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 20 August 2020.

[2] European Centre For Disease Prevention And Control. "Strategies And Action Plans On Antimicrobial Resistance. Luxembourg". [<https://ecdc.europa.eu/en/publications-data/directory-guidance-prevention-and-control/antimicrobial-resistance-strategies>]. Accessed 20 August 2020.

1.1.1b

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

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

Current Year Score: 1

Luxembourg has a national laboratory that tests for priority AMR pathogens. The National Health Laboratory (Laboratoire National de Santé, LNS), assumes the role of a national control or reference laboratory. The LNS was created in 2012 and operates under the Ministry of Health. The LNS's analysis book lists hundreds of tests conducted by the LNS, including tests for E. coli, S. aureus, S. pneumoniae, Salmonella spp., Shigella spp and N. gonorrhoeae [1]. However, neither K. pneumonia nor mycobacterium tuberculosis tests are listed in the LNS's analysis book [1]. Luxembourg reports antimicrobial resistance testing, which include K. pneumonia, to the European Antimicrobial Resistance Surveillance Network [2]. Luxembourg's sentinel surveillance network is a collaboration between the LNS and a network of general practitioners and paediatricians

[3].

[1] National Health Laboratory. 2019. "Analysis Book". [<https://Ins.lu/en/analysis-book/>]. Accessed 20 August 2020.

[2] European Centre For Disease Prevention And Control (ECDC). 2017. "ECDC Country Visit To Luxembourg To Discuss Antimicrobial Resistance Issues. 29 May–2 June 2017". [<https://ecdc.europa.eu/sites/portal/files/documents/ECDC-country-visit%20AMR-LUX-2017.pdf>]. Accessed 20 August 2020.

[3] RTL. 2018. "Epidemic threshold reached according to Luxembourg's National Health Lab (LNS)". 24 December 2018. [<https://today.rtl.lu/life/health-and-fitness/1284586.html>]. Accessed 20 August 2020

1.1.1c

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg's government agencies conduct surveillance activities for antimicrobial residues or AMR organisms. The National Antibiotic Plan 2018-2022 (NAP) mentions the general involvement of the Ministry of Environment in setting up the national plan and notes the presence of at least three antibiotics (classed of macrolides) in surface water [1]. This is currently being monitored by the Water Management Authority ("Administration de la Gestion de l'Eau"), which is part of the Department of the Environment in the Ministry of Sustainable Development and Infrastructure [2, 3].

[1] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022". ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 20 August 2020.

[2] Environment Agency. 2019. "The Department". [<https://aev.gouvernement.lu/en/administration.html>]. Accessed 20 August 2020.

[3] Guichet.lu. "Bodies & Administrations. Water Management Authority". 2019. [https://guichet.public.lu/en/organismes/organismes_citoyens/administration-gestion-eau.html]. Accessed 20 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: 2

Luxembourg has legislation requiring prescriptions for antibiotic use for humans, and there is no evidence of gaps in enforcement. In Luxembourg it is strictly prohibited to sell antibiotics for human use without prescription [1]. The National Antibiotics Plan 2018-2022 states "in Luxembourg, antibiotics are delivered only on prescription and through a pharmacy" [2]. The regulation of medicinal products for human (and veterinary) use is supervised by the Division of Pharmacy and Drugs of the Health Directorate ("Division de la Pharmacie et des Médicaments de la Direction de la Santé") [3]. In 2012 the European Commission estimated the percentage of systemic antibiotics sold at pharmacies without a prescription in Luxembourg is at 0% [4]. In 2012 the European Commission also reported that only 1% of interviewed participants had obtained antibiotics for human use without a prescription from a pharmacy or elsewhere [4].

[1] European Commission. 6 June 2017. "First National Antibiotics Plan (2018-2022)" ("Premier Plan National Antibiotiques (2018-2022)"). [https://ec.europa.eu/luxembourg/news/premier-plan-national-antibiotiques-2018-2022_fr]. Accessed 21 August 2020

[2] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022, p.11". ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 21 August 2020

[3] Portail-Qualite.LU. "Division of Pharmacy and Drugs of the Health Directorate". ("Division de la Pharmacie et des Médicaments de la Direction de la Santé"). [<https://portail-qualite.public.lu/fr/acteurs/ministere-sante-division-pharmacie.html>]. Accessed 21 August 2020

[4] The Lancet. March 2012. "Antibiotics Obtained Without A Prescription In Europe". [<https://www.thelancet.com/action/showPdf?pii=S1473-3099%2812%2970017-8>]. Accessed 21 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: 2

Luxembourg has legislation requiring prescriptions for antibiotic use for animals, and there is no evidence of gaps in enforcement. According to the National Antibiotic Plan (NAP) 2018-2022, the regulation of drugs for human and veterinary use is supervised by the Division of Pharmacy and Medicines of the Health Directorate ("Division de la pharmacie et des médicaments de la Direction de la santé") [1]. According to the European Commission, in Luxembourg all veterinarians are legally obliged to keep a register of the prescribed medication in each of their veterinarian farms or practices [2]. Since 2006, Luxembourg has been forbidden the use of antibiotic additive with growth promoting effect in animal feed [2].

[1] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022, p.11". ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 21 August 2020

[2] European Commission. 6 June 2017. "First National Antibiotics Plan (2018-2022)" ("Premier Plan National Antibiotiques (2018-2022)"). [https://ec.europa.eu/luxembourg/news/premier-plan-national-antibiotiques-2018-2022_fr]. Accessed 21 August 2020

1.2 ZOO NOTIC 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: 0

There is no evidence that Luxembourg has a national law, plan, or equivalent strategy document on zoonotic disease. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Diseases for Public Health Protection ("Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique") to be implemented in 2019 [1]. This law obliges doctors to declare certain infectious diseases and outlines the administrative measures to take. However, it does not mention zoonotic diseases. In 2019, the Ministry of Health published a Mandatory Declaration Guide for

Doctors, Dentists and Laboratories [2]. The guide is used to implement the law mentioned above, and lists the steps to take to declare the disease. The guide lists more than seventy infectious diseases and pathogens, including zoonotic diseases such as ebola, echinococcosis, Crimean-Congo hemorrhagic fever, Lassa mammarenavirus, virus influenza A HxNy, Leptospira spp, Marburg virus and many more [2]. The websites of the Ministry of Health, the Luxembourg Institute of Health, the Ministry of Agriculture, Viticulture and Consumer Protection (MAVCP) and the National Health Laboratory do not mention any domestic laws, plans or strategies dedicated to zoonotic diseases [3, 4, 5, 6]. However, the MAVCP's website states that it has an Animal Health and Animal Welfare Division ("Division Santé Animale Et Bien-Être Animal"), which is in charge of the surveillance and control of animal diseases, including zoonoses [7].

[1] The Grand Duchy Of Luxembourg Official Journal. 2018. "1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection" (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 21 August 2020

[2] Ministry of Health. 2019. "Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists" ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 21 August 2020

[3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020

[4] Luxembourg Institute of Health. [<https://www.lih.lu>]. Accessed 21 August 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 21 August 2020

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). 2019. [<https://lns.lu/en/>]. Accessed 21 August 2020

[7] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 4 April 2019. Administration of Veterinarian Services ("Administration des services vétérinaires").

[<https://ma.gouvernement.lu/fr/administrations/asv.html#:~:text=La%20Division%20sant%C3%A9%20animale%20et,animales%20y%20compris%20les%20zoonoses%3B&text=le%20contr%C3%B4le%20du%20bien%2D%C3%AAtre%20des%20animaux%20domestiques>]. Accessed 21 August 2020

1.2.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence of national legislation, plans or equivalent strategy documents that include measures for risk identification and reduction for zoonotic disease spillover events from animals to humans. In 2018, Luxembourg passed a law (implemented in 2019) on the Mandatory Declaration of Certain Diseases for Public Health Protection to be implemented in 2019 [1]. In 2019, the Ministry of Health published a Mandatory Declaration Guide for Doctors, Dentists and Laboratories [2]. The guide lists more than seventy infectious diseases and pathogens including zoonotic diseases such as ebola, echinococcosis, Crimean-Congo hemorrhagic fever, Lassa mammarenavirus, virus influenza A HxNy, Leptospira spp, Marburg virus and many more [2]. This guide demonstrates to doctors, dentists and laboratories the steps to take to notify the authorities of diseases. The guide explicitly states that its objective is to identify diseases and control or eliminate them immediately, in order to avoid spillover events [2]. However, neither the guide nor the law mentioned above include measures for risk identification or reduction. The Ministry of Agriculture, Viticulture and Consumer Protection (MAVCP) states that there is an Animal Health and Animal Welfare Division ("Division Santé Animale Et Bien-Être Animal"), which is in

charge of the surveillance and control of animal diseases, including zoonoses [3]. However, the MAVCP's website provides no further details on measures to identify or reduce the risk of zoonotic disease. [4] Similarly, there is no evidence of such measures on the website of the Ministry of Health. [5]

[1] The Grand Duchy Of Luxembourg Official Journal. 2018. 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 21 August 2020

[2] Ministry of Health. 2019. Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 21 August 2020

[3] Ministry of Agriculture, Viticulture and Consumer Protection. 4 April 2019. Administration of Veterinarian Services ("Administration des services vétérinaires"). [<https://ma.gouvernement.lu/fr/administrations/asv.html#:~:text=La%20Division%20sant%C3%A9%20animale%20et,animales%20y%20compris%20les%20zoonoses%3B&text=le%20contr%C3%B4le%20du%20bien%2D%C3%AAtre%20des%20animaux%20domestiques>]. Accessed 21 August 2020

[4] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu>]. Accessed 21 August 2020

[5] Ministry of Health. 2019. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 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: 0

There is no evidence of a national plan, guidelines, or law that accounts for the surveillance and control of multiple zoonotic pathogens of public health concern in Luxembourg. In 2018, Luxembourg passed a law (implemented in 2019) on the Mandatory Declaration of Certain Diseases for Public Health Protection to be implemented in 2019 [1]. In 2019, the Ministry of Health published a Mandatory Declaration Guide for Doctors, Dentists and Laboratories [2]. The guide lists more than seventy infectious diseases and pathogens including zoonotic diseases such as ebola, echinococcosis, Crimean-Congo hemorrhagic fever, Lassa mammarenavirus, virus influenza A HxNy, Leptospira spp, Marburg virus and many more [2]. This guide demonstrates to doctors, dentists and laboratories the steps to take to notify the authorities of diseases. Each section of the disease contains general information of the disease itself, its transmission, incubation period, people who are at risk, public health measures taken to control it and finally national and international collaboration to tackle the disease [2]. However, the guide does not contain detailed measures for surveillance or control of zoonotic pathogens. [2] The Ministry of Agriculture, Viticulture and Consumer Protection (MAVCP) states that there is an Animal Health and Animal Welfare Division ("La division santé animale et bien-être animal"), which is in charge of the surveillance and control of animal diseases, including zoonoses [3]. However, the MAVCP's website provides no further details on surveillance or control measures. [4] Similarly, there is no evidence of such measures on the website of the Ministry of Health. [5]

[1] The Grand Duchy Of Luxembourg Official Journal. 2018. 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 21 August 2020

[2] Ministry of Health. 2019. "Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory

Declaration for Doctors and Dentists" ("Maladies infectieuses et agents pathogènes à déclaration obligatoire ").
[<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 21 August 2020

[3] Ministry of Agriculture, Viticulture and Consumer Protection. 4 April 2019. Administration of Veterinarian Services ("Administration des services vétérinaires").

[<https://ma.gouvernement.lu/fr/administrations/asv.html#:~:text=La%20Division%20sant%C3%A9%20animale%20et,animale%20y%20compris%20les%20zoonoses%3B&text=le%20contr%C3%B4le%20du%20bien%2D%C3%AAtre%20des%20animaux%20domestiques>]. Accessed 21 August 2020

[4] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu>]. Accessed 21 August 2020

[5] Ministry of Health. 2019. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020

1.2.1d

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has a department, agency or similar unit dedicated to zoonotic disease that functions across ministries. The Ministry of Agriculture, Viticulture and Consumer Protection mentions that there is an Animal Health and Animal Welfare Division ("Division Santé Animale Et Bien-Être Animal") which is in charge of the surveillance and control of animal diseases including zoonotic ones [1]. However, there are no further clarifications about the division's functions. The websites of the Ministry of Health and the National Health Laboratory do not mention a department or an agency unit dedicated to zoonotic disease [2,3].

[1] Ministry of Agriculture, Viticulture and Consumer Protection. 4 April 2019. Administration of Veterinarian Services ("Administration des services vétérinaires").

[<https://ma.gouvernement.lu/fr/administrations/asv.html#:~:text=La%20Division%20sant%C3%A9%20animale%20et,animale%20y%20compris%20les%20zoonoses%3B&text=le%20contr%C3%B4le%20du%20bien%2D%C3%AAtre%20des%20animaux%20domestiques>]. Accessed 21 August 2020

[2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 09 October 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 09 October 2020.

1.2.2 Surveillance systems for zoonotic diseases/pathogens

1.2.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has a national mechanism for owners of livestock to conduct and report on disease surveillance to a central government agency. The 1912 Law on Livestock Health Control And Improvement of Horses, Horned Animals and Pigs mentions that the public administration takes measures to prevent infectious diseases [1]. It also states that owners of livestock will be reimbursed if an animal killed due to having an infectious disease turns out not to have had the disease in question [1]. However, this law does not make mention any mechanism to conduct and report on disease

surveillance to a central government agency. Moreover, the 2011 Regulation on the Surveillance and Control of Bovine Viral Diarrhea and Bovine Mucous Membrane Disease lists measures to take in case of contamination, but it does not mention reporting to a central government agency [2]. There is no evidence of a relevant mechanism on the websites of the Ministry of Health or the Ministry of Agriculture, Viticulture and Consumer Protection [3, 4].

[1] The Grand Duchy Of Luxembourg Official Journal. "Law Of 29 July 1912 Relative To Livestock Health Control And Improvement Of Horses, Horned Animals And Pigs " ("Loi Du 29 Juillet 1912 Concernant La Police Sanitaire Du Bétail Et L'amélioration Des Chevaux, Des Bêtes A Cornes Et Des Porcs "). [<http://www.legilux.lu/eli/etat/leg/loi/1912/07/29/n1/jo>]. Accessed 21 August 2020

[2] The Grand Duchy Of Luxembourg Official Journal. "Regulation Of 23 October 2011 Relative To Surveillance And Control Of Bovine Viral Diarrhea And Bovine Mucous Membrane Disease " ("Reglement Du 23 Octobre 2011 Concernant La Surveillance Et La Lutte Contre La Diarrhée Virale Bovine Et La Maladie Des Muqueuses Bovines "). [<http://data.legilux.public.lu/file/eli-etat-leg-memorial-2011-219-fr-pdf.pdf>]. Accessed 21 August 2020

[3] Ministry of Health. 2019. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 February 2019.

[4] Ministry of Agriculture, Viticulture and Consumer Protection. 2019. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 21 August 2020

1.2.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence of laws or guidelines that safeguard the confidentiality of information generated through surveillance activities for animals (for owners). The Ministry of Health, Ministry of Agriculture, Viticulture and Consumer Protection, and the National Health Laboratory websites do not make reference to laws or guidelines that safeguard the confidentiality of information generated through surveillance activities for animals (for owners) [1, 2, 3].

[1] Ministry of Health. 2019. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020

[2] Ministry of Agriculture, Viticulture and Consumer Protection. 2019. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 21 August 2020

[3] National Health Laboratory. 2019. [<https://lns.lu/en/>]. Accessed 21 August 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 public evidence of surveillance of zoonotic disease in wildlife in Luxembourg. The Ministry of Health, Ministry of Agriculture, Viticulture and Consumer Protection, and the National Health Laboratory websites do not make reference to surveillance of zoonotic disease in wildlife [1, 2, 3].

[1] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020

[2] Ministry of Agriculture, Viticulture and Consumer Protection. 2019. [<https://mavpc.gouvernement.lu/en.html>]. Accessed

21 August 2020

[3] National Health Laboratory. [<https://lns.lu/en/>]. Accessed 21 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: -

No data available

OIE WAHIS database

1.2.4b

Number of veterinary para-professionals per 100,000 people

Input number

Current Year Score: -

No data available

OIE WAHIS database

1.2.5 Private sector and zoonotic

1.2.5a

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence that Luxembourg has a national plan on zoonotic disease or other legislation that includes mechanisms for working with the private sector in controlling or responding to zoonoses. There is no evidence of such a

mechanism on the websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection or the National Health Laboratory [1, 2, 3]. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Diseases for Public Health Protection, which requires all doctors, dentists and laboratories to inform the authorities if they encounter a notifiable disease, but the law does not explicitly mention the private sector [4]. In addition, in 2019 the Ministry of Health published the Mandatory Declaration Guide for Doctors, Dentists and Laboratories, a guide for doctors, dentists and laboratories that explains the procedure of notifying the authorities, but again this does not explicitly mention the private sector [5].

[1] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020.

[2] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 21 August 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lms.lu/en/>]. Accessed 21 August 2020. [1] The Grand Duchy Of Luxembourg Official Journal. 2018. " 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection" (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 21 August 2020

[4] Ministry of Health. 2019. "Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists" ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 21 August 2020

[5] Ministry of Health. 5 October 2018. " Towards A Better Surveillance Of Infectious Diseases In Luxembourg" ("Vers Une Meilleure Surveillance Des Maladies Infectieuses Au Luxembourg").

[https://msan.gouvernement.lu/fr/actualites.gouvernement%2Bfr%2Bactualites%2Btoutes_actualites%2Bcommuniques%2B2018%2B10-octobre%2B05-mutsch-maladies-infectieuses.html] Accessed 21 August 2020

1.3 BIOSECURITY

1.3.1 Whole-of- government biosecurity systems

1.3.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that Luxembourg has an official record in place of facilities handling especially dangerous pathogens and toxins. The National Health Laboratory ("Laboratoire National de Santé", LNS) under the Ministry of Health handles pathogens and keeps records of results for invasive infections, but there is no public evidence of a record of facilities handling especially dangerous pathogens and toxins [1]. The websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, and the LNS do not mention any such record. [2, 3, 4]. Luxembourg's 2018 and 2019 reports published on the United Nations' Biological Weapons Convention (BWC) electronic confidence building measures portal do not indicate that Luxembourg keeps a record of facilities in which especially dangerous pathogens and toxins are stored or processed [5,6]. The Verification Research, Training and Information Center's database of biosecurity legislation does not mention anything regarding an official record of facilities handling especially dangerous pathogens and toxins [7].

- [1] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022" ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 21 August 2020
- [2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 21 August 2020.
- [3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020.
- [4] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 21 August 2020.
- [5] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.
- [6] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.
- [7] Verification Research, Training and Information Centre. "BWC Legislation Database. L." [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 22 August 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 insufficient public evidence that Luxembourg has in place specific legislation that relates to biosecurity. In 2018, Luxembourg passed the Act on the Mandatory Declaration of Certain Disease for Public Health Protection [1]. This law includes, among other things, preventive measures to contain dangerous pathogens from the environment. For instance, section 9 mandates that "national reference laboratories meet the legal standards and regulations for biosecurity as well as the requirements of the legislation applicable to medical laboratories", but provides no further details [1]. The Verification Research, Training and Information Center's legislation database does not list any specific biosecurity laws for Luxembourg [2]. Luxembourg's 2018 and 2019 reports published on the United Nations' Biological Weapons Convention (BWC) electronic confidence building measures portal do not indicate that Luxembourg has laws or regulations related to biosecurity that address requirements such as physical containment, operation practices, failure reporting systems and/or cybersecurity of facilities in which especially dangerous pathogens and toxins are stored or processed [3,4]. The websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, and the National Health Laboratory do not mention any legislation that relates to biosecurity [5, 6, 7].

- [1] The Grand Duchy Of Luxembourg Official Journal. 2018. " 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection" (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 22 August 2020
- [2] Verification Research, Training and Information Centre. "BWC Legislation Database. L." [<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 22 August 2020
- [3] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.
- [4] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.

[5] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020.

[6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 21 August 2020.

[7] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 21 August 2020.

1.3.1c

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence that Luxembourg has a separate agency responsible for the enforcement of biosecurity legislation and regulations. The highest institutional authority in the area of health is the Health Directorate ("Direction de la santé") [1]. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Disease for Public Health Protection [2]. This law includes, among other things, preventive measures to contain dangerous pathogens from the environment, but does not mention an agency responsible for biosecurity [2]. The Verification Research, Training and Information Center's legislation database does not make reference to specific biosecurity laws for Luxembourg or an agency responsible for enforcing such legislation [3]. Luxembourg's 2018 and 2019 reports published on the United Nations' Biological Weapons Convention (BWC) electronic confidence building measures portal do not indicate that Luxembourg has a separate agency responsible for the enforcement of biosecurity legislation and regulations [4,5]. A 2019 news article quotes the agriculture minister as saying that it is necessary for hunters and farmers to respect biosecurity rules, but he does not mention any agency responsible for the enforcement of such rules [6]. The websites of the Ministry of Health, the National Health Laboratory, the Directorate of Defence and the Ministry of Labour, Employment and the Social and Solidarity Economy do not mention any departments or agencies responsible for the enforcement of biosecurity legislation and regulations [7, 8, 9, 10].

[1] Sante.LU. "Health Directorate" ("Direction de la santé"). [<https://sante.public.lu/fr/politique-sante/ministere-sante/direction-sante/index.html>]. Accessed 22 August 2020

[2] The Grand Duchy Of Luxembourg Official Journal. 2018. " 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection" (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 22 August 2020

[3] VERTIC. [www.vertic.org/pages/homepage/programmes/national-implementation-measures/biological-weapons-and-materials/bwc-legislation-database/l.php?searchresult=1&sstring=luxembourg#wb_98]. Accessed 22 August 2020.

[4] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[5] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.

[6] Agriculture. Public. Lu. 2019. "White Zone And Installation Of A Fence Along The Belgian Border As A Prevention Against African Swine Fever" ("Zone blanche et installation d'une clôture le long de la frontière belge en guise de prévention contre la peste porcine africaine "). [<https://agriculture.public.lu/de/actualites/2019/April-2019/zone-blanche-cloture-asp.html>]. Accessed 22 August 2020

[7] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020.

[8] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 21 August 2020.

[9] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[10] Ministry of Labour, Employment and the Social and Solidarity Economy. [<https://mteess.gouvernement.lu/en.html>].

Accessed 23 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 publicly available evidence that Luxembourg has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities. The websites of the National Health Laboratory, the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the Ministry of Foreign and European Affairs and the Directorate of Defense do not make mention of any government action to consolidate inventories of especially dangerous pathogens and toxins into a minimum number of facilities [1, 2, 3, 4, 5]. Luxembourg's 2018 and 2019 reports published on the Biological Weapons Convention (BWC) electronic confidence building measures portal do not indicate that Luxembourg has taken action to consolidate its inventories of especially dangerous pathogens and toxins into a minimum number of facilities nor does the Verification Research, Training and Information Center's legislation database [6, 7,8].

[1] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). 2019. [<https://lns.lu/en/>]. Accessed 22 August 2020.

[2] Ministry of Health. 2019.[<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 22 August 2020.

[3] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[4] Ministry of Foreign and European Affairs. 2019. <https://maee.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[5] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[6] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[7] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.

[8] VERTIC. [www.vertic.org/pages/homepage/programmes/national-implementation-measures/biological-weapons-and-materials/bwc-legislation-database/l.php?searchresult=1&sstring=luxembourg#wb_98]. Accessed 22 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: 0

There is insufficient evidence that Luxembourg has in-country capacity to conduct polymerase chain reaction (PCR)-based diagnostic testing for anthrax or ebola. Testing for ebola and anthrax is not listed in the analysis book of the National Health Laboratory [1, 2]. However, both diseases are mentioned in the 2019 Guide for the Mandatory Declaration for Doctors and Dentists, which specifically defines the criterion for declaring anthrax as a positive test result through PCR or mass spectrometry [3]. Nonetheless, the document does not explicitly state that PCR testing is possible within the country. The websites of the Ministry of Health, the Directorate of Defense, and the Ministry of Agriculture, Viticulture and Consumer Protection do not make reference to in-country capacity to conduct PCR-based diagnostic testing for anthrax or ebola [4, 5,

6].

- [1] Police Letzebuerg. 2001 "Athrax : The Case of 26 October" ("Anthrax: la situation du 26 octobre"). [https://police.gouvernement.lu/en/actualites.gouvernement%2Bfr%2Bactualites%2Btoutes_actualites%2Bcommuniques%2B2001%2B10%2B26anthrax.html]. Accessed 22 August 2020.
- [2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). 2019. "Analysis Book". [https://lns.lu/en/analysis-book/]. Accessed 22 August 2020.
- [3] Ministry of Health. 2019. "Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists" ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf]. Accessed 25 August 2020
- [4] Ministry of Health. 2019.[http://sante.public.lu/fr/politique-sante/ministere-sante/index.html]. Accessed 22 August 2020.
- [5] Directorate of Defence. [https://defense.gouvernement.lu/en.html]. Accessed 22 August 2020.
- [6] Ministry of Agriculture, Viticulture and Consumer Protection. [https://mavpc.gouvernement.lu/en.html]. Accessed 22 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 public evidence of Luxembourg legislation requiring biosecurity training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential. In 2017, an agreement was signed between the National Health Laboratory and the Luxembourg Hospital Centre ("Centre Hospitalier Luxembourg") to strengthen collaboration between the two institutions in the area of biosecurity [1]. The agreement calls for a collaboration in five areas (biochemistry-immunopathology, haematology, microbiology/serology and molecular biology, allergology/immunogenetics and biosecurity) but does not mention standardized biosecurity training [1]. There is no evidence for the existence of standardized biosecurity training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential on the websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the National Health Laboratory, the Ministry of Foreign and European Affairs, or the Directorate of Defence [2, 3, 4, 5, 6]. There is no mention of biosecurity training in Luxembourg's 2018 and 2019 reports published on the Biological Weapons Convention (BWC) electronic confidence building measures portal, or on the Verification Research, Training and Information Center's legislation database [7,8,9]

- [1] Luxembourg Hospital Centre ("Centre Hospitalier Luxembourg). 14 March 2017. " The NHL and the LHC signe a Collaboration Agreement in Laboratory Analysis" (" Le LNS et le CHL signent une convention de collaboration dans le domaine des analyses de laboratoire"). [www.chl.lu/fr/actualites/le-lns-et-le-chl-signent-une-convention-de-collaboration-dans-le-domaine-des-analyses-de]. Accessed 22 August 2020
- [2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [https://lns.lu/en/]. Accessed 23 August 2020.
- [3] Ministry of Health. 2019.[http://sante.public.lu/fr/politique-sante/ministere-sante/index.html]. Accessed 22 August 2020.
- [4] Ministry of Agriculture, Viticulture and Consumer Protection. [https://mavpc.gouvernement.lu/en.html]. Accessed 22 August 2020.

- [5] Ministry of Foreign and European Affairs. 2019. [<https://maee.gouvernement.lu/en.html>]. Accessed 22 August 2020.
- [6] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 22 August 2020.
- [7] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.
- [8] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.
- [9] VERTIC. [www.vertic.org/pages/homepage/programmes/national-implementation-measures/biological-weapons-and-materials/bwc-legislation-database/l.php?searchresult=1&ssstring=luxembourg#wb_98]. Accessed 22 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

There is no public evidence that Luxembourg has laws or regulations specifying that security or other personnel with access to especially dangerous pathogens, toxins, or biological materials with pandemic potential are subject to drug testing, background checks, or psychological or mental fitness checks. The 1999 Regulation on Protecting Employees Against Endangerment by Biological Agents, which stipulates health and safety standards that must be maintained in facilities that work with biological agents, does not mention such tests, and covers biosafety rather than biosecurity [1]. The websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the Ministry of Foreign and European Affairs, the National Health Laboratory, and the Directorate of Defence do not make reference to such security checks [2, 3, 4, 5, 6]. The Verification Research, Training and Information Centre legislation database does not list for Luxembourg any laws or regulations requiring such checks [7]. The portal of the Biological Weapons Convention's (BWC) confidence building measures also does not include information for Luxembourg on any regulation 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 security checks [8,9].

[1] The Grand Duchy of Luxembourg Official Journal. 1999. "Grand-Ducal Regulation of June 8, 1999 Amending and First Adapting to Technical Progress of the Grand-Ducal Regulation of November 4, 1994 Concerning the Protection of Workers against Risks Related to Biological Agents at Work" ("Règlement Grand-Ducal Du 8 Juin 1999 Portant Modification Et Première Adaptation Au Progrès Technique Du Règlement Grand-Ducal Du 4 Novembre 1994 Concernant La Protection Des Travailleurs Contre Les Risques Liés A Des Agents Biologiques Au Travail").

[<http://legilux.public.lu/eli/etat/leg/rgd/1999/06/08/n1/jo>]. Accessed 22 August 2020.

[2] Ministry of Health. 2019. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 22 August 2020.

[3] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[4] Ministry of Foreign and European Affairs. 2019. [<https://maee.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

[6] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 22 August 2020.

[7] Verification Research, Training and Information Centre. "BWC Legislation Database. L."

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 22 August

2020.

[8] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[9] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 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: 1

Luxembourg has publicly available information on national regulations on the safe and secure transport of infectious substances (categories A and B). The government lists European and international transport regulations on its website on "Dangerous Goods", as well as domestic regulations for the transport of dangerous goods, which, according to international standards, include infectious substances [1]. The transport in Luxembourg of dangerous goods, including category A and B substances, is subject to controls and specific safety regulations for each mode of transport that determines, among others, the conditions of packaging, documentation, loading, unloading, handling and storage of these goods. Domestic regulations include the Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 3 June 2003 on the Carriage of Dangerous Goods By Rail [2]; the Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 31 January 2003 on the Carriage of Dangerous Goods by Road [3]; the Law of 24 December 1999 on Safety Advisers for the Transport by Road, Rail and Inland Waterway of Dangerous Goods [4]; and the Grand-Ducal Regulation of 1 March 2007 Amending (a) the Amended Grand-Ducal Regulation of 31 January 2003 on road Transport of Dangerous Goods and (b) the Grand-Ducal Regulation of 24 December 1999 on the Duties and Training Certificate of the Safety Adviser for the Carriage of Dangerous Goods by Road, Rail or Inland Waterway [5]. At the regional level, Luxembourg is a contracting party of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR); the relevant European legislation on the safe and secure transport, including of infectious substances, is Directive 2008/68/EC of the European Parliament and of the Council of September 2008 on the Inland Transport of Dangerous Goods [6]. Luxembourg's 2017 report published on the United Nations' portal of the Biological Weapons Convention (BWC) does not contain any further relevant information [7].

[1] Single Window for Logistics Luxembourg. "Dangerous goods". [<https://logistics.public.lu/en/formalities-procedures/type-goods/restricted-trading/dangerous-goods.html>]. Accessed 22 August 2020

[2] The Grand Duchy Of Luxembourg Official Journal. 2008. "Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 3 June 2003 on the Carriage of Dangerous Goods By Rail" ("Règlement Grand-Ducal Du 23 Février 2008 Modifiant Le Règlement Grand-Ducal Modifié Du 3 Juin 2003 Sur Les Transports Par Rail De Marchandises Dangereuses"). [<http://legilux.public.lu/eli/etat/leg/rgd/2008/02/23/n6/jo>]. Accessed 22 August 2020

[3] The Grand Duchy Of Luxembourg Official Journal. 2008. "Grand-Ducal Regulation Of 23 February 2008 Amending The Amended Grand-Ducal Regulation Of 31 January 2003 On The Carriage Of Dangerous Goods By Road" ("Règlement Grand-Ducal Du 23 Février 2008 Modifiant Le Règlement Grand-Ducal Modifié Du 31 Janvier 2003 Sur Les Transports Par Route De Marchandises Dangereuses"). [<http://legilux.public.lu/eli/etat/leg/rgd/2008/02/23/n5/jo>]. Accessed 22 August 2020

[4] The Grand Duchy Of Luxembourg Official Journal. 1999. "Law Of 24 December 1999 On Safety Advisers For The Transport By Road, Rail And Inland Waterway Of Dangerous Goods" ("Loi Du 24 Décembre 1999 Relative Aux Conseillers A La Sécurité Pour Le Transport Par Route, Par Rail Et Par Voie Navigable De Marchandises Dangereuses").

[<http://legilux.public.lu/eli/etat/leg/loi/1999/12/24/n6/jo>]. Accessed 22 August 2020

[5] The Grand Duchy Of Luxembourg Official Journal. 2007. "Grand-Ducal Regulation of 1st March 2007 Amending (a) the Amended Grand-Ducal Regulation of 31 January 2003 on road Transport of Dangerous Goods; (b) the Grand-Ducal Regulation of 24 December 1999 on the Duties and Training Certificate of the Safety Adviser for the Carriage of Dangerous Goods by Road, Rail or Inland Waterway". [<http://legilux.public.lu/eli/etat/leg/rgd/2007/03/01/n2/jo>]. Accessed 22 August 2020

[6] European Commission. "Directive 2008/68/EC Of The European Parliament And Of The Council Of September 2008 On The Inland Transport Of Dangerous Goods". [<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0068-20150218&from=EN>]. Accessed 22 August 2020

[7] The Biological Weapons Convention (BWC). 2017 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2017_luxembourg.pdf]. Accessed 22 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: 1

There is legislation in place to oversee the cross-border transport and end-user screening of especially dangerous pathogens, toxins and pathogens with pandemic potential. End-user screening is mandated by the European Union's Regulation No 428/2009 Setting up a Community Regime for the Control of Exports, Transfer, Brokering and Transit of Dual-Use Items. In its list of items covered by the term "dual-use", the regulation includes 91 pathogens and toxins: 32 human viruses, 17 animal viruses, 4 rickettsia, 15 bacteria, 19 toxins, 2 fungi and 2 mycoplasmas [1]. Among others, this includes the pathogens and toxins associated with plague, cholera, encephalitis, ebola, dengue fever, anthrax, salmonellosis, brucellosis, shigellosis, yellow fever and botulism. However, the list omits pathogens and toxins associated with some major infectious diseases, such as influenza and tuberculosis. The regulation states that export authorization is subject to identification of the end-user and intended use [1]. It further states that dual-use items may not be exported when the exporter is informed by member state authorities that they are intended for the production of weapons of mass destruction, or for military use more broadly where the destination country is subject to an arms embargo imposed by the Organisation for Security and Co-operation in Europe (OSCE) or United Nations Security Council [1]. Regulations issued by the European Council are legally binding legislative acts in all European Union member states [2].

[1] European Council. Council Regulation (EC) No 428/2009 of 5 May 2009. ""Setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items."" [<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02009R0428-20191231>]. Accessed 23 August 2020.

[2] European Union. "Regulations, Directives and other acts." [https://europa.eu/european-union/eu-law/legal-acts_en]. Accessed 23 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: 1

Luxembourg has in place a national biosafety regulation. The Regulation on Protecting Employees Against Endangerment by Biological Agents was adopted in 1994 and modified in 1999 [1]. It stipulates health and safety standards that must be maintained in facilities that work with biological agents, including hygiene and risk prevention measures [1]. The law defines biological agents as microorganisms, including genetically modified microorganisms, cultures cells and human endoparasites that can cause infection, allergy or poisoning [2]. Measures included in the law include: providing workers with appropriate and adequate washrooms and sanitary facilities; providing workers with eye drops and skin antiseptics; removing potentially contaminated equipment as soon as workers leave the area of work; and displaying signs to indicate biological hazards [2].

[1] The Grand Duchy Of Luxembourg Official Journal. 1999. "Grand-Ducal Regulation of June 8, 1999 Amending and First Adapting to Technical Progress of the Grand-Ducal Regulation of November 4, 1994 Concerning the Protection of Workers against Risks Related to Biological Agents at Work" ("Règlement Grand-Ducal Du 8 Juin 1999 Portant Modification Et Première Adaptation Au Progrès Technique Du Règlement Grand-Ducal Du 4 Novembre 1994 Concernant La Protection Des Travailleurs Contre Les Risques Liés A Des Agents Biologiques Au Travail").

[<http://legilux.public.lu/eli/etat/leg/rgd/1999/06/08/n1/jo>]. Accessed 22 August 2020.

[2] The Grand Duchy Of Luxembourg Official Journal. 1994. Grand-Ducal Regulation of 4 November 1994 regarding the protection of workers against the risks associated with exposure to biological agents at work ("Règlement grand-ducal du 4 novembre 1994 concernant la protection des travailleurs contre les risques liés à l'exposition à des agents biologiques au travail"). [<http://data.legilux.public.lu/file/eli-etat-leg-memorial-1994-96-fr-pdf.pdf>]. Accessed 22 August 2020.

1.4.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has a specific agency responsible for the enforcement of biosafety legislation and regulations. Article 10 of the Regulation on Protecting Employees Against Endangerment by Biological Agents (adopted 1994 and modified 1999) states that the labor minister, the justice minister and the health minister are in charge of the regulation's execution, but the regulation does not mention an agency responsible for the enforcement. [1] The Verification Research, Training and Information Center Legislation Database does not show any further biosafety legislation for Luxembourg [2]. The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, the Directorate of Defense and the Ministry of Agriculture, Viticulture and Consumer Protection do not mention any agency or department responsible for the enforcing biosafety [3], [4], [5], [6], [7]. The portal of the Biological Weapons Convention (BWC) does not make reference to an agency responsible for the enforcement of biosafety legislation and regulations in Luxembourg [8,9].

[1] The Grand Duchy Of Luxembourg Official Journal. 1999. " Grand-Ducal Regulation of June 8, 1999 Amending and First Adapting to Technical Progress of the Grand-Ducal Regulation of November 4, 1994 Concerning the Protection of Workers against Risks Related to Biological Agents at Work" (" Règlement Grand-Ducal Du 8 Juin 1999 Portant Modification Et Première Adaptation Au Progrès Technique Du Règlement Grand-Ducal Du 4 Novembre 1994 Concernant La Protection Des Travailleurs Contre Les Risques Liés A Des Agents Biologiques Au Travail").

[<http://legilux.public.lu/eli/etat/leg/rgd/1999/06/08/n1/jo>]. Accessed 22 August 2020.

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

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 23 August

2020.

[3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

[4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

[5] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[6] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[7] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[8] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[9] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 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 publicly available evidence that Luxembourg requires biosafety training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential. The Regulation on Protecting Employees Against Endangerment by Biological Agents (adopted 1994 and modified 1999) stipulates health and safety standards that must be maintained in facilities that work with biological agents, including hygiene and risk prevention measures, but it does not mention biosafety training. [1] The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, the Directorate of Defence, the Ministry of Agriculture, Viticulture and Consumer Protection, and the Ministry of Labour, Employment and the Social and Solidarity Economy do not mention a requirement for biosafety training for personnel working in facilities housing or working with especially dangerous pathogens, toxins, or biological materials with pandemic potential [2, 3, 4, 5, 6, 7]. The 2018 and 2019 country reports for Luxembourg, published on the portal of the Biological Weapons Convention (BWC) as well as the Verification Research, Training and Information Center's legislation database do not include such information [8,9,10].

[1] The Grand Duchy Of Luxembourg Official Journal. 1999. " Grand-Ducal Regulation of June 8, 1999 Amending and First Adapting to Technical Progress of the Grand-Ducal Regulation of November 4, 1994 Concerning the Protection of Workers against Risks Related to Biological Agents at Work" (" Règlement Grand-Ducal Du 8 Juin 1999 Portant Modification Et Première Adaptation Au Progrès Technique Du Règlement Grand-Ducal Du 4 Novembre 1994 Concernant La Protection Des Travailleurs Contre Les Risques Liés A Des Agents Biologiques Au Travail".

[<http://legilux.public.lu/eli/etat/leg/rgd/1999/06/08/n1/jo>]. Accessed 22 August 2020.

[2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

[4] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[5] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[7] Ministry of Labour, Employment and the Social and Solidarity Economy. [<https://mteess.gouvernement.lu/en.html>].

Accessed 23 August 2020

[8] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[9] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.

[10] Verification Research, Training and Information Centre. "BWC Legislation Database. L."

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 22 August 2020.

1.5 DUAL-USE RESEARCH AND CULTURE OF RESPONSIBLE SCIENCE

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

1.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence that Luxembourg 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. Luxembourg's National Health Laboratory (NHL) carries out research on especially dangerous pathogens, toxins, pathogens with pandemic potential [1]. According to the NHL's 2017 Annual Report, the NHL is one of few laboratories in Europe to sequence all bacterial pathogens of food origin listed in the country. The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, the Directorate of Defense and the Ministry of Agriculture, Viticulture and Consumer Protection do not make reference to an independent assessment of the capacity to determine whether ongoing research is occurring on especially dangerous pathogens, toxins, pathogens with pandemic potential, or other dual use research [2, 3, 4, 5, 6]. The 2018 and 2019 country reports for Luxembourg, published on the portal of the UN's Biological Weapons Convention (BWC) and the Verification Research, Training and Information Centre legislation database do not make reference to such an independent assessment [7, 8, 9].

[1] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). 2017. "Annual Report". [https://lns.lu/wp-content/uploads/2018/08/18165-03-lns_rapport_annuel.pdf]. [Accessed 23 August 2020].

[2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

[4] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[5] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[7] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[8] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 August 2020.

[9] Verification Research, Training and Information Centre. "BWC Legislation Database. L."

[<https://www.vertic.org/programmes/biological-weapons-and-materials/bwc-legislation-database/l/>]. Accessed 22 August 2020.

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 of a national policy requiring oversight of research with especially dangerous pathogens, toxins, pathogens with pandemic potential and/or other dual-use research [1]. There is no mention of such a policy on the websites of the Luxembourg National Research Fund, the Ministry of Health the National Health Laboratory, the Ministry of Foreign and European Affairs, the Directorate of Defence, or the Ministry of Agriculture, Viticulture and Consumer Protection [2, 3, 4, 5, 6, 7]. The 2018 and 2019 reports for Luxembourg, published on the portal of the United Nations' Biological Weapons Convention (BWC), also do not make reference to such a national policy [8,9].

[1] innovation. public.lu. 2019. "Research and Innovation Policy".

[www.innovation.public.lu/en/decouvrir/politique/politics/index.html]. Accessed 23 August 2020.

[2] Luxembourg National Research Fund. [www.fnr.lu/what-we-do/]. Accessed 23 August 2020.

[3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

[4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

[5] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[6] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[7] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.

[8] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.

[9] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 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 of an agency responsible for oversight of research with especially dangerous pathogens, pathogens with pandemic potential, and/or other dual use research. There is no evidence of such an agency on the websites of the Luxembourg National Research Fund; the Ministry of Health; the National Health Laboratory; the Ministry of Foreign and European Affairs; the Directorate of Defence; and the Ministry of Agriculture, Viticulture and Consumer Protection [1, 2, 3, 4, 5, 6]. Both 2018 and 2019 reports for Luxembourg, published on the portal of the United Nations' Biological Weapons Convention (BWC), also do not include information on such an agency [7,8].

[1] Luxembourg National Research Fund. [www.fnr.lu/what-we-do/]. Accessed 23 August 2020.

[2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.

- [4] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [5] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [7] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.
- [8] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 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 of legislation, regulations, policies or other guidelines requiring the screening of synthesized DNA before it is sold. According to the chapter 10 of the 1997 Law on Genetically Modified Organisms (GMOs), it is necessary to acquire permission from a governmental health department in order to sell GMOs or anything in which GMOs are contained [1]. The law defines "organism" as any non-cellular, cellular or multicellular biological entity capable of reproducing or transferring [1]. In its list of exact procedures that constitute genetic modification, the law includes genetic material recombinant DNA techniques using vector systems. However, this law does not provide any guidelines requiring the screening of synthesized DNA before it is sold. However, there is no evidence of relevant legislation, regulations, policies or guidelines on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, the Directorate of Defense, the Ministry of Agriculture, Viticulture and Consumer Protection or the Ministry of Mobility and Public Works [2, 3, 4, 5, 6, 7]. Luxembourg's 2018 and 2019 report published on portal of the Biological Weapons Convention do not make reference to such legislation either [8,9].

- [1] The Grand Duchy of Luxembourg Official Journal. " Law of 24 January 1997 on the Genetically Modified Organisms " ("Loi du 24 Janvier 1997 sur Organismes Genetiquement Modifiees"). [<http://data.legilux.public.lu/file/eli-etat-leg-memorial-1997-2-fr-pdf.pdf>]. Accessed 23 August 2020
- [2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.
- [3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 23 August 2020.
- [4] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [5] Directorate of Defense. [<https://defense.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 23 August 2020.
- [7] Ministry of Mobility and Public Works. [<https://mmtg.gouvernement.lu/en/le-ministere.html>]. Accessed 23 August 2020
- [8] The Biological Weapons Convention (BWC). 2018 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2018_luxembourg.pdf]. Accessed 21 August 2020.
- [9] The Biological Weapons Convention (BWC). 2019 Report. [https://bwc-ecbm.unog.ch/system/files/form-pdf/bwc_cbm_2019_luxembourg.pdf]. Accessed 21 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: 1

2019

World Health Organization

1.6.1b

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

Yes = 1, No = 0

Current Year Score: 0

2020

OIE WAHIS database

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

2.1 LABORATORY SYSTEMS STRENGTH AND QUALITY

2.1.1 Laboratory testing for detection of priority diseases

2.1.1a

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

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

Current Year Score: 0

Luxembourg's national laboratory has the capacity to conduct two of the 10 WHO-defined core tests. The National Health Laboratory lists the tests it can carry out on its website [1]. The list includes rapid diagnostic testing for plasmodium spp. (malaria) and serology for HIV [1]. The website of the Ministry of Health does not include any additional relevant information

on the capacity of the national laboratory system to conduct diagnostic tests [2].

[1] National Health Laboratory. 2019. "Analysis Book". [<https://Ins.lu/en/analysis-book/>]. Accessed 23 August 2020.

[2] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 23 August 2020.

2.1.1b

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

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

Current Year Score: 1

There is evidence of a national strategy for conducting testing during a public health emergency, but there is insufficient evidence that it includes considerations for testing for novel pathogens, scaling capacity, or defining goals for testing. Luxembourg's Law on the Invasion and Spread of Contagious Diseases (adopted 1885) states that health authorities are authorized to issue the necessary decrees to counter both the invasion and spread of epidemic diseases [1]. The law also allows health authorities to authorise for a cordon sanitaire either locally or at the borders; to quarantine patients; disinfect or destroy effects suspected of being contaminated and finally to visit or examine people who have travelled from an infected country [1]. However, this law does not specifically mention a national plan or strategy which includes considerations for testing for novel pathogens, scaling capacity, and defining goals for testing. In 2006, Luxembourg adopted the Governmental Flu Pandemic Plan "to provide the appropriate planning and preparation, surveillance and prevention, action and management of the consequences in view of the increasing risk of a flu pandemic the A/H5N1 virus might cause." [2]. However, no specific objectives for testing are outlined, and there are no provisions for testing that are applicable to novel pathogens [2]. In July 2020, the Law on Introducing a Series of Measures to Combat the Covid-19 Pandemic was adopted, which introduces new measures such as conducting testing in order to control the number of infections in the country [3]. During the ongoing coronavirus pandemic, Luxembourg has expended its testing strategy and has recorded the highest testing rate in the European Union or the European Economic Area, with 9,582.6 tests per 100,000 inhabitants over a period of 7 days [4]. Moreover, Luxembourg's Ministry of Health in collaboration with the Luxembourg Institute of Health has undertaken large-scale testing, which will expand until at least the first trimester of 2021 and aims at identifying recrudescence of the disease [5]. However, there is no mention of testing for novel pathogens. There is no evidence for testing for novel pathogens, scaling capacity, or defining goals for testing on the Ministry of Agriculture, Viticulture and Consumer Protection website.

[1] The Grand Duchy of Luxembourg Official Journal. 1885. "Law Of 25 March 1885 Regarding The Measures to Take to Avoid an Invasion and Spread of Contagious Diseases" ("Loi du 25 mars 1885 concernant les mesures à prendre pour parer à l'invasion et à la propagation des maladies contagieuses, (No. 20/ 04 April 1885) "). [<http://data.legilux.public.lu/file/eli-etat-leg-memorial-1885-20-fr-pdf.pdf>]. Accessed 24 August 2020.

[2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 24 August 2020.

[3] The Grand Duchy of Luxembourg Official Journal. 2020. "Law of July 17, 2020 on Introducing a Series of Measures to Combat the Covid-19 Pandemic" ("La Loi du 17 Juillet 2020 Portant Introduction d'une Série de Mesures de Lutte Contre la Pandémie Covid-19"). Accessed 24 August 2020.

[4] Ministry of Health. 2020. "COVID-19: Luxembourg's Ambitious Testing Strategy To Tackle The Pandemic".

[https://msan.gouvernement.lu/en/actualites.gouvernement%2Ben%2Bactualites%2Btoutes_actualites%2Barticles%2B2020]

%2B07-juillet%2B16-maee-covid-test-strategy.html] Accessed 24 August 2020.

[5] Ministry of Health. 2020. "Presentation of the Prevention Strategy "Zesumme géint COVID-19"" ("Présentation de la Stratégie de Prévention "Zesumme géint COVID-19"").

[https://msan.gouvernement.lu/fr/actualites.gouvernement%2Bfr%2Bactualites%2Btoutes_actualites%2Bcommuniques%2B2020%2B08-aout%2B14-lenert-covid.html]. Accessed 24 August 2020.

[6] Ministry of Agriculture, Viticulture and Consumer Protection. [https://mavpc.gouvernement.lu/en.html]. Accessed 23 August 2020.

2.1.2 Laboratory quality systems

2.1.2a

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg has a national laboratory that serves as a reference facility, which is accredited. The Department of Medical Biology ("Département de Biologie Médicale") as part of Luxembourg's National Health Laboratory, has an ISO15189 certification of accreditation that is valid until December 2022 (ISO 15189:2012 Specifies Requirements for Quality and Competence in Medical Laboratories) [1, 2, 3].

[1] Potail-qualite.lu. 2017. "National Health Laboratory Customer Record- The Department of Medical Biology" ("Fiche Client Laboratoire National De Santé - Département De Biologie Médicale"). [https://portail-qualite.public.lu/fr/accreditation-notification/organismes-accredites/laboratoires/fiche-client-Ins-biologie-medicale.html]. Accessed 24 August 2020.

[2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [https://Ins.lu/en/]. Accessed 24 August 2020.

[3] International Organisation for Standardisation (ISO). "ISO 15189:2012 Preview Medical laboratories -- Requirements for quality and competence." [https://www.iso.org/standard/56115.html]. Accessed 24 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

There is evidence that Luxembourg has a national reference facility that is subject to external quality assurance review. The Department of Medical Biology ("Département de Biologie Médicale") as part of Luxembourg's National Health Laboratory, has an ISO15189 certification of accreditation that is valid until December 2022 (ISO 15189:2012 Specifies Requirements for Quality and Competence in Medical Laboratories). The ISO 15189 certification requires external quality assurance review. [1, 2, 3]. The National Health Laboratory has quality assurance initiatives in place [1]. Its policies ensure, among other things, "continuous monitoring of performance in the Laboratory through regular internal and external checking", "compliance with good business practices and ethics"; "strict compliance with current legislation"; "effective handling of complaints and irregularities in order to develop corrective actions"; and "continuous process optimization" [4].

[1] Potail-qualite.lu. 2017. "National Health Laboratory Customer Record- The Department of Medical Biology" ("Fiche Client Laboratoire National De Santé - Département De Biologie Médicale"). [https://portail-qualite.public.lu/fr/accreditation-notification/organismes-accredites/laboratoires/fiche-client-Ins-biologie-medicale.html]. Accessed 24 August 2020.

[2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 24 August 2020.

[3] International Organisation for Standardisation (ISO). "ISO 15189:2012 Preview Medical laboratories -- Requirements for quality and competence." [<https://www.iso.org/standard/56115.html>]. Accessed 24 August 2020.

[4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). "Quality initiatives". [https://lns.lu/en/quality-initiatives/?doing_wp_cron=1542793393.4863579273223876953125]. Accessed 24 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 insufficient evidence of a nationwide standardized system for transporting specimens in place in Luxembourg. Luxembourg is a logistics hub and a big importer and exporter of biological samples, especially blood samples [1]. Companies need to be licensed to transport biological samples and must comply with international transport regulations [2]. There are several domestic regulations on the safe transport of Dangerous Goods, including infectious substances, including: the Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 3 June 2003 on the Carriage of Dangerous Goods By Rail [3]; the Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 31 January 2003 on the Carriage of Dangerous Goods by Road [4]; the Law of 24 December 1999 on Safety Advisers for the Transport by Road, Rail and Inland Waterway of Dangerous Goods [5]; and the Grand-Ducal Regulation of 1st March 2007 Amending (a) the Amended Grand-Ducal Regulation of 31 January 2003 on road Transport of Dangerous Goods and (b) the Grand-Ducal Regulation of 24 December 1999 on the Duties and Training Certificate of the Safety Adviser for the Carriage of Dangerous Goods by Road, Rail or Inland Waterway [6]. At the regional level, Luxembourg is a contracting party of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR); the relevant European legislation on the safe and secure transport, including of infectious substances, is Directive 2008/68/EC of the European Parliament and of the Council of September 2008 on the Inland Transport of Dangerous Goods [7]. However, all of this legislations focuses on packaging and labelling rather than actual transportation therefore, none of these regulations refer to a nationwide specimen transport system [3, 4, 5, 6, 7]. The websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the National Health Laboratory and the Luxembourg Institute of Health do not make mention of a system for transporting specimens from the site of collection to a laboratory for testing [8, 9, 10]

[1] AFC International. 2016. "Shipping Blood Samples: The Import Regulations You Need To Know". 27th October, 2016. [www.afcinternationalllc.com/customs-brokerage-news/shipping-blood-samples-the-import-regulations-you-need-to-know/]. Accessed 25 August 2020

[2] Parent's Guide to Cord Blood. 2019. "Future Health - Luxembourg". [https://parentsguidecordblood.org/en/bank_locations/future-health-luxembourg]. Accessed 25 August 2020

[3] The Grand Duchy Of Luxembourg Official Journal. 2008. "Grand-Ducal Regulation of 23 February 2008 Amending the Amended Grand-Ducal Regulation of 3 June 2003 on the Carriage of Dangerous Goods By Rail" ("Règlement Grand-Ducal Du 23 Février 2008 Modifiant Le Règlement Grand-Ducal Modifié Du 3 Juin 2003 Sur Les Transports Par Rail De Marchandises Dangereuses"). [<http://legilux.public.lu/eli/etat/leg/rgd/2008/02/23/n6/jo>]. Accessed 25 August 2020

[4] The Grand Duchy Of Luxembourg Official Journal. 2008. "Grand-Ducal Regulation Of 23 February 2008 Amending The Amended Grand-Ducal Regulation Of 31 January 2003 On The Carriage Of Dangerous Goods By Road" ("Règlement Grand-Ducal Du 23 Février 2008 Modifiant Le Règlement Grand-Ducal Modifié Du 31 Janvier 2003 Sur Les Transports Par Route De

- Marchandises Dangereuses"). [<http://legilux.public.lu/eli/etat/leg/rgd/2008/02/23/n5/jo>]. Accessed 25 August 2020
- [5] The Grand Duchy Of Luxembourg Official Journal. 1999. "Law Of 24 December 1999 On Safety Advisers For The Transport By Road, Rail And Inland Waterway Of Dangerous Goods" (" Loi Du 24 Décembre 1999 Relative Aux Conseillers A La Sécurité Pour Le Transport Par Route, Par Rail Et Par Voie Navigable De Marchandises Dangereuses"). [<http://legilux.public.lu/eli/etat/leg/loi/1999/12/24/n6/jo>]. Accessed 25 August 2020
- [6] The Grand Duchy Of Luxembourg Official Journal. 2007. "Grand-Ducal Regulation of 1st March 2007 Amending (a) the Amended Grand-Ducal Regulation of 31 January 2003 on road Transport of Dangerous Goods; (b) the Grand-Ducal Regulation of 24 December 1999 on the Duties and Training Certificate of the Safety Adviser for the Carriage of Dangerous Goods by Road, Rail or Inland Waterway". [<http://legilux.public.lu/eli/etat/leg/rgd/2007/03/01/n2/jo>]. Accessed 25 August 2020
- [7] European Commission. "Directive 2008/68/EC Of The European Parliament And Of The Council Of September 2008 On The Inland Transport Of Dangerous Goods". [<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0068-20150218&from=EN>]. Accessed 25 August 2020
- [8] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 25 August 2020.
- [9] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 25 August 2020.
- [10] Luxembourg Institute of Health. [<https://www.lih.lu>]. Accessed 25 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 there is a plan to rapidly authorize or license private laboratories to supplement the capacity of the national public health laboratory system to scale up testing during an outbreak. In 2006, Luxembourg published the Flu Pandemic Plan, which outlined the necessary measures to deal with the pandemic. In the crisis management section, the plan states that governmental authorities such as the Ministry of Health, the Ministry of Agriculture, Viticulture and Rural Development, the Ministry of Economy, the Ministry of Justice and the Ministry of Foreign Affairs will assume the structural and operational responsibilities [1]. However, there is no provision or 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. In 2014, Luxembourg published the Ebola Plan, which is an Emergency Intervention Plan in which several measures were taken, such as signing an agreement with both France and Germany to supplement the capacity of hospital beds for patients [2]. However, the Ebola Plan doesn't mention a system in place to scale up testing [2]. In the context of the ongoing coronavirus pandemic, Luxembourg adopted a large-scale testing strategy in accordance with international recommendations, such as those issued by the European Centre for Disease Prevention and Control (ECDC) [3]. The National Health Laboratory (NHL) conducts COVID-19 tests requested by hospitals or health authorities, while tests prescribed by doctors outside of hospitals must be done in private laboratories [4]. The NHL states that tasks have been distributed in the framework of a coordinated approach of all the actors concerned [4]. Moreover, Luxembourg initiated a large-scale screening tests strategy to ease the lockdown [5]. Citizens are invited to join the campaign voluntarily and for free [5]. Tests are sent to specific centres aligned to the cause [5]. No further information was found on the Ministry of Agriculture, Viticulture and Consumer Protection website [6].

[1] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f] Accessed 25 August 2020.

- [2] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)").
[https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 25 August 2020
- [3] Ministry of Health. 2020. "COVID-19: Luxembourg's Ambitious Testing Strategy To Tackle The Pandemic".
[https://msan.gouvernement.lu/en/actualites.gouvernement%2Ben%2Bactualites%2Btoutes_actualites%2Barticles%2B2020%2B07-juillet%2B16-maee-covid-test-strategy.html] Accessed 24 August 2020.
- [4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). 2020. [<https://lns.lu/le-lns-effectue-des-tests-covid-19-uniquelement-pour-les-hopitaux/>]. Accessed 25 August 2020
- [5] Guichet.Lu. June 2020. "Participate in Large-Scale Testing for COVID-19" ("Participer au Dépistage a Grande Echelle du COVID-19"). [<https://guichet.public.lu/fr/citoyens/sante-social/coronavirus/depistage-covid-19.html>]. Accessed 25 August 2020
- [6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 25 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

Luxembourg conducts ongoing event-based surveillance of infectious disease, but there is no evidence that the data are being analyzed on a daily basis. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Diseases for Public Health Protection [1]. Diseases such as anthrax, ebola, malaria and tuberculosis have to be declared by doctors, dentists and laboratories [2]. Declarations can be made by secure electronic means, by fax or by post [2]. Therefore, health authorities will have the necessary information on a possible pandemic and will be able to apply the hygiene measures that will be necessary. This surveillance is also used to allow evaluation and adaptation of public health policies in comparison with neighboring countries [3]. Moreover, according to the Ministry of Health, the National Guidance Group on Prevention of Nosocomial Infection supervises the surveillance of infections associated with intensive care units of certain hospitals, using the Nosocomial Infection Surveillance System (NOSIX) software [4]. The information is collected by nurses and entered in encoded form into the NOSIX central database [5]. Each hospital participating in this surveillance receives the national results as well as its own [4].

[1] The Grand Duchy of Luxembourg Official Journal. 2018. 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection ("La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 25 August 2020

[2] Ministry of Health. 2019. Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 25 August 2020

[3] Sante.Lu. 2018. "Towards a Better Infectious Disease Surveillance in Luxembourg" ("Vers Une Meilleure Surveillance Des Maladies Infectieuses Au Luxembourg"). [<https://sante.public.lu/fr/actualites/2018/10/maladies-infectieuses/index.html>]. Accessed 25 August 2020

[4] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022,p.14" ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 23 August 2020

[5] luxclin. "NOSIX. Pathology : Infectious Diseases. Study Title: Surveillance of Nosocomial Infections in Intensive Care Units". [www.luxclin.lu/Studies/Details/?c=STP1008FGR]. Accessed 25 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: 0

There is no publicly available evidence that Luxembourg has reported a potential public health emergency of international concern (PHEIC) to the World Health Organization (WHO) within the last two years. According to the WHO, Luxembourg has not reported any outbreaks [1]. The WHO Disease Outbreak News pages for 2020 and 2019 do not provide any evidence of the same. [2, 3] Further, on March 01, 2020, the Luxembourg government reported its first case of covid-19 to the WHO, who had previously declared covid-19 a potential PHEIC on January 30, 2020. [4, 5] The website of Luxembourg's Ministry of Health does not make reference to reporting any outbreaks (including COVID-19) to the WHO [6].

[1] World Health Organisation. "Emergencies preparedness, response". [www.who.int/csr/don/archive/country/lux/en/]. Accessed 25 August 2020

[2] World Health Organization (WHO). 2020. "Emergencies preparedness, response: 2020". [<https://www.who.int/csr/don/archive/year/2020/en/>]. Accessed 20 April 2021.

[3] World Health Organization (WHO). 2019. "Emergencies preparedness, response: 2019". [<https://www.who.int/csr/don/archive/year/2019/en/>]. Accessed 20 April 2021.

[4] World Health Organization (WHO). "Luxembourg". [<https://www.who.int/countries/lux/>] Accessed 20 April 2021.

[5] World Health Organization (WHO). 27 April 2020. "Archived: WHO Timeline - COVID-19". [<https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>] Accessed 20 April 2021.

[6] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 25 August 2020.

2.3.2 Interoperable, interconnected, electronic real-time reporting systems

2.3.2a

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg has an electronic reporting surveillance system at both the national and sub-national level. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Diseases for Public Health Protection [1]. Diseases such as anthrax, ebola, malaria and tuberculosis have to be declared by doctors, dentists and laboratories [2]. Declarations can be made by secure electronic means, by fax or by post [2]. Moreover, according to the Ministry of Health, the National Guidance Group on Prevention of Nosocomial Infection supervises the surveillance of infections associated with intensive care units of certain

hospitals, using the Nosocomial Infection Surveillance System (NOSIX) software [3]. The information is collected by nurses and entered in encoded form into the NOSIX central database [4]. Each hospital participating in this surveillance receives the national results as well as its own [3].

[1] The Grand Duchy Of Luxembourg Official Journal. 2018. 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 25 August 2020

[2] Ministry of Health. 2019. Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 25 August 2020

[3] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022,p.14" ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 23 August 2020

[4] luxclin. "NOSIX. Pathology : Infectious Diseases. Study Title: Surveillance of Nosocomial Infections in Intensive Care Units". [www.luxclin.lu/Studies/Details/?c=STP1008FGR]. Accessed 25 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

There is insufficient evidence that Luxembourg has an electronic reporting surveillance system to collect ongoing or real-time laboratory data. In 2018, Luxembourg passed the Law on the Mandatory Declaration of Certain Diseases for Public Health Protection [1]. Diseases such as anthrax, ebola, malaria and tuberculosis have to be declared by doctors, dentists and laboratories [2]. Declarations can be made by secure electronic means, by fax or by post – meaning that the reporting is not in real time. [2] Moreover, according to the Ministry of Health, the National Guidance Group on Prevention of Nosocomial Infection supervises the surveillance of infections associated with intensive care units of certain hospitals, using the Nosocomial Infection Surveillance System (NOSIX) software [3]. The information is collected by nurses and entered in encoded form into the NOSIX central database – meaning that the data are not collected in a real time. [4]

[1] The Grand Duchy Of Luxembourg Official Journal. 2018. 1 August 2018 Law on the Mandatory Declaration of Certain Diseases for Public Health Protection (" La Loi du 1er Aout 2018 Sur La Déclaration Obligatoire De Certaines Maladies Dans Le Cadre De La Protection De La Santé Publique"). [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a705/jo>]. Accessed 25 August 2020

[2] Ministry of Health. 2019. Infectious Diseases And Pathogens With Mandatory Declaration. Guide for the Mandatory Declaration for Doctors and Dentists ("Maladies infectieuses et agents pathogènes à déclaration obligatoire. Guide de la déclaration obligatoire pour médecins et médecins-dentistes 2019"). [<https://guichet.public.lu/dam-assets/catalogue-pdf/sante/maladies-infectieuses-guide-declarant/maladies-infectieuses-guide-declarant.pdf>]. Accessed 25 August 2020

[3] Ministry of Health and Ministry of Agriculture, Viticulture and Consumer Protection. 2018. "National Antibiotics Plan. 2018-2022,p.14" ("Plan National Antibiotiques. 2018-2022"). [<http://sante.public.lu/fr/publications/p/plan-national-antibiotiques-2018-2022/plan-national-antibiotiques-2018-2022.pdf>]. Accessed 25 August 2020

[4] luxclin. "NOSIX. Pathology : Infectious Diseases. Study Title: Surveillance of Nosocomial Infections in Intensive Care Units". [www.luxclin.lu/Studies/Details/?c=STP1008FGR]. Accessed 25 August 2020

2.4 SURVEILLANCE DATA ACCESSIBILITY AND TRANSPARENCY

2.4.1 Coverage and use of electronic health records

2.4.1a

Are electronic health records commonly in use?

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

Current Year Score: 1

Electronic health records are in use, but not commonly. Luxembourg has a system of electronic health records ("dossiers de soins partagé", literally "shared care records") managed by a body called the eHealth Agency ("Agence eSanté"). [1] These records are accessible to the patient and to medical professionals to whom the patient gives permission. [2] They contain all essential health information, including laboratory test results, blood type, allergies, medicine taken, consultation reports, radiological test results, hospitalization reports, and organ donation permission. [3] Any person covered by Luxembourg's social security system can opt to create a record for himself or herself, and can also delete the record at any time. [3] The eHealth Agency is currently in the process of sending everyone instructions on how to create a record, intending to reach everyone by the end of 2021. [3] According to the latest available figures, from March 2020, 90,000 people have records (out of a national population over 600,000) [4, 5].

[1] Guichet.lu. 2018. ""Requesting A Shared Care Record." ("Demander l'ouverture d'un dossier de soins partagé (DSP pilote.)" [<https://guichet.public.lu/fr/citoyens/sante-social/droits-devoirs-patient/droits-devoirs-patient/dossier-soins-partage.html>]. Accessed 4 September 2020.

[2] Agence eSanté. "The DSP (shared care record)" ("Le DSP (dossier de soins partagé)") [<https://www.esante.lu/portal/fr/jem-informe/services-esante-pour-les-patients-187-211.html>]. Accessed 4 September 2020.

[3] Agence eSanté. "FAQ DSP." [<https://www.esante.lu/portal/fr/faq-205-223.html>]. Accessed 4 September 2020.

[4] Luxembourg Post. 2 March 2020. "One Step Forward For Personalised Electronic Medecin" ("Un Pas De Plus Pour La Médecine Numérique Personnalisée"). [<https://www.wort.lu/fr/luxembourg/un-pas-de-plus-pour-la-medecine-numerique-personnalisee-5e5778ccda2cc1784e35709d>]. Accessed 26 August 2020

[5] Statistics Portal of the Grand Duchy of Luxembourg. 2020. "Population by sex and nationality on 1 January (x 1,000) 1981, 1991, 2001 - 2020." ("Population par sexe et par nationalité au 1er janvier (x 1 000) 1981, 1991, 2001 - 2020 Documentation du tableau.") [https://statistiques.public.lu/stat/TableViewer/tableView.aspx?ReportId=12853&IF_Language=fra].

2.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence that the national public health system has access to electronic health records of individuals. Although Luxembourg has an electronic health records system in place, evidence suggests that information can only be accessed by the patient and the designated primary care physician, or any other healthcare professional to whom the patient has given access rights [1]. The system was adopted in 2015 and is currently being rolled out nationwide [2]. It is a secure shared healthcare file that includes medical test results, details on patient consultations, hospitalisations or prescriptions [3]. According to the Ministry of Health, the system's main purpose is "to promote exchanges between healthcare professionals and to enable better coordinated patient care by centralising all of the patient's essential health-related information," but

there is no information on if the Ministry of Health is able to access these records [4]. Luxembourg is seen to have made strides in implementing electronic health records though the system is yet to fully exploit its potential in terms of information it contains. Luxembourg's health care organizations are connected by the eHealth agency. The agency uses a telematics platform known as HealthNet, which "incorporates telemedicine, databases, prescribing and patient files, and new initiatives to foster patient communication and data accesses" [5].

- [1] Agence E-Santé. FAQ. "Who has Access to the Shared Health Record?" ("Qui a Accès au DSP?") [https://www.esante.lu/portal/fr/faq-205-223.html] Accessed 26 August 2020
- [2] European Observatory on Health Systems and Policies. 2015. "Health Systems in Transition. Luxembourg". [https://www.euro.who.int/__data/assets/pdf_file/0006/287943/Mini-HiT_Luxembourg-rev1.pdf]. Accessed 26 August 2020
- [3] CNS d'Gesondheetskeess. 2019. "In Practice". [https://cns.public.lu/en/professionnels-sante/medecins/medecin-referent/en-pratique.html]. Accessed 26 August 2020
- [4] Guichet.lu. 2018. "Requesting A 'Shared Medical File' (DSP)". [https://guichet.public.lu/en/citoyens/sante-social/droits-devoirs-patient/droits-devoirs-patient/dossier-soins-partage.html]. Accessed 26 August 2020
- [5] Mantravadi, S. and Snider, D. 2017. "Comparing Healthcare Systems of Luxembourg and the United States". Journal of Applied Business and Economics. Vol. 19
- [7] 2017. [www.na-businesspress.com/JABE/JABE19-7/MantravadiS_19_7_.pdf]. Accessed 26 August 2020

2.4.1c

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

Yes = 1 , No = 0

Current Year Score: 1

The electronic health records system uses data standards to ensure data is comparable. The Ministry of Internal Security states that given the sensitive nature of electronic health records, measures are taken to guarantee the security and confidentiality of the data to respect patients' rights [3]. Furthermore, the Ministry of Internal Security "specifies the security and interoperability measures to be implemented by the Agence eSanté, which is responsible for managing the national platform for sharing and exchanging health data, as well as by service providers. and publishers of computer programs who wish to connect to the national eHealth platform." [3]. Agence eSanté adheres to ISO 27001 Certification on Information Security Management System [4, 5].

- [1] Agence E-Santé. [https://www.esante.lu/portal/fr/]. Accessed 27 August 2020
- [2] CNS d'Gesondheetskeess. 2019. "In Practice". [https://cns.public.lu/en/professionnels-sante/medecins/medecin-referent/en-pratique.html]. Accessed 27 August 2020
- [3] Ministry of Internal Security. 20 September 2017. "The Shared Health File: Towards the Gradual Deployment of a Secure Collaborative Tool Between Healthcare Professionals and Patients" ("Le Dossier De Soins Partagé: Vers Le Déploiement Progressif D'un Outil Collaboratif Sécurisé Entre Professionnels De Santé Et Patients"). [https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2017/09-septembre/20-dossiers-soins-partage.html]. Accessed 27 August 2020
- [4] Agence E-Santé. "Health Agency ISO 27001 Certification" ("Certification ISO 27001 de l'Agence E-Santé") [https://www.esante.lu/portal/fr/certification-iso-27001-de-l-agence-esante-5-69.html?args=Y29tcF9pZD0xMDgmYWN0aW9uPXZpZdfbmV3c19kZXRhaWwmaWQ9MjQ0NCZjb21wb25lbnQ9Jm1vZHVzZT0mfA==] Accessed 27 August 2020
- [5] ISO. "ISO/IEC 27001 Information Security Management". [https://www.iso.org/isoiec-27001-information-security.html]. Accessed 27 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 an established mechanism at ministries responsible for animal, human and wildlife surveillance to share data in Luxembourg. There is no evidence of such a mechanism on the websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, or the Ministry of the Environment, Climate and Sustainable Development. [1, 2, 3] However, Luxembourg takes part in the active surveillance of activities of exotic mosquitoes in Europe and reports cases of brucellosis annually to the European Centre for Disease Prevention and Control [4, 5, 6]. Furthermore, the National Museum of Natural History's laboratory is creating a mosquito atlas for 2021, which will provide up-to-date information on the distribution of all mosquito species in Luxembourg and hence potential vectors of diseases, providing the Ministry of Health and the other related bodies data on different mosquito species [7].

[1] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 31 August 2020

[2] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 31 August 2020

[3] Ministry of the Environment, Climate and Sustainable Development. [<https://mecdd.gouvernement.lu/en.html>]. Accessed 31 August 2020

[4] Chronicle.lu. 1 August 2018. "1st Japanese Mosquito Recorded in Luxembourg" [www.chronicle.lu/category/at-home/26616-1st-japanese-mosquito-recorded-in-luxembourg]. Accessed 31 August 2020

[5] European Centre for Disease Prevention and Control. 1 February 2018. "Invasive Mosquito Spp. - Current Known Surveillance: January 2018". [<https://ecdc.europa.eu/en/publications-data/invasive-mosquito-spp-current-known-surveillance-january-2018>]. Accessed 31 August 2020

[6] European Centre for Disease Prevention and Control. 27 May 2017. "Annual epidemiological report. Brucellosis" [https://www.ecdc.europa.eu/sites/default/files/documents/Brucellosis-Annual%20epidemiological%20report_1_0.pdf]. Accessed 31 August 2020

[7] Luxembourg Post. 17 September 2019. "These Dangereuse Insects which are Watched Very Closely". ("Ces Insectes Dangereux Surveillés de Très Pres"). [<https://www.wort.lu/fr/luxembourg/ces-insectes-dangereux-surveilles-de-tres-pres-5d80bacada2cc1784e34baa2>]. Accessed 31 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

There is no evidence that Luxembourg makes de-identified health surveillance data on disease outbreaks publicly available on government websites. Luxembourg's hospitals use the methods of the Luxembourg Nosocomial Infection Surveillance System (Nosix) and participate in the European Centre for Disease Prevention and Control Point Prevalence Surveys (ECDC

PPS) [1]. The Ministry of Health publishes statistics on the causes of death on a yearly basis (including the number of deaths due to infectious diseases), but the last such report was published in 2017 [2]. The Ministry of Agriculture, Viticulture and Consumer Protection, the National Health Laboratory and the National Institute of Statistics and Economic Studies (STATEC) do not make publicly available data on de-identified health surveillance data on disease outbreaks [3, 4, 5].

[1] European Centre for Disease Prevention and Control (ECDC). 2017. "ECDC Country Visit to Luxembourg to Discuss Antimicrobial Resistance Issues". [<https://ecdc.europa.eu/sites/portal/files/documents/ECDC-country-visit%20AMR-LUX-2017.pdf>]. Accessed 31 August 2020

[2] Sate.Lu. [<https://sante.public.lu/fr/statistiques/statistiques-causes-deces/index.html>]. Accessed 31 August 2020

[3] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 31 August 2020

[4] National Health Laboratory ("Laboratoire National De SantÃ© Luxembourg"). [<https://lns.lu/en/>]. Accessed 21 August 2020

[5] National Institute of Statistics and Economic Studies ("Institut national de la statistique et des Ã©tudes Ã©conomiques ").

[<https://integratioun.lu/project/statec/#~:text=Le%20STATEC%20est%20l'Institut,%C3%A0%20d.>]. Accessed 31 August 2020

2.4.3b

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg makes de-identified COVID-19 surveillance data available via daily reports on government websites.

Luxembourg's government website makes de-identified surveillance data, including daily case count and mortality rates, available through an online data platform [1]. In addition, there is an open data platform that hosts COVID-19 data from the Ministry of Health [2].

[1] [Government.Lu.2020. Coronavirus. [<https://coronavirus.gouvernement.lu/fr.html>] Accessed 31 August 2020

[2] Data.Public.Lu. 2020. " COVID19 Data" ("Données COVID19") [<https://data.public.lu/fr/datasets/donnees-covid19/#resource-d80cdf8c-e454-4319-8d15-044def8769e3>] Accessed 31 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

In Luxembourg there are laws and regulations in place that safeguard the confidentiality of identifiable personal health information, including those generated through health surveillance activities. On 1 August 2018, Luxembourg adopted two data protection laws. The first law is the Luxembourg Data Protection Law which defines the organisation of the Luxembourg Data Protection Authority (CNPD) and provides for specific requirements or exceptions in implementation of the European Union's General Data Protection Regulation (GDPR) (Regulation No 2016/679) [1]. GDPR strictly regulates the use of personal

health data, genetic data or biometric data and its provisions apply in Luxembourg [1]. The second law is the Luxembourg Law on Criminal Data Protection, which specifically relates to the protection of individuals with regard to the processing of personal data in criminal matters and national security [2]. In addition, the Ministry of Internal Security states that given the sensitive nature of the electronic health card data, measures are taken to guarantee the security and confidentiality of these data to respect patients' rights [3]. The Ministry of Internal Security "specifies the security and interoperability measures to be implemented by the eSanté Agency, which is responsible for managing the national platform for sharing and exchanging health data, as well as by service providers. and publishers of computer programs who wish to connect to the national eHealth platform." [3]

[1] Official Journal of the European Union. 27 April 2016. "Regulation (Eu) 2016/679 Of The European Parliament And Of The Council Of 27 April 2016 On The Protection Of Natural Persons With Regard To The Processing Of Personal Data And On The Free Movement Of Such Data, And Repealing Directive 95/46/EC (General Data Protection Regulation) ". [<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R0679&from=EN>]. Accessed 1 September 2020.

[2] The Grand Duchy Of Luxembourg Official Journal. 2018. "Law Of 1 August 2018 Relating To The Protection Of Natural Persons With Regard To The Processing Of Personal Data In Criminal Matters As Well As In Matters Of National Security" ("Loi Du 1er Août 2018 Relative A La Protection Des Personnes Physiques A L'égard Du Traitement Des Données A Caractère Personnel En Matière Pénale Ainsi Qu'en Matière De Sécurité Nationale.") [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a689/jo>]. Accessed 1 September 2020.

[3] Ministry of Internal Security. 20 September 2017. "The Shared Health File: Towards the Gradual Deployment of a Secure Collaborative Tool Between Healthcare Professionals and Patients" ("Le Dossier De Soins Partagé: Vers Le Déploiement Progressif D'un Outil Collaboratif Sécurisé Entre Professionnels De Santé Et Patients"). [https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2017/09-septembre/20-dossiers-soins-partage.html]. Accessed 1 September 2020

2.4.4b

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg has in place laws and regulations to safeguard the confidentiality of identifiable personal health information, and they include mention of protections from cyber attacks. The country has robust protections in place for private data against cyber attack and the protections cover all private data, including health data [1]. They are laid down in Luxembourg's Penal Code and specific legislation and regulation related to cybersecurity, including 2018's Law on the Protection of Individuals with Regard to the Processing of Personal Data and 2005's Law on Data Protection on Electronic Communications [1, 2, 3]. The Law on the Protection of Individuals with Regard to the Processing of Personal Data defines the organization of the Luxembourg data protection authority (the CNPD) and provides for specific requirements and exceptions in implementation of the European Union's General Data Protection Regulation (GDPR) (Regulation No 2016/679) [4]. GDPR includes specific provisions to protect data against cyber attacks, including a requirement that data held by state authorities must be overseen by a dedicated data protection officer who is proficient in dealing with cyber attacks, and a requirement to inform all individuals affected by a data breach within 72 hours. [4]. Article 6 of the Law on the Protection of Individuals with Regard to the Processing of Personal Data makes provisions against unauthorized data interference, stating that "in case of inaccurate or unlawful transmission personal, the recipient will be informed without delay. In this case, the personal data are rectified or erased or their processing is restricted in accordance with Article 16" [2].

- [1] Cyberwise.eu. "Luxembourg (LU)". [<https://cyberwiser.eu/luxembourg-lu>]. Accessed 1 September 2020
- [2] Journal Officiel du Grand-Duché de Luxembourg. "Law of the 1 August 2008 on the Protection of Individuals with regard to the Processing of Personal Data" ("Loi Du 1er Août 2008 Relative A La Protection Des Personnes Physiques A L'égard Du Traitement Des Données A Caractère Personnel"). Accessed 25 September 2020 [<http://legilux.public.lu/eli/etat/leg/loi/2018/08/01/a689/jo>]
- [3] Journal Officiel du Grand-Duché de Luxembourg. "Law of 30 May 2005 on Data Protection on Electronic Communications" ("Loi Du 30 Mai 2005 Protection Des Données Et Communications Electroniques). [<https://cnpd.public.lu/fr/legislation/droit-lux.html#:~:text=D%C3%A9signation%20officielle%3A%20Loi%20modifi%C3%A9%20du,du%20Code%20d'instruction%20cristminelle.>]
- [4] Official Journal of the European Union. 27 April 2016. "Regulation (Eu) 2016/679 Of The European Parliament And Of The Council Of 27 April 2016 On The Protection Of Natural Persons With Regard To The Processing Of Personal Data And On The Free Movement Of Such Data, And Repealing Directive 95/46/EC (General Data Protection Regulation) ". [<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R0679&from=EN>]. Accessed 1 September 2020.

2.4.5 International data sharing

2.4.5a

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

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

Current Year Score: 2

There is evidence that Luxembourg has a commitment to share data for more than one disease during an active emergency. As a member of the European Union (EU), Luxembourg shares surveillance data during a public health emergency with other countries in the region. All EU and European Economic Area countries are part of the European Centre for Disease Prevention and Control's Early Warning and Response System (EWRS). The EWRS is a platform to "allow exchange of information on risk assessment and risk management for more timely, efficient and coordinated public health action", which is "used for notifications on outbreaks, exchanging information and decisions about the coordination of measures among Member States" [1]. Over the years, it has played an important role in responding to health crises related to severe acute respiratory syndrome (SARS), ebola, avian influenza in humans and other communicable diseases [1]. Article 9 of chapter IV of the EU Decision on Serious Cross-Border Threats to Health notes that the European Commission "shall make available to the national competent authorities through the EWRS any information that may be useful for coordinating the response [...] including information related to serious cross border threats to health and public health measures related to serious cross-border threats to health transmitted through rapid alert and information systems established under other provisions of Union law or the Euratom Treaty. " [2]

[1] European Centre for Disease Prevention and Control. "Early Warning and Response System (EWRS). "

[<https://ecdc.europa.eu/en/early-warning-and-response-system-ewrs>]. Accessed 1 September 2020

[2] Official Journal of the European Union. 5 November 2013. "Decision No 1082/2013/EU of the European Parliament and of the Council of 22 October 2013 on Serious Cross-Border Threats to Health and Repealing Decision No 2119/98/EC".

[https://ec.europa.eu/health/sites/health/files/preparedness_response/docs/decision_serious_crossborder_threats_22102013_en.pdf]. Accessed 1 September 2020

2.5 CASE-BASED INVESTIGATION

2.5.1 Case investigation and contact tracing

2.5.1a

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

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

Current Year Score: 0

There is no evidence that Luxembourg has 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 active or future public health emergencies. During the covid-19 pandemic, Luxembourg has been using a contact tracing system to help reduce the total number of infected people to a minimum and break the chains of infection [1]. The contact tracing is done manually, but Luxembourg's Minister of Health suggested that a mobile application could be developed in the near future [2]. In July 2020, the minister of health mentioned that efforts within the contact tracing task forces had been ramped up "from zero to a hundred" as quickly as possible [3]. However, no further details have been provided regarding specific provisions or funding in place to conduct contact tracing. No information on allocation of resources specifically for contact tracing was found on the websites of the government and the Ministry of Health [4, 5].

[1] Gouvernement. Lu. "Coronavirus". [<https://coronavirus.gouvernement.lu/en.html>]. Accessed 3 September 2020

[2] Delano. 18 June 2020. "Lux Could Create Contact Tracing App "Within Short Time". [<https://delano.lu/d/detail/news/lux-could-create-contact-tracing-app-within-short-time/210809>]. Accessed 3 September 2020

[3] RTL. 22 July 2020. "The Situation Is Under Control: Paulette Lenert". [<https://today.rtl.lu/news/luxembourg/a/1553092.html>]. Accessed 3 September 2020

[4] Gouvernement. Lu. [<https://gouvernement.lu/fr.html>]. Accessed 3 September 2020

[5] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 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 of Luxembourg providing 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, other than measures specific to the COVID-19 pandemic. In July 2020 Luxembourg adopted the Law on a Series of New Measures to Fight the COVID-19 Pandemic [1]. Under this law, people who test positive for COVID-19 are required to stay at their place of residence for 14 days, renewable, while people who have been in contact with someone who tests positive COVID-19 must either stay at their place of residence for 14 days, or stay for 7 days and then test negative for COVID-19 [1, 2]. As a new measure to deal with COVID-19, parents can benefit from fully paid parental leave to look after their children under 13 who are required to stay at home [4]. As another COVID-19 response, the Ministry of Family, Integration and the Greater Region

introduced family support leave, which is fully paid leave to look after old or handicapped family members [5]. Regarding medical attention, the Health Directorate sends two letters to people isolating at home: one contains a set of masks and the other contains a kit explaining the measures necessary to avoid contaminating others, as well as an isolation note for the person's employer [7, 8]. In addition, the Ministry of Health has created a telemonitoring system called Maela, which has been deployed in the whole of Luxembourg to monitor the health condition of COVID-19 patients and identify if they need assistance, or if their symptoms are worsening [9]. The tracking consists of answering a short daily medical questionnaire; a health professional contacts the patient if any problem is detected [9]. However, there is no evidence of such measures that would apply to cases outside of the current COVID-19 pandemic, neither on the websites of the Ministry of Health nor that of the National Health Laboratory [10, 11]

[1] Journal Officiel du Grand-Duché de Luxembourg. 2020. " Law of 17 July 2020 Regarding the Introduction of a Series of New Measures to fight COVID 19 Pandemic" ("Loi Du 17 Juillet 2020 Portant Introduction D'une Série De Mesures De Lutte Contre La Pandémie Covid-19"). [<http://data.legilux.public.lu/file/eli-etat-leg-loi-2020-07-17-a624-jo-fr-pdf.pdf>]. Accessed 1 September 2020

[2] Ministry of Health. "Coronavirus: COVID-19" [<https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html>]. Accessed 1 September 2020

[3] Guichet. Lu. 20 July 2020. "Partial Unemployment During The Economic Recovery Period (From July to December 2020)" ("Chômage Partiel Pendant La Période De Relance Economique (Mois De Juillet A Décembre 2020 - Demande Et Décompte)"). [<https://guichet.public.lu/fr/entreprises/sauvegarde-cessation-activite/sauvegarde-emploi/chomage-partiel-technique/chomage-partiel-relance-eco.html>]. Accessed 8 September 2020.

[4] VOConsulting. "Coronavirus : Les Mesures d'Aides Exceptionnelles Pour Votre Activite et Vos Salaries Au Luxembourg" ("Coronavirus : Exceptional Aid Measures For Your Activity and Your Employees In Luxembourg "). [<https://www.voconsulting.lu/fr/publications/comptabilite/coronavirus-les-mesures-d-aides-exceptionnelles-pour-votre-activite-et-vos-salaries-au-luxembourg>]. Accessed 8 September 2020.

[5] Guichet. Lu. "Request For A Certificate Of Leave For Family Support To Deal With Covid-19" (" Demande de certificat du congé pour soutien familial dans le cadre de la lutte contre le Covid-19"). [<https://guichet.public.lu/fr/citoyens/travail-emploi/conges-jours-feries/situation-personnelle/covid-certificat-conge-soutien-familial.html>]. Accessed 8 September 2020.

[6] Guichet. Lu. 29 July 2020. " Coronavirus - COVID-19 : Steps for SMEs " ("Coronavirus - COVID-19 : Démarches pour les PME"). [<https://guichet.public.lu/fr/support/coronavirus/corona-virus-pme.html>]. Accessed 8 September 2020.

[7] Gouvernement. Lu. "Coronavirus". [https://gouvernement.lu/en/dossiers.gouv_msan%2Ben%2Bdossiers%2B2020%2Bcorona-virus.html]. Accessed 8 September 2020

[8] Ministry of Health. "Coronavirus Covid-19 Home Isolation" ("Coronavirus Covid-19 Isolement À Domicile") [https://msan.gouvernement.lu/dam-assets/covid-19/fiches_information/fr/FICHE-isolement-au-domicile-FR-200313.pdf]. Accessed 8 September 2020.

[9] Health Directorate. "CORONAVIRUS (COVID19) Patient Monitoring". [<https://suivicovid.lu/en.html>]. Accessed 8 September 2020.

[10] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 21 August 2020

[11] National Health Laboratory. [<https://lns.lu/en/>]. Accessed 21 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 Luxembourg makes de-identified data on contact tracing efforts for COVID-19 available. The government and Ministry of Health websites provide detailed data on the ongoing coronavirus pandemic, including regularly updated figures for confirmed cases, deaths, hospitalizations and tests. [1, 2]. However, these data do not include the percentage of new cases identified through contact tracing. There is no evidence of statistics related to contact tracing on the websites of the National Health Laboratory and the Ministry of Agriculture, Viticulture and Consumer Protection. [3, 4]

[1] Gouvernement. Lu. "Coronavirus".

[https://gouvernement.lu/en/dossiers.gouv_msan%2Ben%2Bdossiers%2B2020%2Bcorona-virus.html]. Accessed 8 September 2020

[2] Ministry of Health. "Coronavirus: COVID-19". [<https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html>]. Accessed 8 September 2020.

[3] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 25 August 2020.

[4] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 25 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 public evidence that Luxembourg 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 future public health emergency. Luxembourg has about 200,000 cross-border workers, with some 45% of its workforce arriving daily from neighbouring countries (France, Germany and Belgium) [1]. In the context of COVID 19, the Ministry of Health has stated that cross-border workers are allowed to be tested in Luxembourg if they are covered by Luxembourg's social security system [2]. However, there are no provisions for cooperation between border authorities and the public health system on the websites of the Ministry of Health, the Ministry of Social Security and the Customs and Border Protection Agency for active and future public health emergencies [3, 4, 5].

[1] Luxembourg.public.lu. 25 May 2020. "Luxembourg Job Market". [<https://luxembourg.public.lu/en/work-and-study/employment-in-luxembourg/luxembourg-job-market.html>]. Accessed 8 September 2020

[2] Ministry of Health. "Coronavirus: COVID-19". [<https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html>]. Accessed 8 September 2020.

[3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 8 September 2020

[4] Ministry of Social Security. [<https://mss.gouvernement.lu/fr.html>]. Accessed 8 September 2020.

[5] Portail des Douanes et Accises [<https://douanes.public.lu/fr.html>]. Accessed 8 September 2020.

2.6 EPIDEMIOLOGY WORKFORCE

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

2.6.1a

Does the country meet one of the following criteria?

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

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

Current Year Score: 1

There is public evidence that resources are provided by the government to send citizens to another country to participate in applied epidemiology training programs (such as FETP), but there is no evidence of in-country training. Luxembourg is part of the European Programme for Intervention Epidemiology Training (EPIET), and the government provides resources to train in other countries abroad as part of these programs [1]. However, there is no evidence of a separate program offered in the country [1,2,3,4]

[1] TEPHINET. 2020. "European Programme For Intervention Epidemiology Training (EPIET) And The European Programme For Public Health Microbiology Training (EUPHEM)". [<https://www.tephinet.org/training-programs/european-programme-for-intervention-epidemiology-training-epiet-and-the-european>]. Accessed 1 September 2020

[2] TEPHINET. [<https://www.tephinet.org/training-programs>]. Accessed 1 September 2020

[3] European Centre for Disease Prevention and Control. "Fellowship programme: EPIET/EUPHEM". [<https://www.ecdc.europa.eu/en/epiet-euphem/institutes>]. Accessed 1 September 2020

[4] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 September 2020

2.6.1b

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

Yes = 1 , No = 0

Current Year Score: 1

There are field epidemiology training programs explicitly inclusive of animal health professionals in Luxembourg. The European Programme for Intervention Epidemiology Training (EPIET) and the European Programme for Public Health Microbiology Training (EUPHEM), which are both inclusive of animal health professionals, serve Luxembourg [1]. These programs aim to strengthen the surveillance and control of infectious diseases, to enhance response capacities for effective field investigation and to strengthen the European network of public health professionals through use of shared standards, methods and good practices [1].

[1] TEPHINET. 2020. "European Programme For Intervention Epidemiology Training (EPIET) And The European Programme For Public Health Microbiology Training (EUPHEM)". [<https://www.tephinet.org/training-programs/european-programme-for-intervention-epidemiology-training-epiet-and-the-european>]. Accessed 1 September 2020

for-intervention-epidemiology-training-epiet-and-the-european]. Accessed 1 September 2020

2.6.2 Epidemiology workforce capacity

2.6.2a

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

Yes = 1, No = 0

Current Year Score: 0

2020

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

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

3.1 EMERGENCY PREPAREDNESS AND RESPONSE PLANNING

3.1.1 National public health emergency preparedness and response plan

3.1.1a

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

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

Current Year Score: 1

There is evidence that disease-specific plans are in place, but there is no evidence that Luxembourg has an overarching plan that addresses planning for multiple communicable diseases with pandemic potential [1]. Luxembourg has an Emergency Response to Ebola Plan, which was published in 2014 and sets out the government's planned response to ebola outbreaks at the national level. [2] It specifies the institutions that will manage the crisis, sets how the public and the authorities will be alerted and defines emergency measures. [2] There is also the Government Influenza Pandemic Plan ("Plan Gouvernemental Pandémie Grippale"), which was adopted in 2006 and spells out the government's response to influenza pandemics, including pandemics of avian influenza among animals and humans [3]. Luxembourg also has a Mass Casualty Response Plan, but this does not specifically address planning for multiple communicable diseases with pandemic potential [4]. In March 2018, Luxembourg passed the Law on the Organization of Civil Security, which sets out measures and procedures "to protect people, animals, property and the environment against calamitous events, disasters and catastrophes " [5]. However, the law does not specifically mention anything about pandemics, epidemics or infectious diseases [5]. There is no evidence of any other relevant plans on the websites of the Ministry of Health, the National Laboratory of Health, or the High Commission for National Protection. [6,7,1]

- [1] Hauts Commissariat a La Protection Nationale. "National Plans" ("Plans Nationaux"). [https://hcpn.gouvernement.lu/fr/service/domaines/plans-nationaux.html]. Accessed 1 September 2020
- [2] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)"). [https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020
- [3] European Centre for Disease Prevention and Control. 2006. "Government Plan Influenza Epidemic" ("Plan Governmental Pandémie Grippale"). [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020
- [4] State Ministry. 27 June 2018. "Mass Casualty Response Plan" ("Plan « Nombreuses victimes » ") [https://www.infocrise.lu/documents/20181/30297/NOV1pdf08052019.pdf/f4277d8b-6400-47c7-9971-dbf91d1af2f]. Accessed 1 September 2020
- [5] Journal Officiel du Grand-Duche de Luxembourg. 2018. "Official publication of the law of 27 March 2018 on the organization of civil security". [http://legilux.public.lu/eli/etat/leg/loi/2018/03/27/a221/jo]. Accessed 1 September 2020
- [6] Ministry of Health. [http://sante.public.lu/fr/politique-sante/ministere-sante/index.html]. Accessed 1 September 2020
- [7] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [https://lns.lu/en/]. Accessed 1 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 public evidence that Luxembourg has an overarching national public health emergency response plan that addresses planning for multiple communicable diseases with epidemic or pandemic potential, and none of the disease-specific plans have been updated in the last three years. The High Commission for National Protection lists nine emergency response plans ("Plans d'Interventions d'Urgence"), two of which deal specifically with diseases: the Influenza Pandemic Plan, which was published in July 2006, and the Ebola Plan, which was published in October 2014. [1, 2, 3] There is no evidence that either of these plans has been updated since publication. [1, 2, 3] There is also the Mass Casualty Response Plan, which was last updated in July 2015, and the Law on the Organization of Civil Security, which was adopted in March 2018, but neither of these specifically mentions pandemics, infectious diseases or public health emergencies. [4, 5]. There is no evidence of any other relevant plans on the websites of the Ministry of Health, the National Laboratory of Health or the High Commission for National Protection. [6, 7, 1]

- [1] Hauts Commissariat a La Protection Nationale. "National Plans" ("Plans Nationaux"). [https://hcpn.gouvernement.lu/fr/service/domaines/plans-nationaux.html]. Accessed 1 September 2020
- [2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020
- [3] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)"). [https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020
- [4] State Ministry. 27 June 2018. "Mass Casualty Response Plan" ("Plan « Nombreuses victimes » ") [https://www.infocrise.lu/documents/20181/30297/NOV1pdf08052019.pdf/f4277d8b-6400-47c7-9971-dbf91d1af2f]. Accessed 1 September 2020

- [5] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Official publication of the law of 27 March 2018 on the organisation of civil security". [<http://legilux.public.lu/eli/etat/leg/loi/2018/03/27/a221/jo>]. Accessed 1 September 2020
- [6] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 September 2020
- [7] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September 2020

3.1.1c

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

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

Current Year Score: 0

There is no public evidence that Luxembourg has an overarching national public health emergency response plan that includes considerations for pediatric or other vulnerable populations. The High Commission for National Protection lists nine emergency response plans ("Plans d'Interventions d'Urgence"), two of which deal specifically with diseases: the 2006 Influenza Pandemic Plan and the 2014 Ebola Plan. [1, 2, 3] The Influenza Pandemic Plan does state that the government should "organize support for vulnerable persons", including children, the disabled and residents of retirement homes, but it does not elaborate on this. [2] The Ebola Plan makes no mention of children or other vulnerable populations [3]. The 2018 Mass Casualty Response Plan (which does not specifically mention pandemics or infectious diseases, but covers all emergencies that result in large numbers of casualties, and includes the Ministry of Health as an actor) sets out the conditions under which the Crisis Cell may include representatives of institutions concerned with children (schools, crèches, nurseries) [4]. The 2018 Law on the Organization of Civil Security (which sets out measures and procedures "to protect people, animals, property and the environment against calamitous events, disasters and catastrophes") does not mention children or other vulnerable populations [5]. There is no evidence of any other relevant plans on the websites of the Ministry of Health, the National Laboratory of Health, or the High Commission for National Protection. [6, 7, 1].

- [1] Hauts Commissariat a La Protection Nationale. "National Plans" ("Plans Nationaux"). [<https://hcpn.gouvernement.lu/fr/service/domaines/plans-nationaux.html>]. Accessed 1 September 2020
- [2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020
- [3] The Gouvernement of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)"). [https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020
- [4] State Ministry. 27 June 2018. "Mass Casualty Response Plan" ("Plan « Nombreuses victimes » "). [<https://www.infocrise.lu/documents/20181/30297/NOVIpdf08052019.pdf/f4277d8b-6400-47c7-9971-dbf91d1af2f>]. Accessed 1 September 2020
- [5] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Official publication of the law of 27 March 2018 on the organization of civil security". [<http://legilux.public.lu/eli/etat/leg/loi/2018/03/27/a221/jo>]. Accessed 1 September 2020
- [6] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 September 2020
- [7] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September 2020

3.1.1d

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

Yes = 1, No = 0

Current Year Score: 0

2020

WHO Strategic Partnership for IHR and Health Security (SPH)

3.1.2 Private sector involvement in response planning

3.1.2a

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence that Luxembourg has a specific mechanism in place for engaging with the private sector to assist with outbreak emergency preparedness and response. Luxembourg's Flu pandemic response plan states that "for the elaboration and implementation of measures" there is "coordination between the public sector and the private sector" in place but the plan does not provide any detail on how the co-operation works [1]. In March 2018, Luxembourg passed a "Law on the Organization of Civil Security" which sets out measures and procedures "to protect people, animals, property and the environment against calamitous events, disasters and catastrophes" [2]. The law does not include specific mechanisms for engaging with the private sector to assist with outbreak emergency preparedness and response. The websites of the Ministry of Health and the National Laboratory of Health do not make reference to mechanisms for engaging with the private sector to assist with outbreak emergency preparedness and response [3], [4].

[1] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[2] State Ministry. 27 June 2018. "Mass Casualty Response Plan" ("Plan « Nombreuses victimes » ")

[<https://www.infocrise.lu/documents/20181/30297/NOVIpdf08052019.pdf/f4277d8b-6400-47c7-9971-dbf91d1af2f>]. Accessed 1 September 2020

[3] Ministry of Health. [<http://sante.public.lu/fr/politique-sante/ministere-sante/index.html>]. Accessed 1 September 2020

[4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September 2020

[5] High Commission for National Protection. [<https://hcnp.gouvernement.lu/fr/service.html>]. Accessed 1 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

There is evidence that Luxembourg has a policy, plan or guidelines in place to implement non-pharmaceutical interventions (NPIs) during an epidemic or pandemic, but only for one disease. The High Commission for National Protection lists nine emergency response plans ("Plans d'Interventions d'Urgence"), two of which deal specifically with diseases: the 2006 Influenza Pandemic Plan and the 2014 Ebola Plan. [1, 2, 3] The Influenza Pandemic Plan includes providing home consultations, isolation of potentially infected people and those coming from infected countries, targeted sanitation, and providing masks for people working in the health sector but there is no mention of NPIs such as sanitation measures and awareness generation [2]. The Ebola Plan also includes disinfection and providing ambulance staff with appropriate pandemic uniforms but there is no mention of NPIs in this plan either [3, 4]. However, in July 2020 Luxembourg adopted the Law on the Introduction of a Series of New Measures to Fight the COVID-19 Pandemic, which introduces NPIs such as limits on the number of customers in restaurants (article 2), mandatory masks in closed public areas (article 3), social distancing (article 4) and quarantine of infected people (article 7) [5]. There is no further evidence of standalone plan or disease specific guidelines to implement NPIs during a public health emergency on the website of the Ministry of Health [6].

[1] Hauts Commissariat a La Protection Nationale. "National Plans" ("Plans Nationaux"). [https://hpcn.gouvernement.lu/fr/service/domaines/plans-nationaux.html]. Accessed 1 September 2020

[2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[3] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)").

[https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020

[4] Sante. Lu. November 2014. "Presentation of National Efforts in Preperation for Ebola" ("Présentation des efforts nationaux de préparation à Ebola")

[5] Journal Officiel du Grand-Duche de Luxembourg. 2020. " Law of 17 July 2020 Regarding the Introduction of a Series of New Measures to fight COVID 19 Pandemic" ("Loi Du 17 Juillet 2020 Portant Introduction D'une Série De Mesures De Lutte Contre La Pandémie Covid-19"). [https://sante.public.lu/fr/actualites/2014/11/ebola/index.html]. Accessed 1 September 2020

[6] Ministry of Health. [http://sante.public.lu/fr/politique-sante/ministere-sante/index.html]. Accessed 1 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

In the past year, Luxembourg has activated its national emergency response plan for an infectious disease outbreak, but there is no evidence that it has completed a national-level biological threat-focused exercise. Within the past year, Luxembourg has issued laws and regulations to address the COVID-19 pandemic, most notably the "Law of 17 July 2020 Regarding the Introduction of a Series of New Measures to fight COVID 19 Pandemic". [1, 2] This law provides prevention measures such as restricting the number of people each table in restaurants (article 2) and protective measures such as the obligation to wear masks in public areas (article 1). Furthermore, Luxembourg has created a daily updated COVID-19 website, which provides information on the plan. [3] The World Health Organization action review and simulation exercise calendars do not list Luxembourg as having completed a national-level biological threat-focused exercise [4, 5]. The website of the Ministry of Health does not make reference to such an exercise [6].

[1] Journal Officiel du Grand-Duché de Luxembourg. 2020. "Law of 17 July 2020 Regarding the Introduction of a Series of New Measures to fight COVID 19 Pandemic" ("Loi Du 17 Juillet 2020 Portant Introduction D'une Série De Mesures De Lutte Contre La Pandémie Covid-19"). [<http://legilux.public.lu/eli/etat/leg/loi/2020/07/17/a624/jo>]. Accessed 8 April 2021.

[2] The government of the Grand Duchy of Luxembourg. "Coronavirus: COVID-19" [<https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html>]. Accessed 8 April 2021

[3] The Government of the Grand Duchy of Luxembourg. "Coronavirus." [<https://covid19.public.lu/fr.html>]. Accessed 8 April 2021.

[4] World Health Organization. "After Action Review". [<https://extranet.who.int/sph/after-action-review>]. Accessed 8 April 2021.

[5] World Health Organization. "Simulation Exercise [<https://extranet.who.int/sph/simulation-exercise>]. Accessed 8 April 2021.

[6] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 8 April 2021.

3.2.1b

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

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

Current Year Score: 0

There is no evidence that Luxembourg has in the past year identified a list of gaps and best practices in pandemic response through an exercise focused on biological threats. None of the World Health Organization's webpages list Luxembourg as ever having conducted an exercise focused on biological threats. [1, 2, 3]. There is no evidence that any relevant exercise has been conducted in the past year, or is currently planned, on the websites the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection or the National Health Laboratory [4, 5, 6].

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

[2] World Health Organisation. "After Action Review". [<https://extranet.who.int/sph/after-action-review>]. Accessed 1 September 2020

[3] World Health Organisation Regional Office For Europe. "Luxembourg". [<https://www.euro.who.int/en/countries/Luxembourg>]. Accessed 1 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 1 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 1 September 2020

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://Ins.lu/en/>]. Accessed 1 September 2020

3.2.2 Private sector engagement in exercises

3.2.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has in the past year undergone a national-level biological threat-focused exercise that has included private sector representatives. None of the World Health Organization's webpages list Luxembourg as ever having conducted an exercise focused on biological threats. [1, 2, 3]. There is no evidence that any relevant exercise has been conducted in the past year, or is currently planned, on the websites the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection and the National Health Laboratory [4, 5, 6].

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

[2] World Health Organisation. "After Action Review". [<https://extranet.who.int/sph/after-action-review>]. Accessed 1 September 2020

[3] World Health Organisation Regional Office For Europe. "Luxembourg". [<https://www.euro.who.int/en/countries/Luxembourg>]. Accessed 1 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 1 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>].

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://Ins.lu/en/>]. Accessed 1 September 2020

3.3 EMERGENCY RESPONSE OPERATION

3.3.1 Emergency response operation

3.3.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is insufficient evidence that Luxembourg has an emergency operations center (EOC) that specifically covers health issues. Luxembourg has a High Commission for National Protection (Haut-Commissariat à la Protection Nationale, HCPN), a body that falls under the responsibility of the prime minister and minister of state, which aims "to ensure that the nation is always and in all circumstances protected against threats that could seriously infringe upon the country's sovereignty and independence, the free functioning of its institutions, the safeguarding of its national interests and the safety of the population" [1]. However, the HCPN's website does not explicitly mention pandemics, infectious diseases or public health emergencies [1]. If a crisis occurs or is believed to be imminent, a permanent body known as the Crisis Cell is capable of

meeting urgently, at the prime minister's bequest [2]. Therefore, in the event of emergencies, the Crisis Cell must become operational within one hour [2, 3]. The Crisis Cell, which includes a Communication and Information Unit, deals with transmitting information to the public and is chaired by the HCPN. The Crisis Cell is part of the governance of the National Crisis Center, which convenes at Senningen Castle in times of national crisis, and has all the equipment required for crisis coordination. However, there is no evidence that the Crisis Cell specifically deals with emergencies related to health issues. There is no evidence that a health-related EOC is in place, or is currently planned, on the websites the Ministry of Health or the National Health Laboratory [4], [5].

[1] High Commission for National Protection. "Areas of intervention".

[<https://hcpn.gouvernement.lu/en/service/domaines.html>]. Accessed 2 September 2020

[2] High Commission for National Protection. "Crisis Cell (CC)"("Cellule de Crise (CC)").

[<https://hcpn.gouvernement.lu/fr/service/domaines/protection-nationale/concept-organisation-fonctionnement/cellule-de-crise-cc.html>]. Accessed 2 September 2020

[3] High Commission for National Protection "National Crisis Center" ("Centre National de Crise (CNC)").

[<https://hcpn.gouvernement.lu/fr/service/attributions/missions-nationales/prevention-gestion-crisis/centre-national-de-crise-cnc.html>]. Accessed 2 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 1 September 2020

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September 2020

3.3.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence that the emergency operations center (EOC) must conduct or do conduct drills for public health emergency at least once a year. Luxembourg has a High Commission for National Protection (Haut-Commissariat à la Protection Nationale, HCPN), a body that falls under the responsibility of the prime minister and minister of state, which aims "to ensure that the nation is always and in all circumstances protected against threats that could seriously infringe upon the country's sovereignty and independence, the free functioning of its institutions, the safeguarding of its national interests and the safety of the population" [1]. However, there is no evidence that the HCPN is required to conduct annual drills or that it does so. [1] Luxembourg also has a Crisis Cell and a National Crisis Center, but there is no evidence that either of them conduct annual drills [2, 3]. There is no evidence of an EOC that must conduct annual drills on the websites the Ministry of Health or the National Health Laboratory [4, 5].

[1] High Commission for National Protection. "Areas of intervention".

[<https://hcpn.gouvernement.lu/en/service/domaines.html>]. Accessed 2 September 2020

[2] High Commission for National Protection. "Crisis Cell (CC)"("Cellule de Crise (CC)").

[<https://hcpn.gouvernement.lu/fr/service/domaines/protection-nationale/concept-organisation-fonctionnement/cellule-de-crise-cc.html>]. Accessed 2 September 2020

[3] High Commission for National Protection "National Crisis Center" ("Centre National de Crise (CNC)").

[<https://hcpn.gouvernement.lu/fr/service/attributions/missions-nationales/prevention-gestion-crisis/centre-national-de-crise-cnc.html>]. Accessed 2 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 1 September 2020

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September

2020

3.3.1c

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence 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. In the event of an emergency, Luxembourg activates a Crisis Cell, which is required to be operational within one hour [1, 2]. Due to COVID-19, the Crisis Cell was activated, but there is no evidence that it was activated within 120 minutes of the identification of the emergency [3]. Moreover, it is not clear that the Crisis Cell constitutes an EOC. There is no evidence of an EOC conducting a coordinated emergency response within 120 minutes on the websites the Ministry of Health or the National Health Laboratory [4], [5].

[1] High Commission for National Protection. "Crisis Cell (CC)" ("Cellule de Crise (CC)").

[<https://hcpn.gouvernement.lu/fr/service/domaines/protection-nationale/concept-organisation-fonctionnement/cellule-de-crise-cc.html>]. Accessed 2 September 2020

[2] High Commission for National Protection "National Crisis Center" ("Centre National de Crise (CNC)").

[<https://hcpn.gouvernement.lu/fr/service/attributions/missions-nationales/prevention-gestion-crisis/centre-national-de-crise-cnc.html>]. Accessed 2 September 2020

[3] Government. Lu. 11 March 2020. " COVID-19: The Interministerial Crisis Cell Discusses The Situation " ("COVID-19: La Cellule De Crise Interministérielle Fait Le Point Sur La Situation").

[https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/03-mars/11-covid19-point.html]. Accessed 2 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 1 September 2020

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 1 September 2020

3.4 LINKING PUBLIC HEALTH AND SECURITY AUTHORITIES

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

3.4.1a

Does the country meet one of the following criteria?

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

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

Current Year Score: 1

There is no public evidence that Luxembourg's public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event, but there is a publicly available plan between the public health and security authorities to respond to a potential deliberate biological event. On 12 April 2016, the Council of Government gave its agreement to begin the work on an Emergency Response Plan for the Event of an Attack by Chemical, Biological, Radiological or Nuclear Substances (CBRN ERP) [1]. On 1 June 2018, the Ministry of State and the Ministry of Internal Security published the CBRN ERP. [2] It includes the measures to take in case of a chemical, biological, radiological or nuclear attack, stating that the anti-terrorism Coordination Group would be convened, consisting of the Ministry of Internal Security and the Director of the National Health Directorate, among other members [2]. There is no public evidence that Luxembourg public health and national security authorities have carried out an exercise to respond to a potential deliberate biological event.

[1] Government. Lu. 2016. "Development Of An Emergency Response Plan In The Event Of An Attack" ("Élaboration D'un Plan D'intervention D'urgence En Cas D'attaque CBR") [https://gouvernement.lu/fr/actualites/toutes_actualites/articles/2016/04-avril/12-hcpn-cbrn.html]. Accessed 2 September 2020

[2] Infocrise. Lu. 1 June 2018. "Emergency response plan in the event of an attack involving chemical, biological, radiological or nuclear substances ('CBRN' ERP) ".

[<https://www.infocrise.lu/documents/20181/71878/ERP+CBRN+PUBLIC+VERSION.pdf/c8064654-d96b-46e1-be9e-4903523c6d48>]. Accessed 2 September 2020

3.5 RISK COMMUNICATIONS

3.5.1 Public communication

3.5.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence of plans, legislation, regulations, strategies or other documents that outline how messages will reach populations and sectors with different communicational needs. The National Influenza Pandemic Plan (adopted in 2006) contains risk communication plans, but does not address how messages will reach populations and sectors with different communicational needs [1]. Luxembourg informs the public in the case of emergencies via sirens, the media (including the crisis website "InfoCrise", radio, television and the prime minister's Information and Press Agency) and the municipal authorities [2, 3]. There is no evidence of a regulation or any other official document that specifies the procedures for public communication during emergencies on the websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the National Health Laboratory or the High Commission for National Protection [4, 5, 6, 7].

[1] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[2] Ministry of Interior of the Republic of Finland. "The information and warning system in the Grand Duchy of Luxembourg Mr Charles Bruck". [http://ec.europa.eu/echo/files/civil_protection/civil/act_prog_rep/public_warning_3.pdf]. Accessed 1

September 2020

[3] Vademecum - Civil Protection. "Luxembourg - Prevention & Preparedness".

[<https://ercportal.jrc.ec.europa.eu/vademecum/lu/2-lu-3.html>]. Accessed 1 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 2 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 2 September 2020

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 2 September 2020

[7] High Commission for National Protection. [<https://hcpn.gouvernement.lu/fr/service.html>]. Accessed 2 September 2020

3.5.1 Risk communication planning

3.5.1a

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

Yes = 1, No = 0

Current Year Score: 1

Luxembourg has in place national-level risk communication plans for outbreaks. The Influenza Pandemic Plan (adopted in 2006) is a national disease-specific plan that has a chapter dedicated to communication, presenting a strategy for the event of an outbreak [1]. Specifically, the plan states that "Government information and communication will revolve around two axes: external communication, which includes communication with the general public and responds to questions from individuals, and internal communication to ministries, administrations, national and international institutions and the economic sector." It also states that "A hotline will be established to answer individual questions from the population, as well as a government Internet site dedicated to bird flu" [1]. The Ebola Plan (adopted in 2014) also mentions that that measures to be taken should be "communicated to the public and put in place by the competent agencies and departments." [2]. Furthermore, the High Commission for National Protection (HCPN) explains on its website that during emergencies a Crisis Cell is established, which includes a Communication and Information Unit dedicated to dealing with communicating the information to the public. [3]. There is no mention of a standalone national risk communication plan for public health emergencies on the websites of the Ministry of Health, the Ministry of Agriculture, Viticulture and Consumer Protection, the National Health Laboratory or the HCPN [4, 5, 6, 7].

[1] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[2] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)").

[https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020

[3] High Commission for National Protection. "Crisis Cell (CC)" ("Cellule de Crise (CC)").

[<https://hcpn.gouvernement.lu/fr/service/domaines/protection-nationale/concept-organisation-fonctionnement/cellule-de-crise-cc.html>]. Accessed 2 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 2 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 2 September 2020

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 2 September 2020

[7] High Commission for National Protection. [<https://hcpn.gouvernement.lu/fr/service.html>]. Accessed 1 September 2020

3.5.1c

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

Yes = 1 , No = 0

Current Year Score: 0

Luxembourg does not have a plan that designates a specific position within the government to serve as the primary spokesperson to the public during a public health emergency. The Influenza Pandemic Plan (adopted in 2006) states that the Government Press and Information Service ("Service information et Presse du Gouvernement") is in charge of the horizontal coordination of the organization of external communication during influenza pandemics, including pandemics of avian influenza [1]. Furthermore, the High Commission for National Protection's website states that during emergencies, a Crisis Cell is established, includes a Communication and Information Unit dedicated to dealing with communicating information to the public [2]. However, there is no evidence of a specific governmental emergency spokesperson position on the websites of the Ministry of Health and High Commission for National Protection [2, 3]

[1] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.inforcrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[2] High Commission for National Protection. "Crisis Cell (CC)"("Cellule de Crise (CC)").

[<https://hcpn.gouvernement.lu/fr/service/domaines/protection-nationale/concept-organisation-fonctionnement/cellule-de-crise-cc.html>]. Accessed 2 September 2020

[3] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

3.5.2 Public communication

3.5.2a

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

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

Current Year Score: 2

There is evidence that the government utilizes online media platforms to inform the public about public health emergencies and other public health concerns. Luxembourg's official government website for providing information and communication in the event of a crisis is www.inforcrise.lu [1]. It is maintained by the Office for Crisis Communication at the High Commission for National Protection, and is used to communicate all of the authorities' decisions and actions in an emergency situation [1]. In addition, the National Health Laboratory (NHL) has a Twitter account used to post about public health issues. For instance, NHL Twitter posts have highlighted the NHL's role in identifying a salmonella outbreak and have spread the World

Health Organization's warnings about flu outbreaks [2, 3, 4]. During the covid-19 pandemic, the government has made a dedicated website (www.covid19.lu) with information about the pandemic, including regularly updated figures for confirmed cases, deaths, hospitalizations, and helpline contact numbers [5]. Furthermore, the Ministry of Health also maintains a webpage dedicated to covid-19, with daily updates and information about preventive measures, screening, testing and medical treatment [6].

[1] Infocrise. Lu. "About This Site". [<https://www.infocrise.lu/en/web/guest/about-this-site>]. Accessed 3 September 2020

[2] Twitter. "National Health Laboratory" ("LNS-Laboratoire National de Sante"). [https://twitter.com/LNS_Lux]. Accessed 3 September 2020

[3] Twitter. 14 March 2019. "National Health Laboratory" ("LNS-Laboratoire National de Sante").

[https://twitter.com/LNS_Lux/status/1106124343925526528]. Accessed 3 September 2020

[4] Twitter. 11 March 2019. "National Health Laboratory" ("LNS-Laboratoire National de Sante").

[<https://twitter.com/WHO/status/1105120857591083010>]. Accessed 3 September 2020

[5] Gouvernement. Lu. "Coronavirus". [<https://coronavirus.gouvernement.lu/en.html>]. Accessed 2 September 2020

[6] Ministry of Health. "Coronavirus COVID 19". [<https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html>].

Accessed 2 September 2020

[7] Twitter. "Sante.Lu". [https://twitter.com/sante_lu]. Accessed 3 September 2020

[8] Facebook. "Sante.Lu". [www.facebook.com/sante.lu/]. Accessed 3 September 2020

3.5.2b

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

No = 1, Yes = 0

Current Year Score: 1

There is no evidence that senior leaders have shared disinformation on infectious diseases in the past two years. No evidence of this was found in Luxembourg's online news media [1, 2, 3, 4].

[1] Le Quotidien Independent Luxembourgeois. [<https://lequotidien.lu/>]. Accessed 3 September 2020

[2] RTL. 18 March 2020. "Coronavirus : How to Avoid Fake News" ("Coronavirus: Comment Eviter Les Fake News") [<https://5minutes.rtl.lu/actu/luxembourg/a/1484783.html>]. Accessed 3 September 2020

[3] L'essentiel. [<http://www.lessentiel.lu/fr/>]. Accessed 3 September 2020

[4] The Luxembourg Post. 17 April 2020. "The Fake News on The Virus Gangren the Web" ("Les Fake News sur Le Virus Gangrenent la Toile") [<https://www.wort.lu/fr/luxembourg/les-fakes-news-sur-le-virus-gangrenent-la-toile-5e997b42da2cc1784e35bd0a>]. Accessed 3 September 2020

3.6 ACCESS TO COMMUNICATIONS INFRASTRUCTURE

3.6.1 Internet users

3.6.1a

Percentage of households with Internet

Input number

Current Year Score: 97.06

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: 135.76

2019

International Telecommunication Union (ITU)

3.6.3 Female access to a mobile phone

3.6.3a

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

Input number

Current Year Score: 0

2019

Gallup; Economist Impact calculation

3.6.4 Female access to the Internet

3.6.4a

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

Input number

Current Year Score: 3.0

2019

Gallup; Economist Impact calculation

3.7 TRADE AND TRAVEL RESTRICTIONS

3.7.1 Trade restrictions

3.7.1a

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

Yes = 0 , No = 1

Current Year Score: 0

There is evidence that Luxembourg has in the past year issued a restriction on the export or import of medical goods without international or bilateral support. On 23 April 2020 a new regulation was issued, numbered 2020/568, under which authorization was required to export personal protective equipment out of the European Union, except to Albania, Andorra, Bosnia, the Faroe Islands, Gibraltar, Iceland, Kosovo, Liechtenstein, Montenegro, Norway, North Macedonia, San Marino, Serbia and Switzerland. [1] On 26 May 2020 this rule expired, and special authorization was no longer required. [1] In April 2020, Luxembourg took measures to facilitate mask imports [2].

[1] European Commission. Commission Implementing Regulation (EU) 2020/568 of 23 April 2020. "Making the exportation of certain products subject to the production of an export authorisation." [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0568]. Accessed 7 August 2020.

[2] Portail des Douanes et Accises. 2 April 2020 "Importing Protective Masks" ("Importation De Masques De Protection"). [https://douanes.public.lu/fr/actualites/2020/Importation_masques.html]. Accessed 3 September 2020

3.7.1b

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

Yes = 0 , No = 1

Current Year Score: 1

There is no evidence that Luxembourg has in the past year issued a restriction on the export or import of non-medical goods without international or bilateral support. There is no evidence of such restrictions on the websites of the Ministry of Health, the Ministry of the Economy, Ministry of Ministry of Agriculture, Viticulture and Consumer Protection and the International Trade Centre [1,2,3,4].

[1] Ministry of Health. [https://msan.gouvernement.lu/fr.html]. Accessed 3 September 2020

[2] Ministry of Economy. [https://meco.gouvernement.lu/en/actualites.html]. Accessed 3 September 2020

[3] Ministry of Agriculture, Viticulture and Consumer Protection. [https://mavpc.gouvernement.lu/en.html]. Accessed 3 September 2020

[4] International Trade Centre. "COVID-19 Temporary Trade Measures". [https://www.macmap.org/covid19]. Accessed 3 September 2020

3.7.2 Travel restrictions

3.7.2a

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

Yes = 0 , No = 1

Current Year Score: 0

Luxembourg has in the past year, without international or bilateral support, implemented a ban on travelers arriving from a specific country or countries due to an infectious disease outbreak. In the context of the COVID-19 pandemic, on 17 March 2020 the 27 member states of the European Union (EU) decided to ban entry into the EU from all other countries (except for

EU citizens, British citizens and people who live in the EU or the United Kingdom) [1]. Since then the EU ban has been periodically reviewed, and entry has been allowed from certain countries. [2] However, unlike some other EU countries, Luxembourg has not unilaterally introduced any further restrictions, and in particular has not restricted entry from other EU countries [3]. With approximately 200,000 cross-border workers present in the country, closing the borders would have left the country without key workers such as doctors and nurses, as 70% of hospital employees come from abroad [4]. The state minister declared that cross-border workers are essential to the life of the country and that the virus would not be stopped by closing borders [5]. As such, quarantine and isolation measures were taken by Luxembourg in order to avoid border closure and the virus spread [3, 6].

[1] Deutsche Welle. 18 March 2020. "EU closes borders to foreigners to halt coronavirus spread: What to know." [https://www.dw.com/en/eu-closes-borders-to-foreigners-to-halt-coronavirus-spread-what-to-know/a-52824499]. Accessed 7 August 2020.

[2] Deutsche Welle. 30 June 2020. "EU agrees to reopen borders to 14 countries, extends travel ban for US tourists." [https://www.dw.com/en/eu-agrees-to-reopen-borders-to-14-countries-extends-travel-ban-for-us-tourists/a-53986435]. Accessed 7 August 2020.

[3] Government. Lu. "Europe, Borders and a Virus" ("L'Europe, les frontières et un virus"). [https://gouvernement.lu/fr/actualites/toutes_actualites/interviews/2020/08-aout/28-asselborn-land.html#:~:text=C%3%A9tait%20alors%20une%20action,a%20jamais%20ferm%C3%A9%20ses%20fronti%C3%A8res.]. Accessed 3 September 2020

[4] LaSemaine. 15 March 2020. "Coronavirus: Germany Partially Closes Its Borders, Luxembourg Aligns With France" ("Coronavirus : l'Allemagne ferme partiellement ses frontières, le Luxembourg s'aligne sur la France"). [https://www.lasemaine.fr/coronavirus-lallemagne-ferme-partiellement-ses-frontieres-le-luxembourg-saligne-sur-la-france/]. Accessed 3 September 2020

[5] Actu.fr. 9 July 2020. "Covid-19: Luxembourg Fears A Border Closure In The Event Of A Second Wave" (" Covid-19 : le Luxembourg craint une fermeture des frontières en cas de deuxième vague"). [https://actu.fr/societe/coronavirus/covid-19-le-luxembourg-pourrait-fermer-ses-frontieres-par-crainte-d-une-seconde-vague_34848851.html]. Accessed 3 September 2020

[6] Ministry of Health. "Coronavirus COVID 19". [https://msan.gouvernement.lu/en/dossiers/2020/corona-virus.html]. Accessed 3 September 2020

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

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

4.1.1 Available human resources for the broader healthcare system

4.1.1a

Doctors per 100,000 people

Input number

Current Year Score: 300.9

2017

WHO; national sources

4.1.1b

Nurses and midwives per 100,000 people

Input number

Current Year Score: 1217.44

2017

WHO; national sources

4.1.1c

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has a national health workforce strategy in place to identify fields where there is an insufficient workforce to address these shortcomings.

Luxembourg has a few labour institutions. The National Development Employment Agency matches offers and demands on the national labour market [1]. Moreover, there is a Conjunction Committee which ensures job retention through measures intended to prevent layoffs [2]. Much of the country's labour policies are reflected in the Labour Code [3].

Approximately, 45% of domestic employment in Luxembourg comes from outside the country (France, Germany and Belgium), with 200 000 employees crossing the country's borders daily. [4] Furthermore, 70 % of hospital employees come from abroad [5].

The websites of the Ministry of Health, the Ministry of Labour, Employment and the Social and Solidarity Economy, the National Development Employment Agency and the Conjunction Committee do not make reference to a strategy identifying public health workforce gaps or strategies to close such gaps [1],[2],[6],[7].

In January 2020, Luxembourg announced that to contribute to the sustainability of doctor supply, the University of Luxembourg will open up specialized studies in medicine in the fields of medical oncology, neurology and general medicine [8]. Moreover, a few nursing courses will also be provided [8]

[1] Portail de L'Emploi. "Benefit from ADEM's Services" [<https://adem.public.lu/en/employeurs/beneficier-services-adem.html>]. Accessed 3 September 2020

[2] Conjunction Committee ("Comite de Conjoncture"). [<https://cdc.gouvernement.lu/fr/service.html>]. Accessed 3 September 2020

[3] L&E Global. "Employment Law Overview Luxembourg 2019-2020". [<https://knowledge.leglobal.org/wp->

content/uploads/sites/2/LEGlobal_Memo_Luxembourg.pdf]. Accessed 3 September 2020

[4] Luxembourg.public.lu. 25 May 2020. "Luxembourg Job Market". [<https://luxembourg.public.lu/en/work-and-study/employment-in-luxembourg/luxembourg-job-market.html>]. Accessed 3 September 2020

[5] LaSemaine. 15 March 2020. "Coronavirus: Germany Partially Closes Its Borders, Luxembourg Aligns With France" ("Coronavirus : l'Allemagne Ferme Partiellement Ses Frontières, Le Luxembourg S'aligne Sur La France"). [<https://www.lasemaine.fr/coronavirus-lallemagne-ferme-partiellement-ses-frontieres-le-luxembourg-saligne-sur-la-france/>]. Accessed 3 September 2020

[6] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[7] Ministry of Labour, Employment and the Social and Solidarity Economy. [<https://mteess.gouvernement.lu/en.html>]. Accessed 3 September 2020

[8] Gouvernement. LU. 24 January 2020. "Development of specialized university studies in medicine at the University of Luxembourg" ("Développement des études universitaires spécialisées en médecine à l'Université du Luxembourg"). [https://gouvernement.lu/fr/actualites/toutes_actualites/communiqués/2020/01-janvier/24-developpement-etudes.html]. Accessed 3 September 2020

4.1.2 Facilities capacity

4.1.2a

Hospital beds per 100,000 people

Input number

Current Year Score: 426

2019

WHO/World Bank; national sources

4.1.2b

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

Yes = 1 , No = 0

Current Year Score: 1

Luxembourg has the capacity to isolate patients with highly communicable diseases in a biocontainment patient care unit. The Centre Hospitalier de Luxembourg, the country's public healthcare provider, had High Isolation Rooms (HIRs) with 15 hospital beds as early as 2003 according to a European-wide survey [1]. The survey defines an HIR as a single or double hospital room provided with at least negative pressure and anteroom [1]. A 2014 cross-sectional analysis of isolation facilities in Europe conducted by the European Network for Highly Infectious Diseases confirms that Luxembourg had facilities with Isolation Rooms [2]. In 2009, Luxembourg had the highest number of HIR hospital beds per capita, with 31.5 compared to ratios of 25.9 in Sweden and 0.3 in Germany [3].

[1] European Commission. 2003. "Highly Infectious Diseases and Isolation Room Capabilities in European Countries".

[http://ec.europa.eu/health/ph_projects/2003/action2/docs/2003_2_04_frep_a5_en.pdf]. Accessed 08 September 2020

[2] Schilling S, Fusco FM, De Iaco G, Bannister B, Maltezou HC, Carson G, et al. 2014 "Isolation Facilities for Highly Infectious Diseases in Europe – A Cross-Sectional Analysis in 16 Countries" [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4211666/>].

Accessed 08 September 2020

[3] The Journal of hospital infection. 2009. "Isolation Rooms For Highly Infectious Diseases: An Inventory Of Capabilities In European Countries".

[https://www.researchgate.net/publication/26709792_Isolation_rooms_for_highly_infectious_diseases_an_inventory_of_capabilities_in_European_countries]. Accessed 08 September 2020

4.1.2c

Does the country meet one of the following criteria?

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

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Luxembourg has demonstrated capacity to expand isolation capacity or updated or tested a plan to expand isolation capacity in response to an infectious disease outbreak in the past two years. The Centre Hospitalier de Luxembourg, the country's public healthcare provider, had High Isolation Rooms (HIRs) with 15 hospital beds as early as 2003, according to a Europe-wide survey [1]. The survey defines an HIR as a single or double hospital room provided with at least negative pressure and anteroom [1]. There is no evidence that the Centre Hospitalier de Luxembourg has demonstrated capacity to expand isolation capacity or updated or tested plan to expand isolation capacity in response to an infectious disease outbreak in the past two years. [2] Moreover, there is no evidence of a plan to expand isolation capacity on the Ministry of health website. [3]

[1] European Commission. 2003. "Highly Infectious Diseases and Isolation Room Capabilities in European Countries".

[http://ec.europa.eu/health/ph_projects/2003/action2/docs/2003_2_04_frep_a5_en.pdf]. Accessed April 2021

[2] Centre Hospitalier de Luxembourg. 2021 [<https://www.chl.lu/>]. Accessed April 2021

[3] Ministry of Health. 2021. [<https://msan.gouvernement.lu/fr.html>]. Accessed April 2021

4.2 SUPPLY CHAIN FOR HEALTH SYSTEM AND HEALTHCARE WORKERS

4.2.1 Routine health care and laboratory system supply

4.2.1a

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

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

Current Year Score: 0

There is no evidence that Luxembourg has an established public procurement system for the acquisition of laboratory needs and medical supplies for routine needs. Luxembourg has a public procurement portal whose main purpose is "the publication of calls for tenders by tendering entities, whether it is the state, the communes, public establishments or communal associations" [1]. In April 2018, Luxembourg passed a new public procurement law ("Law on public procurement") and adopted a regulation regarding the implementation of the Law on public procurement of 8th April 2018 [2, 3]. However,

neither the law nor the regulation specifically mentions acquisition of laboratory needs or medical supplies, and the procurement portal itself contains no evidence that it is used for this [1, 2, 3] There is no evidence of a public procurement system for the acquisition of laboratory needs and medical supplies for routine needs on the websites of the Ministry of Health or the Ministry of Agriculture, Viticulture and Consumer Protection [4, 5].

[1] Guichet.lu. 2019. "Portal for Public Procurement Contracts".

[https://guichet.public.lu/en/organismes/organismes_entreprises/ministere-mobilite-travaux-publics/marches-publics.html]. Accessed 08 September 2020

[2] ESPON. 23 May 2018. "New legislation on Public Procurement in Luxembourg & ESPON FAQ". [www.espon.eu/public-procurement-luxembourg]. Accessed 08 September 2020

[3] The Grand Duchy Of Luxembourg Official Journal. 2018 "Law of 18 April 2018 on Public Procurement" ("Loi du 8 avril 2018 sur les marchés publics "). [<http://data.legilux.public.lu/file/eli-etat-leg-loi-2018-04-08-a243-jo-fr-pdf.pdf>]. Accessed 08 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://mavpc.gouvernement.lu/en.html>]. Accessed 3 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: 0

There is no evidence that Luxembourg has a stockpile of medical supplies (e.g. MCMs, medicines, vaccines, medical equipment, PPE) for national use during a public health emergency.

Luxembourg is part of the European Union Joint Procurement Agreement for Medical Countermeasures since 2014, which ensures that members have access to medical countermeasures from abroad if necessary when a serious cross-border threat to health is registered. [1, 2, 3]

However, there is no clear evidence that Luxembourg actually has stockpiles of medical countermeasures for national use during a public health emergency on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defence. [4, 5, 6, 7]

Moreover, in 2020, the COVID 19 pandemic highlighted the lack of stocks of personal protective equipment (PPE) in Luxembourg, with hospitals in the country calling for donations from the population to help finance the purchase of masks and other non-reusable medical equipment [1]. However, the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of defence do not make mention of an agreement with manufacturers or distributors to procure medical countermeasures for national use during a public health emergency. [4, 5, 6, 7]

In March 2020, the European Commission created the first common European reserve of emergency medical equipment rescEU [8]. The members, Luxembourg included, will have access to this mutual aid reserve which contains intensive care medical equipment such as respirators, PPE such as reusable masks, vaccines and treatments, small laboratory equipment

[8].

[1] European Commission. "Joint Procurement Of Medical Countermeasures".

[https://ec.europa.eu/health/preparedness_response/joint_procurement_en]. Accessed April 2021

[2] World Health Organization (WHO) Regional Office for Europe. 6 November 2013. "New European Union Legislation

Improves Health Security In Europe". [[http://www.euro.who.int/en/health-](http://www.euro.who.int/en/health-topics/emergencies/pages/news/news/2013/11/new-eu-legislation-improves-health-security-in-europe)

topics/emergencies/pages/news/news/2013/11/new-eu-legislation-improves-health-security-in-europe]. Accessed April 2021

[3] European Commission. "Joint Procurement Agreement - List of EU countries".

[https://ec.europa.eu/health/preparedness_response/joint_procurement/jpa_signature_en]. Accessed April 2021

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed April 2021

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed April 2021

[6] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed April 2021

[7] Directorate of defence. [<https://defense.gouvernement.lu/en.html>]. Accessed April 2021

[8] European Commission. 19 March 2020. "The Commission Creates The Very First Resceu Reserve Of Medical Equipment" ("La Commission Crée La Toute Première Réserve Resceu De Matériel Médical"). [https://ec.europa.eu/luxembourg/news/la-commission-cr%C3%A9e-la-toute-premi%C3%A8re-r%C3%A9serve-resceu-de-mat%C3%A9riel-m%C3%A9dical_fr]. Accessed April 2021

4.2.2b

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

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

Current Year Score: 0

There is no public evidence that Luxembourg has stockpiles of laboratory supplies for national use during a public health emergency. There is no evidence of such stockpiles on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defense [1,2,3,4]. In May 2020, in the context of the ongoing coronavirus pandemic, it was reported that there was a shortage of reagents in Luxembourg [5]. The Luxembourg Institute of Health declared that the lack of reagents and difficulty of procuring them were the main bottleneck to the country's Covid-19 testing strategy [5].

[1] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[2] National Health Laboratory ("Laboratoire National De Sante; Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[3] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[4] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 3 September 2020

[5] Paperjam. Lu. May 2020. " Why The Test Campaign Cannot Start" ("Pourquoi La Campagne De Tests Ne Peut Pas Demarrer"). [https://www.google.com/search?q=google+translate&rlz=1C1CHBF_en-GBGB797GB797&aq=chrome.1.69i57j35i39l2j0j69i60l4.5691j0j7&sourceid=chrome&ie=UTF-8]. Accessed 3 September 2020

4.2.2c

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence that Luxembourg conducts or requires an annual review of the national stockpile to ensure the supply is sufficient for a public health emergency as there is insufficient evidence of national stockpiles for public health emergencies in the country. In 2007, Luxembourg had set antiviral stockpiling targets in excess of thirty percent of the civilian population [1]. However, there is no evidence of such stockpiles on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defense [2, 3, 4, 5].

Moreover, since 2014 Luxembourg has been part of the European Union Joint Procurement Agreement for Medical Countermeasures, which ensures that members have access to medical countermeasures from abroad if necessary when a serious cross-border threat to health is registered [6, 7, 8]. As such, there is no evidence that Luxembourg conducts or requires an annual review of the national stockpile to ensure the supply is sufficient for a public health emergency on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of defence [9, 10, 11, 12].

[1] Elbe, S; Mahler, A; Long, C. 2015. "Medical Countermeasures For National Security: A New Government Role In The Pharmaceuticalization Of Society" [<https://www.sciencedirect.com/science/article/pii/S0277953614002664>]. Accessed 3 September 2020

[2] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[3] National Health Laboratory ("Laboratoire National De Sante; Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[4] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[5] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 3 September 2020

[6] European Commission. "Joint Procurement Of Medical Countermeasures".

[https://ec.europa.eu/health/preparedness_response/joint_procurement_en]. Accessed April 2021

[7] World Health Organization (WHO) Regional Office for Europe. 6 November 2013. "New European Union Legislation Improves Health Security In Europe". [<http://www.euro.who.int/en/health-topics/emergencies/pages/news/news/2013/11/new-eu-legislation-improves-health-security-in-europe>]. Accessed April 2021

[8] European Commission. "Joint Procurement Agreement - List of EU countries".

[https://ec.europa.eu/health/preparedness_response/joint_procurement/jpa_signature_en]. Accessed April 2021

[9] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed April 2021

[10] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed April 2021

[11] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed April 2021

[12] Directorate of Defence. [<https://defense.gouvernement.lu/en.html>]. Accessed April 2021

4.2.3 Manufacturing and procurement for emergencies

4.2.3a

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 1

Luxembourg has a plan or an agreement to procure medical supplies for national use during a public health emergency, but not to leverage domestic manufacturing capacity.

Since 2014, Luxembourg has been part of the European Union (EU) Joint Procurement Agreement for Medical Countermeasures, which ensures that member states have access to medical countermeasures from abroad if necessary when a serious cross-border threat to health is registered [1, 2, 3]. The agreement aims to "secure more equitable access to specific medical countermeasures and improved security of supply", as well as balancing prices for EU member states. It is also designed to ensure acquisition of vaccines, antivirals and medical countermeasures for serious cross-border threats to health [1].

In March 2020, the European Commission created the first common European reserve of emergency medical equipment, rescEU [4]. The members, Luxembourg included, will have access to this mutual aid reserve, which contains intensive care medical equipment such as respirators, personal protective equipment such as reusable masks, vaccines and treatments, and small laboratory equipment [4]. However, this agreement is in the context of COVID-19 only.

There is evidence of a no plan, program, or guideline to leverage domestic manufacturing capacity to produce medical supplies (e.g. MCMs, medicines, vaccines, equipment, PPE) for national use during a public health emergency on the websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defense. [5, 6, 7, 8]

[1] European Commission. "Joint Procurement Of Medical Countermeasures".

[https://ec.europa.eu/health/preparedness_response/joint_procurement_en]. Accessed 3 September 2020

[2] World Health Organization (WHO) Regional Office for Europe. 6 November 2013. "New European Union Legislation Improves Health Security In Europe". [<http://www.euro.who.int/en/health-topics/emergencies/pages/news/news/2013/11/new-eu-legislation-improves-health-security-in-europe>]. Accessed 3 September 2020

[3] European Commission. "Joint Procurement Agreement - List of EU countries".

[https://ec.europa.eu/health/preparedness_response/joint_procurement/jpa_signature_en]. Accessed 3 September 2020

[4] European Commission. 19 March 2020. "The Commission Creates The Very First Resceu Reserve Of Medical Equipment" ("La Commission Crée La Toute Première Réserve Resceu De Matériel Médical"). [https://ec.europa.eu/luxembourg/news/la-commission-cr%C3%A9e-la-toute-premi%C3%A8re-r%C3%A9serve-resceu-de-mat%C3%A9riel-m%C3%A9dical_fr]. Accessed 3 September 2020

[5] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[6] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[7] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[8] Directorate of defence. [<https://defense.gouvernement.lu/en.html>]. Accessed 3 September 2020

4.2.3b

Does the country meet one of the following criteria?

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

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

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

Current Year Score: 0

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

There is no evidence of such an agreement in Luxembourg's influenza plan (2006) and the Ebola Plan (2014) [1],[2]. Moreover, there is no mention of such a plan or agreement on the websites of The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defense [3], [4], [5], [6].

[1] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan"("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)").

[https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020

[2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[3] Ministry of Health. [https://msan.gouvernement.lu/fr.html]. Accessed 3 September 2020

[4] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [https://lns.lu/en/]. Accessed 3 September 2020

[5] Ministry of Foreign and European Affairs. [https://maee.gouvernement.lu/en.html]. Accessed 3 September 2020

[6] Directorate of Defense. [https://defense.gouvernement.lu/en.html]. Accessed 3 September 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 public evidence that the country has a system in place for dispensing medical countermeasures (MCM) for national use during a public health emergency.

There is no evidence of a standalone plan, program, or guideline for dispensing medical countermeasures for national use during a public health emergency. There is no publicly available evidence showing that Luxembourg can access countermeasures quickly, either through maintained stockpiles or pre-existing agreements. The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs, and the Directorate of Defense make no mention of a plan, program, or guidelines in place for dispensing medical countermeasures for national use during a public health emergency [1], [2], [3], [4].

Since 2014, Luxembourg has been part of the European Union Joint Procurement Agreement for Medical Countermeasures, which ensures that member states have access to medical countermeasures from abroad if necessary when a serious cross-border threat to health is registered [5], [6], [7]. The agreement aims to "secure more equitable access to specific medical countermeasures and improved security of supply", as well as balancing prices for EU member states. It is also designed to

ensure acquisition of vaccines, antivirals and medical countermeasures for serious cross-border threats to health [5].

[1] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[2] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[3] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[4] Directorate of Defense. [<https://defense.gouvernement.lu/en.html>]. Accessed 3 September 2020

[5] European Commission. "Joint Procurement Of Medical Countermeasures".

[https://ec.europa.eu/health/preparedness_response/joint_procurement_en]. Accessed 3 September 2020

[6] World Health Organization (WHO) Regional Office for Europe. 6 November 2013. "New European Union Legislation Improves Health Security In Europe". [<http://www.euro.who.int/en/health-topics/emergencies/pages/news/news/2013/11/new-eu-legislation-improves-health-security-in-europe>]. Accessed 3 September 2020

[7] European Commission. "Joint Procurement Agreement - List of EU countries".

[https://ec.europa.eu/health/preparedness_response/joint_procurement/jpa_signature_en]. Accessed 3 September 2020

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

4.3.2a

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

Yes = 1, No = 0

Current Year Score: 0

There is insufficient evidence of a public plan in place to receive health personnel from other countries to respond to a public health emergency. The websites of the Ministry of Health, the Ministry of Foreign and European Affairs, and the Directorate of Defense do not make mention of such a plan [1], [2], [3]. However, Luxembourg is part of regional efforts to improve public health preparedness and response in the World Health Organisation European Region [4]. This 2018-2023 action plan aims to improve capacity at national and regional level to "effectively prevent, prepare for, detect and respond to public health threats and emergencies and support affected countries" [4]. Members commit to creating systems to develop and deploy medical countermeasures during public health emergencies, which are to include "mechanisms for sending and receiving medical countermeasures and health personnel" [4].

Luxembourg, as a European Union member, is also part of the European Medical Corps, a team mandated to respond to public health emergencies inside and outside the EU [5]. However, these efforts and plans do not outline specific procedures for how personnel can be received in Luxembourg.

[1] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[2] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[3] Directorate of Defense. [<https://defense.gouvernement.lu/en.html>]. Accessed 3 September 2020

[4] World Health Organisation Regional Office for Europe. 16 September 2018. "Action Plan To Improve Public Health Preparedness And Response In The WHO European Region"

[https://www.euro.who.int/__data/assets/pdf_file/0006/378168/68wd14e_ActionPlanPreparedness_180516.pdf]. Accessed 3 September 2020

[5] European Commission. 03 February 2020. "European Civil Protection and Humanitarian Aid Operations. European Medical Corps". [https://ec.europa.eu/echo/printpdf/what-we-do/civil-protection/european-medical-corps_en]. Accessed 3

September 2020

4.4 HEALTHCARE ACCESS

4.4.1 Access to healthcare

4.4.1a

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

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

Current Year Score: 0

2020

World Policy Analysis Center

4.4.1b

Access to skilled birth attendants (% of population)

Input number

Current Year Score: 99.9

2009

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: 636.72

2017

WHO Global Health Expenditure database

4.4.2 Paid medical leave

4.4.2a

Are workers guaranteed paid sick leave?

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

Current Year Score: 2

2020

World Policy Analysis Center

4.4.3 Healthcare worker access to healthcare

4.4.3a

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

Yes = 1, No = 0

Current Year Score: 0

There is no public evidence that the government has 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. There is no such a provision in the 2006 Flu Pandemic Plan or the 2014 Ebola Emergency Plan [1,2]. There is no evidence of such provision on the websites of the Ministry of Health, the national Health Laboratory and the Ministry of Foreign and European Affairs [3,4,5]

[1] The Government of Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan intervention urgence. Cas Probables / Confirmer EBOLA Au Niveau National ("Plan EBOLA)").

[https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 1 September 2020

[2] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic".

[https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 1 September 2020

[3] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[4] National Health Laboratory ("Laboratoire National De Sante Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[5] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

4.5 COMMUNICATIONS WITH HEALTHCARE WORKERS DURING A PUBLIC HEALTH EMERGENCY

4.5.1 Communication with healthcare workers

4.5.1a

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

Yes = 1, No = 0

Current Year Score: 0

There is no evidence of a system for public health officials and healthcare workers to communicate during a public health emergency. The websites of the Ministry of Health and the Ministry of Agriculture, Viticulture and Consumer Protection do not make reference to such a system [1, 2]. Luxembourg's "National Plans" for crisis response, available on the website of the High Commission of National Protection, include some guidance on communication during emergencies, but do not mention an established system for communication [3]. The Flu Pandemic Plan (2006) includes a section on communication, presenting a strategy for communication in the event of an outbreak which covers internal communications (with ministries, local

administrations, business, and both national and international institutions) as well as external communication, which involves communication with the general public and provision of responses to individuals' questions [4]. However, the Flu Pandemic Plan does not refer to a dedicated system for public health officials and healthcare workers to communicate during a public health emergency [4].

[1] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[2] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 3 September 2020

[3] High Commission for National Protection. "National Plans". [<https://hcn.gouvernement.lu/fr/service/domaines/plans-nationaux.html>]. Accessed 1 September 2020

[4] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 3 September 2020

4.5.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence of a system for public health officials and healthcare workers to communicate during a public health emergency that encompasses healthcare workers in both the public and private sector. Neither the High Commission for National Protection nor InfoCrisis, the official Luxembourg government website for providing information and communication in the event of a crisis, have information on how public health officials and healthcare workers are to communicate during an emergency and whether such communication encompasses healthcare workers in the public and private sector [1, 2]. The websites of the Ministry of Health and the Ministry of Agriculture, Viticulture and Consumer Protection also make no reference to such a communication system [3, 4]. The Flu Pandemic Plan (2006) includes a section on communication, presenting a strategy for communication in the event of an outbreak which covers internal communications (with ministries, local administrations, business, and both national and international institutions) as well as external communication, which involves communication with the general public and provision of responses to individuals' questions [5]. However, the Flu Pandemic Plan does not refer to a dedicated system for public health officials and healthcare workers to communicate during a public health emergency, much less include the private sector [5].

[1] High Commission for National Protection. [<https://hcn.gouvernement.lu/en/service.html>]. Accessed 10 September 2020

[2] InfoCrisis. Lu. [<https://www.infocrise.lu/en>]. Accessed 10 September 2020

[3] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[4] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 10 September 2020

[5] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 3 September 2020

4.6 INFECTION CONTROL PRACTICES AND AVAILABILITY OF EQUIPMENT

4.6.1 Healthcare associated infection (HCAI) prevention and control programs

4.6.1a

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that Luxembourg's national public health system is monitoring for and tracking the number of healthcare-associated infections (HCAIs) that take place in healthcare facilities. Since 1997, the National Guidance Group on Prevention of Nosocomial Infection, a consulting body for the Ministry of Health, has been responsible for the surveillance, prevention and control of HCAIs [1]. Moreover, according to the European Centre for Disease Prevention and Control, all hospitals in Luxembourg use the methods of the Luxembourg Nosocomial Infection Surveillance System (NOSIX) which provides ongoing surveillance of HCAIs at intensive care units, and data that can be used in hospitals. However, the European Centre for Disease Prevention and Control notes that not all hospitals monitor surgical site infections "due to barriers in the organisation of medical/surgical services" [2].

[1] Sante.public.Lu. 28 March 2019. "National Guidance Group on Prevention of Nosocomial Infection" ("Groupe National de Guidance en matière de Prévention de l'Infection Nosocomiale "). [<https://sante.public.lu/fr/politique-sante/acteurs/organismes-consultatifs/groupe-nosocomiale/index.html>]. Accessed 10 September 2020

[2] European Centre for Disease Prevention and Control. 29 May- 2 June 2017. "ECDC country visit to Luxembourg to discuss antimicrobial resistance issues". [<https://ecdc.europa.eu/sites/portal/files/documents/ECDC-country-visit%20AMR-LUX-2017.pdf>]. Accessed 10 September 2020

4.7 CAPACITY TO TEST AND APPROVE NEW MEDICAL COUNTERMEASURES

4.7.1 Regulatory process for conducting clinical trials of unregistered interventions

4.7.1a

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

Yes = 1 , No = 0

Current Year Score: 1

There is a national requirement for ethical review before beginning clinical trials. As laid out in the Law on Hospitals and Hospital Planning (adopted 8 March 2018), no trial, study or clinical experimentation can be practiced on human beings for the development of biological or medical knowledge without the Health Minister's authorization, after requesting the opinions of the Health Directorate and the National Research Ethics Committee (Article 27) [1], [2]. The National Research Ethics Committee aims to protect the people taking part in a research project (clinical trials, academic research, etc.). Its

role is therefore bound to the fields of research which involve human subjects [2].

[1] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Law Of 8 March 2018 On Hospitals And Hospital Planning " ("Loi Du 8 Mars 2018 Relative Aux Etablissements Hospitaliers Et A La Planification Hospitalière").

[<http://data.legilux.public.lu/file/eli-etat-leg-loi-2018-03-08-a222-jo-fr-pdf.pdf>]. Accessed 10 September 2020

[2] National Research Ethics Committee. [<https://www.cner.lu/en-gb/About-us>]. Accessed 10 September 2020

4.7.1b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no public evidence of an expedited process for approving clinical trials for unregistered medical countermeasures to treat ongoing pandemics. There is no mention of such a process in the Law on Hospitals and Hospital Planning (adopted 8 March 2018) [1]. Moreover, the Medical Deontology Code (adopted on 13 March 2013) does not address clinical trials during pandemics [2]. Furthermore, the Research Ethics Guidelines, published by the University of Luxembourg, do not make mention of an expedited process [3]. The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs and the National Research Ethics Committee do not provide evidence of such a process [4,5,6,7].

[1] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Law Of 8 March 2018 On Hospitals And Hospital Planning " ("Loi Du 8 Mars 2018 Relative Aux Etablissements Hospitaliers Et A La Planification Hospitalière").

[<http://data.legilux.public.lu/file/eli-etat-leg-loi-2018-03-08-a222-jo-fr-pdf.pdf>]. Accessed 10 September 2020

[2] Journal Officiel du Grand-Duché de Luxembourg. 13 March 2013. "Medical Deontology Code".

[[https://www.cner.lu/Portals/0/code%20d%C3%A9ontologie%20m%C3%A9decins%20version%202013%20\(cf%20chapt%20V\).pdf](https://www.cner.lu/Portals/0/code%20d%C3%A9ontologie%20m%C3%A9decins%20version%202013%20(cf%20chapt%20V).pdf)]. Accessed 10 September 2020

[3] University of Luxembourg. 2017. "Research Ethics Guidelines".

[http://geophy.uni.lu/users/tonie.vandam/audit/20170602_Research_Ethics_Guidelines.pdf]. Accessed 10 September 2020

[4] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020

[5] National Health Laboratory ("Laboratoire National De Santé Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020

[6] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020

[7] National Research Ethics Committee. [<https://www.cner.lu/en-gb/About-us>]. Accessed 10 September 2020

4.7.2 Regulatory process for approving medical countermeasures

4.7.2a

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

Yes = 1 , No = 0

Current Year Score: 1

There is evidence that Luxembourg has a government agency responsible for approving new medical countermeasures (MCM) for humans. In order for a medication to be marketed in Luxembourg, it must possess a marketing authorization

(autorisation de mise sur le marché; AMM) valid in Luxembourg issued by the Ministry of Health [1, 2].

[1] CNS. Public. Lu. 2016. "List Of Medications Marketed In Luxembourg".

[https://www.euro.who.int/__data/assets/pdf_file/0019/322444/HiT-pharmaceutical-regulation-15-European-countries.pdf?ua=1]. Accessed 10 September 2020

[2] World Health Organisation. 2016. "Pharmaceutical regulation in 15 European countries".[

https://www.euro.who.int/__data/assets/pdf_file/0019/322444/HiT-pharmaceutical-regulation-15-European-countries.pdf?ua=1]. Accessed 10 September 2020

4.7.2b

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence Luxembourg has an expedited process for approving medical countermeasures (MCM) for human use during public health emergencies. Luxembourg has a government institution responsible for approving new medical countermeasures for humans. In order for a medication to be marketed in Luxembourg, it must meet requirements to be granted a marketing authorisation (autorisation de mise sur le marché; AMM) valid in Luxembourg issued by the Ministry of Health [1, 2]. However, there is no mention of an expedited process in case of a pandemic. Luxembourg is part of regional efforts to improve public health preparedness and response in the World Health Organisation European Region [3]. Members agree to "develop a system for activating and coordinating medical countermeasures during a public health emergency, including mechanisms for sending and receiving medical countermeasures and deployed health personnel" [3]. Nonetheless, the approval process for the activation of these is not described. [3] There is no mention of such a process in Luxembourg's Law on Hospitals and Hospital Planning (adopted 8 March 2018) [4]. Moreover, the Medical Deontology Code (adopted on 13 March 2013) does not address approval of MCM during pandemics [5]. Furthermore, the Research Ethics Guidelines, published by the University of Luxembourg, do not make mention of an expedited process [6]. The websites of the Ministry of Health, the National Health Laboratory, the Ministry of Foreign and European Affairs and the National Research Ethics Committee do not provide evidence of such a process either [7, 8, 9, 10].

[1] CNS. Public. Lu. 2016. "List Of Medications Marketed In Luxembourg".

[https://www.euro.who.int/__data/assets/pdf_file/0019/322444/HiT-pharmaceutical-regulation-15-European-countries.pdf?ua=1]. Accessed 10 September 2020

[2] World Health Organisation. 2016. "Pharmaceutical regulation in 15 European countries".[

https://www.euro.who.int/__data/assets/pdf_file/0019/322444/HiT-pharmaceutical-regulation-15-European-countries.pdf?ua=1]. Accessed 10 September 2020

[3] World Health Organisation Regional Office for Europe. 16 September 2018. "Action Plan To Improve Public Health Preparedness And Response In The WHO European Region"

[https://www.euro.who.int/__data/assets/pdf_file/0006/378168/68wd14e_ActionPlanPreparedness_180516.pdf]. Accessed 3 September 2020

[4] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Law Of 8 March 2018 On Hospitals And Hospital Planning" ("Loi Du 8 Mars 2018 Relative Aux Etablissements Hospitaliers Et A La Planification Hospitaliere").

[<http://data.legilux.public.lu/file/eli-etat-leg-loi-2018-03-08-a222-jo-fr-pdf.pdf>]. Accessed 10 September 2020

[5] Journal Officiel du Grand-Duché de Luxembourg. 13 March 2013. "Medical Deontology Code".

[[https://www.cner.lu/Portals/0/code%20d%C3%A9ontologie%20m%C3%A9decins%20version%202013%20\(cf%20chapt%20V\).pdf](https://www.cner.lu/Portals/0/code%20d%C3%A9ontologie%20m%C3%A9decins%20version%202013%20(cf%20chapt%20V).pdf)]. Accessed 10 September 2020

- [6] University of Luxembourg. 2017. "Research Ethics Guidelines".
[http://geophy.uni.lu/users/tonie.vandam/audit/20170602_Research_Ethics_Guidelines.pdf]. Accessed 10 September 2020
- [7] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 3 September 2020
- [8] National Health Laboratory ("Laboratoire National De Sante; Luxembourg"). [<https://lns.lu/en/>]. Accessed 3 September 2020
- [9] Ministry of Foreign and European Affairs. [<https://maee.gouvernement.lu/en.html>]. Accessed 3 September 2020
- [10] National Research Ethics Committee. [<https://www.cner.lu/en-gb/About-us>]. Accessed 10 September 2020

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

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

5.1.1 Official IHR reporting

5.1.1a

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

Yes = 1 , No = 0

Current Year Score: 1

2020

World Health Organization

5.1.2 Integration of health into disaster risk reduction

5.1.2a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that epidemics and pandemics are integrated into Luxembourg's national risk reduction strategy or that it has a standalone national disaster risk reduction strategy for epidemics and pandemics. Luxembourg has standalone Emergency Intervention Plans ("Plans d'Interventions d'Urgence" - PIUs) for crises, but these are disaster response plans and not disaster risk reduction plans [1], [2].

No risk reduction elements are present in the Flu Pandemic Plan (2006) or the Ebola Plan (2014) [3],[4]. The websites of the Ministry of Health and the Ministry of Agriculture, Viticulture and Consumer Protection do not make reference to a

standalone national disaster risk reduction strategy for pandemics [5], [6].

[1] High Commission for National Protection. "National Plans". [<https://hcpn.gouvernement.lu/fr/service/domaines/plans-nationaux.html>]. Accessed 10 September 2020

[2] InfoCrise. Lu. [www.infocrise.lu/en]. Accessed 10 September 2020

[3] European Centre for Disease Prevention and Control. 2006. "Governmental Plan. Flu Pandemic". [https://www.infocrise.lu/documents/20181/30435/PLAN_FLU_PANDEMIC.pdf/4c8c2291-19ce-43a0-9e47-96a26fca320f]. Accessed 3 September 2020

[4] Government of the Grand Duchy of Luxembourg. 2014. "Emergency Intervention Plan. EBOLA Plan" ("Plan d'Intervention d'Urgence. Cas Probables / Confirmés EBOLA Au Niveau National ("Plan EBOLA)"). [https://www.infocrise.lu/documents/20181/30443/PLAN_EBOLA_VERSION_PUBLIQUE_LR.pdf/825be696-3a2f-4ed6-8022-876af4a8e6d3]. Accessed 10 September 2020

[5] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[6] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 10 September 2020

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

5.2.1 Cross-border agreements

5.2.1a

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

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

Current Year Score: 2

Luxembourg has cross-border agreements on public health emergencies with neighboring countries and as part of a regional group, and there is no evidence of gaps in implementation. As a member of the European Union (EU), Luxembourg has access to the European Center for Disease Prevention and Control, which, among other things, provides support during public health emergencies. [1] In addition, within the EU, the Health Security Committee provides a platform for the health ministries of member states to co-ordinate national responses to cross-border public health emergencies [2], [3]. Moreover, Luxembourg, as an EU member is part of the Civil Protection Mechanism, which aims to improve "prevention, preparedness and response to disasters", permitting member states to request assistance from others if their response capacity is not equal to a specific emergency. [4]

[1] European center for Disease Prevention and Control. "ECDC Activities On Epidemic Intelligence And Outbreak Response." [<https://www.ecdc.europa.eu/en/about-us/what-we-do/ecdc-activities-epidemic-intelligence-and-outbreak-response>]. Accessed 10 September 2020

[2] European Commission. "Health Security Committee Members." [https://ec.europa.eu/health/preparedness_response/risk_management/hsc/members_en]. Accessed 10 September 2020

[3] European Parliament and Council of the European Union. Decision No 1082/2013/EU of 22 October 2013. "On serious cross-border threats to health and repealing Decision No 2119/98/EC." [<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02013D1082-20131105>]. Accessed 10 September 2020

[4] European Commission. 4 May 2020. "EU Civil Protection Mechanism". [<https://ec.europa.eu/echo/what/civil->

protection/mechanism_en]. Accessed 10 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

Luxembourg has cross-border agreements on animal health emergencies as part of a regional group, and there is no evidence of gaps in implementation. As a member of the European Union (EU), Luxembourg is entitled to request assistance from the EU's Veterinary Emergency Team (VET) [1], [2]. The team responds in animal health situations; it consists of experts in the fields of veterinary sciences, virology, wildlife, laboratory testing, risk management and other areas [1]. The VET was deployed to Luxembourg in May 2019 in response to an outbreak of African Swine Fever. [3] No evidence of gaps in implementation was found in a report on the mission. [4]

[1] European Commission. "Veterinary Emergency Team". [https://ec.europa.eu/food/animals/animal-diseases/emergency-team_en]. Accessed 10 September 2020

[2] European Commission. Decision No 2007/142/EC of 28 February 2007. "Establishing a Community Veterinary Emergency Team To Assist The Commission In Supporting Member States And Third Countries In Veterinary Matters Relating To Certain Animal Diseases". [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32007D0142]. Accessed 10 September 2020

[3] European Commission. "European Veterinary Emergency Team Missions". [https://ec.europa.eu/food/sites/food/files/animals/docs/ad_emergency_cvvet_experts_missions.pdf]. Accessed 23 September 2020.

[4] European Commission. 2019. "Missions of the EUVET to Luxembourg". [https://ec.europa.eu/food/sites/food/files/animals/docs/reg-com_ahw_20190612_asf_lux-euvet.pdf]. Accessed 23 September 2020.

5.3 INTERNATIONAL COMMITMENTS

5.3.1 Participation in international agreements

5.3.1a

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

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

Current Year Score: 2

2021

Biological Weapons Convention

5.3.1b

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

Yes = 1, No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1c

Has the state provided the required United Nations Security Council Resolution (UNSCR) 1540 report to the Security Council Committee established pursuant to resolution 1540 (1540 Committee)?

Yes = 1 , No = 0

Current Year Score: 1

2021

Biological Weapons Convention

5.3.1d

Extent of United Nations Security Council Resolution (UNSCR) 1540 implementation related to legal frameworks and enforcement for countering biological weapons:

Very good (60+ points) = 4, Good (45–59 points) = 3, Moderate (30–44 points) = 2, Weak (15–29 points) = 1, Very weak (0–14 points) or no matrix exists/country is not party to the BWC = 0

Current Year Score: 4

2021

Biological Weapons Convention

5.3.2 Voluntary memberships

5.3.2a

Does the country meet at least 2 of the following criteria?

- Membership in Global Health Security Agenda (GHSA)
- Membership in the Alliance for Country Assessments for Global Health Security and IHR Implementation (JEE Alliance)
- Membership in the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP)
- Membership in the Australia Group (AG)
- Membership in the Proliferation Security Initiative (PSI)

Needs to meet at least two of the criteria to be scored a 1 on this measure. , Yes for five = 1 , Yes for four = 1 , Yes for three = 1 , Yes for two = 1 , Yes for one = 0 , No for all = 0

Current Year Score: 1

2021

Global Health Security Agenda; JE Alliance; Global Partnership; Australia Group; PSI

5.4 JOINT EXTERNAL EVALUATION (JEE) AND PERFORMANCE OF VETERINARY SERVICES PATHWAY (PVS)

5.4.1 Completion and publication of a Joint External Evaluation (JEE) assessment and gap analysis

5.4.1a

Has the country completed a Joint External Evaluation (JEE) or precursor external evaluation (e.g., GHSA pilot external assessment) and published a full public report in the last five years?

Yes = 1, No = 0

Current Year Score: 0

2021

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

5.4.1b

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

Yes = 1, No = 0

Current Year Score: 0

2021

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

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

5.4.2a

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

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.4.2b

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

Yes = 1, No = 0

Current Year Score: 0

2021

OIE PVS assessments

5.5 FINANCING

5.5.1 National financing for epidemic preparedness

5.5.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence of specific funding for improvement of capacity for future epidemic response in the past three years. The Law on Hospitals and Hospital Planning (adopted 8 March 2018) mentions that the State contributes 80% of investments in hospitals authorized by the Minister of Health [1]. Luxembourg spends EUR 3575 (USD 4180) per capita on health care which is above the EU average of EUR 2 884 (USD 3370), and health care expenditure is valued at 6.1% of the country's GDP. [1] However, no evidence of funding specifically allocated for improvement of capacity to respond to future epidemics in the past three years was available on the websites of the Ministry of Health, Ministry of Economy and the Ministry of Agriculture, Viticulture and Consumer Protection [3,4,5].

[1] Journal Officiel du Grand-Duché de Luxembourg. 2018. "Law Of 8 March 2018 On Hospitals And Hospital Planning " ("Loi Du 8 Mars 2018 Relative Aux Etablissements Hospitaliers Et A La Planification Hospitaliere").

[<http://data.legilux.public.lu/file/eli-etat-leg-loi-2018-03-08-a222-jo-fr-pdf.pdf>]. Accessed 10 September 2020

[2] European Commission. 2019. "State of Health in the EU Luxembourg Country Health Profile 2019".

[https://ec.europa.eu/health/sites/health/files/state/docs/2019_chp_lu_english.pdf]. Accessed 10 September 2020

[3] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[4] Ministry of Economy. [<https://meco.gouvernement.lu/en.html>]. Accessed 10 September 2020

[5] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 3 September 2020

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

5.5.2a

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

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

Current Year Score: 0

2021

5.5.2b

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

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

Current Year Score: 0

2021

OIE PVS assessments

5.5.3 Financing for emergency response

5.5.3a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no evidence that Luxembourg has an emergency public financing mechanism in place in case of a public health emergency. As a member of the European Commission Civil Protection Mechanism, Luxembourg can access EU funds to respond to an emergency, but this is not specifically reserved for Luxembourg [1]. There is no public evidence of a national-level public financing mechanisms and funds which the country can access in the face of a public health emergency, based on the information available on the websites of the Ministry of Health, Ministry of Agriculture, Viticulture and Consumer Protection and the High Commission for National Protection [2], [3], [4].

As a high-income country, Luxembourg is a donor to multilateral emergency funding mechanisms combating pandemics. Since 2009, Luxembourg has provided 1% of its gross national income to development assistance of the World Health Organization, making it one of the few countries that exceeds the United Nations target of 0.7% [5]. In 2017, Luxembourg committed to providing EUR 1.5 million (USD 1.75 million) of fully flexible funding to support health emergencies, of which EUR 1 million (USD 1.17 million) (between 2018-2019) was dedicated to WHO's Contingency Fund for Emergencies [5]. As such, Luxembourg is a contributor to and thus not eligible for the IDA or the World Bank Pandemic Emergency Financing Facility [6], [7].

[1] European Commission. 4 May 2020. "EU Civil Protection Mechanism". [https://ec.europa.eu/echo/what/civil-protection/mechanism_en]. Accessed 10 September 2020

[2] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[3] Ministry of Agriculture, Viticulture and Consumer Protection. [<https://ma.gouvernement.lu/en.html>]. Accessed 10 September 2020

[4] High Commission for National Protection. [<https://hcpn.gouvernement.lu/en/service.html>]. Accessed 10 September 2020

[5] World Health Organization. "Luxembourg. Making An Impact In Health Development".

[<https://www.who.int/about/planning-finance-and-accountability/financing-campaign/luxembourg-impact>]. Accessed 10 September 2020

[6] International Developmental Association (IDA). "Borrowing Countries". [<http://ida.worldbank.org/about/borrowing-countries>]. Accessed 10 September 2020

[7] World Bank. 2018. "Pandemic Financing Facility". [<http://pubdocs.worldbank.org/en/119961516647620597/PEF-Operational-Brief-Dec-2017.pdf>]. Accessed 10 September 2020

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

5.5.4a

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

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

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

Current Year Score: 1

There is evidence that Luxembourg senior leaders have, in the past three years, made a public commitment to support other countries to improve capacity to address epidemic threats, but not to improve the country's domestic capacity. Luxembourg is the second-largest per capita donor to polio eradication, having contributed US\$ 20 million to the Global Polio Eradication Initiative in 2017-2019 [1]. In November 2017, Luxembourg's prime minister, Xavier Bettel, was awarded the Polio Eradication Champion Award, and commented that "Luxembourg is committed to support the fight against polio until the end" [2]. In 2020, during the COVID-19 pandemic, Franz Fayot, Luxembourg's minister for development cooperation and humanitarian affairs and minister of the economy, committed to supporting other countries' response to the epidemic, stating "the health, economic and social crisis is even harsher in developing countries. We therefore redirected funds, particularly in Niger, where we financed a COVID-19 aid and prevention plan, but also in Burkina Faso". In September 2020, Luxembourg's minister of health, Paulette Lenert, declared that "It is difficult to predict how the epidemic will develop. The government will position itself according to the evolution of the situation, ensuring that the interests of each are reflected in the mechanism put in place. It's a complex exercise, but we are doing everything we can to make it as successful as possible" [4]. However, there is no evidence of an explicit commitment to improve domestic capacity. In March 2020, Luxembourg dedicated EUR 9 billion (USD 10.3 billion) to facing the COVID-19 crisis, but this investment is dedicated to supporting the economy and people whose livelihoods have been negatively affected, not to improving healthcare capacity [5].

[1] World Health Organization. "Luxembourg. Making An Impact In Health Development".

[<https://www.who.int/about/planning-finance-and-accountability/financing-campaign/luxembourg-impact>]. Accessed 10 September 2020

[2] Twitter. 16 November 2017. "Xavier Bettel". [https://twitter.com/xavier_bettel/status/931206684680294401?lang=en]. Accessed 10 September 2020

[3] Ada. 2020 "Interview with Minister Franz Fayot". [<https://www.ada-microfinance.org/en/interview-of-ministre-franz-fayot>]. Accessed 10 September 2020

[4] Government.Lu. 23 September 2020. "The Government Will Do Everything In Its Power To Avoid A New Lockdown" ("Le Gouvernement Fera Tout Ce Qui Est Dans Son Pouvoir Afin D'éviter Un Nouveau Confinement").

[https://gouvernement.lu/fr/actualites/toutes_actualites/interviews/2020/09-septembre/23-lenert-connect.html]. Accessed 28 September 2020

[5] actu.fr. 25 March 2020. "Coronavirus: Luxembourg To Spend 9 Billion Euros To Deal With The Crisis" ("Coronavirus: Le Luxembourg Va Dépenser 9 Milliards D'euros Pour Faire Face A La Crise". [https://actu.fr/societe/coronavirus/coronavirus-luxembourg-va-depenser-9-milliards-deuros-faire-face-la-crise_32551148.html]. Accessed 10 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

In the past three years, Luxembourg has invested finances or provided technical support to support other countries to improve capacity to address epidemic threats, but there is no evidence that Luxembourg has requested finances to improve domestic capacity to address epidemic threats.

Since 2009, Luxembourg has allocated 1% of its gross national income to development assistance to provide foreign aid (it is one of the few countries that exceeds the UN target of 0.7% of GDP). Approximately 15% of Luxembourg's development assistance is spent on health [1]. Luxembourg is also a contributor to the Global Fund, a partnership that seeks to accelerate the end of AIDS, tuberculosis and malaria as epidemics [2]. In 2019, Luxembourg increased its pledge to the global fund by 15% [1]. As of September 2020, Luxembourg's total contribution to the Global Fund was over EUR 44.85 million (US\$ 53.06 million) [2]. Furthermore, Luxembourg is the second-largest per capita donor to polio eradication, contributing US\$ 540 000, US\$ 590 000, and US\$ 560 000 for 2017, 2018 and 2019 respectively, making its total contribution to the programme to US\$ 20 million [1, 3]. For 2018–2019, as part of a 3-year commitment, Luxembourg contributed EUR 1 million (US\$ 1.2 million) to support the World Health Organisation (WHO) Contingency Fund for Emergencies. The Contingency Fund for Emergencies allows the WHO to respond immediately to disease outbreaks and humanitarian crises [1]. In the context of coronavirus, Luxembourg financed COVID-19 aid and prevention plans in Niger and Burkina Faso. [4] In March 2020, Luxembourg dedicated EUR 9 billion (USD 10.3 billion) to facing the COVID-19 crisis, but this investment is dedicated to supporting the economy and people whose livelihoods have been negatively affected, not to improving healthcare capacity [5].

There is no evidence on the websites of the Ministry of Health or the Ministry of Economy that Luxembourg has requested finances to improve domestic capacity to address epidemic threats [6, 7]. The recipient profile for Luxembourg on the Global Health Security Tracking website does not provide any evidence of the country receiving funding either. [8]

[1] World Health Organization. "Luxembourg. Making An Impact In Health Development".

[<https://www.who.int/about/planning-finance-and-accountability/financing-campaign/luxembourg-impact>]. Accessed 10 September 2020

[2] The Global Fund. 2020. "Luxembourg".

[<https://www.theglobalfund.org/en/government/profiles/luxembourg/#:~:text=Luxembourg%20has%20been%20an%20essential,increased%20its%20pledges%20over%20time.>]. Accessed 10 September 2020

[3] Polioeradication.org. 30 March 2020. "Contributions and Pledges to the Global Polio Eradication Initiative, 1985-2019".

[<http://polioeradication.org/wp-content/uploads/2020/06/GPEI-Historical-Contributions-Charts-v11.pdf>]. Accessed 10 September 2020

[4] Ada. 2020 "Interview with Minister Franz Fayot". [<https://www.ada-microfinance.org/en/interview-of-ministre-franz-fayot>]. Accessed 10 September 2020

[5] actu.fr. 25 March 2020. "Coronavirus: Luxembourg To Spend 9 Billion Euros To Deal With The Crisis" ("Coronavirus: Le

Luxembourg Va Dépenser 9 Milliards D'euros Pour Faire Face A La Crise". [https://actu.fr/societe/coronavirus/coronavirus-luxembourg-va-depenser-9-milliards-deuros-faire-face-la-crise_32551148.html]. Accessed 10 September 2020

[6] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[7] Ministry of Economy. [<https://meco.gouvernement.lu/en.html>]. Accessed 10 September 2020

[8] Global Health Security Tracking. "Recipient profile: Luxembourg". [<https://tracking.ghscosting.org/details/989/recipient>] Accessed May 10, 2021.

5.5.4c

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

Yes = 1 , No = 0

Current Year Score: 1

2021

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

5.6 COMMITMENT TO SHARING OF GENETIC AND BIOLOGICAL DATA AND SPECIMENS

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

5.6.1a

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

Yes = 1 , No = 0

Current Year Score: 0

There is no publicly available evidence of a plan or policy in Luxembourg for sharing genetic data, epidemiological data, clinical specimens, and/or isolated specimens (biological materials) with international organizations and/or other countries that goes beyond influenza. The website of the Ministry of Health does not make reference to any such information [1]. In 2018, the European Union, of which Luxembourg is a member, published a plan of action to step up efforts to increase availability and boost health data sharing. The initiative intends to create the technical infrastructure to facilitate linking existing and future genomic databases, so as to improve disease prevention across Europe [2], [3]. However, there is no evidence that the initiative specifically targets sharing epidemiological data, clinical specimens or isolated specimens.

[1] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

[2] European Commission. 2018. "Data In The EU: Commission Steps Up Efforts To Increase Availability And Boost Healthcare Data Sharing". Press Release. 25 April 2018. [http://europa.eu/rapid/press-release_IP-18-3364_en.htm]. Accessed 10 September 2020

[3] European Commission. 1 April 2020. "European '1+ Million Genomes' Initiative." [<https://ec.europa.eu/digital-single-market/en/european-1-million-genomes-initiative>]. Accessed 10 September 2020

5.6.1b

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

Yes = 0, No = 1

Current Year Score: 1

There is no public evidence that Luxembourg has failed to share samples in accordance with the Pandemic Influenza Preparedness (PIP) framework in the past two years. The websites of the World Health Organisation, Luxembourg's Ministry of Health and domestic and international media do not make reference to Luxembourg ever failing to share samples in accordance with the PIP framework [1],[2], [3].

[1] World Health Organisation. "Pandemic Influenza Preparedness (PIP) Framework".

[<https://www.who.int/influenza/pip/en/>]. Accessed 10 September 2020

[2] World Health Organisation "Influenza.Virus Sharing ". [www.who.int/influenza/pip/virus_sharing/en/]. Accessed 10 September 2020

[3] Ministry of Health. [<https://msan.gouvernement.lu/fr.html>]. Accessed 10 September 2020

5.6.1c

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

Yes = 0, No = 1

Current Year Score: 1

There is no public evidence that Luxembourg has not shared pandemic pathogen samples during an outbreak in the past two years. There is no evidence of Luxembourg either sharing or failing to share pathogen samples, including coronavirus samples, on the World Health Organization's website or in Luxembourg's national or international media [1], [2], [3].

[1] World Health organization. [<http://www.who.int/>]. Accessed 10 September 2020

[2] World Health organization. "Pandemic preparedness and response".

[www.who.int/csr/disease/swineflu/guidance/pandemic_preparedness/en/]. Accessed 10 September 2020

[3] World Health Organisation "Influenza.Virus Sharing ". [www.who.int/influenza/pip/virus_sharing/en/]. Accessed 10 September 2020

Category 6: Overall risk environment and vulnerability to biological threats

6.1 POLITICAL AND SECURITY RISK

6.1.1 Government effectiveness

6.1.1a

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

Input number

Current Year Score: 4

2020

Economist Intelligence

6.1.1b

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

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1c

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

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1d

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

Input number

Current Year Score: 4

2020

Economist Intelligence

6.1.1e

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

Input number

Current Year Score: 80

2020

Transparency International

6.1.1f

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

Input number

Current Year Score: 3

2020

Economist Intelligence

6.1.1g

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

Input number

Current Year Score: 4

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: 4

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: 4

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: 2

2020

UN Office of Drugs and Crime (UNODC)

6.1.4c

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

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

Current Year Score: 3

2021

Economist Intelligence

6.1.5 Armed conflict

6.1.5a

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

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

Current Year Score: 4

2021

Economist Intelligence

6.1.6 Government territorial control

6.1.6a

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

Yes = 1, No = 0

Current Year Score: 1

2021

Economist Intelligence

6.1.7 International tensions

6.1.7a

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

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

Current Year Score: 2

2021

Economist Intelligence

6.2 SOCIO-ECONOMIC RESILIENCE

6.2.1 Literacy

6.2.1a

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

Input number

Current Year Score: 99.9

2008-2018

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: 0.92

2018

United Nations Development Programme (UNDP); The Economist Intelligence Unit

6.2.3 Social inclusion

6.2.3a

Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)

Input number

Current Year Score: 0.2

2017

World Bank; Economist Impact

6.2.3b

Share of employment in the informal sector

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

Current Year Score: 0

The share of employment in the informal sector is very low in Luxembourg. The latest available figures indicate that in 2007, 5% of employment was in the informal sector [1]. Luxembourg's Cross-National Data Centre (LIS), excluded Luxembourg from its 2019 Informal activity on the labour market dataset due to the low relevance of informal activities [2]. Moreover, Luxembourg's underground economy, which includes employment in the informal sector, represented 8.2% (2012) and 8.1% (2015) of its GDP [3], [4].

The statistical databases maintained by the World Bank and the International Labor Organization do not provide statistics on informal employment in Luxembourg [5], [6]. The websites of the Ministry of Labour, Employment and the Social and Solidarity Economy and Luxembourg's Statistics Centre (STATEC) do not provide statistics on employment in the informal sector [7], [8].

[1] Cairn.info. 2009. "Underground Economy and Informal Employment in European Union Countries" ("Économie Non Observée Et Emploi Informel Dans Les Pays De L'union Européenne"). [<https://www.cairn.info/revue-economique-2009-5-page-1117.htm?contenu=resume>]. Accessed 10 September 2020

[2] Cross-National Data Centre in Luxembourg (LIS). June 2019. "Informal Activity On The Labour Market – A New LIS Variable". [<https://www.lisdatacenter.org/newsletter/nl-2019-10-h-2/>]. Accessed 10 September 2020

[3] University Of Strasbourg. "Underground Economy and Public Finance in the European Union" ("Économie souterraine et finances publiques dans l'Union européenne"). [<https://opee.unistra.fr/spip.php?article306>]. Accessed 10 September 2020

[4] Bilan. 15 September 2015. "Switzerland Champion in the Fight Against Underground Economy" ("La Suisse championne de la lutte contre l'économie souterraine").

[https://www.bilan.ch/economie/la_suisse_championne_de_la_lutte_contre_l_economie_souterraine]. Accessed 10 September 2020

[5] World Bank. "Informal Employment (% of total non-agricultural employment-Luxembourg".

[<https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS?locations=LU>]. Accessed 10 September 2020

[6] International Labor Organization. "Country profiles." [<https://ilostat.ilo.org/data/country-profiles/>]. Accessed 10 September 2020

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6.2.3c

Coverage of social insurance programs (% of population)

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

Current Year Score: 3

2016, or latest available

World Bank; Economist Impact calculations

6.2.4 Public confidence in government

6.2.4a

Level of confidence in public institutions

Input number

Current Year Score: 2

2021

Economist Intelligence Democracy Index

6.2.5 Local media and reporting

6.2.5a

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

Input number

Current Year Score: 2

2021

Economist Intelligence Democracy Index

6.2.6 Inequality

6.2.6a

Gini coefficient

Scored 0-1, where 0=best

Current Year Score: 0.35

Latest available.

World Bank; Economist Impact calculations

6.3 INFRASTRUCTURE ADEQUACY

6.3.1 Adequacy of road network

6.3.1a

What is the risk that the road network will prove inadequate to meet needs?

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

Current Year Score: 4

2021

Economist Intelligence

6.3.2 Adequacy of airports

6.3.2a

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

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

Current Year Score: 4

2021

Economist Intelligence

6.3.3 Adequacy of power network

6.3.3a

What is the risk that power shortages could be disruptive?

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

Current Year Score: 4

2021

Economist Intelligence

6.4 ENVIRONMENTAL RISKS

6.4.1 Urbanization

6.4.1a

Urban population (% of total population)

Input number

Current Year Score: 91.22

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: 0.16

2008-2018

World Bank; Economist Impact

6.4.3 Natural disaster risk

6.4.3a

What is the risk that the economy will suffer a major disruption owing to a natural disaster?

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

Current Year Score: 4

2021

Economist Intelligence

6.5 PUBLIC HEALTH VULNERABILITIES

6.5.1 Access to quality healthcare

6.5.1a

Total life expectancy (years)

Input number

Current Year Score: 82.3

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: 303.1

2019

WHO

6.5.1c

Population ages 65 and above (% of total population)

Input number

Current Year Score: 14.27

2019

World Bank

6.5.1d

Prevalence of current tobacco use (% of adults)

Input number

Current Year Score: 21.7

2018

World Bank

6.5.1e

Prevalence of obesity among adults

Input number

Current Year Score: 22.6

2016

WHO

6.5.2 Access to potable water and sanitation

6.5.2a

Percentage of homes with access to at least basic water infrastructure

Input number

Current Year Score: 99

2017

UNICEF; Economist Impact

6.5.2b

Percentage of homes with access to at least basic sanitation facilities

Input number

Current Year Score: 97.6

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: 5135.88

2018

WHO Global Health Expenditure database

6.5.4 Trust in medical and health advice

6.5.4a

Trust medical and health advice from the government

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

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018

6.5.4b

Trust medical and health advice from medical workers

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

Current Year Score: 2

2018

Wellcome Trust Global Monitor 2018