Joint External Evaluation (JEE) of the Republic of Liberia International Health Regulations (IHR) core capacities

September 2023

Contents

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Abbreviations

AFL: Armed forces of Liberia

AMR: Antimicrobial resistance

AMS: Antimicrobial stewardship

AMU: Antimicrobial use

CBRN: Chemical, biological, radiological and nuclear

EBS: Evidence-based surveillance

ECOWAS: Economic Community of West African States

EIA: Environmental impact assessment

eIDSR: Electronic Integrated Disease Surveillance and Response

EML: Essential medicines list

EMT: Emergency medical technician

EOC: Emergency operation centres

EPA Environmental protection agency

EPR: Emergency preparedness and response

FAO: Food and Agriculture Organization of the United Nations

FETP: Field epidemiology training programme

GLASS: Global antimicrobial resistance and use surveillance system

HAI: Healthcare associated infections

HCAI: Health care acquired infections

IADSR: Integrated animal disease surveillance and response

IAEA: International Atomic Energy Agency

IBS: Indicator-based surveillance

IDSR: Integrated disease surveillance and response

IHR: International health regulations

IMS: Incident management system

INFOSAN: International Food Safety Authorities Network

IPC: Infection prevention and control

JHPIEGO: Johns Hopkins Programme for International Education in Gynaecology and Obstetrics

LMHRA: Liberia medicine health regulatory authority

MFDP: The Ministry of Finance and Development Planning

MoA: Ministry of Agriculture

MoH: Ministry of Health

NAP: National action plan

NAPHS: National Action Plan for Health Security

NFP: National focal point

NPHIL: National Public Health Institute of Liberia

NRL: National Reference Laboratory

NSL: National Standards Laboratory of Liberia

NSTG: National standard treatment guidelines

OH: One Health

PCR: Polymerase chain reaction

PHEM: Public health emergency management

PHEOC: Public health emergency operation centres

PoE: Point of entry

RCCE: Risk communication and community engagement

RRT: Rapid response team

SimEx: Simulation exercises

SOP: Standard operating procedure

TOR: Term of reference

TWG: Technical working group

UNICEF: United Nations Children's Fund

US CDC: United States Centers for Disease Control and Prevention

USAID: United States Agency for International Development

VRA: Vulnerability and risk assessment

WASH: Water, sanitation and hygiene

WHO: World Health Organization

WOAH: World Organisation for Animal Health (formerly the OIE).

Executive summary

The Joint External Evaluation (JEE) is one of four key tools used to assess and test member states' Capacities and capabilities to comply with International Health Regulations (IHR (2005)). It was developed based on previously existing World Health Organization (WHO) tools and various regional strategies and other initiatives such as the Global Health Security Agenda (GHSA), and the World Organisation for Animal Health (WOAH) Performance of Veterinary Services (PVS) Pathway. The first edition of the tool was published in 2016.

Liberia was the first country in West Africa to undergo the JEE assessment in 2016 using the first edition of the JEE tool. An international multisectoral team of experts and observers participated in a weeklong assessment to jointly assess Liberia's strengths and weaknesses and develop priority actions for each of the 19 technical areas. As Liberia was in the immediate post Ebola period of the 2014/2015 Ebola Outbreak, this assessment was critical for determining critical areas of preparedness and response to prevent future outbreaks and build resilience of the public health system.

In September 2023, Liberia underwent a second JEE assessment using the third edition of the tool. The weeklong assessment was led by WHO's Regional Office for Africa and the host country. The host country participated in a facilitated discussion with an international evaluation team of fifteen (15) multisectoral experts to jointly assess Liberia's strengths, weaknesses and priority actions in health security preparedness and response.

Results were finalized through consensus between the evaluation team and the host country. Results from the assessment were presented to senior government officials of the Government of Liberia with key stakeholders, partners, and media present. The overall IHR core capacity of the country is 43.9%.

Overarching issues and priority action

Since the last JEE, Liberia has made notable progress in strengthening its capacity for emergency preparedness and response. Significant gains have been made in surveillance, diagnostic capacity, immunisation, emergency management and workforce development. Multisectoral coordination has also become integrated into IHR activities implementation, an important factor for sustaining capacity across multiple sectors and providing support to animal and environmental health stakeholders.

Key achievements

- There is a strong political will and partners support to strengthen Liberia IHR core capacities by taking forward a multi-sectoral approach.
- A National IHR focal point centre has been established.
- The country has established a cohort of Public Health Emergency Management Fellows to provide expertise in risk assessment and incident management at national and subnational levels.
- A national public health emergency operations centre (PHEOC) that is linked to 15 subnational PHEOCs exists, is functional and can activate within 120 minutes of receiving an early warning and mount a response within 72 hours.
- Liberia has established a National Public Health Institute to strengthen existing infection prevention and control efforts, laboratories, surveillance, infectious disease control, public health capacity building, response to outbreaks, and monitoring of diseases with epidemic potential.

- Liberia has a One Health platform that has demonstrated the capacity to coordinate multi sectoral responses to public health events.
- The Field Epidemiology Training Programme (FETP) and the In-Service Applied Veterinary Epidemiology Training (ISAVET) Programme have expanded to include cohorts in the frontline and intermediate. There exist arrangements for advanced level training in neighbouring countries. The FETP programme has graduated more than 200 persons with competencies in public health/veterinarian epidemiology and outbreak investigation and response.
- Liberia has a functioning national public health reference laboratory (NPHRL) central veterinary laboratory and the National Standards Laboratory. Only the NPHRL has diagnostic capacity for all the priority diseases formally identified by the country.
- Liberia has a functioning National Expanded Programme on Immunization (EPI) and maintains its ability to administer mass vaccination campaigns at national and subnational levels.
- There is a robust public health disease surveillance system, and an animal disease surveillance system has been established.
- A multi hazard preparedness plan has been developed that was informed by multi sectoral risk profiling and mapping across all sectors.
- Routine readiness assessments via simulation exercises are conducted bi-annually at both national and subnational levels.

Key areas for improvement

- The country should codify the revised Public Health Law and put in place the requisite policies and guidelines for its implementation.
- Establish and fund a national budget line for routine IHR implementation including public health emergency response across sectors at county, district and community levels.
- Establish a functioning animal health workforce with practising veterinarians and para veterinarians accessible at national and subnational level.
- Establish a functioning integrated specimen referral system sustainable across all relevant sectors at national and subnational levels.
- Review available options and implement an electronic surveillance reporting system that penetrates to all levels and relevant cross-sectors with adequate training and supervision to community and primary care level teams to effectively report using the system.
- Develop a sustainable National External Quality Assurance (EQA) Programme across One Health sector laboratories.
- Identify and implement remedial actions needed to achieve laboratory accreditation and licensing in relevant human and animal health laboratories.
- Finalize and implement the integrated AMR surveillance strategy and antimicrobial use/consumption monitoring guidelines for use across relevant sectors (e.g. human, animal health and environment).
- Develop and codify a legislative framework that governs animal health and production services.
- Capacity of technical staff involved in zoonosis surveillance and response should be improved to conduct risk mapping and analyses.
- Provide dedicated personnel and logistics for outbreak investigation in relevant IHR sectors.

- Roll out the national infection prevention and control (IPC) strategic plan at the subnational level of the health system and ensure that all facilities have facility-based IPC plan to guide IPC implementation.
- Conduct a national assessment of capacities to lead to the establishment and development of policies and regulations for the National Laboratory Behaviour Based Safety (BBS) Regulatory Body.
- Engagement of training institutions across relevant IHR sectors to include biosafety and biosecurity into their training curricula.
- Develop and implement a national personnel surge plan for public health emergencies.
- Conduct a national One Health readiness assessment to determine needed human resources and required skills to respond to hazards identified in the national multi-hazard preparedness plan.
- Develop and operationalize a mechanism for systematic exchange of relevant information between One Health sectors.

Republic of Liberia JEE scorecard

Technical areas	Indicator number	Indicator	Score	Priority Actions
PREVENT				
P1. Legal instruments	P.1.1	Legal instruments	2	• Ensure the passage of the Public Health Law. • Conduct legal analysis/mapping to identify and review gaps in the existing relevant legal instruments in all sectors across government to develop or revise necessary legal instruments for IHR implementation. • Build the capacity of legal practitioners on the revised Public Health Law. • Conduct a gender equity assessment in at least one IHR capacity and incorporate the priority activities into the annual work plans. • Review legal instruments for the adequate protection of vulnerable and at-risk populations during public health emergencies.
	P.1.2	Gender equity and equality in health emergencies	1	
P2. Financing	P.2.1	Financing for IHR implementation	2	• Commitment from the Government of Liberia to include IHR activities as well as a dedicated line for emergency response in the national budget via specific budget lines. • Establish, designate and operationalize a specific public financial resource mechanism to receive, distribute and use funds in a timely manner for public health emergency response and link the expenditures to the national health accounts. • Update and cost the National Action Plan for Health Security (NAPHS) and its monitoring and evaluation framework based on the results from the 2023 JEE. • Plan and execute annual budgeting exercises of NAPHS and other IHR related activities.
	P.2.2	Financing for public health emergency response	2	
P3. IHR coordination, National IHR Focal Point functions and advocacy	P.3.1	National IHR Focal Point functions	2	• Develop or leverage on a data platform to facilitate timely information exchange and consolidate surveillance information across sectors. • Update and implement the National Action Plan for Health Security (NAPHS), resource mapping (REMAP) and a monitoring and evaluation framework. • Develop a business continuity plan to obtain dedicated funding for emergency preparedness and response.
	P.3.2	Multisectoral coordination mechanisms	3	
	P.3.3	Strategic planning for IHR, preparedness or health security	3	

Technical areas	Indicator number	Indicator	Score	Priority Actions
				• Develop an advocacy strategy for the implementation of IHR and systematically sensitize the decision-makers at the national and intermediate levels. • Strengthen the one health coordination platform at all levels with a functional steering committee chaired by the office of the vice president, a secretariat and a one health coordinator.
P4. Antimicrobial resistance (AMR)	P.4.1	Multisectoral coordination on AMR	**3**	• Revise and cost the National Action Plan on AMR using One Health approach and support its implementation across sectors at all levels. • Establish a Multisectoral National Coordinating Centre (MNCC) to advocate for government budgetary support for AMR activities implementation using the One Health approach. • Finalise and implement the integrated AMR surveillance strategy and antimicrobial use/consumption monitoring guidelines and resultant programme in public and private entities across sectors (human, animal health and environment). • Develop and implement national prescription policies and regulations on appropriate use, availability and quality of antimicrobials in human and animal health. • Strengthen the performance of quality control laboratory to ensure safety, efficacy and quality monitoring of antimicrobials and other essential medicines.
	P.4.2	Surveillance of AMR	**2**	
	P.4.3	Prevention of MDRO	**2**	
	P.4.4	Optimal use of antimicrobial medicines in human health	**3**	
	P.4.5	Optimal use of antimicrobial medicines in animal health and agriculture	**2**	
P5. Zoonotic disease	P.5.1	Surveillance of zoonotic diseases	**3**	• Animal health and production legislative framework needs to be developed and enacted into law. • List of priority one health zoonotic diseases for surveillance need to be revised and expanded. • Commit government to budget and provide financial and technical support for zoonosis diseases surveillance and response. • Capacity of technical staff involved in zoonosis surveillance and communication should be improved to conduct risk mapping and analysis for response; and establish a communication and information exchange unit to provide accurate and appropriate messaging on zoonosis.
	P.5.2	Response to zoonotic diseases	**3**	
	P.5.3	Sanitary animal production practices	**1**	

Technical areas	Indicator number	Indicator	Score	Priority Actions
				• Improve the sanitary condition of animal production sites (slaughterhouses and abattoirs) through provision of waste disposal supplies, PPE for staff and improve the workstation infrastructure.
P6. Food safety	P.6.1	Surveillance of foodborne diseases and contamination	**3**	• Develop and validate case definitions for additional priority foodborne diseases and implement them through the current surveillance system. • Develop and implement the national food safety emergency plan, and food safety policy. • Disseminate food safety guidelines, SOPs and train different stakeholders for surveillance, response, emergency management, rapid risk assessment and laboratory testing for food safety. • Evaluate diagnostic capacity of targeted national laboratories for food safety, and provide required equipment, reagents and SOPs for foodborne diseases or food contamination (chemical and microbiological) detection according to existing reference tests. • Increase food safety awareness at all levels including the industry players and communities.
	P.6.2	Response and management of food safety emergencies	**1**	
P7. Biosafety and biosecurity	P.7.1	Whole-of-government biosafety and biosecurity system is in place for human, animal and agriculture facilities	**1**	• Hiring of SME to help in conducting national assessment of capacities across the one health sectors and findings will lead to the establishment and development of policies and regulations for the National Lab BBS regulatory body. • Engagement of training institutions to include biosafety and biosecurity into their training curricula. Also, establish long- and short-term certificate programmes. Expand to other areas e.g. agricultural etc. in a multisectoral approach. • National legislative enactment of biological safety and biosecurity programme, policies and regulations • Establish a National Bio-risk management licensure and monitoring lab programme. • Establish a sustainable information and data sharing mechanism system for OH sectors labs on biosafety and biosecurity.
	P.7.2	Biosafety and biosecurity training and practices in all relevant sectors (including human, animal and agriculture)	**1**	

Technical areas	Indicator number	Indicator	Score	Priority Actions
P8. Immunization	P.8.1	Vaccine coverage (measles) as part of national programme	3	• Conduct Immunization Equity Assessment. • Operationalize Immunization Equity Plan (Zero Dose, under immunised Children & Missed Communities) – use equity findings to inform strategic intervention. • Conduct Post Integration Survey to determine the effectiveness of Covid-19 Vaccination in Routine Immunization. • Conduct Immunization gender-related barriers Assessment. • Institutionalise missed opportunity vaccination (MOV).
	P.8.2	National vaccine access and delivery	4	
	P.8.3	Mass vaccination for epidemics of VPDs	4	
DETECT				
D1. National laboratory systems laboratory	D.1.1	Specimen referral and transport system	1	• Clearly define referral pathways for specimens across One Health stakeholders, develop and formalize (MOU) national laboratory network and identify ways of making an integrated (human, animal, environmental) transport system sustainable across the sectors and levels of the health system. • Develop a sustainable national external quality assurance (EQA) programme across OH sector labs across all organisms and across laboratory sectors. • Establish a core facility for genetic sequencing at the National Public Health laboratory. • Identify and implement remedial actions needed to achieve laboratory accreditation and licensing for human and veterinary labs. • Ensure availability of specimen collection, packaging and transportation supplies for human, animal and environment samples across the country.
	D.1.2	Laboratory quality system	2	
	D.1.3	Laboratory testing capacity modalities	3	
	D.1.4	Effective national diagnostic network	1	
D2. Surveillance	D.2.1	Early warning surveillance function	2	• Integrate the IBS and the EBS systems and implement them at all levels as appropriate using the OH approach. • Extend the rollout of the early warning system to all private and public health facilities through training, provision of tools, supportive supervision, and performance monitoring including data quality audits. • Review and update the national immediately reportable priority diseases list to include diseases like Malaria etc.
	D.2.2	Event verification and investigation	3	
	D.2.3	Analysis and information sharing	4	

Technical areas	Indicator number	Indicator	Score	Priority Actions
				• Establish mechanisms between the different systems across the different sectors (human, animal and environmental health) to strengthen data sharing. • Build capacity for advanced data analytics at the national and sub national levels, through training/refresher training, provision of tools and logistics and, supportive supervision.
D3. Human resources	D.3.1	Multisectoral workforce strategy	1	• Develop the multisectoral surge workforce strategy for public health emergency response. • Ensure required workforce competencies have been mapped and aligned with the health workforce strategy. • Develop and maintain a One Health Workforce database.
	D.3.2	Human resources for implementation of IHR	2	
	D.3.3	Workforce training	1	
	D.3.4	Workforce surge during a public health event	1	
RESPOND				
R1. Health emergency management	R.1.1	Emergency risk assessment and readiness	2	• Conduct an all-hazard national risk assessment using standard tools like STAR followed by development of an integrated action plan. • Develop and validate a personnel deployment plan and emergency management team plan including a database for both plans. • Identify and train surge personnel, RRT and EMT. • Conduct simulation exercises (including for deployment of surge personnel and sending and receiving health personnel and teams) and implement recommendations. • Develop disease-specific contingency plans for all risks that are ranked very high, high or moderate from the national multihazard risk assessment.
	R.1.2	Public health emergency operations centre (PHEOC)	4	
	R.1.3	Management of health emergency response	4	
	R.1.4	Activation and coordination of health personnel in a public health emergency	1	
	R.1.5	Emergency logistic and supply chain management	1	
	R.1.6	Research, development and innovation	3	

Technical areas	Indicator number	Indicator	Score	Priority Actions
R2. Linking public health and security authorities	R.2.1	Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological, chemical or radiological event	**2**	● Establish an MoU between Public Health and Security Authorities. ● Develop a joint curriculum for training for risk assessment and investigation specific to public health security. ● Conduct a joint simulation exercise (SimEx) between the public health and the security authorities.
R3. Health services provision	R.3.1	Case management	**1**	● Develop case management guidelines for priority health events including chemical, trauma and radiation emergencies. ● Improve utilization of health services through availability of essential medicines and supplies at service delivery points. ● Increase access to, and quality health services by ensuring a better distribution and competent health workforce. ● Update the national and county operational plans to include the continuity of essential services during health emergencies.
	R.3.2	Utilization of health services	**1**	
	R.3.3	Continuity of essential health services (EHS)	**4**	
R4. Infection prevention and control (IPC)	R.4.1	IPC programmes	**2**	● Ministry of Health should establish a dedicated budget line and allocate resources for IPC, HAI and AMR surveillance. ● MoH should allocate funds for laboratories to conduct water safety testing and analysis for water sources in all health facilities. ● Establish HAI surveillance system and ensure technical capacities are built to support the system including a national data system for generating and storing IPC data for evidence and decision-making. ● MoH should allocate resources to increase and improve WASH infrastructure and activities in all health facilities. ● Rollout National Strategic Plan and ensure all facilities have facility-based IPC plans to guide IPC implementation.

	R.4.2	HCAI surveillance	**1**	
	R.4.3	Safe environment in health facilities	**2**	
R5. Risk communication and community engagement (RCCE)	R.5.1	RCCE systems for emergencies	**3**	• Develop, (validate and disseminate) OH multihazard RCCE strategy and plan for EPR and reinforce its implementation; • Develop and implement an effective community engagement multisectoral national plan to strengthen community protection and resilience.
	R.5.2	Risk communication	**2**	
	R.5.3	Community engagement	**3**	
IHR RELATED HAZARDS AND POINTS OF ENTRY AND BORDER HEALTH				
PoE: Points of entry and border health	PoE.1	Core capacity requirements at all times for PoEs (airports, ports and ground crossings)	**2**	• Increase response capacity and capability of staff at the PoEs by providing regular and appropriate trainings, supervision and required supplies. • Ensure that testing (rapid tests) facility is available at the designated PoEs for humans and animals. • Ensure that all designated PoEs have vaccination capacity for humans and animals. • Ensure that SOPs for management and referral of sick travellers are available and implemented, also that appropriate equipment are available. • Strengthen cross border coordination with neighbouring countries for public health events preparedness and response.
	PoE.2	Public health response at PoEs	**3**	
	PoE.3	Risk-based approach to international travel-related measures	**1**	
CE. Chemical events	CE.1	Mechanisms established and functioning for detecting and responding to chemical events or emergencies	**3**	• Financial support for all institutions that have the mandate to manage and respond to chemical events. Such budgetary allotment or pool fund should be used to establish the crisis management team made up of all relevant institutions in responding to any chemical spillage or hazards. • Training opportunities should be explored and provided for staffs from all institutions responsible to manage and respond to chemical events. Training should include but not limited to laboratory investigation, wastewater treatment, the capacity to monitor hardest food and goods.
	CE.2	Enabling environment in place for management of chemical event	**2**	
RE. Radiation emergencies	RE.1	Mechanisms established and functioning for	**2**	• Establish Liberia Atomic Energy Commission for all matters relating to radiation and nuclear;

		detecting and responding to radiological and nuclear emergencies		● Validate all draft polices, guidelines, legislations and other documents relating to radiation emergency preparedness and response; ● Conduct radiation inventory for other sectors to complete national source registry.
	RE.2	Enabling environment in place for management of radiological and nuclear emergencies	**2**	

Prevent

P1. Legal instruments

Introduction

The International Health Regulations (IHR) (2005) provide obligations and rights for States Parties. In some States Parties, implementation of the IHR (2005) may require new or modified legislation. Even if new or revised legislation may not be specifically required, States may still choose to revise some regulations or other instruments in order to facilitate IHR implementation and maintenance. Implementing legislation could serve to institutionalise and strengthen the role of IHR (2005) and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. See detailed guidance on IHR (2005) implementation in national legislation. In addition, policies that identify national structures and responsibilities as well as the allocation of adequate financial resources are also important.

Target

Adequate legal instruments for States Parties to support and enable the implementation of all their obligations and rights created by the IHR. The development of new or modified legal instruments in some States Parties for the implementation of the Regulations. Where new or revised legal instruments may not be specifically required under a State Party's legal system, the State may revise some laws, regulations or other legal instruments in order to facilitate their implementation in a more efficient, effective or beneficial manner.

Liberia level of capabilities

The Public Health Law of 1976 has undergone functional review, and revisions have been done to address present-day health realities and to provide for the implementation of the International Health Regulations (IHR 2005). The public health bill has included provisions for zoonotic diseases, biosafety and biosecurity, sexual and reproductive health, use of antimicrobials, non-communicable diseases, One Health coordination platform, anti-discrimination, handling and disposal of healthcare waste and clinical trials. The bill has been passed by the House of Representatives and submitted to the Senate for concurrence. Even though the bill has not been passed into law, many of its provisions are already being implemented, particularly in the area of antidiscrimination and One Health coordination.

Liberia established the Gender and Social Protection unit in the Ministry of Gender, Children and Social Protection in 2013 to specifically address gender and inequality issues. Liberia has high rates of sexual and gender-based violence, which are usually both heightened during times of crisis, including public health emergencies. The health sector is a major employer of women in Liberia, approx. 69% of nurses and 94% of midwives are women.[1] Systematic analysis and implementation of gender gaps in IHR capacities is a unique opportunity to identify and address issues that disproportionately affect women in Liberia.

Indicators and scores

P.1.1 Legal instruments – Score 2

The country has conducted mapping of the relevant legal instruments for IHR implementations, reviewed and revised the Public Health Act (1976) to fill the gaps identified in the areas of zoonotic diseases, biosafety and biosecurity, sexual and reproductive health, use of antimicrobials, non-communicable diseases, one health coordination platform, antidiscrimination, handling and disposal of healthcare waste and clinical trials. However, the revised PHA (1976) is yet to be passed by the senate. In addition, legal assessments of relevant IHR legal instruments in other sectors have not been conducted.

[1] Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH. *Improving career opportunities for women in the health work force*. Accessed September 6, 2023. < https://www.giz.de/en/worldwide/59985.html>

Strengths

- The Public Health Act (1976) has been functionally reviewed, gaps identified and revisions proposed to facilitate IHR implementation.
- The proposed revisions include provisions for zoonotic diseases, biosafety and biosecurity, sexual and reproductive health, use of antimicrobials, non-communicable diseases, One Health coordination platform, antidiscrimination, handling and disposal of healthcare waste and clinical trials.

Challenges

- The Public Health Law has not yet been passed by the Senate and, therefore, not codified into law.
- There is no legal analysis done to identify and review gaps in the existing legal instruments in all sectors across the government to develop or revise necessary legal instruments for IHR implementation.
- Limited knowledge of legal practitioners in Public Health Law.

P.1.2 Gender equity and equality in health emergencies – Score 1

In 2013, Liberia established the Ministry of Gender, Children and Social Protection to address gender and inequality issues. The revised Public Health bill provides for antidiscrimination and has included provisions on gender equity and equality on HIV and AIDS related interventions and services. The country has not conducted any systematic assessment of gender gaps in any of the IHR capacities.

Strengths

- Liberia established the Gender and Social Protection unit in the Ministry of Gender, Children and Social Protection in 2013 to specifically address gender and inequality issues.
- The Public Health Bill proposes provisions for antidiscrimination and is replete with provisions on gender equality and equity specifically on HIV and AIDS related interventions and services.
- The Ministry of Health has assessed gender barriers to immunisation.
- The Government of Liberia aims to first conduct a gender assessment of Liberia's National Community Health Assistant Programme. The health sector is a major employer of women in Liberia; approx. 69% of nurses and 94% of midwives are women.

Challenges

- No systematic assessment of gender gaps in any of the IHR capacities has been conducted.
- No action plans to address identified gender gaps have been developed, nor have any plans to address gaps been included in annual work plans.
- Liberia has high rates of reported sexual and gender-based violence against women, along with low educational attainment for women.
- Less than 20% of Liberia's community health workers are women, yet women are more likely to be caretakers of children and sick family members.[2]

Recommendations for priority actions

- Ensure the passage of the Public Health Law.
- Conduct legal analysis/mapping to identify and review gaps in the existing relevant legal instruments in all sectors across government to develop or revise necessary legal instruments for IHR implementation.

[2] Sali Hafez and others, Examining the gender imbalance in the National Community Health Assistant Programme in Liberia: a qualitative analysis of policy and Programme implementation, *Health Policy and Planning*, Volume 38, Issue 2, March 2023, Pages 181–191, https://doi.org/10.1093/heapol/czac075

- Conduct a gender equity assessment in at least one IHR capacity and incorporate the priority activities into the annual work plans.
- Review legal instruments for the adequate provision for the protection of vulnerable and at-risk populations during public health emergencies.
- Build the capacity of legal practitioners on Public Health Law.

P2. Financing

Introduction

The implementation of the IHR, including development of the core capacities, requires adequate financing. State Parties should ensure sufficient allocation of funds for IHR implementation.

Target

States Parties ensure provision of adequate funding for IHR implementation through the national budget or other mechanisms. Country has access to financial resources for the routine implementation of IHR capacities and financial resources that can be accessed on time and distributed for readiness and response to public health emergencies, is available.

Liberia level of capabilities

Liberia has seen important external investment and commitment of government resources to improve IHR capacity. Liberia's National Health Policy makes explicit mention of the need for the country to develop a mechanism for the quick mobilization of funds to respond to emergencies.

The country has access to external resources through donor funding to implement some IHR capacities in multiple sectors. While there aren't specific budget lines in the national budget for IHR implementation, the government does leverage existing resources to contribute some personnel time, infrastructure, and logistics to facilitate IHR implementation.

Significant funding and implementation gaps remain in animal health and environmental health sectors, and the overwhelming majority of IHR implementation is heavily dependent on external donor financing. Throughout the evaluation process, each technical area noted the lack of funding from public sources as a challenge. Financing at the subnational level is particularly challenging, and insufficient personnel is a challenge at all levels.

Despite these challenges, Liberia completed a National Action Plan for Health Security (NAPHS), which has been costed and used to guide the country's IHR implementation. The One Health Platform has been established and functions as an effective mechanism for multisectoral coordination of IHR activities, including responding to public health events. The Ministry of Finance and Development Planning (MFDP) has functioned as the public financial mechanism to set up extra-budgetary mechanisms to quickly receive and disburse funds in an emergency. This was done during the Ebola Outbreak. Per the National Health Finance Policy, the Government of Liberia plans to set up a special emergency health response fund.

The most recent National Health Financing Policy for Liberia notes that resources for health have increased dramatically since 2007, at least threefold, from 100 million US dollars to over 338 million US dollars in 2015. However, this is still inadequate as resource needs are estimated at over 1 billion US dollars. The government's health expenditure compared to GDP is approximately 12.4%, one of the lowest in sub-Saharan Africa and below the 15% target set by the Abuja Declaration. Over half (53%) of health expenditure in Liberia is out of pocket payments from households, despite Liberia's free health care scheme. The remaining 47% of expenditures are divided between government and donor financing. Exacerbating this shortage is that there are no dedicated budget lines for IHR capacities, including emergency response. IHR activities are heavily financed through external donors.

Indicators and scores

P2.1. Financing resources for IHR implementation – Score 2

Consolidated IHR resource needs are costed in the NAPHS. However, less than half of the NAPHS has been implemented, and that implementation is largely funded by external financing to some (but not all) key sectors

namely human health and agriculture. However, key actors in other sectors are often included in trainings and participate in multisectoral coordination mechanisms. Therefore, the country is scored at a 2.

Strengths

- The establishment of the One Health Platform has made good progress in multisectoral coordination and the expansion of multiple sectors to be included in the implementation of IHR activities.
- A National Action Plan for Health Security (NAPHS) was adopted in 2018 and is currently being updated.
- External donors have committed to funding activities in the NAPHS and continue to finance IHR activities across multiple sectors.
- Resource needs for IHR implementation have been prioritized and costed in the NAPHS 2018–2022.

Challenges

- Except for existing government personnel, very little of the activities listed in the NAPHS are funded through the national budget.
- Overall, it is estimated that 45% of NAPHS activities have been implemented. The vast majority of implemented activities are financed from external donor funding.
- While external financing is significant, it does not adequately cover all relevant sectors.[3]

P2.2. Financial resources for public health emergency response – Score 2

Liberia's Ministry of Finance and Development Planning (MFDP) has created a public financial resource mechanism to receive, distribute and use funding in the past, specifically the Ebola Trust Fund, which was used to coordinate funding during the 2014–2016 Ebola Outbreak. However, since then, no emergency public financial resource mechanism has been designated for public health emergencies, although there are ongoing discussions to establish one. Therefore, the country is scored at Level 2.

Strengths

- There is a functioning One Health platform that has demonstrated its ability to coordinate multisectoral responses to public health events, including drafting response-specific budgets that are then financed by external partners.
- The Ministry of Finance and Development Planning (MFDP) is designated as the emergency public financial resources mechanism to receive, distribute and use funds for responding to public health emergencies.
- The MFDP has created extra-budgetary mechanisms for emergency response in the past, including the 2014 Ebola Outbreak.
- The Government of Liberia has explicitly mentioned the need to establish a specific fund for health emergency response in the National Health Finance policy.

Challenges

- The One Health Platform is able to coordinate multisectoral responses but does not have the capacity to receive and distribute funds.

[3] Relevant sectors include human health, animal health, agriculture, disaster management, food safety, livestock, fisheries, trade, international transport/points of entry (PoEs), emergency services, environment, finance, chemical safety, radiation safety, labour, education, foreign affairs, civil society, other sectors.

Recommendations for priority actions

- Commitment from the Government of Liberia to include IHR activities and a dedicated line for emergency response in the national budget via specific budget lines.
- Establish, designate and operationalize a specific public financial resource mechanism to receive, distribute and use funds promptly for public health emergency response.
- Update and cost out the National Action Plan for Health Security (NAPHS) based on the results from the 2023 JEE.
- Plan and execute annual budgeting exercises of NAPHS and other IHR related activities.

P3. IHR coordination, national IHR focal point functions and advocacy

Introduction

The effective implementation of the IHR requires Multisectoral/multidisciplinary approaches through national partnerships for efficient alert and response systems. Coordination of nationwide resources, including the designation of a national IHR focal point (NFP), and adequate resources for IHR implementation and communication, is a key requisite for a functioning IHR mechanism at the country level.

Target

Multisectoral/multidisciplinary approaches through national partnerships that allow efficient, alert and response systems for effective implementation of the IHR Coordinate nation-wide resources, including sustainable functioning of a National IHR Focal Point (NFP) – a national centre for IHR communications which is a key obligation of the IHR – that is accessible at all times. States Parties provide WHO with contact details of National IHR Focal Points, continuously update and annually confirm them. Timely and accurate reporting of notifiable diseases, including the reporting of any events of potential public health significance according to WHO requirements and consistent relay of information to FAO and OIE. Planning and capacity development are undertaken and supported through advocacy measures to ensure high-level support for the implementation of IHR.

Liberia level of capabilities

Liberia has an NFP centre in the Division of Infectious Diseases and Epidemiology at the National Public Health Institute of Liberia (NPHIL). The NFP consist of a lead and designated focal points for the areas of Public Health Surveillance, Livestock, Emergency Preparedness and Response, Points of entry (POE) and Environmental Protection Agency (EPA). The Director of the Division of Infectious Disease and Epidemiology in the NPHIL is designated as NFP Lead and is the authorizing official for communication on behalf of the government of Liberia.

The IHR focal point has undergone the NFP-IHR on boarding training conducted by WHO country office (WCO), WHO Regional Office for Africa and WHO headquarters. The National IHR Focal Point is accessible at all times for communications with WHO IHR contact points. Information from WHO is communicated to the Government through the IHR NFP lead. Formalized communication channels for sharing IHR information among stakeholders, such as weekly EPI bulletins, disease outbreak-specific situation reports and a website, are in place.

A well-coordinated governance structure has been established with steering and technical committees and six technical working groups (TWGs) functioning with leadership and having regular dates for engagement. There is a clear term of reference (TOR) for these TWGs. Also, there is a functional and active One Health Secretariat with membership including a Coordinator, National IHR Focal Points, OIE Delegate, Communication Officer, Laboratory Specialist, NAPHS M&E Officer, Finance Officer, and others. A second One Health Governance Manual has been developed with authority and institutional arrangements, relevant information, and sources with decision-making authorities. One Health platform also facilitates the dissemination of information to, and consolidation of inputs from, all relevant sectors.

Contingency plans have been developed for some of the high-ranking public health risks through a multisectoral approach. A multihazard public health national emergency response plan has been developed.

Indicators and scores

P3.1. National IHR Focal Point functions – Score 2

Liberia has a designated NFP centre in the Division of Infectious Diseases and Epidemiology at the National Public Health Institute of Liberia (NPHIL) with clear terms of reference. The IHR NFP personnel are trained on the incident management system (IMS) and capable of communicating with WHO and other focal points when necessary. However, the centre is not adequately equipped with administrative, technological and financial resources to effectively carry out the National IHR Focal Point communication, monitoring and evaluation functions.

Strengths

- Terms of reference are in place describing the roles and responsibilities of the established National IHR Focal Point.
- The NFP is accessible at all times (24/7/365) for urgent communication with WHO.
- The IHR NFP use the existing One Health Platform, especially the surveillance TWG and emergency preparedness and response (EPR) TWG, to communicate and collect information.
- The IHR NFP has personnel trained on IMS and other functions that support the functions of the NFP.

The NFP uses various platforms e.g. One Health (OH), Integrated Disease Surveillance and Response (IDSR), WhatsApp chatrooms, and regularly updated email chains.

Challenges

- The IHR NFP centre is inadequately resourced to effectively carry out its communication, monitoring and evaluation functions.
- Intersectoral coordination and integration across all sectors at the national level to ensure timely and systematic information exchange, including consolidation of surveillance information, is weak.

P3.2. Multisectoral coordination mechanisms – Score 3

Continuous multisectoral coordination is mainly based on the national level monthly OH TWGs meetings where different sectors come together. There is also a regular weekly National Emergency Preparedness and Response Committee (NEPRC) meeting involving all sectors and partners. The intermediate level lacks such a coordination mechanism. The One Health Governance Manual also advocates multisectoral coordination. A strategic OH plan and other institutional strategic plans are disseminated to partners and stakeholders to ensure that government priorities are considered.

Strengths

- There is an existence of an OH platform that includes TWGs such as Surveillance, EPR, IPC (Infection prevention and control), Risk communication etc.
- Monthly multisectoral OH TWGs meeting including relevant sectors and partners.
- Weekly National Emergency Preparedness and Response Committee (NEPRC) meeting involving all sectors and partners.
- One Health Governance Manual is in place and includes the One Health Secretariat, steering and technical committees, coordinating committee and technical working groups.

- SOPs are in place for activation of the Multisectoral IMS.

Challenges

- The Multisectoral mechanism for coordination and integration across all sectors at the intermediate level, to ensure timely and systematic information exchange, including consolidation of surveillance information, is very weak.

P3.3. Strategic planning for IHR, preparedness or health security – Score 3

A Multisectoral multihazard emergency response plan is available for coordinating emergency preparedness measures and is linked to hazard-specific plans. There also exist a National Action Plan for Health Security (NAPHS) that expired in 2022. The system, however, lacks routine monitoring or updating of the implementation of the national action plans. Simulation exercises are not conducted regularly to test the country's level of preparedness and readiness. The country also lacks a dedicated stand-by contingency fund to be utilized in the event of an emergency. Decision-makers in government/ legislative bodies at the national level are sensitized to IHR/health security on an ad hoc basis.

Strengths

- Capacity assessments and resource mapping have been done using the vulnerability and risk assessment (VRA) tool.
- Availability of a multisectoral multihazard emergency response plan.
- A contingency plan exists for a few high-ranking hazards (Ebola & Lassa).

Challenges

- Simulation exercises are not carried out regularly to test the country's level of readiness.
- Emergency or contingency funds are not readily available to support response.
- There is no business continuity plan.
- Outdated National Action Plan for Health Security.
- There is no written advocacy strategy for IHR implementation.

Recommendations for priority actions

- Develop or leverage on a data platform to facilitate timely information exchange and consolidate surveillance information across sectors.
- Update and implement the National Action Plan for Health Security (NAPHS), resource mapping (REMAP) and a monitoring and evaluation framework.
- Develop a business continuity plan to obtain dedicated funding for emergency preparedness and response.
- Develop an advocacy strategy for the implementation of IHR and systematically sensitize the decision-makers at the national and intermediate levels.

- Strengthen the one health coordination platform at all levels with a functional steering committee chaired by the office of the vice president, a secretariat and a one health coordinator.

P4. Antimicrobial resistance (AMR)

Introduction

Bacteria and other microbes evolve in response to their environment and inevitably develop mechanisms to resist being killed by antimicrobial agents. For many decades, the problem was manageable as the growth of resistance was slow and the pharmaceutical industry continued to create new antibiotics.

Over the past decade, however, this problem has become a crisis. Antimicrobial resistance is evolving at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security and national security.

Target

A functional system in place for the national response to combat antimicrobial resistance (AMR) with a One-Health approach, including:

a) Multisectoral work spanning human, animal, crops, food safety and environmental aspects. This comprises developing and implementing a national action plan to combat AMR, consistent with the Global Action Plan (GAP) on AMR.
b) Surveillance capacity for AMR and antimicrobial use at the national level, following and using internationally agreed systems such as the WHO Global Antimicrobial Resistance Surveillance System (GLASS) and the OIE global database on use of antimicrobial agents in animals.
c) Prevention of AMR in health care facilities, food production and the community, through infection prevention and control measures.
d) Ensuring appropriate use of antimicrobials, including assuring quality of available medicines, conservation of existing treatments and access to appropriate antimicrobials when needed, while reducing inappropriate use.

Liberia level of capabilities

Liberia takes a serious view of antimicrobial resistance (AMR) and developed a costed multisectoral AMR National Action Plan (NAP) in 2018 based on the GAP. The One Health AMR-TWG is established with clear TOR and meets monthly. There are designated National Focal Points for AMR and Data Managers from the human and animal sectors coordinating the AMR One Health approach. Antimicrobial stewardship (AMS) and AMR focal points at selected major hospitals are appointed.

Despite these successes, notable challenges need to be addressed through a multistakeholder approach to ensure a successful implementation of AMR programmes. These will be expanded below in the report.

Indicators and scores

P4.1. Multisectoral coordination on AMR – Score 3

The development and dissemination of a multisectoral national action plan in support of AMR coordination has been done. Multisectoral coordination mechanism is ongoing, led by the human health sector with clear terms of reference and regular meetings. Some implementation of the national action plan has been achieved.

Strengths/Best practices

- A costed multisectoral AMR-NAP is developed and disseminated but requires revision.
- A functional and well-coordinated multisectoral One Health AMR-TWG is established at national level with clear TORs, which meet monthly to discuss their work.
- Focal points and multidisciplinary staff in human health have been trained and designated in five sentinel sites in five counties in antimicrobial sensitivity testing (AST), antimicrobial resistance (AMR) and healthcare-acquired infections (HAI) surveillance.
- Designated AMR/AMS focal points have been identified in major hospitals.
- Integration of AMS and AMR into quality improvement (QI) programmes (IPC, WASH).
- Multisectoral training conducted for laboratory staff from human (public & private), animal, environmental, and regulatory sectors on AMR specimen collection and reporting.

Challenges

- The existing AMR-NAP is outdated and needs to be revised and costed to reflect the current situation.
- There is no Multisectoral National Coordinating Centre (MNCC) to advocate for government budgetary lines and dedicated funding to support the implementation of the AMR-NAP across all sectors.
- There is limited commitment and ownership in implementing AMR-NAP as most national policies and laws do not reflect AMR.
- The National Drug and Therapeutic Committee (DTC) is not constituted.
- The national essential medicines list (EML) and standard treatment guidelines (STG) have been revised but not disseminated and made available in health facilities.
- There is no enforcement of policies and regulations on sales and appropriate use of antimicrobials across all sectors and all levels.
- Supply of IPC and WASH supplies and infrastructure in all sectors is limited and associated with frequent stockouts.

P4.2. Surveillance of AMR – Score 2

Surveillance of AMR must occur in both human health and animal food production sectors, monitored and reported to global monitoring databases such as GLASS, Global Database for Tracking Antimicrobial Resistance (AMR) Country Self-Assessment Survey (TrACSS), FAO Atlas and PVS indicators. The evaluation of AMR surveillance capacities is therefore conducted for both human health and animal food production.

Strengths/best practices

- National validated surveillance strategy for AMR organisms in foods of animal origin and animal feeds
- AMR is embedded in the Healthcare Quality Management Team with TORs in line with AMS guidelines and toolkits to promote healthcare quality, including stewardship, IPC, and WASH.
- Five sentinel sites for AMR surveillance in human health with trained staff identified. Annual Reports have been submitted to GLASS as of 2021.
- Development of a standardized AMR data collection and reporting tool for use by all sectors based on the GLASS reporting tool.

- Multisectoral core technical working group reviews AMR data from sentinel sites before submission to GLASS.
- AMR surveillance baseline assessment from selected sites to inform GLASS data collection and reporting.
- AMR testing capacity in the animal health sector established at the Central Veterinary Laboratory (CVL).

Challenges

- There is no government budgetary line nor dedicated funding to support AMU/AMR surveillance implementation across all sectors.
- Limited guidelines for AMU/AMR surveillance and IPC in animal health, fisheries, environment, and agricultural sectors.
- Lack of surveillance system in place to monitor antimicrobial residue in wastewater and the environment.
- Inadequate microbiology laboratory support across all sectors.
- Weak enforcement mechanisms of existing policies and/or regulations on sales and use of antimicrobials.

P4.3. Prevention of multidrug resistant organism (MDRO) – Score 2

The current country AMR-NAP is outmoded and needs to be revised. Along with this, a national strategy should be developed to optimise the use of antimicrobial medicines in human and animal health with monitoring to prevent the emergence of antimicrobial resistance. There is a robust surveillance system in place however the lack of enforcement of regulations on antimicrobial use and stewardship will promote the emergence of drug-resistant strains of organisms. Non-availability of EML and STG at facility level will lead to unbridled use of antimicrobials promoting the emergence of drug resistant organisms.

Strengths

- There is a national strategy (guidance) for MDRO containment.
- Laboratory personnel in human and animal sectors are trained to conduct bacterial culturing.
- Gene-Xpert testing platform is available but only used for Rifampicin resistance testing for TB.

Challenges

- Weak enforcement mechanisms of existing policies and regulations on appropriate use, availability, sales, and quality of antimicrobials in human health.
- Implementation of functional AMS programme is limited in healthcare facilities (private and public).
- There is no protocol or guidance document for antimicrobial stewardship (AMS) at community-level health facilities.
- Quality monitoring of antimicrobials and other essential medicines in the quality control laboratory is weak.
- The revised national STG and EML for healthcare facilities have not been rolled out to guide prescribing practices in facilities.

P4.4. Optimal use of antimicrobial medicines in human health – Score 3

Developed policy and guidelines is available and implemented in support of an antimicrobial stewardship programme which ensures the optimal use of antimicrobials in human health is maintained. Antimicrobial stewardship programme currently exists in the 7 sentinel sites. The “Access, Watch and Reserve” (AWaRe) classification of antibiotics has been adopted in the national essential medicines list.

Strengths

- Development of AMS guidelines and tool Kits with inputs from relevant sectors to inform education on the appropriate use of antimicrobials and AMS programmes.
- Multidisciplinary healthcare professionals trained in seven hospitals in five out of 15 counties.
- The AMS programme is integrated with healthcare quality management teams in seven hospitals.
- Incorporation of WHO AWaRe Classification of antibiotics in the NSTG/EML to guide appropriate indication of antibiotics to optimize treatment outcomes.
- Baseline assessment of antibiotic consumption and resistance using the point prevalence survey in selected hospitals.
- Quality control guidelines and Lab at Liberia Medicine Health Regulatory Authority (LMHRA) for regulation of antimicrobial importation, efficacy, and potency to ensure quality, efficacy and potency of essential medicines, including antimicrobials.
- Pharmacovigilance programme at LMHRA to monitor adverse events of antimicrobials and other medications in hospitals.

Challenges

- Weak enforcement mechanisms of existing policies and or regulations on sales and use of antimicrobials.
- Lack of a national prescription policy on the use of antibiotics.
- The NSTG and EML for healthcare facilities have not been rolled out nor disseminated.
- There is no monitoring of the use of NSTG and EML in healthcare facilities.
- Implementation of functional AMS programme is limited in healthcare facilities (private and public).
- There is no protocol or guidance document for AMS at community-level health facilities.
- Quality monitoring of antimicrobials and other essential medicines in the quality control laboratory is weak.

P4.5. Optimal use of antimicrobial medicines in animal health and agriculture – Score 2

National legislation exists to cover aspects of national manufacture, import, marketing authorization, control of safety, quality and efficacy and distribution of antimicrobial products and/ or antimicrobial pesticides in the country. However, enforcement of these regulations on using antimicrobials in animal production is weak.

Strengths

- Draft National Public Health Law (under revision) makes provision for regulation of sales and effective use of antimicrobial agents in humans and animals.
- AMS guidelines & toolkits recently produced with inputs from all One Health sectors.
- Some public education and awareness on appropriate prescription and use of antimicrobials in animals and humans has been done.

Challenges

- Poor dissemination of guidelines for antimicrobial use (AMU) and AMR surveillance, IPC in animal health, fisheries, environment and agricultural sector.

- Some commercial poultry farm managers, free-range animal farmers and live-bird traders in markets have been trained on the rational use of antimicrobials in animal production.
- Weak enforcement mechanisms of existing policies and regulations on sales and use of antimicrobials in animal husbandry and animal production.
- Lack of surveillance system in place to monitor antimicrobial residues and wastewater in the environment.

Recommendations for priority actions

- Revise and cost the National Action Plan on AMR using One Health approach and support its implementation across sectors at all levels.
- Establish a Multisectoral National Coordinating Centre (MNCC) to advocate for government budgetary support for AMR activities implementation using the One Health approach.
- Finalise and implement the integrated AMR surveillance strategy and antimicrobial use/consumption monitoring guidelines and resultant programme in public and private entities across sectors (human, animal health and environment).
- Develop and implement national prescription policies and regulations on appropriate use, availability and quality of antimicrobials in human and animal health.
- Strengthen the performance of quality control laboratory to ensure safety, efficacy and quality monitoring of antimicrobials and other essential medicines.

P5. Zoonotic diseases

Introduction

Zoonotic diseases are communicable diseases that can spread between animals and humans. These diseases are caused by viruses, bacteria, parasites, and fungi carried by animals, insects or inanimate vectors that aid in its transmission. Approximately 75% of recently emerging infectious diseases affecting humans are of animal origin; and approximately 60% of all human pathogens are zoonotic.

Target

Functional multi-sectoral, multidisciplinary mechanisms, policies, systems, and practices are in place to minimize the transmission of zoonotic diseases from animals to human populations.

Liberia level of capabilities

Liberia has a significant occurrence of zoonosis spill over into the population with resultant major impacts on health, livelihoods, and economies. In the last few years, there have been repeated outbreaks of zoonotic diseases in different patterns, such as sustained outbreaks of Lassa fever and sporadic outbreaks of Anthrax, Bovine Tuberculosis, Brucellosis, Rabies, and Mpox. The National Technical Guidelines for Integrated Disease Surveillance and Response mentions these diseases as zoonotic diseases which could transfer to humans and hence require surveillance. Viral haemorrhagic fevers (including Ebola and Lassa) in humans have occurred through consumption of bush meat or other transmission events, whilst dog bites have resulted in rabies cases. The country is supported by several international development partners to address the zoonosis problems.

Indicators and scores

P5.1. Surveillance of zoonotic diseases – Score 3

Surveillance of zoonotic diseases has been prioritized by the country with the internal identification of a list of priority zoonotic diseases for surveillance across animal health, public health, and environmental sectors. There is formalized coordination of surveillance activities between animal health, public health, and environmental sectors with systematic sharing and exchange of information as well as joint assessment of risks using a One Health approach.

Strengths

- There is an identified list of priority zoonotic diseases for surveillance. Additionally, zoonotic events are also followed for action.
- A national integrated disease surveillance system exists for both human and animal health diseases.
- Technical guidelines for integrated surveillance of animal diseases and events have been developed (IADSR).
- Surveillance activities are well coordinated between animal health, public health, and environmental sectors, and there is frequent information sharing between these sectors.

Challenges

- Surveillance reports from community to national levels face challenges with completeness and timeliness due to poor internet connection and road networks for submission.
- The prioritized zoonotic diseases list needs to be revised and expanded to include other zoonotic diseases such as Leptospirosis, Cysticercosis, Salmonellosis and others that may not cause large outbreaks.
- Surveillance system for zoonotic diseases needs to be expanded to include other zoonotic diseases such as Leptospirosis, Cysticercosis, Salmonellosis and others that may not cause large outbreaks.
- There is limited data to support the zoonotic diseases prioritisation.

P5.2. Response to zoonotic diseases – Score 3

The Veterinary Services and Wildlife Services are the designated agencies to respond to zoonotic disease events and outbreaks. A multisectoral operational mechanism for coordinated response to outbreaks of endemic, emerging, or re-emerging zoonotic diseases by human health, animal health and environment sectors is in place. Multisectoral contingency plans following the One Health approach have been developed to guide the response to outbreaks of important endemic and epidemic zoonotic diseases.

Strengths

- Zoonotic Rapid Response Teams (RRT) have been created at national and subnational levels across the country and trained to respond to zoonotic disease outbreak events.
- RRTs have clear TORs and guidelines for their activities.
- RRTs have responded to recent disease outbreaks using the One Health approach.

Challenges

- Timely multisectoral preparedness and response activities are inadequate.
- Funding of disease response activities is limited.
- There is no dedicated funding to support disease outbreak investigations.

P5.3. Sanitary animal production practices – Score 1

Some efforts have been initiated to support farmers involved in livestock production in commercial and small-scale quantities to understand the need for sanitary animal production practices, including biosafety and biosecurity. Some activities have been conducted to promote good sanitary practices in animal breeding and production of animal products, limiting the risks of transmission of zoonotic diseases.

Strengths

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- Value chain studies conducted in some production systems and Bush Meat value chain.
- Biosafety and biosecurity trainings have been conducted for some farmers.
- Training manuals for surveillance and biosafety/biosecurity have been developed.
- Good collaboration between the public sector and farmer-producer associations.

Challenges

- Lack of legislative framework that governs animal health services in the country.
- The Phyto-Sanitary Services Committee of Veterinary Services which supervises sanitary animal production exists though not active.
- There is only one slaughterhouse in Monrovia and several unsupervised slaughter slabs around the country.

Recommendations for priority actions

- Animal health and production legislative framework needs to be developed and enacted into law.
- List of priority one health zoonotic diseases for surveillance need to be revised and expanded.

- Commit government to budget and provide financial and technical support for zoonosis diseases surveillance and response.
- Capacity of technical staff involved in zoonosis surveillance and communication should be improved to conduct risk mapping and analysis for response; and establish a communication and information exchange unit to provide accurate and appropriate messaging on zoonosis.
- Improve the sanitary condition of animal production sites (slaughter houses and abattoirs) through provision of waste disposal supplies, PPE for staff and improve the workstation infrastructure.

P.6 Food safety

Introduction

Food- and water-borne diarrhoeal diseases are leading causes of illness and death, particularly in less developed countries. The rapid globalization of food production and trade has increased the potential likelihood of international incidents involving contaminated food. The identification of the source of an outbreak and its containment is critical for control. Risk management capacity with regard to control throughout the food chain continuum must be developed. If epidemiological analysis identifies food as the source of an event, based on a risk assessment, suitable risk management options that ensure the prevention of human cases (or further cases) need to be put in place.

Target

A functional system is in place for surveillance and response capacity of States Parties for foodborne disease and food contamination risks or events with effective communication and collaboration among the sectors responsible for food safety.

Liberia level of capabilities

The Government of Liberia has established policies, regulations, guidelines and SOPs (such as the National Food and Feed Quality and Safety Act of 2019) and others for food and feed safety control, surveillance and response for foodborne diseases and contamination. In this regard, the provisions in the Act give the National Public Health Institute of Liberia (NPHIL) the authority on food safety control in the country. The NPHIL has food safety officers at the national level and environmental health technicians at the intermediate level who are responsible for surveillance, response and management of food safety.

In January 2021, the Foodborne Diseases Detection and Surveillance Framework was developed using a One Health approach to guide various aspects of surveillance, which includes rapid risk assessment, investigation, response, and multisectoral collaboration related to priority foodborne diseases and hazards (microbiological, chemical, and radiological). There is a national coordination mechanism i.e. the National Codex Committee and a Food Safety Technical Working Group with a clear Terms of Reference (TORs) that meets regularly (i.e monthly). The codex committee is multisectoral, consisting of members from human, animal and environmental health sectors alongside their relevant parastatals, including the National Standards Laboratory of Liberia (NSL) and other relevant food industry stakeholders.

The country is part of the International Food Safety Authorities Network (INFOSAN), and the Director General of NPHIL is the INFOSAN point of contact. At national and intermediate levels, some of the food safety personnel have been trained to conduct surveillance, response and management of food safety emergencies. The surveillance for foodborne diseases is integrated with Integrated Disease Surveillance and Response (IDSR) and is done together with other priority diseases in the country to detect and monitor foodborne events (outbreaks or contamination). Some of the case definitions for priority foodborne diseases have been developed and disseminated. There is some limited laboratory capacity at NSL and NPHIL to test for some priority foodborne diseases, priority foodborne hazards (chemical and microbiological), and food contamination. Some aspects of monitoring are done through inspection of food premises and or establishments.

Indicators and scores

P6.1. Surveillance of foodborne diseases and contamination – Score 3

Surveillance for foodborne diseases is integrated with IDSR and is done together with other priority diseases in the country. There is a list of priority foodborne diseases and hazards with few case definitions. The country has some limited capacity to conduct microbiological and chemical analyses of specimens for organisms or contaminants. Key stakeholders and focal points for foodborne disease surveillance and food contamination monitoring have been identified. There is a routine inspection of food and food markets, premises or establishments.

Strengths

- There is a national foodborne disease surveillance framework that is operational.
- There is a national food law (National Food and Feed Quality and Safety Act of 2019), food safety guidelines, food safety SOPs and several food standards in place.
- There is a national coordination mechanism through the National Codex Committee and Technical Working Group for food safety that meets regularly.
- There is an INFOSAN point of contact (Director General of NPHIL) and contact points in key ministries and agencies.
- There is some limited capacity of laboratories for microbiological and chemical analysis of specimens for organisms or contaminants.
- Some of the food inspectors and surveillance staff have been trained.

Challenges

- Case definitions are not comprehensive enough to cover all priority listed foodborne diseases.
- Limited capacity of human resources to implement surveillance activities of foodborne diseases and contamination.
- Limited laboratory capacity to assign aetiology of foodborne diseases and contamination.
- Limited funding to support foodborne disease surveillance, response and management.

P6.2. Response and management of food safety emergencies – Score 1

The country has not developed a National Food Safety Emergency Plan with food safety emergencies defined to serve as a trigger for escalating appropriate response.

Strengths

- A national multisectoral coordination mechanism (National Codex Committee and Technical Working Group on food safety) is in place.
- There is a designated national contact person, and TORs on stakeholder roles and responsibilities have been developed.
- A good surveillance system is in place which supports detection and response to foodborne outbreaks.
- Incidents of foodborne risks investigated.

Challenges

- There is low level of awareness among food industry players and communities on food safety;
- Limited resources (human, logistical and financial) to support foodborne disease surveillance, response and management of food safety emergencies;
- There is limited capacity to undertake rapid risk assessments.
- Limited capacity building for intermediate staff and other food actors.

Recommendations for priority actions

- Develop and validate case definitions for additional priority foodborne diseases and implement them through the current surveillance system.
- Develop and implement the national food safety emergency plan and food safety policy.
- Disseminate food safety guidelines and SOPs and train different stakeholders for surveillance, response, emergency management, rapid risk assessment and diagnostic laboratory testing for food safety.
- Evaluate the diagnostic capacity of targeted national laboratories for food safety and provide the required equipment, reagents and SOPs for foodborne diseases or food contamination (chemical and microbiological) detection according to existing reference tests.
- Increase food safety awareness at all levels, including the industry players and communities and provide logistics support to multisectoral coordination mechanisms (National Codex, INFOSAN committees), sanitary and food safety inspectors, surveillance staff to undertake surveillance and response to food borne diseases.

P7. Biosafety and biosecurity

Introduction

It is vital to work with pathogens in the laboratory to ensure that the global community possesses a robust set of tools – such as drugs, diagnostics, and vaccines – to counter the ever-evolving threat of infectious diseases.

Research with infectious agents is critical for the development and availability of public health and medical tools that are needed to detect, diagnose, recognize and respond to outbreaks of infectious diseases of both natural and deliberate origin. At the same time, the expansion of infrastructure and resources dedicated to work with infectious agents have raised concerns regarding the need to ensure proper biosafety and biosecurity to protect researchers and the community. Biosecurity is important in order to secure infectious agents against those who would deliberately misuse them to harm people, animals, plants or the environment.

Target

A whole-of-government multisectoral national biosafety and biosecurity system with high-consequence biological agents identified, held, secured and monitored in a minimal number of facilities according to best practices, biological risk management training and educational outreach conducted to promote a shared culture of responsibility, reduce dual-use risks, mitigate biological proliferation and deliberate use threats, and ensure safe transfer of biological agents; and country-specific biosafety and biosecurity legislation, laboratory licensing and pathogen control measures in place as appropriate.

Liberia level of capabilities

Since the previous JEE the country has worked at developing capacity in this technical area, and significant progress has been made in the human health sector. However, this technical area now has a multisectoral approach and includes agricultural and environmental sectors, which are catching up. Biosecurity is not well developed in the country, but there is a good understanding and comprehension of the area and what activities need to be done.

Liberia has initiated biosafety training in many institutions at national and intermediate levels. The country has certified biosafety cabinet technicians and International Federation of Biosafety Associations (IFBA) Certified Specialists. There is also excellent coordination and collaboration between the health, agriculture, and environment sectors through the One Health coordination mechanism. Technical Working Groups represent all players, including human, animal, agriculture facilities, environment, food safety, and water quality laboratories. The Country is a member of the West Africa Biosafety Network. The laboratories utilize a transportation system called "Riders for Health" to send specimens. These riders are trained in the safe shipping of infectious substances and operate throughout the country. The National Reference laboratory collaborates with other key laboratories in the region such as IP Dakar, IP Cameroon, and IP Abidjan. Liberia has a National Biosafety and Biosecurity Policy that includes information on draft biosecurity legislation.

There are considerable challenges to be addressed when it comes to funding activities and advancing them, such as boosting biosafety in agriculture and establishing a strong biosecurity system. Additionally, there is a lack of laws and framework covering biosafety and biosecurity, with little oversight and monitoring of both the public and private sectors. There is no monitoring or inventory of high level pathogens in public and private sectors, donor projects, and research laboratories.

There is a good understanding of biosecurity among the stakeholders, but there has not been engagement to move the agenda forward. Notably, with the support from partners, biosafety and biosecurity components have been included in the "in-service: curriculum for laboratory scientists.

Indicators and scores

P7.1. Whole-of-government biosafety and biosecurity system is in place for human, animal and agriculture facilities – Score 1

Liberia has developed biosafety in the human health sector. However, the agricultural and environmental sectors fall behind. It is recognised that the health sector is above a level of 1 as many things have advanced in this area since the JEE in 2016. The score provided reflects the lowest score from the 3 different sectors, human health, animal health and environmental health that need to be assessed for this indicator. It is noted that the score within the human health sector alone is 2 or 3. However, the animal health and environment sectors have not developed or advanced capacities in biosafety and biosecurity, therefore, the final score is reported as the lowest of the three.

Strengths

- Laboratories and institutions are committed and aware of actions that need to be taken to improve biosafety and biosecurity;
- There are some technical capacities in the country.

Challenges

- Lack of laws on biosafety and biosecurity programme establishment and regulatory framework;
- Laboratory Quality System lacks the funding to continue the implementation and monitoring of biosafety and biosecurity initiatives within the national system and network;
- No monitoring of public and private sectors, donor projects, and research laboratories handling high-level pathogens and record on inventory to account for these pathogens.

P7.2. Biosafety and biosecurity training and practices in all relevant sectors (including human, animal and agriculture) – Score 1

The country has instituted biosafety training as part of the health laboratory curriculum. However, this is not evident in the animal and environment sectors. The final score for this indicator was, as described above, the lowest score achieved by any one of the sectors to be evaluated under this indicator. As with the above indicator, the human health sector is more advanced with respect to achieving IHR core capacities than the environment and animal health sectors, which has impacted the scoring.

Strengths

- The government, working with partners, has initiated the training for national and intermediate levels laboratorians on biosafety and biosecurity;
- The country has conducted biosafety and biosecurity training needs assessment and identified gaps in biosafety and biosecurity training across the One Health Laboratory network in the national laboratory system;
- Development of a comprehensive training plan costed with implementation timelines and institution specific needs;
- Implementation of the developed training plan to ensure biosafety and biosecurity capacity to ensure laboratories get required training based on needs (One Health Laboratory Network);
- Revision and strengthening the integrated laboratory quality management systems across the One Health Laboratory Network.

Challenges

- No budgetary allocations or funds to support biosafety and biosecurity activities, including plans;
- Frequent stock out of personal protective equipment (PPE) and risk mitigation commodities;
- Routine calibration and maintenance of biosafety and biosecurity equipment is not done;
- Lack of/ limited funds to decentralize training capacity development;
- Human resource gaps for specialists in biosafety and biosecurity in particular the technical expertise specific to each of the sectors to enhance capacities and train laboratory personnel and those in other sectors (e.g. border protection etc.);

- Lack of dedicated funding to logistics and support to the County Diagnostics Officers (Human Health), including the One Health Laboratory System to carry out their duties.

Recommendations for priority actions*

- Hiring of subject matter expert (SME) to help in conducting a national assessment of capacities and findings will lead to the establishment and development of policies and regulations for the National Lab Biosafety and Biosecurity regulatory body;
- Engagement of training institutions to include biosafety and biosecurity into their training curricula. Also, establish long and short-term certificate programmes; Expand to other areas e.g. agriculture etc. in a multisectoral approach.
- National legislative enactment of biological safety and biosecurity programme, policies and regulations
- Establish a National Bio-risk management licensure and monitoring lab programme.
- Establish a sustainable information and data sharing mechanism system for OH sectors labs on biosafety and biosecurity.

*Recommendations are not in order of priority

P8. Immunization

Introduction

Immunizations are estimated to prevent more than two million deaths a year globally. Immunization is one of the most successful global health interventions and cost-effective ways to save lives and prevent disease. Measles immunization is emphasized because it is widely recognized as a proxy indicator for overall immunization against vaccine preventable diseases. Countries will also identify and target immunization to populations at risk of other epidemic-prone vaccine preventable diseases of national importance (e.g. cholera, Japanese encephalitis, meningococcal disease, typhoid and yellow fever). Diseases that are transferable from cattle to humans, such as anthrax and rabies, are also included.

Target

A national vaccine delivery system – with nationwide reach, effective distribution, easy access for marginalized populations, adequate cold chain and ongoing quality control – that is able to respond to new disease threats.

Liberia level of capabilities

Liberia's Expanded Programme on Immunization (EPI) was launched in 1978. A total of eight new vaccines have been introduced after the launch of Liberia's EPI programme including hepatitis B, Haemophilus influenza type b, yellow fever, Rotavirus, pneumonia, human papillomavirus, typhoid fever and COVID-19. There are two operational EPI regional stores (Bong & Grand Gedeh). There are 211 new-generation cold chain equipment (SDD) installed in health facilities out of the 1,060 total health facilities (government, private and faith based) country-wide. The immunization coverage has been expanded from a little over 300 to 622 health facilities (HFs). There are two main traditional immunization partners, which include WHO and UNICEF.

Donor – United States Centers for Disease Control and Prevention (US CDC) Foundation, GAVI, World Bank, United States Agency for International Development (USAID).

Extended Partner – JHPIEGO, John Snow Inc. (JSI), Last Mile Health, FHI 360, Break Through Action, Frontier Health Markets (FHM). These partners provide technical as well as financial support to the National Immunization Programme

Logistics:

- National: Vehicles for vaccine distribution – 1 dry storage truck, 2 double cabin pickups and 3 refrigerated vans;
- Regional: 2 Refrigerated vans (1 each per each region);
- County: 15 double cabin pickups (1 each).

Governance & Leadership:

- Updated Immunization Policies and Strategies;
- National Immunization Strategy (NIS);
- Continuous Improvement Plan (cIP);
- Strong coordination and collaboration with partners (internal and external).

Service Delivery

- Routine Immunization Coverage: Progressive routine immunization coverage rates as defined by Penta 3/DPT3 and MCV1 (e.g., WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) 2022 Report);
- Availability of data quality & improvement plan (DQIP);
- Flexible and adaptable Immunization Service Delivery Strategy.

Accessibility & Equity:

- Quality immunization services being provided to all targeted beneficiaries irrespective of their residence
- Monitoring, evaluation, accountability & learning (MEAL) approach: Examining immunization data, learning and making informed decisions

Areas which need strengthening

- Surveillance for safety measures.
- Mobility for last-mile distribution, especially in rural remote Liberia.

Indicators and scores

P8.1. Vaccine coverage (measles) as part of national programme – Score 3

The country proposed a score of level 4, claiming that 98% of the country's 12-month- population has received at least one dose of MCV but reported that partners (WHO and UNICEF) report 0nly 79% coverage of MCV. Therefore, a consensus was reached that the country should be graded a level 3 for this indicator.

Strengths

- Measles application for mass vaccination accepted and scheduled for the first quarter of 2024 with forecasting completed and submitted for procurement and supply.
- Developed and validated a measles response plan with a budget.
- Routine immunization coverage monitoring and evaluation.

Challenges

- Underreporting of vaccination coverage.
- Inadequate transportation for access to all communities (aged and damaged motorcycles).

P8.2. National vaccine access and delivery – Score 4

Strengths

- The country conducts regular vaccine forecasts.
- There is evidence of a monthly stock management technical reporting.
- Country has vehicles (pickups and trucks) and refrigerated cold vans for vaccine distribution.
- Availability of regional cold vans and dedicated vehicles to facilitate timely distribution of bundle vaccines, thereby mitigating potential stock out.
- There is strong coordination and collaboration between immunization partners.
- Cold Chain: (National Cold Chain capacity: 600-meter cube positive cold Room, 113-meter cube freezer room, 30 cube meter packing room, 40 cube meters positive cold (2 sets), 30-meter cube freezer room, Regional Cold Chain Capacity: Two Regional Stores (Bong & Grand Gedeh) with each having a 40-meter cube positive cold room. Ice-lined Refrigerator – 16 units (8 each), County: Solar Direct Drive (546 SDD); Ice-lined refrigerator (32 units), Available Solar Direct Drive (SDD) at Health Care Facility and Ice-Line Refrigerators at the County levels

Challenges

- Aged motorcycles cause accessibility issues for last-mile distribution.

- No solarisation of nine counties.

P8.3. Mass vaccination for epidemics of VPDs – Score 4

The country initially scored at level 4, but they had not shared or disseminated the necessary protocols and information at the local level. However, they were able to submit the required documents, so the score was maintained at level 4.

Strengths

- Available National Vaccine Deployment Plan.
- Collaboration with the Liberia Medicine & Health Regulatory Authority (LMHRA).
- Collaboration with the Department of Infectious Disease and Epidemiology (DIDE) at the National Public Health Institute (NPHIL).

Challenges

- Need for sharing of protocols and other information on experimental vaccine approval

Recommendations for priority actions

- Conduct immunization equity assessment.
- Operationalize immunization equity plan (Zero Dose, Unvaccinated Children & Missed Communities) – use equity findings to inform strategic intervention.
- Conduct post integration survey to determine the effectiveness of COVID-19 vaccination in routine immunization.
- Conduct immunization gender-related barriers assessment.
- Institutionalise missed opportunity vaccination (MOV).

Detect

D1. National laboratory system

Introduction

Public health laboratories provide essential services including disease and outbreak detection, emergency response, environmental monitoring and disease surveillance. State and local public health laboratories can serve as a focal point for a national system, through their core functions for human, veterinary and food safety including disease prevention, control and surveillance; integrated data management; reference and specialized testing; laboratory oversight; emergency response; public health research; training and education; and partnerships and communication.

Target

Surveillance with a national laboratory system, including all relevant sectors,[55] particularly human and animal health, and effective modern[56] point-of-care and laboratory-based diagnostics.

Liberia level of capabilities

Liberia has a dedicated National Reference Laboratory (NRL) for the detection of pathogens of public health importance. Within the country, there is a strong One Health collaboration and although the animal health laboratory is fully functional and has the capacity to detect zoonotic pathogens some of the capacities in the animal health sector are not yet to an equivalent level of those in the human health sector.

There are a number of stakeholders in the public health laboratory space in Liberia including (list not exhaustive): The Ministry of Health, Ministry of Agriculture, National Fisheries and Aquaculture Authority (NaFAA), Environmental Protection Agency (EPA), National One Health Coordination Platform (NOHP). The Ministry of Health has decentralized human health testing and has laboratory representatives at the intermediate level and County Diagnostics Officers to coordinate county level activities in all 15 counties of Liberia.

The key component in the public health laboratory system in Liberia is the NRL which is located outside of Monrovia. The facility has 26 staff comprised of those dedicated to specific research projects, diagnostic activities or volunteers. The NRL houses a number of ongoing research projects with partners. At the laboratory, they are able to perform molecular testing, serology and bacterial culture, although bacterial culture is only performed for detection of enteric pathogens.

At the NRL there is only capacity for bacterial culture and antibiotic sensitivity for enteric pathogens and tuberculosis (TB).
Renovations are being conducted to laboratories at the NRL site, specifically, the TB laboratory and other research laboratories are under renovation. There is adequate space to expand and there are a number of research labs at the facility utilized by partners for specific projects. A new insectary has just been completed on site to complement the existing facilities.

However, the location of the laboratory is possibly a key challenge for advancing the public health laboratory capacity in Liberia. The NRL is outside of Monrovia and although this is advantageous for high-threat pathogen work the location and access to the laboratory may impact staff recruitment and retention, transport of sensitive equipment, specimen transport to the lab etc.

Indicators and scores

Below is a table indicating the proposed scores from the country and the final scores once both human and animal sectors had been engaged in the scoring process as the initial scores (in parentheses with indicator). The initial scores (proposed scores) were based on the assessment of the human health sector alone, however for this indicator, each sector is scored separately and the lowest score is adopted, as indicated below.

Indicator	INDICATOR (Country Self Assessed Proposed Score)	Human	Animal	Final
1	Specimen referral and transport system (4)	2	1	**1**
2	Laboratory quality system (3)	2	2	**2**
3	Laboratory testing capacity modalities (4)	3	3	**3**
4	Effective national diagnostic network (4)	3	1	**1**

D1.1. Specimen referral and transport system – Score 1

The National Reference Laboratory is serviced by Riders for Health, a commercial transport/courier service in the country. This company is well versed in biosafety and biosecurity requirements for the transport of infectious substances. The animal health laboratory services do not have a dedicated specimen referral service, hence the score for this sector would be 1, which is the final score.

Strengths

- There is a system in place for specimen referral "Riders for Health". and has been funded by the partners and an effective sample referral mechanism is in place.

Challenges

- The specimen referral system in place "Riders for Health", although functional, is funded by donors and partners with little buy-in from national counterparts so is in danger of collapse if donor/partner funding is not available.

D1.2. Laboratory quality system – Score 2

The self-reported score for this component was 3, however, after review of both sectors and the criteria to achieve a score of 3 it was agreed to give each sector a score of 2, making the final score 2.

With the support of partners, laboratory standards have been developed and are noted in laboratory policy documents however they are not yet fully implemented and the country is working towards laboratory accreditation to international standards. A number of trainings have been initiated to support the implementation of a Laboratory Quality Management System (LQMS) and individuals have been trained to be auditors of LQMS. The REDISSE project has supported the Laboratory Association and Board in conducting training of trainers on Laboratory Licensure processes, requirements, and laboratorians and institutions licensing.

Strengths

- The government, working with partners has initiated the training for national and intermediate level laboratorians on Laboratory Quality Management Systems implementation, monitoring, and evaluation.

- A national One Health coordination platform is established that supports multisectoral collaboration and coordination within the laboratory network and would facilitate the sharing of resources e.g. technicians trained for certification of Biosafety Cabinets.

Challenges

- Laboratory Quality System lacks the funding to continue the implementation and monitoring of the national system and network consequently the gains made have been lost.
- There is a lack of monitoring and supervision visits including regular visits to conduct laboratory quality management audits by internal and external auditors.
- The National Diagnostics Division of the MOH and the Laboratory Board including the Laboratory Association lack the resources to conduct regular monitoring and supervision visits required due to logistical challenges of vehicles and fuel needed to carry out timely and adequate laboratory quality monitoring.

D1.3. Laboratory testing capacity modalities – Score 3

Both human and animal health laboratories have the capacity to test using PCR, serology, bacterial culture with antimicrobial sensitivity and have some quality assurance mechanisms in place for specific tests.
The self-assessed score for the human health laboratory was 4, however, on review of the scoring criteria the score was changed to 3. The animal health sector, although not initially scored has a score of 3 in line with the human health laboratory.

Strengths

- Both human and animal health laboratories have the capacity to test using multiple modalities i.e. PCR serology, bacterial culture;
- Sequencing capacity is being established at the National Reference Laboratory in conjunction with partners.
- There is a strong One Health collaboration in the country which would facilitate cross-training and development of a national core sequencing facility at NRL;
- There is government commitment to strengthening laboratory systems.

Challenges

- Frequent stock out of lab reagents and commodities;
- There is no routine calibration and maintenance of equipment;
- Sustainable laboratory testing capacity modalities amongst the One Health laboratory network specifically veterinary laboratories for zoonotic disease detection.

D1.4. Effective national diagnostic network – Score 1

For this indicator, the self-reported score, based on the human health sector was 4. On review of the scoring criteria this score, in agreement with national counterparts, was reduced to 3. In the strategic plan, there is evidence of testing menus at each level of the health system and a referral pathway for escalation and what specimens should be tested for what disease at national level. Although no evidence of laboratory reports from subnational county level was available, assurance was given that testing was being implemented. The score for the animal sector was 1. However, it should be noted that animal health testing is limited at present to 2 laboratories and there is a national referral system for zoonotic specimens to be tested at national level.

Strengths

- Laboratory networking with regional and international referral laboratories (IP Dakar, IP Abidjan, IP Yaoundé, etc.)
- There is good coordination between the technical working groups for various sectors involved in laboratory work for public health e.g. human, animal, environment, food safety and water quality laboratories.
- Partners and regional organizations support to laboratory system.

Challenges

- There is a lack of funds to fully decentralize testing capacity.
- There are human resource gaps and staff retention is a challenge.
- There is no dedicated funding to support networking.
- There is a lack of dedicated funding for logistics and support to the County Diagnostics Officers (human health) including the One Health Laboratory System to carry out their duties.

Recommendations for priority actions

- Clearly define referral pathways for specimens across One Health stakeholders, develop and formalize (MOU) national laboratory network and identify ways of making an integrated (human, animal, environmental) transport system sustainable across the sectors and levels of the health system.
- Develop a sustainable national external quality assurance (EQA) programme across OH sector labs across all organisms and across laboratory sectors.
- Establish a core facility for genetic sequencing at the National Public Health laboratory.
- Identify and implement remedial actions needed to achieve laboratory accreditation and licensing for Human and Veterinary Labs.
- Ensure availability of specimen's collection, packaging and transportation supplies for human, animal and environment samples across the country.

D2. Surveillance

Introduction

The purpose of real-time surveillance is to advance the safety, security and resilience of the nation by leading an integrated surveillance effort that facilitates early warning and situational awareness of all IHR hazard-related events.

Target

Strengthened early warning surveillance systems that are able to detect events of significance for public health and health security; (2) improved communication and collaboration across sectors and between national, intermediate and primary public health response levels of authority regarding surveillance of events of public health significance; and (3) improved national and intermediate level capacity to analyse data. This could include epidemiological, clinical, laboratory, environmental testing, product safety and quality, bioinformatics data; and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR.

Liberia: level of capabilities

In 2019, Liberia adopted the third edition of the Integrated Disease Surveillance and Response (IDSR) strategy of WHO Regional Officer for Africa. This was followed by a nationwide rollout with three staff per facility trained. There are 48 priority diseases, conditions and events for the human health sector as part of the IDSR implementation. Of these, 21 diseases, conditions and events are immediately reportable. The animal health sector has the Integrated Animal Disease Surveillance and Response (IADSR) technical guidelines with 16 diseases under surveillance. The environmental health sector keeps surveillance on chemical, radiological, nuclear, and biological health events through the Environmental Impact Assessment (EIA) procedural guidelines. The surveillance system uses a five-layered structure (Community, health facility, district, county, and national) to achieve the global health security goal of prevention, early detection, and response to public health threats. The country's early warning surveillance system includes indicator-based, event-based and community-based surveillance. These systems provide data for situational awareness of all the country's prioritized events of public health concern. The event-based surveillance is mainly through hotlines and media scanning. An electronic disease surveillance system is currently being pilot tested. A weekly epidemiological bulletin is regularly produced and disseminated to stakeholders at national and international levels. There is an OH surveillance technical working group at the national level that meets monthly. The One Health platform is used to improve communication and collaboration across the sectors and between national and intermediate levels regarding surveillance and response to events of public health significance. However, the effectiveness of the animal health surveillance system and the integration of the laboratories into the surveillance system require more attention. Additionally, regular supportive supervision and data quality audits are required to ensure the quality of the system.

Indicators and scores

D2.1. Early warning surveillance function – Score 2

The country adopted and rolled out the third edition IDSR strategy, which is being implemented at all levels of the health systems. Additionally, the country has developed guidelines for event-based surveillance (EBS). However, the EBS is not fully integrated into the indicator-based surveillance (IBS) and across all administrative levels. Also, the immediate and weekly reporting system does not integrate laboratory results for all priority diseases.

Strengths

- Human, animal, and environmental surveillance structure exists at the national, county, district, health facility (HF), and community levels.
- A list of priority diseases, conditions and events is available for human and animal health surveillance.
- All health facilities have at least one health worker trained in IDSR.
- An early warning system is in place that includes IBS, EBS and community-based surveillance (CBS).
- EBS implemented through toll-free hotline and media scanning.
- The country has identified thresholds for some priority diseases.
- The surveillance system has targets for timeliness and completeness of reporting and national and intermediate levels.
- All guidelines and reporting tools are printed and disseminated to all levels of the system.
- Weekly epidemiological bulletins are produced and shared with national and international stakeholders.

Challenges

- Lack of integration of laboratory results for most immediate and weekly reportable priority diseases.
- Supportive supervision and data quality audits not conducted regularly to ensure the quality of the system.
- Lack of integration of indicator-based and event-based surveillance systems.
- Community based surveillance not fully functional.
- The early warning systems have no alert logbooks/alert management at lower levels.
- IDSR roll-out training not completed in Montserrado, Grand Bassa, and Bomi counties.

D2.2. Event verification and investigation – Score 3

Mechanisms for verifying and investigating detected events have been developed and are being implemented at national and intermediate levels. There is limited evidence to support the claim advising that adequately trained personnel are available for event verification, investigation, and risk assessment from multiple sectors. Investigation and reporting tools are not available. National RRT (rapid response team) guidelines and SOPs were developed and RRT members were trained at the national level to verify, investigate and assess detected events using a multisectoral approach.

Strengths

- Dedicated and trained staff from human, animal and environment sectors available at all levels for event verification and investigation.
- A multidisciplinary rapid response team (RRT) is trained and available at the national level for event verification and investigation.
- Standard operating procedures for RRTs are developed and implemented.
- Risk assessment information and reports shared through emails or during meetings.

Challenges

- Guidance for risk assessment using the Strategic Tool for Assessing Risk (STAR) not available/implemented at the national level.

- Guidance for risk assessment using the Threat Hazard Identification and Risk Assessment tool (THIRA) not available/implemented at the intermediate level.
- Inadequate capacity in the area of event-based and community based surveillance.
- Lack of developed electronic integrated tools for data and information sharing between the human and animal health sectors.

D2.3. Analysis and information sharing – Score 4

Surveillance data are received and analysed regularly. Epidemiological bulletins are generated and disseminated across sectors and internationally on a regular basis. Data are shared across sectors and internationally on a regular basis. Laboratory data are included in the shared epidemiological reports. The country is facing a challenge in storing data and needs adequate software to analyse data from all sectors (human, animal, and environment).

Strengths

- Availability of trained human resources for data analysis at the national level.
- FETP training for relevant sectors (human, animal, environment, private, partners, etc.)
- Electronic Integrated Disease Surveillance and Response (eIDSR) platform being pilot tested.
- Data is stored in the District Health Information System (DHIS2) and Health Management Information System (HMIS) database at the national level for human health surveillance.
- Weekly epidemiological bulletins are generated and disseminated across sectors and internationally on a regular basis.

Challenges

- Inadequate data analysis and information sharing, especially at the district level.
- Lack of interoperability between different systems across sectors.
- Limited logistics (internet service, laptops, etc.) for surveillance data functions.
- Lack of capacity for advanced surveillance data analysis.
- Limited support for the nationwide rollout of the eIDSR platform.
- Lack of electronic tools to link case-level data with laboratory data.

Recommendations for priority actions

- Integrate the IBS and the EBS systems and implement them at all levels as appropriate using the OH approach.
- Develop/establish electronic systems to link case-level data with laboratory data.
- Extend the rollout of the early warning system to all private and public health facilities through training, provision of tools, supportive supervision, and performance monitoring, including data quality audits.
- Establish interoperability between the different systems across the different sectors (human, animal and environmental health) to strengthen data sharing.
- Build capacity for advanced data analytics at the national and subnational level, through training/refresher training, provision of tools and logistics and, supportive supervision.

D3. Human resources

Introduction

Human resources are important in order to develop a sustainable public health system over time by developing and maintaining a highly qualified public health workforce with appropriate technical training, scientific skills and subject-matter expertise. Human resources include nurses and midwives, physicians, public health and environmental specialists, social scientists, communication, occupational health, laboratory scientists/technicians, biostatisticians, IT specialists and biomedical technicians and a corresponding workforce in the animal sector: veterinarians, animal health professionals, para-veterinarians, epidemiologists, IT specialists etc.

The recommended density of doctors, nurses and midwives per 1,000 populations for operational routine services is 4.45 plus 30% surge capacity. The optimal target for surveillance is one trained (field) epidemiologist (or equivalent) per 200,000 populations who can systematically cooperate to meet relevant IHR and PVS core competencies. One trained epidemiologist is needed per rapid response team.

Target

States Parties with skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR (2005).

Liberia level of capabilities

Following the Civil War and the Ebola epidemic, Liberia's health workforce was devastated, and essential health services and primary healthcare were severely disrupted. The health workforce was depleted due to vast migration and death. By 1998, the total number of public health workforce personnel had fallen more than 50% from 3,526 to 1,396. The total number of physicians declined to fewer than 30 for a population of over 4 million. (Ann Glob Health, 2021).

Between 2014 and2016, Liberia suffered 10,678 cases and 4,810 deaths due to the West Africa Ebola Outbreak. This was compounded in the health workforce with at least 375 health worker infections and 189 deaths.

Based on the 2014 Health Workforce Training Institutions Assessment, at projected rates of production and attrition, the gaps in Liberia's health workforce will continue to grow and continue to fall short of the target needed to meet the population's needs. As of 2018, Liberia has approximately 2 nurses for every 1000 persons and 6 physicians per 100,000 persons. There are no active veterinarians in the country and there is insufficient staff available to provide adequate services at the subnational level and at designated Points of Entry. Liberia does have an Environmental Protection Agency (EPA) and a Forestry Development Authority (FDA), but both are inadequately staffed and resourced.

Despite these challenges, multisectoral coordination is pursued between human health, agriculture, environment, security and other relevant sectors through the National One Health Platform.

Progress has been made towards building a skilled and competent workforce to effectively implement IHR particularly the Field Epidemiology Training Programme (FETP). The stakeholders involved include the National Public Health Institute of Liberia, Ministry of Health, Ministry of Agriculture, Environmental Protection Agency, National Disasters Management Agency and partners.

Indicators and scores

D3.1. Multisectoral workforce strategy – Score 1

The country is planning to conduct a One Health workforce needs assessment that will lead to the development of the Workforce Strategy. Human and agriculture sectors have already assessed gaps and developed sector specific workforce development strategies. However, a multisectoral workforce strategy has been developed.

Strengths

- There is a plan to conduct a One Health workforce needs assessment that will lead to the development of the Workforce Strategy.
- Sector specific workforce development strategies for veterinary and health sectors have been developed.

Challenges

- A multisectoral health workforce strategy and plan have not been developed.

D3.2. Human resources for implementation of IHR – Score 2

There is human resource capacity in relevant sectors (human, animal, environment) to detect, report and respond to outbreaks, events or public health threats at the national level. Animal and human sectors have the human resource capacity to detect and respond to outbreaks at intermediary and primary levels. However, the environment sector has no capacity at the intermediary level. The required human resource at all levels is lacking in all sectors.

Strengths

- Available human resources in relevant sectors (human, animal, environment) to detect, report and respond to outbreaks, events or public health threats at the national level, including nurses, doctors, laboratory technicians, para-veterinaries, forest rangers, environment officers and animal health officers**.**
- Animal and human sectors have the human resource capacity to detect and respond to outbreaks at intermediary and primary levels, which includes veterinary extension officers, clinicians, nurses, laboratory assistants, community animal health workers, community health assistants, etc.

Challenges

- There is no active practising veterinarian in the country. However, there are para-veterinaries, veterinary extension officers, and community animal health workers in the country.
- There are no appropriate human resources, particularly for the environment at the intermediary levels.
- Inadequate required human resources in all sectors (human, animal and environment).

D3.3. Workforce training – Score 1

There is an existing Field Epidemiology Training Programme (FETP) with basic and intermediate levels which trains key staff from other relevant sectors: security, environment, and animal sectors. However, required workforce competencies have not been aligned with the health workforce strategy.

Strengths

- Establishment of Liberia FETP in country with basic and intermediate tiers.
- FETP trains key staff from other relevant sectors including the security, environment, and animal sectors.
- Animal health officers have received In-Service Applied Veterinary Epidemiology Training (ISAVET) competency-based training in veterinary epidemiology principles, animal health surveillance, zoonotic disease and outbreak disease management/investigation.
- There are trained rapid response teams at the national and subnational level.

Challenges

- The advanced level of the FETP programme is not established in the country. Fellows selected for the advanced programme must go outside of the country for 1-2 years to complete the programme.

- Regular and routine competency-based training programmes are not available for all professions, cadres and sectors.

D3.4. Workforce surge during a public health event – Score 1

The country has trained rapid response teams (RRTs) at national and subnational (county) levels. However, a multi sectoral surge workforce plan with systems in place for the identification and recruitment of required surge workforce personnel, including procedures or policies for pre-deployment, deployment and post-deployment, has not yet been developed.

Strengths

- The country has trained rapid response teams (RRTs) at national and subnational (county) levels.

Challenges

- A gap analysis for the surge workforce required in all sectors for emergencies, including security, human health, animal health, and environment, has not been conducted.
- A multisectoral surge workforce plan with systems in place for identification and recruitment of required surge workforce personnel, including procedures or policies for pre-deployment, deployment and post-deployment, has not yet been developed.

Recommendations for priority actions

- Develop the multisectoral surge workforce strategy for public health emergency response.
- Ensure required workforce competencies have been mapped and aligned with the health workforce strategy.
- Develop and maintain a One Health workforce database.

Respond

R1. Health emergency management

Introduction

This capacity focuses on the management of health emergencies and systems for enabling countries to be prepared and operationally ready for response to any public health event, including emergencies, as per the all-hazard requirement of IHR. Ensuring risk-based plans for emergency preparedness, readiness and response, robust emergency management structures and mobilization of resources during an emergency is critical for a timely response to public health emergencies.

Target

(1) Existence of national strategic multi-hazard emergency assessments (risk profiles) and resource mapping. (2) Existence of emergency readiness assessment (3) Development of national health EOC81 plans and procedures. (4) Establishment of an emergency response coordination mechanism or incident management system. (5) Evidence of at least one response to a public health emergency within the previous year that demonstrates that the country sent or received medical countermeasures and personnel according to written national or international protocols. (6) Existence of an emergency logistic and supply chain management system/mechanism. (7) Existence of policies and procedures for research, development and innovation for emergency preparedness and response.

Liberia level of capabilities

Liberia is responsible for coordinating emergency management at all stages, including watch, alert, and response. The country is also responsible for developing emergency response documents such as preparedness plans, training manuals, policies, and regulations, etc. and planning and conducting exercises, training response professionals, and conducting vulnerability assessments.

Based on the evaluation, the country has registered tremendous progress. Looking at the first indicator of emergency risk and readiness assessment, they were able to realize a formal readiness assessment tool for public health events done through simulation exercises both at national and subnational levels and has been scheduled to be conducted twice a year. A multisectoral risk profiling and mapping across all sectors with the use of the Vulnerability and Risk Assessment Mapping (VRAM) tool was conducted, and the report was completed in 2020. Regarding the second indicator, there has been an establishment of dedicated and operational physical PHEOCs (Public Health Emergency Operation Centres) at national and county levels with trained staff and successful activation of the EOC (emergency operation center) within 24 hours after an emergency is declared. A PHEOC handbook was equally developed to guide the operations at both national and intermediate levels. For the management of health emergency and response, simulation exercises (tabletop, full scale, functional exercise) are being conducted periodically to improve the system that has been put in place. There has been active participation in emergency medical technician (EMT) activities with trained staff at operational levels across the national and subnational levels, with coordination across the One Health sector. With an existing capacity to produce antibiotics, vaccines, laboratory supplies/equipment or other medical, an agreement has been made with manufacturers or distributors to procure medical counter measures (MCM) during an emergency. Lastly, staff have been trained to conduct research in various fields (e.g. Medical microbiology, medical science, applied parasitology, molecular genetics, nursing and patient care). This, and more, shows the capacity and capability of the country's health emergency management system, which should serve as a model for other countries to emulate.

The country has also had to deal with many challenges at all levels. One major setback is the limited funding for overall PHEOC operations at national and intermediate levels. Currently, overall operations are funded by donors with little or no support from the government, which has greatly affected the staffing in the PHEOCs. There is limited knowledge of the standards for personnel deployment due to the absence of a surge personnel deployment plan. Lastly, the absence of a disease-specific contingency plan greatly affects the country's readiness. All of the above circumstances will impact the country's health emergency management capacity.

Indicators and scores

R1.1. Emergency risk and readiness assessment – Level 2

Based on the exchanges, Liberia was able to confirm that they had developed a national all-hazards risk profile, based on a multihazard risk assessment and capacity/readiness assessment (completed in 2020) for potential public health emergencies which had been conducted in the past five years, with priorities identified.

Strengths

- A multisector coordination and collaboration mechanism is in place using the One Health platform for response to identify hazards at all levels.
- A national One Health profile has been conducted with findings incorporated in the Multihazard Preparedness Plan.

Challenges

- Lack of awareness by policymakers on the implementation of the plan.
- Varying statutory mandates across institutions during implementation.
- Though a risk profiling was conducted, a national One Health readiness assessment has not been done to determine human resource (HR)and required skills to respond to these hazards identified.

R1.2. Public Health Emergency Operations Centre (PHEOC) – Level 4

After assessing the Liberian PHEOC, it was proven that the country has a national PHEOC, occupying a designated permanent facility, has been established, and an associated PHEOC handbook with full content was in place. In addition, an operating budget exists for the core staffing, daily operations, and maintenance of the national PHEOC and the national PHEOC is capable of activating a coordinated response within 120 minutes of receiving an early warning or other information of an emergency requiring PHEOC activation. Furthermore, PHEOCs have been established at intermediate levels, their associated PHEOC handbooks with full content are in place, and their staff identified to conduct core incident management system (IMS) functions have been trained against public health emergency management (PHEM) competencies. This raised the scoring of this indicator to a level 4, proving the country's competence in this domain.

Strengths

- The existence of physical structures at national and intermediate (county) levels with trained staff, with an updated handbook to support the operations of EOCs.

Challenges

- Limited budget for overall operations of the PHEOCs at national and intermediate levels.
- Limited PHEOC operations due to the unreliability of a power supply.

R1.3. Management of health emergency response – Level 4

Regarding the management of health emergency response, the country attests that an IMS integrated with a national PHEOC, or equivalent structure, is in place and operational at the national level and able to support intermediate levels. Nonetheless, the IMS is unable to support primary public health levels as a result of limited resources.

Strengths

- Available PHEM experts to manage national PHEOCs, ensuring that the IMS is integrated at national and county levels.

Challenges

- PHEM training for staff at national and subnational levels.
- Lack of a well-documented plan for the continuation and sustenance of the PHEM training programme.

R1.4. Activation and coordination of health personnel in a public health emergency – Level 1

With the progress made in the previous indicators, unfortunately, there has been little progress regarding the activation and coordination of health personnel in a public health emergency. There is no national personnel surge plan that has been drafted or is under development

Strengths

- An established One Health multidisciplinary rapid response team trained in emergency response with a clearly defined TOR before, during and post-emergency.

Challenges

- No existing plans to address international deployment (sending/receiving personnel during a public health emergency).
- Limited resources to periodically test coordination amongst One Health sector and to cascade rapid response team (RRT) training across all subnational levels (districts).

R1.5. Emergency logistic and supply chain management – Level 1

With verification from the country, an emergency logistics and supply chain management system/mechanism is under development and are not able to provide adequate support for health emergencies.

Strengths

- A Medical Counter Measure Plan (MCM) has been developed.

Challenges

- Staffing for delivery, receiving and tracking countermeasures.
- International/regional countermeasures procuring, sharing, and distributing agreements.
- Limited support for the implementation of the MCM plan.

R1.6. Research, development, and innovation – Level 3

Liberia has made some progress in research development and innovation. The country has been able to develop a health emergency action plan or framework, which includes mechanisms and procedures for research and

development (R&D), regulatory review for emergency preparedness and response which is implemented and includes identification of institutions (i.e. within and/or outside the country) to support research.

Strengths

- Available scientific integrity policy to ensure that all research follow standards and procedures.
- A developed authorship policy is which assign both credit and responsibility for intellectual work.
- Assistance of Institutional Review Board (IRB).
- Potential members of the IRB are trained.
- A dedicated research unit at NPHIL.

Challenges

- Collaboration with other vertical national programmes.
- Limited collaborations with vertical national programmes that have programmatic roles such the National Malaria Control Programme (NMCP), National Aids Control Programme (NACP) and National Tuberculosis and Leprosy Control Programme (NTLCP).

Recommendations for priority actions

- Conduct an all-hazard national risk assessment using standard tools like STAR followed by development of an integrated action plan.
- Develop and validate a personnel deployment plan and emergency management team plan, including a database for both plans.
- Identify and train surge personnel, RRT and EMT.
- Conduct simulation exercises (including for deployment of surge personnel and sending and receiving health personnel and teams) and implement recommendations.
- Develop disease-specific contingency plans for all risks that are ranked very high, high or moderate from the national multihazard risk assessment.

R2. Linking public health and security authorities

Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade or naturally occurring. In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials.

Target

The country conducts a rapid, multisectoral response for any event of suspected or confirmed deliberate origin, including the capacity to link public health and law enforcement, and to provide timely international assistance.

Liberia level of capabilities

Liberia made a clear presentation of its capabilities, including experience in conducting a rapid multisectoral response for previous outbreaks (EVD, COVID-19), capacity to suspect or confirm cases of deliberate origin, capacity to link public health and law enforcement agencies, and to collaborate with international aid organizations. There is an existing legal framework and statutes which are the basis for emergency response for security forces. These frameworks allow the sharing of relevant information among appropriate human and animal health and law enforcement personnel. Liberia has systems to conduct and support joint epidemiological and criminal investigations to identify and respond to suspected biological, chemical, radiological, and nuclear incidents in collaboration with individual Biological and Toxin Weapons Convention (BTWC) States Parties. The technical lead for the joint security comprises the Ministry of Defense (MOD), Liberian National Police (LNP), Liberia Immigration Services (LIS), and the Liberia National Fire Services (LNFS). The LNP heads the joint security in close collaboration with international humanitarian law (IHL), chemical, biological, and radiological technical leads and focal points. The joint security provided multiple functions including protection of healthcare and outbreak responders, security to quarantine sites and communities, and healthcare support.

In terms of best practices, the country listed the following:

- Coordination and collaborations with civil authorities (Joint security and public health);
- Protection for healthcare workers and other response personnel (LNP, AFL, LIS, LNFS);
- Centralized response centre (Incident Management System)- Joint security headquarters;
- Support to healthcare provision and hospitalization (Military, LNFS);
- Quarantine of target communities (Military, LNP, LIS);
- Joint security submission to civil authority during outbreak responses.

Indicators and scores

R2.1. Public health and security authorities, (e.g. law enforcement, border control, customs) are involved during a suspect or confirmed biological, chemical or radiological event – Score 2

The country proposed a score of 3, considering that the score of the previous JEE was 2, and the security authorities have made internal efforts to respond to health emergencies on time, produce and implement, for example, the Liberia National Police Act (2016). Security authorities have benefited from integrated training alongside public health, despite not all security sectors having the benefit of these trainings. Security authorities are part of the One

Health group. Despite these relationships, there are no roles and responsibilities of the security authorities in the National Emergency Preparedness and Response Plan. There isn't any formal MoU, or agreement signed between the two entities, and security authorities have not been part of any simulation exercise of preparedness for public health events. No One Health training on how security forces can respond to a public health event has been delivered by public health partners. Security authorities have not yet participated in a joint investigation, although lessons learned from Ebola and COVID-19 outbreak response. Therefore, both the JEE team and the host country agreed to score 2.

Strengths

- Regular collaboration amongst security forces and security forces with MOH/NPHIL.
- Strengthening the military healthcare response capacities.
- Consultative meetings with regional partners for Health Disaster response (APORA, ECOWAS).
- Regular Joint security meetings to integrate efforts for strategic response.
- Conduct of joint exercises for national emergency response.
- Various Acts that established each Security Institution (AFL, LNP, LIS, LNFS).

Challenges

- Efficiency in response timelines with an established MoU.
- Lack of an MoU for response between the Law enforcement Agency and Public health.
- Collaboration between Joint Security, NPHIL, MoA, and EPA to be strengthened.
- Inadequate collaboration between IHR focal point and security focal points (e.g. IHR Focal Point to conduct monthly or quarterly meetings with Security Focal Points).
- Lack of adequate integrated training at the national level for Joint Security.
- Lack of regular updates and revisions of SOPs (LNP/LIS PoEs),
- Inadequate coordination between IHR Focal Point and Security Focal Point.
- Bureaucracy for Joint security response time due to the inexistence of established MoU with the public health sector.

Recommendations for priority actions

- Establish an MoU between public health and security authorities.
- Develop a joint curriculum for training for risk assessment and investigation specific to public health security.
- Conduct a joint simulation exercise (SimEx) between the public health and the security authorities.

R3. Health services provision

Introduction

Resilient national health systems are essential for countries to prevent, detect, respond to and recover from public health events, while ensuring the maintenance of health systems functions, including the continued delivery of essential health services at all levels. Particularly in emergencies, health services provision for both event-related case management and routine health services are equally as important. Moreover, ensuring minimal disruption in health service utilization before, during and beyond an emergency and across the varied contexts within a country is also a critical aspect of a resilient health system.

Target

(1) Evidence of demonstrated application of case management procedures for events caused by IHR relevant hazards. (2) Optimal utilization of health services, including during emergencies. (3) Ensuring continuity of essential health services in emergencies.

Liberia level of capabilities

Liberia has qualified and experienced case managers and isolation facilities for case management established in public and private referral health facilities. There is infrastructure for the production and distribution of medical grade *oxygen* for treatment of critically-ill patients. In addition, there are national technical guidelines for the clinical management of infectious diseases such as COVID-19 and Ebola Virus Diseases (EVD). Other critical technical guidelines existing include national therapeutic guidelines (hospitals and clinics), national standard treatment guidelines for all diseases and essential medicine list. The country has integrated COVID-19 clinical care into routine health services (COVID-19 Treatment Handbook), and there is regular follow-up of survivors of disease outbreaks to document the evolution of the diseases and any adverse events. The country also conducts systematic reviews and updates of clinical guidelines and SOPs for case management, psychosocial and mental health. Challenges impeding health service provisions include limited access to health services (30% of the population lack access to health facilities), frequent stock out of essential drugs and medical supplies, and high health workforce attrition, maldistribution and demotivation.

Indicators and scores

R3.1. Case *management* – Score 1

Strengths

- Availability of case management guidelines for COVID-19 and Ebola Virus Disease (EVD).
- There is also a standard national therapeutic guideline (hospital and clinics), national standard treatment guidelines for all diseases and essential medicine list.

Challenges

- Inadequate availability of the case management guidelines with SOPs on list of designated referral health-care facilities, referral procedures, field triage, safe transportation and case management guidelines to treat pathologies resulting from the events for some of the national priority diseases such as Lassa fever, etc.

R3.2. Utilization of health services – Score 1

Strengths

- There are supervisory and mentorship visits done to the health facilities to identify challenges in the provision of health services.

Challenges

- There are very low levels of health service utilization (number of outpatient department visits is <1.0 visit/person/year in urban and rural areas.
- Thirty percent of the population lack access to health facilities.
- Frequent stock out of essential drugs and medical supplies.
- High health workforce attrition, maldistribution and demotivation.

R3.3. Continuity of essential health services (EHS) – Score 4

Strengths

- There is a defined package of Essential Health Services (EHS).
- There are plan/guidelines on continuity of EHS in emergencies developed during COVID-19.
- A survey has been conducted to monitor service continuity at the national, intermediate and primary public health levels during COVID-19.
- Mechanisms for monitoring service continuity during emergencies are in place at the national, intermediate and primary levels.

Challenges

Mechanisms for monitoring service continuity based on existing guidelines are defined and functional at all levels but have not yet been exercised, reviewed, evaluated and updated with improvements based on simulation exercises and lessons learned from real-world events-e.g., IAR (Intra-Action Reviews) or AAR (After Action Review).

Recommendations for priority actions

- Develop case management guidelines for priority health events, including chemical, trauma and radiation emergencies.
- Improve utilization of health services through the availability of essential medicines and supplies at service delivery points.
- Increase access to, and quality health services by ensuring a better distribution and competent health workforce.
- Update the national and county operational plans to include the continuity of essential services during health emergencies.

R4. Infection prevention and control

Introduction

To have strong, effective infection prevention and control (IPC) programmes that enables safe health care and essential services delivery and prevention and control of health care acquired infections (HCAIs). It is critical to initially ensure that at least the minimum requirements for IPC are in place, both at the national and facility level, and to gradually progress to the full achievement of all requirements within the WHO IPC core components recommendations.

Target

(1) National IPC programme strategy has been developed and disseminated. (2) Implementation of the national IPC programme plans, with monitoring and reporting of HCAIs. (3) Established national standards and resources for safe health facilities.

Liberia level of capabilities

The 2014–16 Ebola Virus Disease (EVD) Outbreak in Liberia highlighted critical gaps in the health system and clearly demonstrated a lack of infection prevention and control (IPC) practices, resulting in EVD transmission to both healthcare workers (HCWs) and patients. A key lesson learnt was that to prevent future outbreaks, a culture of IPC needed to be incorporated in the routine health care system; an IPC structure and programme that would provide leadership and guidance for IPC practices within Liberia.

Several stakeholders came together then to develop the National IPC Programme of Liberia which permeates all levels of the health system. Health facility-level stakeholders are the key drivers for implementing IPC activities within the health system. District level stakeholders support the full implementation of IPC activities in various health facilities through proper leadership. County health team stakeholders provide supervision on IPC activities that should implemented at various facilities within their county. National level stakeholders provide strategic and policy direction by developing standards, guidelines, and protocols to be implemented at lower levels. They also conduct monitoring and evaluation support throughout subnational levels of the health system as managers of the IPC programme.

In Liberia, national level IPC stakeholders include MOH programmes, other line agencies and ministries (NPHIL MOA, MOE, Security Agencies etc.); international partners (WHO, Jhpiego, US CDC, Last Mile Health, GIZ, UNICEF, Africa CDC, JICA etc.); and local NGO partners.

Indicators and scores

R4.1. IPC programmes – Score 2

The national IPC programme runs from national level to health facility level with defined objectives to meet the WHO recommended IPC minimum requirements of the core components for IPC programmes to provide minimum protection and safety to patients, healthcare workers and visitors at national and health facility levels. Some facility level IPC plans are not fully implemented. All stakeholders contribute at their level of implementation to ensure complete success of the programme.

Strengths

- The IPC Unit, located within the Ministry of Health, oversees the IPC programme at all health system levels according to established guidelines and standards. A new national IPC strategic plan (2023–2027) which provides strategic direction for interventions has been developed.

- The IPC programme is well decentralized at the national, county, district and facility level and integrated into the structures of tertiary, secondary and primary health facilities.
- Each level of decentralized IPC implementation has a trained IPC focal person with guidelines and standards to support their work.

Challenges

- No government budgetary support is provided to support the IPC programme sustenance.
- Majority of health facilities do not have safe water sources.
- There is limited funding for continuous training of clinical staff on IPC in health facilities.
- There is no standardized continuing professional training programme for IPC in health facilities.
- There is limited technical capacity to sustain IPC education and research.

R4.2. Healthcare associated infections (HAI) surveillance – Score 1

Healthcare associated infections (HAI) are a major patient safety problem, resulting in increased morbidity and mortality, prolongation of hospital admission, and significant economic burden to health systems worldwide. This is observed to be significantly higher in developing countries like Liberia compared to developed countries due to poor infrastructure, insufficient equipment, and health care worker knowledge gap on HAI/IPC prevention.

There is no national HAI surveillance programme or national strategic plan for HAIs surveillance, including pathogens that are antimicrobial resistant and/ or prone to outbreaks.

Strengths

- (No strength)

Challenges

- There is no budgetary support to establish the HAI surveillance system.
- There is limited clinical laboratory capacity to facilitate HAI surveillance programme delivery.
- There is limited technical capacity to undertake HAI surveillance.
- There is no standardized data collection, analysis, interpretation, dissemination and storage system to support HAI surveillance.

R4.3. Safe environment in health facilities – Score 2

There are national standards and guidelines for a safe built environment e.g., WASH, screening, isolation areas and sterilization services in health care facilities, including appropriate infrastructure, materials, and equipment for IPC. There are also standards for the reduction of overcrowding and optimization of staffing levels in healthcare facilities, according to WHO minimum requirements. These are not fully implemented through a national plan. Health facility managers do well to maintain a safe environment for the delivery of healthcare services with the limited resources available in the face of severe challenges to achieve this.

Strengths

- National guidelines, standards and procedures to maintain a safe environment in health facilities exist and have been made available at all health facilities.

- All health facilities within the country have water sources (pipe-borne, mechanized boreholes, hand pumps), however, the safety of the water available cannot be fully guaranteed.
- WASH assessment is normally included in safety and functionality assessment of health facilities.
- National healthcare waste management guidelines and occupation health and safety guidelines have been developed and disseminated to all public healthcare facilities.
- The IPC Programme is embedded in the National Quality Management Unit of the Ministry of Health.

Challenges

- There is a lack of standardized data collection, analysis, interpretation, dissemination, and storage system.
- There is a lack of support for education and research.
- There is capacity for water testing and quality control at the national laboratory, but this service is not available to all health facilities due to funding constraints.

Recommendations for priority actions

- The Ministry of Health should establish a dedicated budget line and allocate resources for IPC, HAI and AMR surveillance.
- The Ministry of Health should allocate funds for laboratories to conduct water safety testing and analysis for water sources in all health facilities.
- Establish HAI surveillance system and ensure technical capacities are built to support the system including a national data system for generating and storing IPC data for evidence and decision-making.
- The Ministry of Health should allocate resources to increase and improve WASH infrastructure and activities in all health facilities.
- Rollout National Strategic Plan at subnational level of the health system and ensure that all facilities have facility-based IPC plans to guide IPC implementation.

R5. Risk communication and community engagement

Introduction

Risk communications should be a multilevel and multifaceted process which aims at helping stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience, thereby promoting the capacity to cope with an unfolding public health emergency. An essential part of risk communication is the dissemination of information to the public about health risks and events, such as disease outbreaks. For any communication about risk caused by a specific event to be effective, the social, religious, cultural, political and economic aspects associated with the event should be taken into account, including the voice of the affected population.

Target

States Parties use multilevel, multisectoral and multifaceted risk communication and community engagement (RCCE) capacity for public health emergencies. Real-time exchange of information, advice and opinions during unusual and unexpected events and emergencies so that informed decisions to mitigate the effects of threats, and protective and preventive action can be made. This includes a mix of communication and engagement strategies, such as media and social media communications, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement community engagement and infodemic management.

Liberia level of capabilities

Risk communication and community engagement (RCCE) is critical to Liberia's health security infrastructure. RCCE is a core component of the National Emergency Response and Preparedness Plan and is an independent pillar within the One Health platform. RCCE for health security in Liberia revolves around four key areas: message and material development; advocacy, social mobilization, community engagement and interpersonal communication; rumour monitoring and management; and media and public communication. The rotational leadership structure is made up of multisectoral stakeholders from animal, human and environment. There has been integration of community animal health workers into the National Community Health Assistant (CHA) Programme. There is a multisectoral RCCE technical working group (TWG) that meets regularly and manages the development of all public communication for One Health activities. RCCE capacity is present at national and subnational levels, although systematic mechanisms at the community level are non-existent. Gaps also exist in behavioural research and tertiary training opportunities to drive the desired data-driven approach.

Indicators and scores

R5.1. RCCE systems for emergencies – Score 3

The country conducts routine national RCCE functions and some aspects of infodemic management and behavioural and cultural insight. However, human and financial resources are limited, particularly at the subnational level. A multisectoral approach is employed to coordinate technical areas, but it is hampered by fragmentation and limited capacity in other sectors.

Strengths

- Rotational leadership structure through stakeholders from animal, human and environmental sectors.
- RCCE TWGs established are functional at national and county levels.

- Demonstrated examples of multisectoral collaboration during outbreaks (each sector works collaboratively during outbreaks).
- Multiple agencies have developed communication/risk communication strategies.
- A rumour monitoring team exists and is trained across all One Health (OH) sectors and uses a rumour monitoring tracking tool with established terms of reference.
- Rumour management is integrated with surveillance rumour tracking.

Challenges

- No budget allocation for RCCE in the national budget. Burdensome bureaucracy to access funding.
- Fragmentation and collaboration between sectors at the subnational level.
- Lack of access to training and practical opportunities at the tertiary level for RCCE specialists.
- Limited availability of recent behavioural research on infectious disease.
- Lack of supervision or monitoring mechanisms, no simulation exercises.

R5.2. Risk communication – Score 2

The country had scored itself at level three, but during the evaluation process, the score was downgraded to level two, and consensus was reached. Although risk communication plans, policies and procedures are in place and there is some analysis of target audience bases, however, there is a gap in routine infodemic management and insight analysis functioning. Therefore, the country's capacity is scored at level two.

Strengths

- RCCE One Health Sop Operational Procedures and annual work plan.
- Clearinghouse with standard procedures for message development for dissemination.
- RCCE TWG has a functioning media team and coordinates with media partners.
- A validated message guide exists for One Health priority zoonotic diseases.
- Audio and print materials for all priority diseases have been developed.

Challenges

- No existing platform to capture, store and share data.
- Limited existing RCCE monitoring tools and indicators.
- There is no central RCCE repository for existing and future materials.
- Delay in getting approval for spokespersons for other sectors outside of human health.

R5.3. Community engagement – Score 3

Active communication channels with community actors have been established for the coordination of emergency response. Stakeholders have been mapped, and there is a hotline (#455) for communities to report events. Social behavioural research was conducted during the COVID-19 pandemic, and findings have been incorporated into practice moving forward.

Strengths

- There is a national community health programme with community health assistants, and community animal health workers that are supported by the RCCE secretariat to deliver RCCE on priority diseases and provide support during outbreaks.
- Community engagement structures and stakeholders have been identified to establish quick and active communication channels with national RCCE structures, particularly useful in an outbreak situation.
- Community engagement is a core area within the RCCE One Health Technical Working Group. RCCE SOP clearly states the function of Community Engagement.
- RCCE uses a data-driven approach to drive messaging and overall strategy.

Challenges

- Inadequate information dissemination in remote areas coupled with difficulty training local leaders in these areas due to accessibility.
- Geographical barriers limit access to hard-to-reach communities.
- Low community-level ownership, leadership, and initiative.
- Delayed access to actionable health information by communities.

Recommendations for priority actions

- Establish a system for routine infodemic management and insight analysis.
- Develop, (validate and disseminate) a One Health multihazard Risk Communication and Community Engagement (RCCE) Strategy and Plan for Emergency Preparedness and Response and reinforce its implementation.
- Conduct a simulation exercise (SIMEX) for One Health RCCE and integrate RCCE into Full-scale/functional SIMEX.
- Establish a robust monitoring and evaluation system to assess RCCE implementation and performance.
- Develop and implement a national multisectoral and multihazard community engagement plan to strengthen community protection and resilience.

IHR-related hazards, points of entry and border health

PoE: Points of entry and border health

Introduction

All core capacities and potential hazards apply to "points of entry" and thus enable the effective application of health measures to prevent international spread of diseases. States Parties are required to maintain core capacities at designated international airports and ports (and were justified for public health reasons, a State Party may designate ground crossings), which will implement specific public health measures required to manage a variety of public health risks.

Target

States Parties designate and maintain core capacities at international airports and ports (and were justified for public health reasons, a State Party may designate ground crossings) that implement specific public health measures required to manage a variety of public health risks.

Liberia level of capabilities

The Ministry of Health /National IHR Focal Point has designated 8 Points of Entry (PoE): two (out of four) seaports, two airports, and four (out of 45 formal) ground crossings. The World Organisation for Animal Health (WOAH/OIE) focal point has 17 designated PoE: three (out of four) seaports, two airports, and 12 (out of 25 formal) ground crossings. There is a multisectoral involvement of stakeholders' focal point in PoE activities.

Roles and responsibilities of all stakeholders are clearly defined and distributed for the Ministry of Health /National Public Health Institute of Liberia, Ministry of Agriculture (MoA), Ministry of Commerce & Industry, Liberia Maritime Authority, Liberia Civil Aviation Authority, Liberia Airport Authority, National Port Authority, Liberia Revenue Authority, Liberia Immigration Service, Partners (IOM, WHO, Jhpiego, ADB, AFENET, US CDC, Africa CDC), and the private sector.

Indicators and scores

PoE1. Core capacity requirements at all times for PoE (airports, ports and ground crossings) – Score 2

Strengths

- The eight designated PoE have access to appropriate medical services including (diagnostic facilities, prompt assessment, care of ill travellers, adequate staff, equipment and premises, and facilities to assess potentially contaminated/ infected travellers and animals), either onsite or through a link with district or county health team.
- Referral of ill travellers is integrated into the National Emergency Preparedness and Response (EPR) Plan and existing surveillance structure at both national and intermediate levels.
- There is a close collaboration between Port Health Officers (PHO) and Quarantine Officers (QO), existing of draft legislation that covers the activities of private vet pending approval MoU with referral centres for animal health between MoA and private vet facilities, and PoE activities integrated into the national Epidemiology (EPI) Bulletin.
- All designated PoE have SOPs, and trained staff that understand the referral pathway and all non-designated PoE have SOPs, trained non-health stakeholders understand the referral pathway.

- All staff at sea, airports, and ground crossing have gone through COVID-19 training, SOPs, and developed training modules.
- The field visit of the Free Port of Monrovia confirms that the procedure of handling incoming vessels was satisfactorily outlined, with a suitable landing party and handling of necessary documents.

Challenges

- Despite having a draft legislation covering private vet facilities (two facilities) and the university, yet no referral means – unsupervised transport by the animals' owners.
- Inadequate number of trained personnel to effectively implement PoE activities.
- No joint training of all sectors which, introduces a coordination nightmare.

PoE2. Public health response at PoE – Score 3

Strengths

- All eight designated and four out of 45 non-designated PoE have specific Public Health Emergency Contingency Plan (PHECP).
- Referral system and transport for the safe transfer of ill travellers is in place and satisfactory.
- There are appropriate medical facilities for all sea and airports.
- Liberia Immigration Services (LIS) controls and security presence at entry and existing points are operational.
- Constructed two holder facilities (RIA & Bo waterside).
- The handling of sick travellers and deceased individuals while on board is commendable. The emergency response plan was well thought out, with clearly defined roles and standard operating procedures and guidelines. The administrative arrangement with Redemption hospital is in place, but a private local facility is used for emergencies and as a holding unit. Simulations were conducted beforehand with all parties involved, and agriculture conducted inspections of plant material, food, and animals. Overall, the procedures in place are satisfactory.
- An In-service training during emergency (COVID-19 focused) was conducted.
- Ports' management provides logistics support for emergency coordination with relevant governmental bodies.
- The private sector is involved during an emergency (social responsibility).

Challenges

- Updating of the SoPs & PHECPs: (Sea, Air, Ground Crossing); Despite clear roles and responsibility, overlapping functions interfere with activities.
- No ambulance (borrowed from a private entity).
- No animal quarantine facility and no capacity for checking chemical levels in ship and food.
- Lack of appropriate means of transportation of sick travellers or suspected cases from the PoE to the nearest health care facility.

PoE3. Risk-based approach to international travel-related measures – Score 1

Strengths

- The country has the capacities in place to adjust, adapt, and implement travel protocol with a multisectoral strategy for international travel-related measures.

- The PoE paper base screening tools have been transformed to an electronic base and is currently in use at four designated PoEs (RIA, Ganta, Yekepa, Bo-water side).
- There are enacted laws that govern the activities of the Ministry of Health, and of the Ministry of Agriculture regarding personnel and movement agriculture articles.

Challenges

- Effective coordination between different partners is challenging because of their large number and overlapping schedules, rendering the whole process time-consuming.
- Lack of isolation and holding centers for Ganta, Yekepa, Loguatuo, James Spriggs Paynes Airport.

Recommendations for priority actions

- Increase response capacity and capability of staff at the PoEs by providing regular and appropriate trainings, supervision and required supplies.
- Ensure that testing (rapid tests) facility is available at the designated PoEs for humans and animals.
- Ensure that all designated PoEs have vaccination capacity for humans and animals.
- Ensure that SOPs for management and referral of sick travellers are available and implemented, also that appropriate equipment are available.
- Strengthen cross border coordination with neighbouring countries for public health events preparedness and response.

CE. Chemical events

Introduction

Timely detection and effective response of potential chemical risks and/or events requires collaboration with other sectors responsible for chemical safety, industries, transportation and safe disposal. This would entail that State Parties need to have surveillance and response capacity to manage chemical risk or events and effective communication and collaboration among the sectors responsible for chemical safety.

Target

States Parties with surveillance and capacity for chemical risks or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, including health, occupational health, emergencies, environment, transportation and safe disposal, agriculture/veterinary, as well as industries.

Liberia level of capabilities

The country has identified critical sectors where large scale use of chemicals is used, such as agriculture and mining. The government has assigned the Environmental Protection Agency (EPA) to regulate the use of chemicals in the country. To safeguard the environment from chemical incidents, the country has implemented legislation, including the Environmental Protection and Management Law of Liberia (2003). Furthermore, the Chemical Biological Radiological Network (CBRN) has been established in Liberia.

The National Public Health Institute of Liberia (NPHIL) has a division of Environmental Health which collaborates with the EPA and other relevant sector Ministries, Agencies and Corporation (MACs) to strengthen the existing laboratories, surveillance, public health capacity building, response to chemical control and spillage, and monitoring of event and emergencies with public health potential.

Finally, there is an SOP for the handling and transporting chemicals and a register of chemicals in the country.

Indicators and scores

CE1. Mechanisms established and functioning for detecting and responding to chemical events or emergencies – Score 3

The country has mechanisms to ensure that chemicals are registered in case of an event, and the laboratory capacity has been enhanced for the detection of chemical agents. However, it was noted that training for laboratory investigation, transporting, storage and general handling of chemicals needed to be enhanced. Training has been provided to EPA inspectors and other EPA staff in the Environmental and Social Impact Assessment (ESIA) process and other specific related topics on the monitoring, handling and prevention of spills into the environment. Notably, there is a mechanism to ensure that companies involved in chemical usage build quality tailing storage facilities (TSF).

Strengths

- Liberia is using IDSR, EBS and IBS within IDSR to identify alerts and events of a chemical nature.
- The Environmental Protection Agency laboratory has the capacity to respond to chemical spills.
- Regular in-service training of personnel to manage chemical events through the EPA and ESIA process.

Challenges

- The response to chemical events is currently limited to the EPA, and not integrated into the One Health framework or other emergency networks.
- Training and monitoring activities for chemical events are housed within the EPA. Limited information is available from other sectors.
- Collaboration and coordination among stakeholders is poor at the time of managing chemical spillage.

CE2. Enabling environment in place for management of chemical events – Score 2

The score here was reduced from the self-reported 3 to the score of 2 as there is no chemical event response plan in place. It should be noted, though, that the country does have mechanisms to respond to chemical events through the established CBRN mechanism. It was recognised that there is a need to build stronger collaboration in the formation of the rapid response team (crisis management team) and its operation in responding to chemical events, and it would be advantageous to conduct simulation exercises with all stakeholders, including first responders to enhance coordination in spills and other chemical events.

Strengths

- There is a CBRN mechanism established in the country with over 20 ministries engaged.
- The Environmental Protection Agency laboratory has the capacity to respond to chemical spills.
- Regular in-service training of personnel to manage chemical events through the EPA and ESIA process.

Challenges

- The response to chemical spillage is limited to the EPA;
- Need to establish stronger collaboration with all stakeholders in time of managing chemical spillage.

Recommendations for priority actions

- Financial support for all institutions that have the mandate to manage and respond to chemical events. Such budgetary allotment or pool funds should be used to establish the crisis management team made up of all relevant institutions in responding to any chemical spillage or hazards.
- Training opportunities should be explored and provided for staff of all institutions responsible for managing and responding to chemical events. Training should include but not be limited to laboratory investigation, wastewater treatment, and the capacity to monitor hardest food and goods.
- Need to have One Health monitoring and response team for chemical management and response to chemical events.
- Recommend that the head of the Incident Management Committee link with colleagues of the EPA or the institution leading the investigation to ensure the availability of reports emerging from the events.

RE. Radiation emergencies

Introduction

To counter radiological and nuclear emergencies, timely detection and an effective response towards potential radiological and nuclear hazards/events/emergencies are required in collaboration with sectors responsible for radiation emergency management.

- Public health impact due to human continuous unaware exposure to ionizing radiation from medical devices, industrial materials and the environment is of high significance in Liberia.
- The unmonitored importation and usage of devices such as x-rays, CT, mammography, density gauges, XRFs in medical and industrial sectors is usually abandon into the environment causing cancer related illnesses to people and environmental degradation.
- These Radiation Sources in Liberia must be regulated to protect people and the environment.

In 2003 the EPA in Liberia was established. The EPA is the regulatory Institution of the Government of Liberia and responsible for the sustainable management of the environment and its natural resources and has the mandate to regulate Ionization and other Radiation in Liberia. At present laws in the **Environmental Protection and Management Law (PART IV)** regarding radiation in Liberia include:

- **Section 44-** Standards for Ionization and other Radiation
- **Section 45-** Offences Relating to Ionizing Radiation
- **Section 46-** Powers of Environmental Inspectors Relating to Ionizing Radiation

Target

States Parties should have surveillance and response capacity for radiological emergencies and nuclear accidents. This requires effective coordination among all sectors involved in radiation emergencies preparedness and response. Some of the goals of Liberia are to:

- *Establish Liberia Atomic Energy Commission for all matters relating to radiation and Nuclear*
- *Validate all draft polices, guidelines, legislations and other documents relating to radiation emergency preparedness and response*

Liberia level of capabilities

In the country, certain areas such as agriculture, medicine, and mining have been identified for the use of radioactive nuclear material. To ensure proper coordination, a Technical Working Group has been established as part of the CBRN Inter-ministerial mechanism. Liberia has identified 21 stakeholders and responsible parties. The government has signed the Terrorist Act, which provides guidelines for the safe handling of nuclear material and is now participating in the ECOWAS Nuclear Security Regime. Currently, Liberia is developing a Cabinet Memo for government approval and submission to the International Atomic Energy Agency (IAEA) for adherence to the Convention on the Physical Protection of Nuclear Material (CPPM). However, the country has not signed the Convention on the Early Notification of a Nuclear Accident or the Convention on Assistance in a Nuclear Accident or Radiological Emergency. Despite this, no radiological events have occurred in Liberia so far and there is no plan to become a signatory of these conventions. Although there have been no comprehensive radiation assessments in the past five years, the agency responsible for radio nuclear matters has been identified and legislation is being drafted to address this issue.

The EPA has been given the mandate for regulating radiation and radio nuclear activities, however, the agency has a broad mandate and a key challenge is the level of resources directed and/or dedicated to addressing the regulation of radiation and radio nuclear activities. Additionally, policies, procedures and guidelines are not validated, so implementation is challenging, and enforcement of regulations is difficult. A strategic plan has been developed by the CBRNe "*National Action Plan*" to guide its Radiation and Nuclear Science and Technology Programme.

Indicators and scores

RE1. Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies – Score 2

Strengths

- Radiation monitoring activities can be performed in the country;
- An inventory has been completed for radiation sources in the medical sector and is in progress for other sectors such as private medical facilities, industrial and mining sectors in Liberia;
- Regulations relating to ionizing radiation regulation are being drafted;
- A programme is established for activities involving ionizing radiation, including granting of licenses, training of radiation protection officers, developing checklists for inspections in medical and industrial sectors, radiation source registry, etc.

Challenges

- Lack of national radiation and nuclear regulatory body independent of the EPA;
- Legislation covering radio and nuclear issues is still in draft format;
- No national stockpiles of pharmaceutical countermeasures for radiation emergencies.

RE2. Enabling environment in place for management of radiological and nuclear emergencies – Score 2

Strengths

- Capacity building opportunities relating to radiation and nuclear science and technology;
- The EPA and the CBRN are seated at the Ministry of Foreign Affairs have the mechanism to mobilize government and partners support to mobilize funding.
- There is a linkage to the IAEA response and assistance network RANET;
- CBRN is established in Liberia and is active;
- EPA has been identified as the body responsible for radio nuclear matters;
- Radiation laboratory is established with equipment for radiological analysis and monitoring;
- A source inventory for medical facilities is completed.

Challenges

- Lack of national radiation and nuclear regulatory body independent of the EPA;
- No regulations around transport of radio nuclear material, but staff are currently undergoing training in this area;
- Limited links to other key radiation event response networks.
- No emergency response plan for a radiological or nuclear emergency

Recommendations for priority actions

- Establish Liberia Atomic Energy Commission for all matters relating to radiation and nuclear activities.
- Validate all draft policies, guidelines, legislations and other documents relating to radiation emergency preparedness and response.
- Conduct radiation inventory for other sectors to complete national source registry.

In addition to the above recommendation and priority actions, the following should be considered:

- More support is needed in order to validate all draft policies, guidelines, legislations and other documents relating to radiation emergency preparedness and response;
- More capacity needs to be built on how to use the available equipment for responding to radiation emergencies and events.
- More attention needs to be given to radiological inventories and sources

Relevant Documentation

Prevent

P1. Legal instruments

- Public Health Law (1976)
- Public Health Bill: https://www.dropbox.com/s/uxyzzxxkwyspeyc/PUBLIC%20HEALTH%20BILL--CLEAN-JULY%202022.docx?dl=0
- Liberia national gender policy (2010–2015) https://www.oecd.org/swac/data-and-dialogue/gender-west-africa/Liberia%20National%20Gender%20Policy%202010-2015_EN.pdf
- Pro-poor agenda for prosperity and development (2018–2023); https://cdn.climatepolicyradar.org/navigator/LBR/2018/pro-poor-agenda-for-prosperity-and-development_3549c2d5ab82ce58a5b59fe6b9afa671.pdf
- National health policy plan (2011–2021) National-Health-Policy-Plan-MOH-2011-2021-Liberia.pdf

P2. Financing

- National health policy and plan 2022
- National health financing policy 2023
- NAPHS 2018–2023

P3. IHR coordination, national IHR focal point functions and advocacy

- One Health governance manual, 2022
- After action review report, 2023
- Draft national public health institute strategic plan 2023
- IHR-NFP composition
- IHR NFP notification email to WHO under Article 6 of IHR
- Multihazard contingency plan, March 2018
- National Action Plan for Health Security 2018–2022
- Report of the Liberia Joint External Evaluation (JEE) self-assessment for 2023
- Standard operating procedures for IHR national focal point
- State party annual report (SPAR) 2021
- Vulnerability and risk assessment (VRA) tool report 2021

P4. Antimicrobial resistance (AMR)

- ATLASS/PMP report. Liberia. 2022. Progressive management pathway for antimicrobial resistance and assessment of the national AMR surveillance system in the food, agriculture and human sectors
- Integrated AMR surveillance strategy (Validated 2023)
- Joint national action plan for health security (NAPHS, 2018–2022)
- MOH. 2018. National infection prevention and control guidelines
- MOH. 2022. Baseline assessment of antibiotic consumption and resistance using the point prevalence survey. 2022.
- MOH. 2023. National IPC strategic Plan (2023–2027)
- MOH/NPHIL. 2021. National healthcare waste management guidelines
- National action plan on prevention and containment of antimicrobial resistance in Liberia (2018–2022)
- National healthcare waste management guidelines
- National surveillance strategy for antimicrobial resistance (AMR) organisms in foods of animal origin and animal feeds

- Republic of Liberia One Health coordination platform. 2018. Ministry of Health, Ministry of Agriculture, National public health institute of Liberia, Environmental Protection Agency and the Forest Development Authority
- LMHRA. 2010. An act to establish the Liberia medicines and health products regulatory authority
- LMHRA. 2021. Guidelines for quality assurance/quality control of medicines and health products version
- FAO/MOA. 2021. Situational analysis of antimicrobial resistance

P5. Zoonotic diseases

- Integrated animal disease surveillance response strategy second edition-2023
- Integrated disease surveillance and response -3rd edition-
- One Health governance manual –second edition -2022
- Wildlife surveillance strategy 2023
- Amended public health law of Liberia 2019
- Bush meat value chain report 2021
- Poultry value chain report 2020
- Poultry farmers training report 2021
- BS/BS trainings for some farmers
- Training manuals for surveillance and BS/BS
- One Health profiling report 2023

P.6 Food safety

- Liberia food law (National Food and Feed Quality and Safety Act of 2019)
- National Codex Committee (NCC) Procedural Manual 2018
- Terms of reference for the National Codex Committee
- Food diseases surveillance detection framework 2021
- Standard case definitions for foodborne diseases
- Food safety guidelines and standard operating procedures (SOPs)
- Meeting report for International Food Safety Authorities Network (INFOSAN) National Workshop for Liberia & Namibia

P7. Biosafety and biosecurity

- National biosafety and biosecurity policy
- National biosafety and biosecurity guide for laboratories Republic of Liberia One Health platform, September 2020

P8. Immunization

- National immunization strategies 2023–2027
- Immunization policies and strategies 2023–2027
- Continuous improvement plan (cIP) 2023–2027
- Comprehensive EPI review report (CER) 2022
- National vaccine implementation plan 2022
- Measles application for mass vaccination
- Measles guidelines
- Effective vaccine management assessment report 2022
- AEFI guidelines and SOPs
- Liberia national deployment and vaccine plan (NDVP)

- Liberia Medicine and Health Products Regulatory Authority Act

Detect

D1. National laboratory system

- Five-year strategic plan for the national health laboratory system in Liberia 2019–2024, MOH, October 2019
- National medical laboratory physical infrastructure guidelines, national health laboratory system of Liberia, MOH, April 2020
- National laboratory standardization guidelines, MOH, July 2019
- National laboratory system policy of Liberia, MOH, July 2019
- National health laboratory strategic plan 2023–2026, NPHIL, November 2022
- Integrated disease surveillance and response system (IADSRS) in Liberia, MOA, February 2023
- Competency-based curriculum pre-service training for medical laboratory technicians, MOH September 2017
- Pre-service education standards for medical laboratory technician programmes Liberia, MOH 2018
- Pre-service education accreditation assessment tools for medical laboratory technology, Liberia, May 2018

D2. Surveillance

- IDSR technical guidelines 3rd Edition-2019
- Surveillance contingency plan - 2023
- National surveillance strategy 2023–2027
- EBS framework and SOP - 2023
- EBOLA SOP – 2016
- EIA-procedure guideline-2017
- Monkey pox SOP-2022
- Revised CEBS manual-2022
- One Health governance manual - 2019
- ADSR technical guideline – 2018
- Rumour/event logbook
- EPI week 34 epidemiological bulletin
- Email pdf of last information shared for EPI week 34
- National RRT guidelines and SOPs

D3. Human resources

- Veterinary workforce development strategy
- Health workforce strategy for Ministry of Health, 2015–2021

Respond

R1. Health emergency management

Relevant documentation

- National EPR Plan/ National multihazard
- VRAM report
- RRT SOPs

- PHEOC handbook
- Draft MCM plan
- National public health and medical research agenda
- NPHI capacity assessment for public health information system
- National TTX presentation
- Referral pathway guidelines
- CONOPS
- PHEOC activation notice
- Last regulatory review for EPR
- Risk assessment report

R2. Linking public health and security authorities

- National Defense Act (2006)
- Liberia National Police Act (2016)

R3. Health services provision

- Essential package of health services for universal health coverage 2022
- Essential package of health services II, Liberia 2022
- National standard therapeutic guideline for hospitals 2023
- Liberia national standard therapeutic guidelines 2023
- Liberia clinic treatment guidelines (CTGs), based on the national standard treatment guidelines (STGs)
- National guideline for health services continuity planning during public health events in Liberia, 2023
- Investment plan for building a resilient health system in Liberia (2011–2021)
- Liberia essential medicine list (LEML) 2023
- Clinical guidelines for treatment of specific diseases (COVID-19, EVD, HIV, TB, NTDs)
- COVID-19 treatment handbook
- Package of essential health services (EHS)
- Plan/guideline on continuity of EHS in emergencies
- Report of the EHS survey report

R4. Infection prevention and control

- National IPC strategic plan (2023–2027)
- National IPC guideline (2018–2023)
- National healthcare waste management guidelines
- National occupation health and safety guideline
- Joint integrated supportive supervision (JISS) tool
- WASH fit assessment tool.
- Hand hygiene tool
- SARA Report

R5. Risk communication and community engagement

- Liberia national risk communication strategic plan 2018–2021
- Standard operating procedures (SOPs) on risk communication coronavirus (COVID-19) April 2020
- Environmental protection agency communication and awareness strategy July 2018
- One Health platform (governance manual) 2nd Edition September, 2021
- National One Health message guide for priority zoonotic diseases in Liberia 2021

- Message guide for Ebola communication version 4 June 1, 2015
- National policy and strategic plan on health promotion Republic of Liberia 2022-2026
- National all hazards risk communication and community engagement strategy for Liberia, (2023 -2033)

IHR-related hazards, points of entry and border health

PoE: Points of entry and border health

- Airport Authority Act.
- Civil Aviation Safety Act.
- Environmental Protection Agency Act.
- Liberia Maritime Authority Act.
- Agriculture Law of Liberia and National Forestry Reform Law.
- Public Health Law of Liberia.
- Standard operation procedure (sea, airport, ground crossing).
- Public health emergency contingency plan (sea, airport, ground crossing).
- PoE risk and need assessment report.
- Weekly EPI bulletin.

CE. Chemical events

- Environmental Protection and Management Law of Liberia (2003)
- SOPs for chemical handling and transportation
- Data on national chemical inventory.
- ESIA Report of recent chemical spillage

RE. Radiation emergencies

- Operational policy and procedures for inspection, Environmental Protection Agency, Republic of Liberia

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4-8 Sept 2023 JEE Attendance list		
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Dr Nakyeyune Phiona	National	MoH