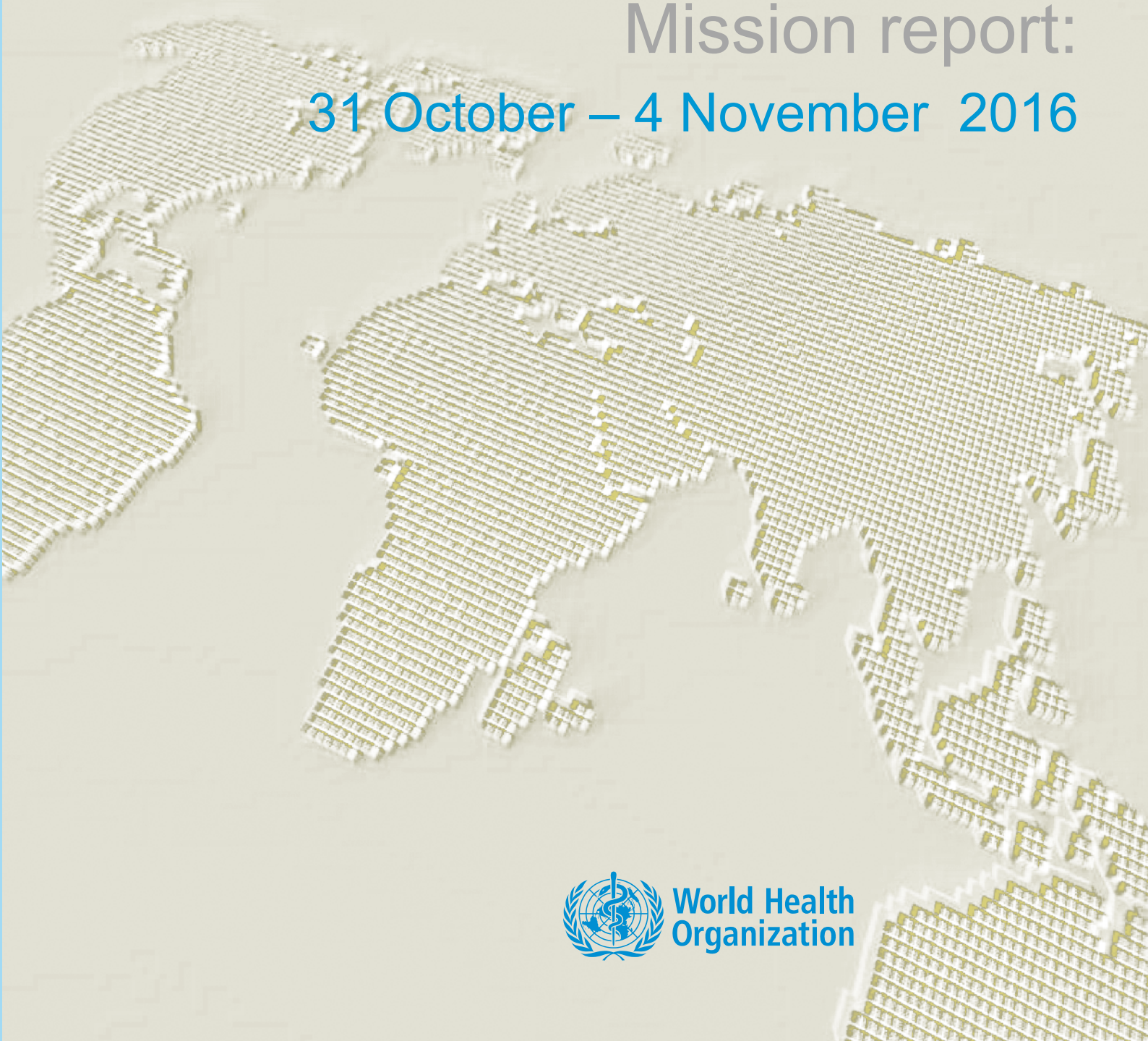
JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of the

REPUBLIC OF SIERRA LEONE

Mission report:

31 October – 4 November 2016



World Health Organization

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- Global Health Security Agenda for their collaboration and support.

Contents

Abbreviations

AFP	Acute Flaccid Paralysis
CDC	Centers for Disease Prevention and Control
cMYP	Comprehensive Multi Year Plan for Immunization
CPHRL	Central Public Health Reference Laboratory
DEHS	Directorate of Environmental Health Services
DHMT	District Health Management Team
EOC	Emergency Operation Center
EVD	Ebola Virus Disease
FCCC	United Nations Framework Convention on Climate Change
FETP	Field Epidemiology Training Program
FAO	United Nations Food and Agriculture Organization
GHSA	Global Health Security Agenda
HCAI	Health Care Associated Infection
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
INFOSAN	International Food Safety Authority Network
IPC	Infection Prevention and Control
IT	Information Technology
JEE	Joint External Evaluation
MAFFS	Ministry of Agriculture, Forestry and Food Security
MARPOL	International Convention for the Prevention of Pollution from Ships
MOU	Memorandum of Understanding
NFP	National Focal Person
OIE	World Organisation for Animal Health
ONS	Office of the National Security
PHEIC	Public Health Emergency International Concern
PHEMC	Public Health Emergency Medical Committee
PVS	Performance of Veterinary Services
POE	Point of Entry
REDISSE	Regional Disease Surveillance Systems Enhancement
RRT	Rapid Response Team
SARI	Severe Acute Respiratory Infection
SAICM	Strategic Approach to International Chemicals Management
SLMTA	Strengthening Laboratory Management Toward Accreditation
SLSB	Sierra Leone Standard Bureau
SOP	Standard Operating Procedure
WHO	World Health Organization

Executive summary

Since June 2007, countries have been making efforts to strengthen their core capacities as stipulated by the International Health Regulations (2005) (IHR). Under Article 54 of the IHR, countries are required to report annually to the World Health Assembly on progress made in implementing the Regulations. IHR review committees and several expert panels have recommended a review of events and voluntary independent external evaluation. Consequently, the World Health Organization (WHO) and its partners have developed the Joint External Evaluation (JEE) tool based on earlier tools such as the IHR monitoring questionnaires and the Global Health Security Agenda (GHSA) assessment tool.

Findings from the JEE

Key best practices

- Strong political and technical leadership have facilitated significant progress in the recovery from the disruptions caused by the unprecedented Ebola virus disease (EVD) outbreak.
- Laws and legislation exist to support IHR implementation, including the Public Health Ordinance, 1960, the Animal Act, 1949, and the Environmental Protection Agency (EPA) Act, 2008, but they are in need of urgent revision and amendment.
- The National IHR Focal Point and the OIE (World Organisation for Animal Health) delegate have been designated but both remain as individuals and not centres or units.
- Strong collaboration and synergy exists between in-country partners and stakeholders, especially in the human health sector.
- A robust revitalized integrated disease surveillance and response (IDSR) system with countrywide coverage in human health, including indicators and event-based and syndromic surveillance systems is in place.
- Regular analysis of data and feedback at national and subnational level occurs.
- An excellent national laboratory network system has been set up and is a best practice in the human health sector but not in the animal health sector.
- There are highly effective emergency operation centres (EOCs) with clear plans and standard operating procedures (SOPs), a functioning multisectoral and multidisciplinary incident management system and multisectoral and multidisciplinary rapid response teams (RRTs).
- A foundational field epidemiology training programme (FETP) has been established.
- There are commendable links between public health and the security authorities.
- There is commendable capacity for the isolation, transport and referral of highly infectious patients and good collaboration with infection prevention and control (IPC) programmes for health care-associated infections (HCAIs).
- Formal government arrangements and systems are in place for risk communication with multisectoral and multistakeholder involvement.

Key areas for improvement

- Revise laws and legislation to facilitate the implementation of the IHR 2005, specifically the Public Health Ordinance, 1960 and the Animal Act, 1949.
- Fast track the approval of policies and strategies that are in draft form.

- Create a budget line for IHR and ensure funding for IHR core capacity-building from domestic and international sources.
- Systematize and provide resources and direction to strengthen and sustain the National IHR Focal Point and OIE functions with attention to appropriate staffing and effective SOPs, specifying roles, relationships and responsibilities and supported by appropriate office, information technology (IT) and logistics provision.
- Formulate a multi-hazard National Public Health Emergency Preparedness and Response (NPHEPR) plan, underpinned by the One Health and whole-of-government approach. The plan should be integrated with points of entry (PoEs) contingency plans for the airport, sea ports and designated major land crossings.
- Strengthen cross-border collaboration and initiatives and cross-border community-based surveillance as part of the comprehensive NPHEPR plan.
- Ensure tri-hazards assessment – radiation, chemical and infection risks.
- Accelerate the implementation of the One Health approach.
- Gaps in veterinary and animal health compromise One Health integrated risk assessment for early recognition of emerging or re-emerging zoonoses.
- Improve coordination and collaboration between human and animal health laboratory systems.
- Conduct joint Ministry of Health and Sanitation (MOHS) and Ministry of Agriculture, Forestry and Food Security (MAFFS) formal prioritization of the zoonotic diseases list.
- Develop strategies and plans for the detection of antimicrobial resistance and its mitigation and stewardship.
- Establish all elements of a comprehensive national biosafety and biosecurity system for both human and animal health sectors.
- Establish staffing norms and standards for the health workforce in the human, animal and wild life sectors to ensure the availability of multidisciplinary teams at all relevant levels for preparedness and response to public health emergencies.
- Scale-up the FETP programme to cover intermediate and advanced courses at national and district level including veterinary and laboratory staff.
- Conduct capacity assessments at all designated PoEs to guide the development of contingency plans with clear timelines and milestones for assessing progress.
- Establish coordination mechanisms and develop a strategic plan, guidelines and SOPs to facilitate capacity-building for laboratory, syndromic surveillance and response to chemical hazards.
- Improve capacity (human resources, laboratory) for the detection and response to radiation hazards.

Sierra Leone scores

Capacities	Indicators	Score
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR	2
	P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005)	2
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of the IHR	2
Antimicrobial resistance	P.3.1 Detection of antimicrobial resistance	1
	P.3.2 Surveillance of infections caused by resistant pathogens	1
	P.3.3 HCAI prevention and control programmes	2
	P.3.4 Antimicrobial stewardship activities	1
Zoonotic diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases and pathogens	1
	P.4.2 Veterinary or animal health workforce	1
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	1
Food safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination	2
Biosafety and biosecurity	P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal and agricultural facilities	1
	P.6.2 Biosafety and biosecurity training and practices	2
Immunization	P.7.1 Vaccine coverage (measles) as part of the national programme	3
	P.7.2 National vaccines access and delivery	3
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	4 1
	D.1.2 Specimen referral and transport system	3 1
	D.1.3 Effective modern point-of-care and laboratory-based diagnostics	3 1
	D.1.4 Laboratory quality system	2 1
Real-time surveillance	D.2.1 Indicator and event-based surveillance systems	4
	D.2.2 Interoperable, interconnected electronic real-time reporting system	2
	D.2.3 Analysis of surveillance data	4
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, the United Nations Food and Agriculture Organization (FAO) and OIE	3
	D.3.2 Reporting network and protocols in-country	2
Workforce development	D.4.1 Human resources are available to implement IHR core capacity requirements	2
	D.4.2 FETP or other applied epidemiology training programme in place	3
	D.4.3 Workforce strategy	2 1

Preparedness	R.1.1 Multi-hazard NPHEPR plan is developed and implemented	1
	R.1.2 Priority public health risks and resources are mapped and utilized	1
Emergency response operations	R.2.1 Capacity to activate emergency operations	4
	R.2.2 EOC operating procedures and plans	3
	R.2.3 Emergency operations programme	4
	R.2.4 Case management procedures are implemented for IHR relevant hazards	2
Linking public health and security authorities	R.3.1 Public health and security authorities, (for example, law enforcement, border control, customs) are linked during a suspected or confirmed biological event	4
Medical countermeasures and personnel deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	2
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	1
Risk communication	R.5.1 Risk communication systems (plans, mechanisms, etc.)	3
	R.5.2 Internal and partner communication and coordination	4
	R.5.3 Public communication	3
	R.5.4 Communication engagement with affected communities	2
	R.5.5 Dynamic listening and rumour management	3
PoEs	PoE.1 Routine capacities are established at PoEs	2
	PoE.2 Effective public health response at PoEs	1
Chemical events	CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	2
	CE.2 Enabling environment is in place for the management of chemical events	2
Radiation emergencies	RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	2
	RE.2 Enabling environment is in place for management of radiation emergencies	2

Note on scoring of technical areas of the JEE tool

The JEE process is a peer to peer review. As such, it is a collaborative effort between host country experts and JEE team members. In completing the self-evaluation – the first step in the JEE process – and as part of the preparation for an external evaluation, host countries are asked to focus on providing information on their capabilities based on the indicators and technical questions included in the JEE tool.

The host country may score their self-evaluation or propose a score during the on-site consultation with the external team. The entire external evaluation, including the discussions around the scores, strengths/best practices, the areas which need strengthening and challenges, and the priority actions should be done in a collaborative manner, with JEE team members and host country experts seeking agreement.

Should there be significant and irreconcilable disagreement between the JEE team members and the host country experts or among the external or among the host country experts, the JEE Team Lead will decide on the final score and this will be noted in the final report, along with the justification for each party's position.

PREVENT

National legislation, policy and financing

Introduction

The IHR (2005) provide obligations and rights for States Parties. In some States Parties, implementation of the IHR 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 to facilitate IHR implementation and maintenance in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. See detailed guidance on IHR implementation in national legislation at http://www.who.int/ihr/legal_issues/legislation/en/index.html. In addition, policies which identify national structures and responsibilities as well as the allocation of adequate financial resources are also important.

Target

States Parties should have an adequate legal framework to support and enable the implementation of all their obligations and rights to comply with and implement the IHR (2005). In some States Parties, implementation of the IHR may require new or modified legislation. Even where new or revised legislation may not be specifically required under the State Party's legal system, States may still choose to revise some legislation, regulations or other instruments to facilitate their implementation and maintenance in a more efficient, effective or beneficial manner.

States Parties should ensure provision of adequate funding for IHR implementation through the national budget or other mechanisms.

Sierra Leone level of capabilities

The country has legislation and several regulations and administrative documents that govern public health surveillance and response. Examples include the Public Health Ordinance, 1960, the Radiation Protection Act, 2012, the Animal Disease Ordinance, 1949, the Environmental Protection Act, 2008, and the Food Safety Act, 2015. The Public Health Ordinance is currently being revised to incorporate provisions that will facilitate IHR implementation while the Animal Disease Ordinance, 1949, has been revised but it is still in a draft form.

A rapid assessment of the Public Health Act was carried out in December 2015. In addition, frameworks between MOHS and MAFFS in the context of EVD are in existence and an IHR/GHSA One Health coordination structure has already been proposed.

MOUs between Sierra Leone, Liberia and the Republic of Guinea exist to cover EVD. There are specific MOUs between Kambia and Koinadugu districts with their counterparts in Guinea for information sharing and joint planning and response and discussions are ongoing to develop further MOUs between the other districts and their counterparts in Guinea and Liberia.

Recommendations for priority actions

- Hasten the review of the Public Health Ordinance and develop related policy guidelines.
- Review other laws touching on the implementation of the IHR and develop their policy guidelines.
- Sensitize relevant stakeholders to this law.
- Assess the Environmental Protection Act and MAFFS.
- Improve, update or develop MOUs and other cross-border bilateral agreements to make them more comprehensive, beyond EVD.
- Improve intersectoral collaboration.

Indicators and scores

P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR – Score 2

Assessment of relevant legislation, regulation, administrative requirements and other government instruments for IHR implementation has been carried out.

Strengths/best practices

- An IHR desk review (December 2015) recommended review of legislation, policies and regulations for IHR.
- Legislation, regulations and policies are in place.
- The Animal Health Act is also under review.
- MOUs exist with Guinea and Liberia.
- Cross-border collaboration has been tested in two out of seven districts.
- District to prefecture MOUs are to be operationalized.

Areas that need strengthening/challenges

- Some legislation has not yet been reviewed.
- Hastening revision of the Public Health Ordinance and other relevant laws.
- Developing requisite government policies.
- Finalizing the Animal Health Act.
- Collaboration across government sectors is not yet seamless.

P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005) – Score 3

The country can demonstrate the existence and use of relevant laws and policies in the various sectors involved in the implementation of the IHR.

Strengths/best practices

- The Public Health Ordinance is under review.
- There is evidence of the use of existing legislation and policies including action at PoEs, cross-border collaboration and border screening.

- There is good inter-ministerial collaboration.
- Review of the existing legislation, policies and regulations was conducted in December 2015.
- The IHR/GHSA coordination mechanism is being put in place.

Areas that need strengthening/challenges

- International engagement with neighbouring countries requires the involvement of other government agencies.
- Attaining regional consensus is a challenge.

IHR Coordination, communication and advocacy

Introduction

The effective implementation of the IHR requires multisectoral and multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the designation of a National IHR Focal Point – the national centre for IHR communications – is a key requisite for IHR implementation.

Target

The National IHR Focal Point should always be accessible to communicate with the WHO IHR Regional Contact Points and with all relevant sectors and other stakeholders in the country. States Parties should provide WHO with contact details of focal points, continuously update and annually confirm them.

Sierra Leone level of capabilities

Sierra Leone has yet to establish a fully competent National Focal Point fully compliant with the IHR. It was noted, however, that there is evidence of a move towards the creation of an IHR-compliant National IHR Focal Point. A major concern regarding the National IHR Focal Point mandate was voiced, but during the assessment the hosts concluded that fresh thinking was required, focusing on the outcome of achieving a working National IHR Focal Point by jointly working across departments, rather than being constrained by undue emphasis on interdepartmental mandates. It should be made clear that the National IHR Focal Point is a function rather than a person. This function provides the single authoritative national point of communication to WHO by the Department of Health, of timely epidemiological summaries and risk assessments of events of public health concern to neighbouring states and the wider international community.

The National IHR Focal Point could be located within the PHEOC. The National IHR Focal Point may reasonably be seen as a function of the PHEOC and consideration should be given to locating it within the PHEOC site and administration. Coordination between ministries through the Public Health Emergency Operations Centre (PHEOC) and the Public Health Emergency Medical Committee (PHEMC) is in place, although SOPs for the National IHR Focal Point function have yet to be written. It was noted that establishing the National IHR Focal Point was also consistent with the Regional Disease Surveillance Systems Enhancement (REDISSE) project (http://projects.worldbank.org/P154807?lang=en).

An example of the need for further development of the Sierra Leone National IHR Focal Point was discussed. There was an outbreak of Rift Valley fever in Liberia and on its border with Sierra Leone. It was reported that there had been 28 human deaths. A Liberian and Sierra Leonean team was reported to have jointly examined this outbreak, but it was unclear whether this had been communicated to WHO by the Sierra Leone National IHR Focal Point with the level of completeness and coherence required for full compliance with IHR.

It appears that risk assessments within the National IHR Focal Point and IHR/GHSA framework are not yet tri-hazard – that is they do not yet routinely consider chemical and radiation hazards in addition to infection hazards. There is some evidence that communication and joint risk assessment between human and animal health needs to be strengthened.

It was agreed that the National IHR Focal Point might consider working jointly with a wider range of government functions such as education and communication. There is a need to systematize and set up

a functioning National IHR Focal Point. Further, weakness of veterinary and animal health surveillance compromises One Health (human and animal) integrated risk assessment for the early recognition of emerging or re-emerging zoonoses. Finally, there is a need to ensure a tri-hazards approach – radiation and chemical, as well as infection risk assessment.

Recommendations for priority actions

- Set up a National IHR Focal Point within the PHEOC supported by SOPs.
- Strengthen veterinary and animal health joint working and event surveillance (One Health).
- Commence regular meetings of the National IHR Focal Point with all line ministries and key agencies.
- Start tri-hazards – chemical, radiation and infection – surveillance and risk assessment within the National IHR Focal Point.
- Build technical capacity for the National IHR Focal Point function by training technical people on IHR implementation areas.

Indicators and scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR – Score 2

Coordination mechanism between relevant ministries is in place.

Strengths/best practices

- Highly effective PHEOC in place with proven competence in managing the EVD outbreak.
- National SOPs or equivalent exists for coordination between the National IHR Focal Point and relevant sectors.

Areas that need strengthening/challenges

- Very weak veterinary and animal health capacity needs priority investment and development and integration with human health within a One Health framework.

Antimicrobial resistance

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. The evolution of antimicrobial resistance is occurring 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 and economic and national security.

Target

Support work being coordinated by WHO, FAO and OIE to develop an integrated and global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (that is, a One Health approach). This includes:

- *Each country having its own national comprehensive plan to combat antimicrobial resistance.*
- *Strengthening surveillance and laboratory capacity at the national and international level following agreed international standards developed in the framework of the Global Action Plan.*
- *Improving conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures and rapid, point-of-care diagnostics, including systems to preserve new antibiotics.*

Sierra Leone level of capabilities

Worldwide, decisive, and comprehensive action is needed to enhance infection prevention and to prevent the emergence and spread of antimicrobial resistance, especially among drug-resistant bacteria. Sierra Leone has three national reference laboratories: the Central Public Health Reference Laboratory (CPHRL), the MOHS-China P3 Lab, and the Tuberculosis (TB) Reference Laboratory. The CPHRL will be the designated laboratory for antimicrobial resistance detection and reporting. HCAI sentinel sites have not yet been set up.

There is no mention of antimicrobial resistant pathogens in the National Health Laboratory Strategic Plan 2016–2020. No national plan for surveillance of infections caused by antimicrobial resistant pathogens exists.

Policy, guidelines and SOPs for IPC are available and in use but there is no national guidance on appropriate antibiotic use and poor enforcement of pharmacy board regulations.

Recommendations for priority actions

- Support the implementation of the National Health Laboratory Strategic Plan 2016–2020 and the GHSA 5-year roadmap for the advancement of in-country antimicrobial resistance laboratory capacity.
- Ensure reporting of antimicrobial resistance is incorporated in the MOHS pathogen reporting systems with plans and procedures for sharing reports for action and strategic planning.

- Create a monitoring and evaluation framework to ensure routine assessment, data management, analysis and reporting in antimicrobial resistance.
- Conduct a survey on antibiotic use.
- Develop an action plan to address gaps in sustainable adequate isolation capacity in tertiary hospitals.

Indicators and scores

P.3.1 Antimicrobial resistance detection – Score 1

No national plan for detection and reporting of priority antimicrobial resistant pathogens has been approved.

Strengths/best practices

- An antimicrobial resistance plan is included in the 5-year GHSA roadmap.

Areas that need strengthening / challenges

- There is a need to strengthen detection capacity.
- National antimicrobial resistance reference laboratory has not yet been established.
- The National Health Laboratory Strategic Plan 2016–2020 does not address antimicrobial resistance.
- There is a need to allocate funding for antimicrobial resistance surveillance.

P.3.2 Surveillance of infections caused by antimicrobial resistant pathogens – Score 1

No national plan for surveillance of infections caused by priority antimicrobial resistant pathogens has been approved.

Strengths/best practices

- Antimicrobial resistance capacity improvements are included in the 5-year GHSA roadmap. Hospitals have already been selected for designation as antimicrobial resistance sentinel surveillance sites.

Areas that need strengthening/challenges

- No current surveillance.
- No national plan.
- No funding.
- Limited expertise.

P.3.3 Health care-associated infections (HCAI) prevention and control programmes – Score 2

National plan for HCAI programmes has been approved

Strengths/best practices

- There are trained IPC professionals in all tertiary hospitals.
- There is a functioning IPC policy, operational plan and SOPs at all health-care facilities.
- There is a national plan for HCAI.

Areas that need strengthening/challenges

- Designate facilities to conduct HCAI prevention programmes.

P.3.4 Antimicrobial stewardship activities – Score 1

No national plan for antimicrobial stewardship has been approved.

Strengths/best practices

- Essential treatment guidelines exist and are in use.

Areas that need strengthening/challenges

- No national guidance on appropriate antibiotic use in humans.
- Weak capacity for improving antibiotic prescribing and consumption in humans because antibiotics are available without prescription.
- No regulation of antibiotic use in animals.

Zoonotic diseases

Introduction

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

Target

Adopted measured behaviours, policies and/or practices that minimize the transmission of zoonotic diseases from animals into human populations.

Sierra Leone level of capabilities

Zoonotic diseases identified as being of the greatest public health concern are influenza (caused by the new subtype), Ebola, monkey pox, plague, rabies, yellow fever, Lassa fever and anthrax. However, the prioritized diseases were not determined jointly between human and animal health specialists. The country has no One Health policy and needs to strengthen existing surveillance systems for prioritized zoonoses. There is a disparity between the human and animal health surveillance systems that are in place. While human public health surveillance effectively tracks the prioritized zoonotic diseases and pathogens, the animal health system lacks a surveillance system.

There is limited and diminishing capacity in animal health (there is a limited workforce and the Central Veterinary Laboratory has been out of operation for three years and is in need of complete refurbishment), a lack of zoonotic surveillance systems and no information sharing between human and animal health specialists. There is a diminished veterinary or animal health workforce.

There are no established mechanisms for coordinated response to outbreaks of zoonotic diseases by the human, animal or wildlife sectors.

Recommendations for priority actions

- Build and develop capacity for animal health and veterinary public health including human resources and organizational structure.
- Implement a One Health framework with joint planning, data and information sharing and joint response.
- Strengthen surveillance for zoonoses with the development of country guidelines.
- Strengthen technical capacity for animal health including technical capacity development programmes.
- Strengthen animal health clinical and laboratory services.

Indicators and scores

P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens – Score 1

No zoonotic surveillance systems exist.

Strengths/best practices

- Partnerships between MOHS, MAFFS and wildlife specialists and with the American company Metabiota Inc.
- Mechanism in place (IDSR) to identify priority zoonotic diseases posing a public health risk.
- EVD, monkey pox, rabies, avian influenza, anthrax covered in IDSR – human health surveillance.
- Zoonotic surveillance system in MAFFS.
- Rabies task force in place.
- There is training in controlling zoonotic disease in animal populations.
- Estimates of animal populations for 2013 are available.

Areas that need strengthening/challenges

- There is currently no One Health policy in place.
- No mechanism currently in place for information sharing between animal and human public health laboratories either on a regular basis or during an outbreak situation.
- No list of priority zoonotic diseases for which control policies exist.
- FETP does not include a veterinary epidemiology component.
- No periodic communication such as a bulletin on animal health.
- Reports on zoonosis from animal health are not shared with MOHS.
- Human and animal health laboratories are not linked.

P.4.2 Veterinary or animal health workforce – Score 1

Country has no animal health workforce capacity capable of conducting One Health activities.

Strengths/best practices

- Njala University offers animal science and production courses.
- Environmental health inspectors training course at Njala University has a veterinary public health component.

Areas that need strengthening/challenges

- A major challenge is that there is no mechanism in place for the sustained recruitment of animal health specialists into the public health service.
- Animal science and production course at Njala University does not cover veterinary public health.
- The country has a huge shortage of animal health specialists.
- FETP training does not include animal health specialists.
- The actual animal population in the country has not been established.

P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional – Score 1

A mechanism for responding to infectious zoonoses and potential zoonoses has not been established. There is no national policy or plan for responding to zoonotic events. The limited human resource capacity in animal health is critical.

Strengths/best practices

- Zoonotic diseases are included on the list of IDSR priority diseases.
- The country has trained national and district multidisciplinary RRTs that include animal health specialists.
- A rabies task force is set up.
- Multisectoral PHEMC has been established to coordinate response to public health events that include zoonoses.
- IHR/GHSA One Health organogram is under development.
- Ad hoc collaboration between animal and human health specialists in response to the rabies case in Port Loko district.
- Multisectoral RRTs were identified as an area of best practice.

Areas that need strengthening/challenges

- Poor workforce policy in the animal sector (understaffing and poor remuneration).
- Poor veterinary clinic network.
- Inadequate laboratory system.
- Limited human resource capacity in animal health.
- Lack of an information sharing mechanism for zoonoses.
- No policy guidelines or MOU for multisectoral response to zoonoses.
- The One Health approach is not developed.

Food safety

Introduction

Food and waterborne 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

States Parties should have surveillance and response capacity for food and waterborne disease risk or events. It requires effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

Sierra Leone level of capabilities

The Government of Sierra Leone has established policies and regulations (such as the Public Health Ordinance, 1960, Fisheries Management Act, 1994, Fishery Product Regulations, 2007) to provide a platform for food safety control and surveillance and response capacity for food and waterborne disease risk or events. In this regard, provisions in the Public Health Ordinance, 1960, section 109 and 110, give the MOHS Directorate of Environmental Health Services (DEHS) the authority to manage food safety control in the country. This responsibility is put in place by the head of the DEHS Food Safety Unit who coordinates and manages the safety of food supplies to service providers, consumers and export markets. At district level, the process is coordinated by the District Environmental Health Superintendent.

However, the country does not have comprehensive food safety legislation in place, but rather, fragmented food safety standards for different food units, and so far, the country is also using Codex Alimentarius provisions as a guideline.

Furthermore, there is a lack of proper coordination among all stakeholders; even when MOUs exist, they are not really enforced. Currently, there is no sanitary and phytosanitary committee in the country to link up with international bodies. Consequently, mechanisms for multisectoral collaboration to ensure a rapid response to food safety emergencies and outbreaks of foodborne diseases have not yet been established. Thus, recently, during the cholera outbreak of 2012, a cholera task force was formed to address the emergency and to manage the disposal of food items unfit for consumption and a committee comprising key stakeholders set up at the Office of National Security to validate SOPs to manage this process.

To address this situation, the government has taken the initiative to develop a Food Safety Act which will establish a National Food Safety Authority. This new entity will be devoted to ensuring multisectoral collaboration of all stakeholders and to coordinating their interventions. The Authority will join the International Food Safety Authority Network (INFOSAN).

In the meantime, an EOC providing a platform for collaboration of stakeholders has been created to coordinate the surveillance and response to disease outbreaks and other public health events. RRTs including, food safety personnel, have been formed at district and national levels and trained to respond

to outbreaks and other public health events. This represents a valuable tool and an opportunity to enforce food safety management and provisions should be taken to include foodborne outbreak surveillance and response into their intervention tools.

Major stakeholders include the following national institutions and technical international partners:

- MOHS/DEHS
- Ministry of Trade and Industry/Sierra Leone Standards Bureau (SLSB)
- MAFFS, Directorate of Livestock and Veterinary Services
- Ministry of Fisheries and Marine Resources
- Customs and Immigration
- Office of National Security
- FAO and WHO

Recommendations for priority actions

- Establish an interagency coordination platform or other mechanism to ensure strong cooperation among all food safety stakeholders in the country to facilitate the implementation of the food safety programme.
- Accelerate the Parliamentary ratification of the Food Safety Act and establish food safety standards.
- Establish a National Food Safety Authority and sanitary court.
- Develop and disseminate guidelines and training programmes for surveillance, response, diagnostic laboratory testing for food safety.
- Finalize and disseminate the SOP for the disposal of food items unfit for human consumption.

Indicators and scores

P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination – Score 2

Strengths/best practices

- Sierra Leone has national food safety standards available for fisheries.
- RRTs have been nominated at district and national levels for training in food safety related events.
- A cholera task force was formed in 2012 for rapid information exchange between stakeholders and relevant sectors during suspected foodborne disease outbreak investigations.
- SOPs have been drafted on the disposal of food items unfit for human consumption.
- Inclusion of food safety personnel in RRTs.

Areas that need strengthening/challenges

- Development of food safety standards for foods other than fish.
- Food safety control management systems are not implemented.
- Operational links are not established between surveillance, response, food safety, animal health and laboratories.
- No risk profiling of food safety problems.

- Mechanism for communication between food safety stakeholders not yet functioning.
- No risk communication mechanism and materials in place across the farm-to-fork continuum.
- Inadequate coordination among stakeholders.
- Lack of support from partners.

Biosafety and biosecurity

Introduction

Working with pathogens in the laboratory is vital to ensuring 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 on 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 national biosafety and biosecurity system is in place, ensuring that especially dangerous pathogens are identified, held, secured and monitored in a minimal number of facilities according to best practices. Biological risk management training and educational outreach are 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. Country-specific biosafety and biosecurity legislation, laboratory licensing, and pathogen control measures are in place as appropriate.

Sierra Leone level of capabilities

Biosecurity and biosafety were underappreciated until the EVD event, which stimulated considerable activity and attention directed most urgently towards enhancing biosafety for health workers. Initial laboratory efforts were aimed at research and reference facilities and only now are clinical laboratories receiving remedial attention. The ongoing presence of partner laboratories highlights disparities in biosafety and biosecurity training and facilities for laboratory workers. There is a general lack of awareness among the laboratory workforce of international biosafety and biosecurity best practices for safe, secure and responsible conduct.

There are no elements of a comprehensive national biosafety and biosecurity system in place. Biological risk management training and educational outreach are not conducted to promote a shared culture of responsibility, reduce dual use risks and mitigate biological proliferation and deliberate use threats. There is no system in place to identify, hold, secure and monitor dangerous pathogens. There is no system in place for the safe transfer of biological agents, while country-specific biosafety and biosecurity legislation, laboratory licensing and pathogen control measures are non-existent.

The country has conducted a training needs assessment and identified gaps in biosafety and biosecurity training but has not yet implemented comprehensive training or a common training curriculum. The country does not yet have sustained academic training in institutions that train those who maintain or work with dangerous pathogens and toxins. Training needs which have been identified and begun to be addressed include bio-risk management training for regional laboratory personnel, pre- and in-service training for medical laboratory personnel, and IPC trainings for health workers.

Recommendations for priority actions

- Establish and enact legislation and regulations on biosafety and biosecurity.
- Develop national guidelines on biosafety and biosecurity.
- Establish a regulatory framework for laboratory practice in line with the national laboratory strategy.
- Ensure implementation of the Strengthening of Laboratory Management Towards Accreditation (SLMTA) programme as a quality improvement process.

Indicators and scores

P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal and agricultural facilities – Score 1

No elements of a comprehensive national biosafety and biosecurity plans are in place.

Strengths/best practices

- There are guidelines on laboratory biosafety in various documents including the Human Health and Safety Policy.
- Appropriate security measures are in place to minimize potential inappropriate removal or release of biological agents at CPHRL and the Lassa Fever Laboratory.
- A policy on sample referral is being developed.
- Health and safety policy is disseminated across the districts.
- There is good ongoing collaboration with the IPC programme on addressing issues of HCAIs.

Areas that need strengthening/challenges

- There is no mechanism for monitoring and developing an updated record and inventory of pathogens within facilities that store or process dangerous pathogens and toxins.
- There is no legislation or regulations on biosecurity.
- The country has no regulatory body for licensing laboratories.
- Guidelines on laboratory biosafety that exist in various documents do not address animal health.
- Regional laboratories do not have access controls to minimize potential inappropriate removal or release of biological agents.
- There is inadequate leadership and inadequate funding to support the sector, as well as too many partner parallel programmes without collaboration or coordination.

P.6.2 Biosafety and biosecurity training and practices – Score 2

The country has conducted a training needs assessment and identified gaps in biosafety and biosecurity training but has not yet implemented comprehensive training or a common training curriculum. There is a general lack of awareness among the laboratory workforce of international biosafety and biosecurity best practices for safe, secure and responsible conduct. The country does not yet have sustained academic training in institutions that train those who maintain or work with dangerous pathogens and toxins.

Strengths/best practices

- Biosafety training is being carried out in all districts.
- A biosafety curriculum has been developed and used for training health facilities.

- Master trainers on biosafety are available to expand and support training.
- The University of Sierra Leone offers pre-service training for medical laboratory scientists.
- Laboratory-specific training has been performed for four pathogens, a programme of simulation exercises has been developed and one simulation exercise has been completed.

Areas that need strengthening/challenges

- There is minimal training on biosecurity available.
- The country does not conduct needs assessments for biosafety and biosecurity trainings.
- There is no guidance on staff testing or exercising on biosecurity and biosecurity procedures.
- There are no master trainers on biosecurity.
- There is limited funding to support biosecurity

Immunization

Introduction

Immunization is one of the most successful global health interventions and one of the most cost-effective ways to save lives and prevent disease. Immunizations are estimated to prevent more than two-million deaths a year globally.

Target

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

Sierra Leone level of capabilities

Sierra Leone has a National Expanded Programme on Immunization, responsible for the implementation and management of immunization services in the country guided by the Comprehensive Multi-Year Plan for Immunization (cMYP) 2012–2016. A current cMYP under development is being aligned with the Global Vaccine Action Plan and Global Immunization Strategy.

The country is working to establish a functioning national vaccine delivery system – with nationwide reach, effective distribution, access for marginalized populations, adequate cold chain and ongoing quality control. The programme aims at reaching every child. Functional vaccine procurement and forecasting means that there are no stock outs at the central level and rare stock outs at the district level. Over 80% of districts are covered.

A cold chain assessment was conducted in 2013 and implementation of the recommendations from the improvement plan is ongoing. A similar assessment was carried out in 2016 and recommendations are also expected from the report. Vaccine delivery (maintaining the cold chain) is available in 60–79% of districts within the country.

Dropout rate for immunization was 10% in 2013, 12% in 2014 and 14% in 2015.

A recent coverage survey indicated that approximately 90% of the country's 12-month-old population has received at least one dose of measles vaccine; this followed a supplementary immunization campaign after a measles outbreak and may not necessarily reflect sustainable routine immunization. A second dose of measles vaccine was recently introduced but uptake has not been very encouraging.

There are some challenges with urban immunization and coverage in hard to reach areas. Many staff members are not on the government payroll leading to poor commitment to provide routine immunization services. Vaccination is very donor driven and heavily dependent on external support.

Recommendations for priority actions

- Track development of the new cMYP (2017–2021) by the end of 2016.
- Implement recommendations of the cold chain assessment as soon as possible.
- Conduct refresher training of District Health Management Teams (DHMTs) on the District Vaccination Data Management Tool.

- Devise strategies for accessing hard to reach areas and urban children to achieve the 'reach every child' target.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme – Score 3

70–89% of the country's 12-month-old population has received at least one dose of measles vaccine, as demonstrated by coverage surveys or administrative data. A plan is in place to reach 90% within the next three years.

Strengths/best practices

- Sierra Leone has a national-level immunization programme with immunization being mandatory.
- No vaccine stock outs at central level.
- Over 80% of all district units are covered.
- The Extended Programme on Immunization (EPI) successfully led the EVD ring vaccination.
- Performance-based financing provides an opportunity to improve immunization services at health facility level.

Areas which need strengthening /challenges

- Inadequate cold chain maintenance at facility level.
- Occasional vaccine stock outs observed at health facility level.
- Zoonosis of national concern not included in the EPI plan.

P.7.2 National vaccine access and delivery – Score 3

- Vaccine delivery (maintaining the cold chain) is available in 60–79% of districts within the country; vaccine procurement and forecasting leads to no stock outs of vaccines at central level and occasional stock outs at district level.

Strengths/best practices

- Two walk in cold rooms are available at the national level (airport and MOHS HQ).
- All districts have functional cold rooms.
- Most health facilities countrywide have functional solar fridges and there are plans to replace obsolete vaccine fridges 7 to 10 years old and over including those in the private sector.
- Vaccine requirements are forecast annually.
- The District Vaccination Data Management Tool is used to monitor vaccine utilization at district and health facility levels.
- Performance Based Funding provides an opportunity to improve immunization services at health facility level.
- District specific micro-plans have been developed.

Areas that need strengthening/challenges

- Adverse events following immunization surveillance system has been established within the IDSR although there could be underreporting as some staff view adverse effects as an indictment against them. Consequently, adverse effects are only reported during supplementary immunization activities.
- Some health facilities countrywide do not have functional fridges.
- Regular power cuts could affect the quality of vaccines where there is no solar energy.
- Many of the staff are not on the government payroll leading to poor commitment to provide routine immunization services.

DETECT

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

Real-time biosurveillance, with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics.

Sierra Leone level of capabilities

The MOHS has a national laboratory services programme that operates under the Directorate of Hospitals and Laboratory Services and provides overarching policy leadership, including setting national norms and standards, building capacity and monitoring service quality. There are 179 functioning laboratories, operating in a four-tiered system, with increasing degrees of competence and capacity through the tiers. For animal health there is one Central Veterinary Laboratory at Teko in Makeni. The laboratory has not been functional for the past three years because of a lack of water and electricity and a crumbling physical infrastructure.

The CPHRL and the wider laboratory system comply with the recommendations of the WHO IHR framework by providing the following core tests: Plasmodium spp., HIV, TB, influenza, measles, Lassa, Ebola and acute flaccid paralysis (AFP) as a sign of polio. Proficiency exists in classical diagnostic techniques, including serology and polymerase chain reaction (PCR) techniques at referral laboratories for core tests. Bacteriology capacity development at CPHRL is a work in progress. Accreditation process under the SLMTA programme has commenced at the CPHRL. Health laboratories are licensed under the hospital licensure process and there is no laboratory-specific licence.

Systems are in place to transport specific disease specimens (viral haemorrhagic fevers, measles, AFP) to national laboratories from all the districts for advanced diagnostics. Tier-specific diagnostic testing strategies are documented, but not fully implemented.

Recommendations for priority actions

- Develop functional capacity within the entire animal laboratory system including at the Central Veterinary Laboratory.
- Establish a functional bacteriology section in the CPHRL.
- Finalize and implement the draft sample transportation policy and SOPs.

- Complete the SLMTA process as part of the quality improvement system.
- Establish a mechanism for the regulation of laboratory practice in the country including private laboratories.

Indicators and scores

D.1.1 Laboratory testing for detection of priority diseases – Score 4 (Human health)

D.1.1 Laboratory testing for detection of priority diseases – Score 1 (Animal health)

The national laboratory system for human health is capable of conducting five or more of the ten core tests. However, the national laboratory system for animal health is not capable of conducting any core tests.

Strengths/best practices

- National diagnostic algorithms for performance of the WHO core laboratory tests are available.
- Malaria and HIV testing is available in nearly all health facilities with laboratories.
- TB testing is available in many facilities in the country.
- The CPHRL offers measles, Lassa, EVD and influenza testing.
- There are official agreements with laboratories outside the country for specialized testing not available in-country.
- CPHRL and other reference laboratories have testing algorithms which are disseminated.
- The IDSR revitalization raised awareness of the need to test for the detection of priority diseases, conditions and events.

Areas that need strengthening/challenges

- Some tests such as cholera culture are not consistently done.
- Most of the district laboratories do not have the equipment for the required or expected tests.
- The majority of district laboratories have no established SOPs for laboratory tests.
- Frequent stock outs of laboratory commodities.
- Lack of animal health testing.

D.1.2 Specimen referral and transport system – Score 3 (Human health)

D.1.2 Specimen referral and transport system – Score 1 (Animal health)

A system is in place to transport specimens to national laboratories for human health from 50–80% of intermediate level and districts within the country for advanced diagnostics. However, there is no system in place for transporting specimens from intermediate level and districts to national laboratories for animal health, only ad hoc transporting.

Strengths/best practices

- The specimen referral network is well documented for EVD, TB and measles samples.
- A draft policy for specimen transportation has been developed.
- The country participates in international laboratory networks – FluNet, measles, HIV test networks.
- The IDSR revitalization has contributed to the establishment of a strong specimen referral and transport system for priority diseases, conditions and events.

Areas that need strengthening/challenges

- There are no specific regulations or guidelines for the appropriate packaging and referral of specimens except for a few priority diseases such as EVD, AFP/polio and measles.
- Apart from EVD, there is no designated transport mechanism for referral of specimen from the peripheral level to the national level.
- There is a lack of funding to support specimen referral and transport systems and inadequate coordination among stakeholders.

D.1.3 Effective modern point-of-care and laboratory-based diagnostics – Score 2 (Human health)

D.1.3 Effective modern point-of-care and laboratory-based diagnostics – Score 1 (Animal health)

Minimal laboratory diagnostic capacity exists within the country, but no tier-specific diagnostic testing strategies are documented. Point-of-care diagnostics are used for country priority diseases.

This indicator for human health was downgraded from 3 to 2 because of the lack of bacteriology capacity in-country and the critical importance of antimicrobial resistance.

There is no evidence of the use of rapid and accurate point-of-care and laboratory-based diagnostics for animal health and no tier-specific diagnostic testing strategies are documented.

Strengths/best practices

- Sierra Leone has a National Laboratory Strategic Plan in place to improve the availability of point-of-care diagnostics at clinical sites.
- There are procurement processes for the purchase of media and reagents to carry out core laboratory tests.
- The IDSR revitalization has contributed to raising awareness of the importance of availability of media and reagents for the performance of core laboratory tests.
- The laboratory has serology and PCR capacity, however, bacteriology capacity is lacking.

Areas that need strengthening/challenges

- There is no in-country production or procurement process for acquiring the necessary media and reagents to carry out core laboratory tests.
- The country is heavily dependent on donors to access all laboratory supplies.
- There are frequent stock outs of media and reagents for the performance of core laboratory tests.

D.1.4 Laboratory quality system – Score 2 (Human health)

D.1.4 Laboratory quality system – Score 1 (Animal health)

National quality standards have been developed for human health but there is no system for verifying their implementation. However, there are no national laboratory quality standards for animal health.

Strengths/best practices

- National laboratories use the services of foreign, national or regional accreditation bodies.
- The laboratory accreditation process is currently ongoing.

- The CPHRL has received provisional accreditation by WHO to conduct measles and yellow fever testing.
- There is a post-marketing validation protocol with regard to the registration procedure for in vitro diagnostic medical laboratories.
- Laboratory quality audits and support supervision are carried out and feedback provided. There are ten quality indicators to measure progress in laboratory test quality.
- The country has a national external quality assessment programme for EVD, TB and HIV.
- There is good collaboration between laboratories, IDSR, IPC and EPI stakeholders that contributes to improving the laboratory quality system.

Areas that need strengthening/challenges

- There is no national body in charge of laboratory licensing, laboratory inspection, laboratory certification and laboratory accreditation.
- There is currently no accredited laboratory in the country.
- There is no specific national document which describes the registration procedure for in vitro diagnostic medical laboratories.
- There are no guidelines for mandatory external quality assessment and no legal framework to ensure regulatory compliance – private laboratories are covered under the Medical and Dental Council.
- There is a private laboratory participating in severe acute respiratory infection but otherwise no oversight over private laboratories.
- There is insufficient coordination and collaboration between human and animal health laboratory systems.

Real-time surveillance

Introduction

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

Target

Strengthened foundational indicator- and event-based surveillance systems that are able to detect events of significance for public health, animal health and health security are in place. Improved communication and collaboration exists across sectors and between subnational, national and international levels of authority regarding the surveillance of events of public health significance. Improved country and regional capacity is present to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This can include epidemiologic, clinical, laboratory, environmental testing, product safety and quality and bioinformatics data, and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR and OIE standards.

Sierra Leone level of capabilities

Sierra Leone participates in a surveillance programme managed by the MOHS Directorate of Disease Prevention and Control. The country has a list of priority diseases, conditions and events. Some are notifiable immediately and others reportable weekly.

Event-based surveillance is in place both for formal and informal reporting and rumour logging. All districts report events through the 117 national telephone hotline. Community-based surveillance (CBS) is being rolled out with three out of 14 districts currently implementing it with planned scale-up. Community health workers report through their peer supervisor to health facilities that respond by investigating the reported diseases, conditions and events. Indicator-based surveillance for human health priority diseases is being conducted. Reports are generated from all health facilities and sent to DHMTs weekly. DHMTs then submit details to HQ by 4.00 pm every Monday, from where a report is sent to WHO by 6.00 pm every Monday.

The country revised its IDSR strategy in 2015, printed and distributed guidelines, job aids and reporting tools. At least one health worker from each health facility has been trained in IDSR. Timeliness and completeness of weekly reporting is above 90% for the public sector. The private sector does not report. Reporting is currently both paper-based and electronic, with an electronic web-based national database. A weekly epidemiologic bulletin is produced and circulated widely at national level and in each of the 13 districts. The MOHS monitors and validates data weekly and data quality audits are conducted bi-annually. Support supervision for IDSR is conducted at national level quarterly and by districts monthly.

The MOHS is currently developing an interoperable, interconnected, real-time surveillance reporting system based on the already existing DHIS 2 platform. Animal surveillance reporting tools are utilized and ongoing reports are submitted to the African Union and OIE. Although a database is available, no organized and structured data quality assurance and validation for animal health surveillance exists. The reporting system is not currently interoperable or integrated with other systems and there are no arrangements for sharing data routinely with other ministries or sectors. Staff at district and national levels analyse data but there is minimal data analysis ongoing at health facilities.

Syndromic surveillance is conducted for a number of diseases and conditions such as polio, severe acute respiratory infection, influenza, acute viral haemorrhagic fever and acute diarrhoea with dehydration. Syndromic surveillance is also conducted for animal health.

Recommendations for priority actions

- Finalize roll out of CBS and strengthen event-based surveillance systems.
- Strengthen animal health surveillance at all levels.
- Use the One Health platform to improve information sharing.
- Improve technical capacity by training and mentoring personnel including clinical, laboratory and middle-level management staff.
- Involve the private sector in surveillance
- Finalize and deploy the electronic surveillance reporting platform that will be integrated and interoperable with other systems.

Indicators and scores

D.2.1 Indicator and event-based surveillance systems – Score 4

Indicator and event-based surveillance system(s) are in place to detect public health threats.

Strengths/best practices

- Surveillance programme at MOHS is dedicated to surveillance and response.
- List of priority diseases, conditions and events exist.
- IDSR strategy revised in 2015.
- Indicator-based surveillance exists.
- Events based surveillance and CBS implemented.
- All health facilities have at least one trained health worker.
- All guidelines, job aids, training materials and reporting tools are printed and distributed.
- Animal health system is also conducting surveillance.
- Consistent production of weekly epidemiological bulletins at national level and in all 13 districts for information sharing and feedback.

Areas that need strengthening/challenges

- Scaling up CBS to all districts and chiefdoms.
- Only 29% of health facilities keeping updated rumour log books (as of July 2016).
- Training more health workers at all levels.
- Improving and strengthening animal health surveillance.
- No information sharing between sectors.

D.2.2 Interoperable, interconnected, electronic real-time reporting system – Score 2

Country is developing an interoperable, interconnected, electronic real-time reporting system, for either public health or veterinary surveillance.

Strengths/best practices

- Currently reporting is both paper-based and electronic.
- MOHS developing an electronic web-based reporting platform.

Areas that need strengthening/challenges

- Moving down data entry on the electronic platform from district level to health facilities.
- Integrating the IDSR reporting platform with other platforms and sectors and making it interoperable.
- Poor network and Internet coverage.
- Health workers not comfortable using electronic platforms to report (use of IT is challenging).
- High cost of investment.

D.2.3 Analysis of surveillance data – Score 4

Annually or monthly reporting; attributed functions to experts for analysing, assessing and reporting data.

Strengths/best practices

- Data analysis is conducted at national level and all districts.
- All levels are using IT for data analysis.
- All levels produce a bulletin for information sharing.
- Production of bulletins.

Areas that need strengthening/challenges

- Health facilities are not largely analysing data.
- Provision of IT equipment to districts and major health facilities.
- Adequate numbers of IT equipment for data analysis.

D.2.4 Syndromic surveillance systems – Score 4

Syndromic surveillance system(s) are in place to detect three or more core syndromes indicative of public health emergencies.

Strengths/best practices

- Syndromic surveillance well developed as a part of IDSR.
- Use of laboratory to support syndromic surveillance.
- Monitoring performance of syndromic surveillance through indicators like non-AFP detection rate.

Areas that need strengthening/challenges

- Assessing performance of syndromic surveillance for all critical syndromes.

Reporting

Introduction

Health threats at the human – animal – ecosystem interface have increased over recent decades, as pathogens continue to evolve and adapt to new hosts and environments, imposing a burden on human and animal health systems. Collaborative multidisciplinary reporting on the health of humans, animals and ecosystems reduces the risk of disease at the interfaces between them.

Target

Timely and accurate disease reporting according to WHO requirements and consistent with FAO and OIE is in place.

Sierra Leone level of capabilities

The country has designated a National IHR Focal Point in MOHS and an OIE focal point in the Ministry of Agriculture and Food Safety Services. The personnel have been trained on IHR (2005) regulations from the relevant sectors.

The health sector has demonstrated capacity to identify and notify potential Public Health Emergency of International Concern (PHEIC) events to WHO. Recent events of this kind include a buccal swab collected in Tonkolili district that had tested positive for Ebola and a suspected yellow fever case in Moyamba district. However, the country does not have SOPs, policies and legislation in place for approving and reporting of a potential PHEIC to WHO other than the IDSR guidelines.

A PHEMC has been established within the MOHS that provides a mechanism for sharing information between the different disciplines. There is no formal mechanism established for the exchange of information between different sectors in the country and with neighbouring countries. Not all key sectors in the country having major roles in the implementation of the IHR are represented at the IHR focal point and the reporting system in the agricultural sector is not as efficient as in the public health sector.

Recommendations for priority actions

- Designate and train all ministry and sector focal point personnel so as to constitute a National IHR Focal Point team.
- Further training for National IHR Focal Point and OIE focal point personnel and other ministry and sector representatives.
- Develop legislation, policies, guidelines and SOPs for reporting.
- Develop regional multilateral and bilateral arrangements for information sharing.

Indicators and scores

D.4.1 System for efficient reporting to WHO, FAO and OIE – Score 3

The country has the demonstrated ability to identify a potential PHEIC and file a report to WHO based on an exercise or real event, and similarly to the OIE for relevant zoonotic diseases

Strengths/best practices

- The Sierra Leone MOHS has nominated a National IHR Focal Point for IHR and a contact person for OIE from the agricultural sector and these personnel have been trained on the regulations.
- A multidisciplinary and multisectoral PHEMC has been established for reviewing potential PHEIC events in the country.
- The country has demonstrated a capacity for notification of potential PHEIC events to WHO although this only applies to the public health system.
- The existence of a bilateral agreement between some districts and counterparts in neighbouring countries is good experience to be expanded to country-level cooperation.

Areas that need strengthening/challenges

- More effort is required to develop national legislation, policy, guidelines and SOPs for notification of potential PHEICs to WHO and OIE and to exchange information between key sectors.
- The National IHR Focal Point needs to have representation from all key sectors in Sierra Leone that have major roles in the implementation of the IHR.
- Linking the national electronic public health and veterinary surveillance systems to the PHEOC are critical areas for improvement.

D.4.2 Reporting network and protocols in-country – Score 2

The country is in the process of developing and establishing protocols, processes, regulations and legislation governing reporting to be implemented within a year.

Strengths/best practices

- A PHEOC has been established for coordinating information through the National IHR Focal Point on potential PHEICs which has been tested by notifying WHO about the recent Ebola and yellow fever events.
- The country is implementing an electronic reporting system (DHIS 2) which in turn strengthens the reporting network by improving surveillance report completeness and timeliness.

Areas that need strengthening/challenges

- National legislation, guidelines and SOPs for notification of PHEIC events and mechanisms for sharing information between key sectors, other countries and WHO are critical.
- The agricultural sector must be supported to establish detection and reporting capacity for priority zoonotic diseases.

Workforce development

Introduction

Workforce development is important 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.

A competent multidisciplinary workforce is key to developing a sustainable public health system over time and to ensure a timely and effectively response to emergencies. It requires the skills and competencies of a variety of professionals in the human and animal health sector. This should include physicians, nurses and laboratory scientists as well as epidemiologists, social scientists, biostatisticians, information system specialists and biomedical engineers. Corresponding competencies are needed on the animal side requiring not only the availability of veterinarians, wildlife, farming and livestock professionals, but also of epidemiologists, laboratory specialists and IT staff.

Ensuring quality of pre-service training based on comprehensive curricula with a skills-based approach and continued in-service education will result in sustainable long-term workforce development. However, high attrition rates may hamper the increased availability of specialists. Therefore, workforce development needs to consider adequate payment, a positive work environment, clear career paths and other concepts in support of long-term retention of staff. While these aspects are not unique to the implementation of the IHR, they are essential to the long-term sustainability of progress.

Most emerging infectious diseases originate in animals, thus the animal–human interface is critical to prevent, detect and control new outbreaks. Therefore, it is crucial that both sectors, the human health and animal health sector, have strong workforce and personnel who can systematically cooperate to meet relevant IHR and the Performance of Veterinary Services (PVS) requirements.

Target

States Parties should have 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). The workforce includes physicians, animal health specialists or veterinarians, biostatisticians, laboratory scientists and farming and livestock professionals, with an optimal target of one trained field epidemiologist (or equivalent) per 200,000 population, who can systematically cooperate to meet relevant IHR and PVS core competencies.

Sierra Leone level of capabilities

Sierra Leone's health workforce is facing severe constraints in terms of numbers of qualified staff, equitable distribution throughout the country and level of skills and competence. This situation was further compounded by the Ebola outbreak causing the deaths of 339 health workers. Constraints concern both the human and the animal health sector with the shortcomings being more pronounced in the animal health sector.

Currently, there are only four veterinarians in the whole country, two of them working in administrative positions and two staff with a Bachelor of Science in senior positions in animal production. There are 13 district livestock officers supported by livestock assistants, two laboratory technicians and no animal health epidemiologist, nor IT staff.

In the human health sector an overall gap of 8481 health professionals currently exists between the Basic Package of Essential Health Services (BPEHS) staffing norms and the current workforce (human resources for health (HRH) country profile, September 2016). Gaps vary by cadre. Higher qualified cadres such as state registered nurses, midwives and physicians are lacking. More than 50% of the health workforce is found in Freetown, where only ~25% of the population resides. Unsalaried workers comprise nearly half of the workforce (total 10 140 employed, 9120 unsalaried, 2016). Even districts with a large workforce have a significant facility-level gap.

However, retention has significantly increased since the introduction of performance-based financing in 2010. The draft human resource strategy 2016 is based on BPEHS and does not include epidemiologists or social scientists. There are two public health nurses per district and most District Medical Officers (DMOs) have a Master of Public Health (MPH) and some training in epidemiology.

Recommendations for priority actions

- Revisit pre-service curricula of health staff to ensure that aspects of One Health and integrated disease surveillance are covered in pre-service training.
- Develop minimum standards for animal and human health staffing levels that include (among others) social scientists and revisit HRH strategies for their inclusion.
- Work on retention strategies for animal health staff.
- Fast track the recruitment process into vacant posts.
- Develop plans for the sustainability of the basic field epidemiology and laboratory training programme (FELTP) that includes veterinarian and laboratory staff and for advanced training in the western African Region to expand developed capacities.

Indicators and scores

D.4.1 Human resources are available to implement IHR core capacity requirements – Score 2

The country has multidisciplinary human resources capacity (epidemiologists, veterinarians, clinicians and laboratory specialists or technicians) at the national level.

The country is working to establish a multidisciplinary human resources capacity at all levels of the health system. There are few epidemiologists, veterinarians or wildlife officers, clinicians and some laboratory specialists and technicians available at national level and there are very few trained qualified professionals at district and primary care unit level. Even at national level not all disciplines are available or fully trained. In particular laboratory specialists and other laboratory staff, epidemiologists and nurses-in-charge are limited and need additional training. While most DMOs have an MPH and have some training in basic epidemiology, the number of officers currently being trained in field epidemiology is not yet sufficient to cover the whole area and respond to all needs. The capacity of the animal health workforce is extremely limited and no incentives are available to support retention and career development. One veterinarian is currently undergoing short-course epidemiology training in Ghana.

Strengths/best practices

The presence of WHO District Epidemiologists provides a great opportunity to mentor district RRTs and FETP graduates and enhance their practice after initial training. While WHO currently provides this support, it provides an excellent model for continued skills building once more advanced national epidemiologists become available.

The introduction of performance-based financing as an incentive system during the free health-care initiative has led to substantial increases in number and pay and a reported reduction in absenteeism and attrition and an increase of outputs of health workers.[1]

Areas that need strengthening/challenges

- Despite progress made the multidisciplinary capacity is still confined to certain specialities and mostly at national level. More specialized staff are needed (for example, laboratory specialists, social scientists, veterinarians) and staff having undergone basic training will need further upgrading.
- There is an inadequate number of animal health specialists in the country and there is no incentive system to attract more people into the profession.
- No animal health staff have been trained as RRTs.
- Competencies that are currently being built through in-service training should be addressed in curricula of pre-service education and training to ensure long-term strengthening of the workforce.
- Fast tracking recruitment of staff into vacant positions is a high priority to make better use of already available skills and competencies and thus rapidly strengthening the workforce.
- Posts need to be established for professions currently not covered in the HRH strategy such as epidemiologists, social scientists, biostatisticians, IT specialists and biomedical technicians to ensure sustained capacity.
- Strengthening the human resources information system to be able to better target workforce development and continued in-service education.
- To meet IHR and PVS requirements, it is essential that personnel can systematically cooperate and communicate. The limited workforce at all levels of MAFFS presents a structural limitation to effective communication and coordination.
- Support to the animal health workforce is very limited. This severely threatens the feasibility of implementing a One Health approach which in turn is needed to effectively implement the IHR and work towards health security.

D.4.2 Field epidemiology training programme or other applied epidemiology training programme in place – Score 3

There is an ongoing basic front-line FETP programme in the country with 18 participants recently trained and eight of them working in the system. A second cohort of 19 participants is currently enrolled and there is a plan for a third cohort in next year. Participants are from national and district level. Training materials are available. FETP front-line training does not include a laboratory or veterinary component; no one from the animal sector has been trained so far.

Strengths/best practices

- FETP has resulted in the greater involvement of District Surveillance Officers (DSO) in the production of weekly epidemiology bulletins.
- Training on IDSR has established communications through national and district levels.
- Ongoing mentorship provided by DSO and National Surveillance Officers to front-line staff.

[1] Witter S, Wurie H, Bertone MP. The free health care initiative: how has it affected health workers in Sierra Leone? Health Policy Plan. 2016;31:1–9. doi: 10.1093/heapol/czv006.

Areas that need strengthening/challenges

- Front-line FETP should include laboratory and animal health staff. However, even if included, participation of animal health staff is challenged by the very limited number of staff potentially eligible.
- FETP is currently fully supported by the Centers for Disease Control and Prevention (CDC)/Sierra Leone and CDC/Atlanta as well as the African Field Epidemiology Network. Arrangements need to be made to anchor the training within the Sierra Leone system to ensure long-term sustainability.
- Currently, there are no provisions for advanced FETP. This could be made available through arrangements with other countries in western Africa, but financial support would be needed.
- There is no partnership with other countries in the region to share FETP graduates during emergency events.

D.4.3 Workforce strategy – Score 2 (Human health)

D.4.3 Workforce strategy – Score 1 (Animal health)

A health-care workforce strategy exists but does not include public health professionals (such as epidemiologists, veterinarians and laboratory technicians). No health workforce strategy exists in the animal sector.

Strengths/best practices

- Based on the HRH Profile (2011) and the HRH Policy (2012), the country had developed a HRH Strategic Plan (2012–2016). Now a roadmap for a refreshed HRH policy and strategic plan (HRH Summit, 2 June 2016) is available. The upcoming period will address some critical issues like improved planning of human resources based on improved data (introduction of a human resources information system), increasing the number, skills and distribution of the health workforce as well as enhancing recruitment, financing mechanisms, regulation and performance management.
- The introduction of an incentive system in the health sector has resulted in low attrition rates in the MOHS.

Areas that need strengthening/challenges

- The current HRH strategy is based on the need to deliver a basic package of services. Though it is ambitious, it does not yet include professions like epidemiologists, biostatisticians and social scientists hampering the needed establishment of such posts.
- A human resources for animal health strategy is not available, but would be essential to successfully plan the workforce according to needs. Currently staffing levels as presented on the nominal staff list seem inappropriate in relation to the functions needed to implement an effective animal health system that can respond to all needs.
- There is no mechanism for monitoring the implementation and tracking of the workforce strategy.
- There is no identified career path for public health staff at the MOHS.

RESPOND

Preparedness

Introduction

Preparedness includes the development and maintenance of national, intermediate and community or primary response level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. Other components of preparedness include mapping of potential hazards, the identification and maintenances of available resources, including national stockpiles and the capacity to support operations at the intermediate and community or primary response levels during a public health emergency.

Target

Preparedness includes the development and maintenance of national, intermediate and local or primary response level public health emergency response plans for relevant biological, chemical, radiological and nuclear hazards. This covers mapping of potential hazards, identification and maintenance of available resources, including national stockpiles and the capacity to support operations at the intermediate and local or primary response levels during a public health emergency.

Sierra Leone level of capabilities

Sierra Leone has developed a National Multi-Hazard Contingency Plan (2007) coordinated by the Office of National Security (ONS) that includes disaster management. Though it is not oriented to health, it was used to respond to H1N1 influenza. However, it does not meet IHR core capacity requirements. Existing plans are thematically based (focusing specifically on Ebola, cholera, Zika and floods) and not integrated into a comprehensive public health emergency preparedness and response plan.

A draft framework has been developed, but not yet finalized, to incorporate multisectoral components (including PoEs), but it does not clearly define procedures to mobilize surge resources or stockpiling. While the country team indicated that surge capacity and stockpiling are available, a site visit by the JEE team to Connaught and Military Hospitals found that insufficient supplies were available at either, and staff estimated that after 72 hours their ability to cope with a public health emergency of concern would be fully tapped.

The country faces challenges in obtaining drugs and medical supplies at short notice or in the case of emergencies, as demonstrated by EVD. Procurement lag times due to long production cycles and multi-country pre-orders render the government dependent on partner donations and coordination during emergencies.

At the national level, a multi-hazard risk profiling has been completed, including biological, chemical, radiation and natural hazards. This risk-profiling exercise was completed in September 2016 with multisectoral partners. A similar risk-profiling process is yet to be conducted at district level to address district emergencies. Resource mapping has not been conducted and logistic pre-positioning at the district level is only in place for cholera, measles and EVD.

There is a variety of mechanisms to report a PHEIC, but no standardized or best practice way. The general population is encouraged to call the 117 telephone hotline to report public health concerns and the 119

hotline in the case of an emergency, disaster or a security issue. While 117 is a generally known and well-used resource, there is a need to publicize the 119 hotline to make it effective, as there is little awareness of its existence.

There is a comprehensive EOC and preparedness structures at district level are synergized and coordinated by the District Disaster Management Committee (DDMC), and other structures. The Emergency Preparedness Resilience and Response Teams meet weekly at the national EOC to identify needs and allocations of resources.

When the need arises, regulatory bodies are engaged to give waivers during emergencies such as the flexibility granted for health staff to respond during EVD and waivers granted by the pharmacy board for certification of drugs during the EVD outbreak.

While some Ebola Treatment Centres are being decommissioned, a plan to construct facilities for the management of highly infectious diseases is being implemented for all secondary hospitals. As part of preparedness, hospitals in four districts have identified staff that can be readily deployed to these isolation units to manage cases when the need arises.

Recommendations for priority actions

- Conduct risk and resources mapping of all priority public health risks.
- Develop and implement multi-hazard a NPHEPR plan that includes a costing element.
- Develop a stockpiling emergency plan and establish mechanisms for accessing funds for emergencies and supplies.

Indicators and scores

R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented – Score 1

A NPHEPR plan is not available to meet the IHR core capacity requirements. (Annex 1A, Article 2).

Strengths/best practices

- Draft plans exist for cholera, floods, EVD and Zika as separate documents.
- Surge capacity to respond to public health emergencies of national and international concern exists.
- An EOC is in place and functional.
- Emergency response structures are available across lower levels of government: PHEMC, DDMC and National and District RRT. All RRTs from the 14 districts have been trained and a functional list of RRTs will be available for reference.
- There are mechanisms for transfer of some limited resources in emergencies.
- Mechanisms also allow the MOHS to move health personnel to fill needs and functions in emergencies. While the human resources code may not show certain categories of expertise, there are methods by which people with that capacity to be easily deployed and this was tested during the EVD.

Areas that need strengthening/challenges

- No comprehensive, costed national hazard emergency plan is available.
- The non-availability of standby funds for emergencies limits the ability to plan.
- There are inadequate structures for pre-emergency procurement and planning, evident during the Ebola outbreak when there were procurement delays in accessing essential drugs and items. Partners with faster procurement procedures were relied on to fast track delivery of items.

- No hotline for clinicians to call in case of a disease of unknown origin. There is a best practice of notifying the DHMT and the District Surveillance Officer, however this needs to be standardized.
- Inadequate resources – human, logistics, funding – for preparedness.

R.1.2 Priority public health risks and resources are mapped and utilized – Score 1

Public health risk and resources mapping is not utilized.

Strengths/best practices

- Risk profiling was conducted for all hazards: biological, chemical, radiation and natural hazards.
- Risk profile and risk matrix were drafted, profiling cholera, EVD, Zika and flooding.

Areas that need strengthening/challenges

- Resource mapping for all hazards.
- Inadequate resources– human, logistics, funding – for preparedness.

Emergency response operations

Introduction

A public health EOC is a central location for coordinating operational information and resources for strategic management of public health emergencies and emergency exercises. EOCs provide communication and information tools and services and a management system during a response to an emergency or emergency exercise. They also provide other essential functions to support decision-making and implementation, coordination and collaboration.

Target

Countries will have a public health EOC functioning according to minimum common standards; maintaining trained, functioning, multisectoral RRTs and real-time biosurveillance laboratory networks and information systems; and trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

Sierra Leone level of capabilities

The establishment of the national and district PHEOCs was one of the key strategies to fight the EVD outbreak in Sierra Leone. During the EVD outbreak, 13 district structures were transformed and one national EOC was fully constructed. The EOCs were furnished with office furniture, computers, TV monitors, Internet, training facilities and generators. These resources will need maintenance to remain operational hence sustainability is an issue.

The EOC convenes incidence management meetings, NPHEPR meetings and technical meetings. The coordination structures and functions are not without terms of reference and frequencies are tailored to incidence and standing meetings. Although the establishment of the EOC was not commissioned by legislation, it was directed by strong leadership from the Offices of the President of the Republic and the Minister of Health and Sanitation.

The national PHEOC is home to the Incident Manager and Director of Disease Prevention and Control, the ONS, Public Health Agency, Public Health England, Centers for Disease Control and Prevention (USA), the African Field Epidemiology and Laboratory Training Network (FELTP), Emory University (USA) and relevant technical offices (administrative, finance, laboratory, training, disease surveillance and data units). The national PHEOC is routinely opened eight hours daily but not linked to the national emergency medical services call centre. It is currently housed in a building within the premises of the Republic of Sierra Leone Armed Forces, a permanent, well-resourced structure manned by the Armed Forces and a private security firm.

To operationalize the EOC there is an established incident management system, emergency operations plan, EOC operational plan and Emergency Operations Centre SOP. There is surge capacity as shown by the presence of standby ambulances and 4x4 vehicles, stocks of response supplies and national and district RRTs. Meanwhile, IDSR focused simulations are yet to be conducted.

The country has developed appreciable public health emergency operations systems and instruments to activate (within 120 mins as demonstrated by the recent flare-up of EVD and measles outbreaks), deactivate and respond to emergency operations at national and district levels using the One Health platform. However, the need to develop IHR-related case management tools, increase human resources capacity and capabilities and ensure sustainable financing, cannot be over emphasized.

Recommendations for priority actions

- Increased training and retention of surge capacity staff in emergency response operations competencies.
- Government ownership as demonstrated by dedicated budgetary support to ensure sustainable funding and authority to the national EOC to mobilize resources required for response.
- Develop curriculum and institutionalized EOC and simulation training programmes.

Indicators and scores

R.2.1 Capacity to activate emergency operations – Score 4:

In addition to activities for developed capacity, there is a dedicated EOC staff that have received training and can activate a response within two hours.

Strengths/best practices

- Sierra Leone has functional EOCs at 13 districts and one national EOC.
- There is evidence of trained and dedicated EOC staff at national and district levels to coordinate and activate an emergency response within 120 minutes with relevant coordination structures and documented terms of reference.
- The coordination structures are inclusive of line ministries, agencies, partners and security services and there is also proof that the country has tested the system of activation and response during the EVD and measles outbreaks.
- Working closely with partners during emergencies and routinely helps to transfer skills and knowledge in response to emergencies.

Areas that need strengthening / challenges

- Increase capacity for additional staff not trained at EOC in emergency management, public health administration and logistics. Other areas to consider include training in emergency medical services for call centre staff, ambulance drivers and nurses.
- The operationalization of the EOC is currently partner dependent. Government centred ownership to provide functional support remains a challenge to be addressed.

R.2.2 EOC operating procedures and plans – Score 3

In addition to meeting requirements of limited capacity, EOC plans are in place for functions including public health science (epidemiology, medical and other subject matter expertise), public communications and partner liaison.

Strengths/best practices

- Sierra Leone has shown tested capacity of their EOC procedures and plans developed as a result of the EVD flare-up and measles outbreaks.
- In addition to the EOC plans and draft SOP, there are event specific national emergency preparedness and response plans, though skewed to health for pandemic influenza, EVD, cholera and avian flu (2006). These plans form the guiding documents for the response to public health events.

Areas that need strengthening/challenges

- To ensure that the progress made can be maintained, the national PHEOC SOPs should be aligned with the national disaster operation centre tools, an integrated multi-hazard preparedness and response plan should be developed, and capacity in human and animal epidemiology should be increased.

R.2.3 Emergency operations programme – Score 4

EOC activated a coordinated emergency response or exercise within 120 minutes of the identification of a public health emergency. This response utilized operations, logistic and planning functions.

Strengths/best practices

- Emergency operations at national and district levels are decentralized and are guided by sound, well-structured documents. This allows for a certain level of self-reliance and decision-making. Evidence of this approach was the coordinated response during the EVD and measles outbreaks from the national and district EOCs.
- Partnership and collaboration through hands-on transfer of skills to local staff and knowledge in response to emergencies is an evidence model that still exists at the EOCs.

Areas that need strengthening/challenges

- For the efficient coordination of response activities and the day-to-day operation of the EOC, logistics capacity and a long-term equipment maintenance plan, beyond the investment period of partners, must be developed.
- The mobilization of resources for EOC operations is still partner dependent as the EOC has no resource mobilization authority.

R.2.4 Case management procedures are implemented for IHR relevant hazards – Score 2

Case management guidelines are available for priority epidemic-prone diseases.

Strengths/best practices

- Sierra Leone has in place epidemic preparedness and response plans and related case management guidelines (EVD case management and cholera case management guidelines) but skewed to epidemic-prone diseases.

Areas that need strengthening/challenges

- There is a need to develop multi-hazard preparedness and response plans with related case management guidelines in relation to IHR core competencies. These case management instruments should be developed inclusive of the pre-service institutions, before all relevant stakeholders institutionalize them.

Linking public health and security authorities

Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is the result of human intervention (such as the anthrax terrorist attacks) or occurs naturally (such as flu pandemics). In a public health emergency, law enforcement will need to quickly coordinate its response with that of public health and medical officials.

Target

In the event of a biological event of suspected or confirmed deliberate origin, the country will be able to conduct a rapid, multisectoral response, including the capacity to link public health and law enforcement, and to provide or request effective and timely international assistance, including to investigate alleged use events.

Sierra Leone level of capabilities

The Public Health Ordinance, 1960 provides the overarching legal basis to authorize the Office of National Security (ONS) to engage in a public health emergency response and this legislation provided for the engagement of ONS with all other areas of government, especially the MOHS, in responding to the EVD outbreak. The ONS made a substantial and effective contribution to the control of the EVD epidemic, a situation of protracted dread to the population, without a breakdown in law and order or undermining public confidence in the democratic structures of Sierra Leone. This is a remarkable achievement and demonstrates a high level of capability in integrating security with the public health emergency response in Sierra Leone.

Although the Public Health Ordinance, 1960, provided the legal basis for the deployment of the security services in a public health emergency response, other enabling legislation was also available and effectively used, including a standing order to enact joint deployment of the military and police during civil emergencies (including public health emergencies) and the Military Aid to Civilian Populations Act.

These structures, resources and powers supported quarantine, detention of individuals believed to pose a risk to public health and actions to minimize public movement and mixing.

Recommendations for priority actions

- Create a formal agreement to give guidance and improve coordination and collaboration between all stakeholders.
- Formalize agreement between security and health at PoEs.

Indicators and scores

R.3.1 Public health and security authorities, (such as law enforcement, border control and customs) are linked during a suspect or confirmed biological event – Score 4

At least one public health emergency response or exercise within the previous year that included information sharing with the security services using a formal MOU or other agreement (that is, protocol).

Strengths/best practices

- Legislation is in place with explicit provision to link public health and security authorities.
- Government Institutions are empowered to collaborate during emergency situations as needed.
- These provisions were shown to work effectively during the EVD epidemic without compromising democratic institutions.
- Situation reports were regularly shared between security and public health authorities at regional and national levels.
- Security authorities attended and participated in the EOC.
- Security services successfully worked with health agencies throughout the prolonged EVD emergency.
- Effective structures have been enhanced and enriched as a result of the EVD epidemic response.
- The 119 telephone hotline serves as a means of notification of all hazards and generates an alert to the National Security Situation Room.
- ONS has had a multi-hazard contingency plan since 2007 that has been exercised by many different civil emergencies.

Areas that need strengthening/challenges

- Need to strengthen integration of the MAFFS with veterinary medicine and animal health authorities to strengthen surveillance for emerging or re-emerging zoonoses.
- Need for SOPs for different types and levels of engagement to further optimize coordination and response.
- Challenge of constrained resources.

Medical countermeasures and personnel deployment

Introduction

Medical countermeasures are vital to national security and protect nations from potentially catastrophic infectious disease threats. Investments in medical countermeasures create opportunities to improve overall public health. In addition, it is important to have trained personnel who can be deployed in case of a public health emergency.

Target

A national framework is in place for transferring (sending and receiving) medical countermeasures and public health and medical personnel among international partners during public health emergencies.

Sierra Leone level of capabilities

During the final months of the EVD epidemic, and subsequently during an outbreak of measles, the Government of Sierra Leone was successful in providing regulatory and logistic oversight for the procurement, distribution and administration of vaccine countermeasures to combat disease transmission. While these actions were taken in the context of significant threats to public health, currently the country's plan for the procurement and utilization of medical countermeasures is not specific to emergency situations.

The country's principal authority for medical countermeasures is the Pharmacy Board of Sierra Leone (PBSL). The medical countermeasures plan established by PBSL dictates procedures and decision-making with regard to medical countermeasures receipt and distribution. PBSL has regulatory oversight over medical countermeasures utilization and is responsible for assessing the quality, efficacy and safety of medical countermeasures used in-country. In emergency situations, medical countermeasures are distributed through the Central Medical Stores network using existing distribution matrices. PBSL has dedicated personnel resources for receipt, tracking and distribution of medical countermeasures.

The country participates in regional partnerships through the Mano River, ECOWAS and the West African Health Organisation (WAHO) collectives. These partnerships include agreements to facilitate the sending and receipt of medical countermeasures within the region for example during emergencies or under shortage conditions. The MOHS of Sierra Lone also has a formal relationship with GAVI (the Vaccine Alliance), which supports cost-sharing procurement and utilization of vaccines to prevent childhood infections. Currently Sierra Leone lacks the capacity to manufacture medical countermeasures (vaccines and drugs). Access to veterinary countermeasures is severely limited.

A best practice evident during the 2015 Ebola vaccine trial (Sierra Leone Trial to Introduce a Vaccine against Ebola, STRIVE) was the close working relationship between the PBSL and the Sierra Leone Ethics and Scientific Review Committee. This collaboration ensured that the utilization of the Ebola vaccine was accomplished in full compliance with the regulatory standards governing the use of investigational medical products, and that consideration was given to public health and research ethics in a manner specific to local populations.

The MOHS does not have a formal, approved plan for the sending and receipt of medical and public health personnel during emergencies, but a service-level agreement exists with nongovernmental organization (NGO) partners. This agreement guides procedures and decision-making related to sending and receiving

health personnel, and addresses regulatory and licensure concerns related to the receiving of health personnel from outside countries, including training criteria and standards for health personnel who will be sent or received. The agreement does not address liability, safety or financing.

Recommendations for priority actions

- Develop or update plans to direct the procurement, distribution and utilization of medical countermeasures and the exchange of medical, public health and veterinary personnel on an emergency basis.
- Expand stocks of medical countermeasures (for example, vaccines, antibiotics, infection control supplies and rapid diagnostic tests) to cover all-hazard emergency contingencies, including zoonotic infections.
- Enter agreements with medical countermeasure manufacturers and distributors to accommodate accelerated procurement of medical countermeasures during public health emergencies.
- Improve access to veterinary countermeasures by leveraging existing supranational partnerships, for example, OIE Canine Rabies Vaccine Bank.
- Develop a distribution matrix for veterinary countermeasures for utilization at both national and regional levels.

Indicators and scores

R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency – Score 2

Plans have been drafted that outline systems for sending and receiving medical countermeasures during public health emergencies.

Strengths/best practices

- The Government of Sierra Leone has an exercised a plan housed within the PBSL that identifies procedures to receive and provide quality assurance for medical countermeasures.
- Medical countermeasures are efficiently distributed through the Central Medical Stores using dedicated, trained personnel.
- The Government of Sierra Leone has, in collaboration with external partners, successfully deployed MCMs within the last 12–24 months to halt the spread of infectious diseases in at risk communities.

Areas that need strengthening/challenges

- Country plans for emergency use of medical countermeasures have yet to be finalized, and no plans are under consideration for veterinary countermeasures.
- Sierra Leone currently lacks the capacity to produce medical commodities for use in human or veterinary medicine.
- Agreements could be put in place with manufacturers to procure medical countermeasures expediently during public health emergencies.
- Enhanced access to veterinary medical countermeasures is urgently needed.

R.4.2 System is in place for sending and receiving health personnel during a public health emergency – Score 1. No national personnel deployment plan has been drafted.

Strengths/best practices

- A service-level agreement is in place between MOHS and the Government of Sierra Leone, and NGO partners to send and receive health personnel.

Areas that need strengthening/challenges

- There is currently no plan that incorporates procedures to send or receive health personnel during emergency situations.
- The current service-level agreement does not address liability, safety or financial considerations.
- Other sectors (animal, environmental, etc.) are not included in the service-level agreement.
- No triggers for requesting personnel from other countries, nor procedures for training those that arrive in-country, currently exist.

Risk communication

Introduction

Risk communication should be a multilevel and multifaceted process that aims to help 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 outbreaks of diseases. 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 considered, as well as the voice of the affected population. Communications of this kind promote the establishment of appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through the appropriate channels is essential. Communication partners and stakeholders in the country need to be identified, and functional coordination and communication mechanisms should be established. In addition, the timely release of information and transparency in decision-making are essential for building trust between authorities, populations and partners. Emergency communications plans need to be tested and updated as needed.

Target

States Parties have the capacity for risk communication, that is a multilevel and multifaceted real-time exchange of information, advice and opinion between experts and officials or people who face a threat or hazard to their survival, health or economic or social well-being so that they can take informed decisions to mitigate the effects of the threat or hazard and take protective and preventive action. It includes a mix of communication and engagement strategies like media and social media communication, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement and community engagement.

Sierra Leone level of capabilities

- Sierra Leone has formal government arrangements and systems in place for risk communication with SOPs and the capacity for multisector and multistakeholder involvement. Allocation and alignment of human and financial resources are, however, insufficient.
- Effective, regular communication coordination with partners exists at different levels. Coordination was tested by simulation exercises at national and district levels.
- There are existing information – education – communication materials with messages on different subject areas such as cholera, Lassa fever and preparedness that are updated to suit the emergency and disseminated.
- There is regular dissemination of information on human public health issues however communication related to animal health is lagging behind.
- Stakeholders include the Office of the President, ONS, MAFFS, WHO, UNICEF and FAO.

Recommendations for priority actions

- Finalize the EOC communications strategic plan.
- Develop a training plan to meet the capacity gaps in risk communication.
- Establish a formal mechanism to coordinate communication with the private sector during an emergency.

- Allocate a dedicated budget line in MOHS and MAFFS for addressing communications response.
- Sustain feedback loops between district teams and communities within localities.

Indicators and scores

R.5.1 Risk communication systems (plans, mechanisms, etc.) – Score 3

Formal government arrangements and systems are in place with SOPs and capacity with multisectoral and multistakeholder involvement, but insufficient allocation and alignment of human and financial resources.

Strengths/best practices

- Risk communication is addressed in a national response plan.
- MOHS has internal regulations that guide clearance of public communications before being sent to the media during emergencies. The Chief Medical Officer or EOC incident manager must approve the message before it is sent to the media.
- There are designated permanent personnel dedicated to risk communications during emergencies.
- There is sharing of information and communications plans between other multisectoral response agencies and media through the communications pillar in an emergency response. The communications pillar meets even in the absence of emergencies.
- During emergencies, there is a designated government department,-the Ministry of Information, that responds to public information.

Areas that need strengthening/challenges

- There is no dedicated budget for emergency risk communications.
- The communications plan has never been tested.
- There is no scheduled training for risk communications.
- Communications response personnel have not been trained on response plan changes.
- There is inadequate technical and financial support to implement the plan.

R.5.2 Internal and partner communication and coordination – Score 4

Effective, regular communication coordination with all partners is required at all levels, and their coordination has been tested by a simulation exercise or by a real health emergency.

Strengths/best practices

- There are policies for coordinating internal communications during emergency and non-emergency responses.
- There is a policy to coordinate communications among national stakeholders and response agencies during emergencies.
- Formal mechanisms to coordinate communications with hospitals and the health-care sector during emergencies exist through the MOHS Directorate of Training, Hospital and Laboratory Services.
- Formal mechanisms exist to coordinate communications among civil society organizations during an emergency through PHEMC.
- A desktop simulation exercise was held at national level in November 2015 and at district level.
- There is also a newsletter produced at National EOC shared with 15 countries in WAHO. Contact is maintained with media journalists and health communications in WAHO.

Areas that need strengthening/challenges

- There is no formal mechanism to coordinate communications with the private sector during emergencies.
- There is limited funding to support partner communication and coordination.
- Communication response plans are not regularly developed together with external partners and stakeholders.

R.5.3 Public communication – Score 3

Level 2 (limited capacity) plus proactive public outreach on a mix of platforms (newspapers, radio, TV, social media and web) as appropriate according to national and local preferences; and in relevant national and local languages. Use of locally relevant technologies for public communications (such as mobile phones) exist.

Strengths/best practices

- SOPs for public communications within MOHS Media and Communications Department exist.
- There is a designated public relations officer who is the official MOHS spokesperson.
- MOHS has media monitoring and liaison officers who maintain the social media pages of the EOC and analyse media data to inform messages.
- Communications is provided to local radio stations in local languages (Mende and Temne) as needed by the audience.
- During outbreaks, messaging on EVD was provided through radio, social media and telephone messages, jingles, etc.
- Press briefings are held regularly to publicize EOC activities, and newsletters and bulletins are disseminated regularly.

Areas that need strengthening/challenges

- No operational research on communications methods for behavioural change during emergencies.
- No experience sharing and new strategies with partner organizations to continually improve the communication response.
- Public communication on animal health issues are lagging behind.

R.5.4 Communication engagement with affected communities – Score 2

Community level engagement system is semi-formed with mapping of existing processes, programmes, partners and stakeholders. Social mobilization, behaviour change communication and community engagement are included in the national risk communication strategy in the context of health emergencies. Some key stakeholders in this domain are identified at national and intermediate (provincial or regional) level.

Strengths/best practices

- There are social mobilization units at national level, in the DHMTs and within the social mobilization pillar of the EOC.
- The health education department has community engagement activities or outreach in neighbourhoods and villages during health emergencies.
- DHMT community engagement functions work in a vertical fashion that enables national-level leadership to both learn from district levels and share lessons learnt with other DHMTs.

- Regular and rapid change messaging is developed to address audience feedback, misinformation and questions.
- New messaging was immediately developed to reflect the policy on swabbing of corpses that was altered in June 2016.
- Students from university undergoing training in communication are attached to MOHS for internships.

Areas that need strengthening/challenges

- The feedback loop between at risk and affected populations and response agencies is no longer active.
- Limited funding to strengthen community engagement with affected or at risk communities.

R.5.5 Dynamic listening and rumour management – Score 3

Routine and event-based systems for listening and rumour management or ongoing systems with limited or unpredictable influence on the response exist.

Strengths/best practices

- The media monitoring unit of EOCs monitors and addresses rumours and misinformation.
- Ad hoc rumour monitoring methods through public health workers, EOC social media platforms and the toll free phone number 117 also exist.
- MOHS has trained front-line health workers maintaining rumour log books and verification.
- Media monitoring team gathers responses from across various outlets to evaluate the effectiveness of the changed messaging.
- During the EVD outbreak, MOHS Media and Communications Department redesigned some risk communications messages to counter rumours and misinformation and ensure message consistency.

Areas that need strengthening/challenges

- There is no method to monitor the effectiveness of methods or messages used to disprove rumour or correct information.
- Community resistance to rumours during the EVD response.

POINTS OF ENTRY AND OTHER IHR-RELATED HAZARDS

Points of entry

Introduction

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

Sierra Leone level of capabilities

The country has four designated PoEs; Lungi International Airport, Queen Elizabeth II seaport, Gbalamya ground crossing to Guinea and Jemdema ground crossing to Liberia. In addition to these designated ports of entries, 30 international land crossing points are identified in the national migration policy (15 July 2014).

Port health at Lungi Airport is managed by MOHS staff with capacity-building supported by the International Organization for Migration (IOM). There are SOPs for exit and entry screening used during the EVD outbreak, an airport emergency plan that includes a health component and reports of assessments conducted by MOHS/IOM and CDC (May 2016) and CAPSCA[2] (March 2015). Two standby ambulances owned by the MOHS and trained staff for safe referral and transfer of ill travellers are available at Lungi International Airport. SOPs for vector control are included in the airport public health SOPs.

The airport clinic has not been operational for over two years. There are designated isolation and screening rooms in the arrival and departure halls but they have not been functional since the end of the Ebola outbreak. The two ambulances have no assigned drivers. When the need arises, Lungi Hospital (3 kms away) makes drivers available.

No routine inspection is done by MOHS at the PoEs. The country does not have a specific public health emergency contingency plan for PoEs except the draft national aviation public health emergency preparedness plan for Lungi International Airport. Other PoEs do not have SOPs, MOUs or trained staff for the safe referral and transfer of ill travellers to appropriate medical facilities

[2] The Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation

Recommendations for priority actions

- Develop policy, SOPs, guidelines and plans for port health.
- Conduct capacity assessments at major border crossings and establish PoEs for their designation.
- Establish or strengthen routine inspection programmes at PoEs with 24 hour appropriate services.
- Finalize the national aviation public health emergency preparedness plan.

Indicators and scores

PoE.1 Routine capacities are established at PoEs – Score 2

Designated PoEs have access to appropriate medical services including diagnostic facilities for the prompt assessment and care of ill travellers and with adequate staff, equipment and premises (Annex 1B, 1a).

Strengths/best practices

- Sierra Leone has designated four PoEs, including one airport, one seaport and two ground crossings. Three of the four designated PoEs have space for the isolation of suspected patients.
- In 2015, 41 personnel from the designated PoEs were trained on the inspection of conveyances.
- An airport emergency preparedness plan that includes a health component is available for Lungi International Airport.
- There is an SOP for the transfer of ill travellers through the airport and trained staff for the safe referral and transfer of ill travellers. There are two standby ambulances at the airport.
- Capacity assessment of PoEs has been conducted at Lungi and Koinadugu.
- Some screening is being conducted – screening of vaccination certificates at Lungi and at the ground crossings and temperature checking at the ground crossings.
- SOPs for exit and entry screening used during the EVD outbreak are available.

Areas that need strengthening/challenges

- The designated PoEs should have enough space, equipment and trained staff to implement the IHR (2005) activities required at PoEs.
- All competent authorities at the PoEs must be sensitized about the roles and requirements of the IHR and should develop action plans to implement the regulations.
- Assigning of drivers for the ambulances at Lungi International Airport is crucial for the rapid transportation of ill travellers.
- The designated PoEs should have an MOU with nearby hospitals for patient referral.
- Conducting and maintaining regular screening and inspection at the PoEs and implementing the necessary corrective measures needs to be considered.
- An emergency preparedness and response plan for PoEs should be developed involving key stakeholders and partners.
- A surveillance system for both public health and animal health should be established and linked to the national surveillance system.

PoE.2 Effective public health response at points of entry – Score 1

No national public health emergency contingency plan exists for responding to public health emergencies occurring at PoEs.

Strengths/best practices

- Sierra Leone has developed a draft national aviation public health emergency preparedness plan for Lungi International Airport which is integrated with other national response plans.
- A cholera preparedness plan and a draft public health emergency response plan are available.
- Capacity assessment has been conducted at Lungi International Airport and at Jemdema (Koinadugu district).

Areas which need strengthening and challenges

- Develop a public health emergency contingency plan specific to the PoEs.
- Develop a system for the transfer of ill travellers from the PoEs to appropriate medical facilities.
- Conduct a capacity assessment or evaluation of the two ground PoEs.
- Maintain continuous communication between the IHR national focal point and the competent authorities at the PoEs.

Chemical events

Introduction

States Parties should have surveillance and response capacity for chemical risks or events. This requires effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal

Target

Surveillance and response capacity for chemical risks or events is available. There is effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal.

Sierra Leone level of capabilities

There are several stakeholders involved in the management of chemicals in Sierra Leone, including the Office of the President (the President is also the Minister for the Environment), the Ministry of Energy, the EPA, the ONS, the MAFFS, the Ministry of Trade and Industry and the MOHS.

Sierra Leone has ratified many global conventions relating to the management of chemicals, including the Stockholm Convention on Persistent Organic Pollutants, the International Convention for the Prevention of Pollution from Ships (MARPOL), the Basel Convention, the Rotterdam Convention, the Minamata Convention on Mercury and the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement. Sierra Leone is also a signatory to the Strategic Approach to International Chemicals Management (SAICM).

The country has established an EPA by Act of Parliament in 2008 (as amended 2010) with the overall mandate to effectively protect and sustainably manage the environment and natural resources to ensure a quality environment adequate for human health and well-being of all Sierra Leoneans. National policies, plans and legislation for chemical event surveillance alert and response exist and there is a five-year strategic plan in place. They have also established a process for assessing (with the MOHS) clinical waste management practices in government health-care facilities in Freetown.

Sierra Leone has not been involved in responding to any major chemical event and lacks legal tools relating to several aspects of chemical management. More work is required to strengthen multisectoral working, particularly in relation to case management (for example, decontamination), clinical management (for example, toxicology) and surveillance, assessment and management of chemical events.

Recommendations for priority actions

- Develop a strategic plan for chemical safety.
- Develop comprehensive guidelines or manuals on surveillance, assessment and management of chemical events to support the implementation of the strategic plan for chemical safety.
- Establish a coordination mechanism nationally and at regional and district levels for the detection and response to chemical events and emergencies, to include a public health plan for chemical incidents and emergencies.
- Advocate for an increase in the number of human resources to meet the needs of chemical safety.

Indicators and scores

CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies – Score 2

Guidelines or manuals on the surveillance, assessment and management of chemical events, intoxication and poisoning are available.

Strengths/best practices

- Surveillance is in place for chemical events, intoxication and poisoning but with limited access to laboratory capacity to confirm priority chemical events.
- The focus is mainly on the monitoring of water bodies around companies and this is done by the EPA in close collaboration with laboratories and institutions (including private laboratories, laboratories outside the country and the United Nations Environment Programme).
- Environmental quality monitoring committees were established in 2015 and investigation reports on chemical surveillance and monitoring are produced at regular intervals. Feedback on data and response activities in these areas are also provided.
- A pilot air quality project has been conducted in Freetown and will be expanded to network multiple air monitors. Adding air quality monitors will help identify major pollutants and expand technical capacity to understand potential chemical release events.
- Good collaboration has been established between the EPA and the police through the Environmental Crimes Unit which participates in enforcement exercises.

Areas that need strengthening/challenges

- While the EPA monitors immediate water bodies around companies, this should be strengthened to cover other matrices such as air, soil, deposition and vegetation, not just around companies but also in areas where the population may potentially be exposed to chemical contaminants (for example, people living near waste sites or polluted water).
- There are no comprehensive guidelines or manual for holistic surveillance, assessment and management of chemical events.
- Chemical incident surveillance only includes water and does not include other environments such as air, soil, deposition or vegetation.
- There is no efficient information flow in chemicals surveillance and monitoring.
- The laboratories have limited capacity. EPA works with some private laboratories and laboratories at the University of Sierra Leone, but none are certified.
- There is no coordination mechanism for detection and responding to chemical events at regional and district levels.
- There is no poisons centre in Sierra Leone and no syndromic surveillance mechanisms or formal approaches for dealing with chemical poisoning.

CE.2 An enabling environment is in place for management of chemical events – Score 2

National policies, plans or legislation for chemical event surveillance alert[3] and response exist.

[3] Elements of alert include SOPs for coverage, criteria of when and how to alert, duty rosters, etc.

Strengths/best practices

- Draft chemical legislation is under development and should be ratified soon.
- Chemical control and management of pesticides is being developed.
- A multisectoral coordination committee was established in 2012.
- There is a disaster management department at the ONS.
- A performance audit system for exercises and responses and a database for chemicals is available.
- Sierra Leone has signed up to several international conventions including SAICM, the Stockholm Convention on Persistent Organic Pollutants and MARPOL. The following environmental agreements have also been ratified: the Basel Convention, the Rotterdam Convention, the Minamata Convention on Mercury and the UNFCCC Paris Agreement.
- An example of good practice is the development and establishment of a joint assessment between the EPA and the MOHS on clinical waste management practices in government health-care facilities in Freetown.

Areas which need strengthening and challenges

- There is no strategic plan for chemical safety.
- There is no public health plan for chemical incidents or emergencies.
- There is limited coordination mechanism at regional and district levels.
- There is no MOU with other laboratories except the Sierra Leone Standards Bureau.
- There are no protocols or guidelines for case management regarding chemical hazards.
- There is no poisons centre.

Radiation emergencies

Introduction

States Parties should have surveillance and response capacity for radio-nuclear hazards, events or emergencies. It requires effective communication and collaboration among the sectors responsible for radio-nuclear management.

Target

States Parties have in place surveillance and response capacity for radio-nuclear hazards or events or emergencies. There is effective communication and collaboration among the sectors responsible for radio-nuclear management.

Sierra Leone level of capabilities

In Sierra Leone, the Nuclear Safety and Radiation Protection Authority (NSRPA) leads on radiological issues and in doing so has established collaboration with a numbers of other ministries including collaboration with the MOHS on inspection and enforcement facilities, the ONS on radiological concerns and the EPA on environmental concerns with regard to ionizing and non-ionizing issues. The NSRPA is responsible for radiological and nuclear events with a designated focal point for coordination and communication with relevant stakeholders.

The Ministry of Trade and Industry regulates the sale and transfer of radioactive and nuclear sources while the Ministry of Transport and Aviation is engaged in the safe and secure transport of radioactive sources from the PoE to the relevant facility.

The International Atomic Energy Agency (IAEA) provides technical support, training and relevant logistics to the NSRPA while WHO provides technical advice with respect to human and animal health. NSRPA has close links with CDC during radiological accidents leading to the establishment of a likely disease. Sierra Leone has enacted a Nuclear Safety and Radiation Protection Act with basic regulations completed, though some areas including transport, air and regulations are under development. Sierra Leone has also adopted the IAEA guidelines into its regulations. The existing radiation monitoring mechanism in the country requires a more comprehensive risk assessment tool that should include transport and other areas.

Recommendations for priority actions

- Advocate for an increase in the number of human resources to meet the needs for radiation safety.
- Improve laboratory capacity for the detection and response to all radiological and nuclear emergencies.
- Incorporate responding to chemical and radiological emergencies in the draft public health incident and emergency response plan.
- Allocate sufficient budget to meet demand in the event of a radiation emergency.
- Conduct simulation exercises on the appropriate response to radiation emergencies.

Indicators and scores

RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies – Score 2

National policies, strategies or plans for the detection, assessment and response to radiation emergencies are established and a monitoring mechanism exists for radiation emergencies that may constitute a public health event of international concern.

Strengths/best practices

- A Nuclear Safety and Radiation Protection Act was enacted in 2012.
- The NSRPA was established in 2000.
- A monitoring system for radiation hazards in consumer products is being established.
- IAEA guidelines – basic regulations were adopted for Sierra Leone.
- Laboratory facilities are available for the analysis of x-rays and alpha, beta, gamma and neutron radiation.
- Examples of best practice include the retrieval of a Cs-137 radioactive source in a scrap metal collection from a dwelling house at Kissy in 2013, countrywide monitoring of X-ray generators in hospitals and inspecting mineral ores to ensure that radiation levels meet international standards.

Areas which need strengthening and challenges

- Insufficient number of human resources to meet the needs for radiation safety.
- Laboratory facilities need to be upgraded (in line with the IAEA/WHO Network of Secondary Standards Dosimetry Laboratories) for radio-nuclear sources.
- There are no protocols or guidelines for case management regarding radio-nuclear hazards.
- There are no reference health-care facilities for management of radiation emergencies.
- There is inadequate funding to meet the needs for radiation safety.

RE.2 An enabling environment is in place for management of radiation emergencies – Score 2

National authorities responsible for radiological and nuclear events have a designated focal point for coordination and communication with the MOHS and/or IHR national focal point.

Strengths/best practices

- The country has a nuclear safety and radiation protection strategic plan.
- The country has an annual operational plan for nuclear safety and radiation protection.
- The country has a public health and emergency response plan.
- There is an MOU for collaboration with the EPA.
- The country has recently concluded training on security in transporting radioactive materials.
- Good collaboration with the ONS, police, and military for joint planning in readiness for a terrorist threat.
- Good collaboration with the EPA.

Areas that need strengthening/challenges

- The draft public health incident and emergency response plan does not include response to chemical and radiological emergencies.
- In the event of a radiation emergency, there is no evidence of a readily available budget to meet additional demands.
- There has been no simulation exercise for radiation emergency response.
- There is inadequate coordination among stakeholders.

Appendix 1: JEE background

Mission place and dates

Freetown, Sierra Leone; 31 October–4 November 2016

Mission team members

Names	Country (or affiliate multilateral)	Agency
Dr Ambrose Talisuna (Team Lead)	Republic of Congo	WHO Regional Office for Africa
Dr Daniel Yota	Burkina Faso	WHO Regional Office for Africa, Intercountry Support Team for West Africa
Dr Sally-Ann Ohene	Ghana	WHO Ghana Country Office
Mr. Haftom Taame Desta	Ethiopia	African Union, Centres for Disease Control and Prevention
Dr. Daphne Moffett	USA	Centers for Disease Control and Prevention, Atlanta
Dr. Mary Reynolds	USA	Centers for Disease Control and Prevention, Atlanta
Ms. Nathalie Roberts	USA	Centers for Disease Control and Prevention, Atlanta
Dr. Sabine Flessenkämper	Germany	Deutsche Gesellschaft für Internationale Zusammenarbeit
Dr Bengu Said	United Kingdom	Public Health England
United Kingdom	United Kingdom	Public Health England
Dr. Mark Reacher (Team Co-Lead)	United Kingdom	Public Health England
Mr. Thomas Nagbe	Liberia	Ministry of Health and Social Welfare
Dr. Cheikh S. Fall	Senegal	Department of Agriculture, Animal and Plant Health Inspection Service, USA
Mr. Roland K. Wango	Republic of Congo	WHO Regional Office for Africa

Objective

To assess Sierra Leone's capacities and capabilities relevant for the 19 technical areas of the JEE tool to provide baseline data to support Sierra Leone's efforts to reform and improve their public health security.

The JEE process

The JEE process is a peer to peer review. As such, it is a collaborative effort between host country experts and external evaluation team members. The entire external evaluation, including discussions around the scores, the strengths, the areas which need strengthening, best practices, challenges and the priority actions should be collaborative, with external evaluation team members and host country experts seeking full agreement on all aspects of the final report findings and recommendations.

Should there be significant and irreconcilable disagreement between the external team members and the host country experts or among the external or among the host country experts, the external evaluation Team Lead will decide the outcome; this will be noted in the final report along with the justification for each party's position.

Preparation and implementation of the mission

- Held weekly teleconferences on the mission.
- Searched for Team Lead and Co-Lead.
- Put together JEE team.
- Shared self-assessment report and other technical documents with JEE team.
- Provided logistic assistance to JEE team.
- Liaised with WHO Sierra Leone Country Office for routine update on preparations.
- Dispatched an advance team from the WHO Regional Office for Africa to provide technical and logistics support.
- Ensured smooth coordination and implementation of the JEE.

Limitations and assumptions

- The evaluation was limited to one week's time which limited the amount and depth of information which could be managed.
- It is assumed that the results of this evaluation will be made publicly available.
- The evaluation is not an audit and information provided by Sierra Leone will not be independently verified. Information provided by Sierra Leone will be discussed and evaluation rating will be mutually agreed to by the host country and evaluation team. This is a peer to peer review.

Key host country participants and institutions

Names of participants	Organization
Government of Sierra Leone	
Dr. Amara Jambai	MOHS, Chief Medical Officer II
Dr. Foday Dafae	MOHS, Director, Directorate of Disease Prevention and Control
Dr. Ansumana Sillah	MOHS, Director, Department of Environmental Health and Sanitation
Dr Sorie Mohamed Kamara	MAFFS, Director, Livestock and Veterinary Services
Dr Tejan Jalloh	MAFFS, Acting Deputy Director, Animal Health Veterinary Disease Surveillance
Dr. Abdul Gudush Jalloh	MAFFS, Acting Assistant Director, Animal Health
Dr. Alie H. Wurie	MOHS, Directorate of Disease Prevention and Control
Dr. James Akpablie	MOHS, Directorate of Disease Prevention and Control/Commonwealth
Roland M. Conteh	MOHS- Directorate of Disease Prevention and Control/Surveillance Programme Manager
Harold Thomas	MOHS, Directorate of Disease Prevention and Control
Festus Amara	MOHS, Directorate of Disease Prevention and Control
Mohammed Baba Jalloh	MOHS, Directorate of Disease Prevention and Control
Rebecca Neala	MOHS, Directorate of Disease Prevention and Control
Doris Harding	MOHS, Central Public Health Reference Laboratory
Dauda Kamara	MOHS, Central Public Health Reference Laboratory
Agnes k. Dumbuya	MOHS, Central Public Health Reference Laboratory
Fatmata Barrie	MOHS, Central Public Health Reference Laboratory

Zein Sama	MOHS, Central Public Health Reference Laboratory
Manso S. Kargbo	MOHS
Fatmata B. Jalloy	MOHS
Fay Charlobah	MOHS
Benjamin Bangura	MOHS
Anthony Foday	MOHS, Directorate of Environmental Health Services
Edward Kamara	MOHS, Directorate of Environmental Health Services
Charles Ngombu	MOHS, Directorate of Environmental Health Services
Allieu B. Kamara	MOHS, Directorate of Environmental Health Services
Juliana Kamanda	MOHS, Directorate of Environmental Health Services
Christiana Fortune	MOHS, Directorate of Environmental Health Services
Ahmed J. Samba	MOHS, Laboratory
Sabiatu Bakar	ONS
Nathaniel Kaiba Kamara	ONS
Lovetta Joanah	EPA, Sierra Leone
Bashir Kargbo	EPA, Sierra Leone
Partners	
Anders Nordstrom	WHO Country Representative, Sierra Leone
Alex Chimbaru	WHO/MOHS Coordination
Harry Opata	WHO, Sierra Leone
Charles Njuguna	WHO, Sierra Leone
Tobin Ekaete	WHO, Sierra Leone
Shikanga O-tipo	WHO, Sierra Leone
Otim Patrick	WHO, Sierra Leone
Anderson Latt	WHO, Sierra Leone
Asfaw T. Yonas	WHO, Sierra Leone
David Mwathi	WHO, Sierra Leone
Robert Musoke	WHO, Sierra Leone
Lisa Carter	WHO, Sierra Leone
Eric Osoro	WHO, Sierra Leone
Brian Asiimwe	WHO, Sierra Leone
Refaya Ndyamuba	WHO, Sierra Leone
Wilson Gachari	WHO, Sierra Leone
Tonny Musoke	WHO, Sierra Leone
Kilinda Kilei	WHO, Sierra Leone
Tesfai Tseggai	FAO, Sierra Leone
Nyabengi Tito Tipo	FAO, Sierra Leone
Sanusi Savage	IOM, Sierra Leone
Sara Hersey	Centers for Disease Control and Prevention, USA, Director, Sierra Leone
Regan Hartman	Centers for Disease Control and Prevention, USA, Sierra Leone
Daniel Martin	Centers for Disease Control and Prevention, USA
Sarah Bennett	Centers for Disease Control and Prevention, USA

Dorothy Peprah	USAID
Slacy Lama	US Embassy
Isattu Wurie	Association of Public Health laboratories, Laboratory Technical Working Group
Tao Shen	Centers for Disease Control and Prevention, USA, China
Ian Rufus	Public Health England
James Bangura	Metabiota – PREDICT

Supporting documentation provided by host country

National legislation, policy and financing

- Public Health Ordinance, 1960 (http://awoko.org/2015/08/11/sierra-leone-news-1960-public-health-act-requires-urgent-review-madina-rahman/)
- Draft Food Safety Act
- Animal Disease Ordinance, 1949
- Environmental Protection Act, 2008
- Fisheries Products Act, 2014 (Available at http://wahis_oie.int)
- IHR core capacity desk review report of December 2015
- Kambia–Forecariah cross-border collaboration MOU

IHR Coordination, communication and advocacy

- Public Health Ordinance, 1960 (http://awoko.org/2015/08/11/sierra-leone-news-1960-public-health-act-requires-urgent-review-madina-rahman/)
- Animal Disease Ordinance, 1949
- Environmental Protection Act, 2008
- Food Safety Act, 2015
- IHR core capacity desk review report, December 2015
- Kambia–Forecariah cross-border collaboration MOU

Antimicrobial resistance

- Government of Sierra Leone, National Health Laboratory Strategic Plan 2016–2020
- National IPC Policy V1, 2015 (approved)
- WHO/MOHS isolation capacity report, September 2016

Zoonotic diseases

- District weekly IDSR bulletin
- Mailing lists for sharing situation reports during the EVD outbreak
- Mailing lists for sharing the weekly epidemiological bulletin
- REDISSE workplan and proposal
- RRT guidelines and SOPs
- RRT training manual

- Animal Welfare and Protection Bill, 2016
- Animal Diseases Act of Sierra Leone, 5th draft, September 2015

Food Safety

- Public Health Ordinance, 1960, section 109 and 110
- IDSR technical guidelines
- TORs of PHEMC
- Fishery Products Regulations, 2007
- Food Safety Act, 2015
- Standards Act 12, 1996, Registration of food establishments, Street foods, Export and imports

Biosafety and biosecurity

- National IPC guidelines
- IDSR technical guidelines
- SLMTA guide
- National Laboratory Strategic Plan

Immunization

- Comprehensive Multi-Year Plan for Immunization (cMYP), 2012–2016
- Coverage survey report

National laboratory system

- Draft Guidance for Sample Transport from Facilities to Laboratories
- Sierra Leone Ethics and Scientific Review Committee: Guidelines
- Guide for SLMTA
- SLMTA Trainer's Guide
- National Laboratory Strategic Plan

Real-time surveillance

- IDSR Technical Guidelines, 2015
- IDSR training modules
- IDSR reporting tools (assorted)
- CBS guidelines and SOPs
- CBS job aids
- CBS training modules

Reporting

- IHR national focal point and OIE delegates letters of appointment (Dr. Jambai and Dr. Jalloh)
- The Public Health National Emergency Operation Centre organogram

- EVD preparedness and response plan
- Kambia district (Sierra Leone)and Forecariah Prefecture (Guinea) MOU
- Koinadugu district (Sierra Leone) and Farana Prefecture (Guinea) MOU
- Mano River Union MOU/agreement
- Tonkolili outbreak report (MOHS and WHO)
- Suspected yellow fever case investigation report
- The nation's policy of performing buccal swabs for Ebola virus
- IDSR technical guideline, 2010

Workforce development

- MOHS, HRH Policy (2012)
- MOHS, HRH Strategic Plan (2012-2016)
- MOHS A roadmap for Sierra Leone's refreshed HRH Policy and Strategic Plan, HRH Summit, 2 June 2016
- HRH, Sierra Leone Country Profile, September 2016
- MAFFS, Division of Livestock. Nominal roll (staff in post list), October, 2016
- FELTP basic training documentation
- Witter S, Wurie H, Bertone MP. The free health care initiative: how has it affected health workers in Sierra Leone? Health Policy Plan. 2016;31:1–9. doi: 10.1093/heapol/czv006.

Preparedness

- Draft Public Health Incidents and Emergency Response Plan
- National EVD Preparedness and Response Plan, 2016
- Zika Preparedness and Response Plan, 2016
- Cholera Preparedness and Response Plan, 2013–2017

Emergency response operations

- TORs in EOC operational plan
- Report of staff visits to Uganda and Ghana EOC
- Public health incidents and emergency response plan
- Case management plan

Linking public health and security authorities

- DDMC handbook
- Public Health Ordinance Act, no. 23, 1960

Medical countermeasures and personnel deployment

- Distribution matrix from CH-EPI logistics for measles vaccines
- Measles campaign report (EPI)

- Importation documents for medical countermeasures
- MOU/agreement between Guinea, Liberia and Sierra Leone
- CMS workplan manual
- Copy of draft pandemic preparedness plan
- Draft legislation for animal disease control, 2016

Risk communication

- EOC draft strategic communications plan
- Communication coordination member database
- TORs of the EOC communications pillar
- Weekly media monitoring report
- Press briefings from swabs
- Minutes of social mobilization pillar meeting 6 September 2016

Points of entry

- The Public Health Ordinance, 1960: Part 2. Administration (page 11) sanctioned the Environmental Health Division to serve as Port Health Authority. Evidence of document is available
- Report on Lungi Airport assessment conducted in May 2016
- Integrated vector control policy, strategy and SOP
- Checklist for premises inspection in Sierra Leone
- School curriculum for community health, Njala University
- Draft national aviation public health emergency preparedness plan

Chemical events

- EPA Act
- Draft Chemical Management Act
- EPA strategic plan 2012–2016
- Chemical safety monitoring checklist and activity report
- TOR of chemical safety multisectoral and interdisciplinary committee
- MOU with SLSB
- Chemical safety monitoring checklist and activity report
- Report on assessment of persistent organic pollutants
- Chemicals database

Radiation emergencies

- Nuclear Safety and Radiation Protection Act, 2012
- Nuclear safety and radiation protection strategic plan
- Draft public health incident and emergency response plan

- Radiation safety self-assessment report and assessment tool
- Report on the Workshop on Security in Transporting Radioactive Material
- MOU with the EPA

WHO/WHE/CPI/2017.16