

# JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of the

## LAO PEOPLE'S DEMOCRATIC REPUBLIC

Mission report:  
17–24 February 2017



World Health  
Organization



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## Abbreviations

<b>APSED</b>	Asia Pacific Strategy for Emerging Diseases
<b>AMR</b>	antimicrobial resistance
<b>cVDPV</b>	circulating vaccine-derived poliovirus
<b>CIEH</b>	Centre of Information and Education for Health
<b>EOC</b>	emergency operations centre
<b>EQA</b>	external quality assurance
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FETP</b>	Field Epidemiology Training Programme
<b>FETVP</b>	Field Epidemiology Training Programme for Veterinarians
<b>GHSA</b>	Global Health Security Agenda
<b>IHR</b>	International Health Regulations
<b>IMS</b>	Incident Management System
<b>INFOSAN</b>	International Network of Food Safety Authorities
<b>IPC</b>	infection prevention and control
<b>JEE</b>	joint external evaluation
<b>LOMWRU</b>	Lao-Oxford-Mahosot Hospital-Wellcome Trust Research Unit
<b>MERS-CoV</b>	Middle East respiratory syndrome coronavirus
<b>NCCDC</b>	National Committee for Communicable Disease Control
<b>NCLE</b>	National Center for Laboratory and Epidemiology
<b>NIP</b>	National Immunization Programme
<b>OIE</b>	World Organisation for Animal Health
<b>PCR</b>	polymerase chain reaction
<b>polio</b>	poliomyelitis
<b>SDGs</b>	Sustainable Development Goals
<b>SOPs</b>	standard operating procedures
<b>WHO</b>	World Health Organization

# Executive summary

## Background

The International Health Regulations (IHR) were revised in 2005 to help the international community prevent and respond to acute public health events with potential to cross borders and threaten populations worldwide. The IHR (2005) require that countries develop core capacities to prevent, detect and respond to public health events of international concern. They are a binding international legal instrument for all 196 signatory countries, including the Lao People's Democratic Republic.

Over the past decade, the Asia Pacific Strategy for Emerging Diseases (APSED) has been used by countries in the Asia Pacific as a common framework to strengthen IHR (2005) core capacities. Since the IHR (2005) came into force in 2007, the Ministry of Health of Lao People's Democratic Republic has demonstrated its leadership and commitment to securing national health security by using APSED as a guide to develop the Lao People's Democratic Republic National Work Plan for Emerging Infectious Diseases and Public Health Emergencies.

To foster a culture of learning for continuous improvement, the IHR Monitoring and Evaluation Framework was developed by the World Health Organization (WHO) through a global consultative process. The IHR Joint External Evaluation (JEE) is a key component of the Monitoring and Evaluation Framework, and uses a standard tool to measure national capacities across 19 technical areas related to global health security. The JEE is a voluntary process that allows countries to identify the most urgent needs within their health security systems. The process also enables countries to transparently engage with multiple sectors, donors and partners to identify priority actions and mobilize resources.

Lao People's Democratic Republic is the third Member State in the WHO Western Pacific Region to conduct a JEE. Throughout the JEE process, Lao People's Democratic Republic's transparency and engagement of health and non-health sectors has enhanced national and international confidence in the country's progress towards fulfilling its IHR (2005) core capacity requirements. The outcomes of the JEE will contribute to the identification and revision of priority activities in the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies 2016–2020. The updated National Work Plan is expected to serve as a common framework to coordinate health security activities in Lao People's Democratic Republic under various national and international initiatives.

## Main findings

Lao People's Democratic Republic has made strong progress in improving national public health and building IHR (2005) core capacities in recent years. The annual review of the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies is testimony to Lao People's Democratic Republic's commitment to promoting a learning culture. Notable achievements have been made in the areas of IHR communication, coordination and advocacy; surveillance; national laboratory capacity; and multisectoral outbreak response. Lao People's Democratic Republic has established a surveillance system to detect acute public health events and has trained multisectoral rapid response teams that can be quickly deployed to respond to outbreaks. Graduates of the national Field Epidemiology Training Programme (FETP) support infectious disease surveillance and response in all 18 provinces and prefectures, and laboratories are able to diagnose and confirm many communicable diseases. An emergency operations centre (EOC) has been established in the Ministry of Health to coordinate response operations and has been activated for many events, including the recent outbreak of circulating vaccine-derived poliovirus (cVDPV).

Although Lao People's Democratic Republic has made good progress in working towards IHR (2005) requirements, many technical capacities that relate to detecting, preventing and rapidly responding to

emerging diseases and public health emergencies remain under development and capacities at national and subnational levels differ. There was demonstrated capacity for 21% (10/48) of the JEE indicators, but Lao People's Democratic Republic's capacities in the majority of technical areas evaluated were categorized as limited (31%) or developed (33%) under the JEE scoring system. The evaluation identified several overarching challenges including sustainable financing for health security, human resources capacity, intersectoral collaboration and coordination, and the formalization and documentation of procedures.

The National Work Plan for Emerging Infectious Diseases and Public Health Emergencies has been developed, but requires regular and sustainable financing in order to be implemented effectively. Developing and retaining a trained public health workforce is a major challenge, particularly at subnational levels. In some areas, legislative frameworks and processes to support key public health functions are not yet formalized, or still need to be developed. Communication and information sharing across sectors functions well during emergencies, but should also be improved for routine purposes between events. It is vital to empower the national IHR focal point to perform their mandated communication and coordination function, especially across relevant sectors. Cross-sectoral collaboration could also be enhanced in priority areas through approaches including One Health that address antimicrobial resistance (AMR), zoonotic diseases, food safety and novel disease emergence.

## Recommendations

Lao People's Democratic Republic has taken many positive steps to enhance national capacity to prevent, detect and respond to public health threats. To strengthen its capacity to effectively manage public health emergencies and meet its obligations under the IHR (2005), the Government of Lao People's Democratic Republic may consider the following recommendations.

- Revise the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies to take into consideration the recommended priority actions from the JEE mission, as guided by the third Asia Pacific Strategy for Emerging Diseases (APSED III).
- Increase and ensure sustainable financing for health security, including essential public health functions such as surveillance and response.
- Implement the National Health Workforce Strategy 2016–2020 and ensure the strengthening of a health security workforce, including public health and veterinary field epidemiologists.
- Implement functional measures for multiple sectors to collaborate, coordinate and communicate on preparedness and response to all public health emergencies.
- Foster a culture of review, learning and continuous improvement in the area of health security including outbreak reviews, regular exercises and IHR JEEs.
- Review and formalize draft laws, policies and standard operating procedures (SOPs) related to health security with due consideration of international obligations.

## Cross-cutting themes

There are cross-cutting linkages across many of the 19 technical areas evaluated and work done in one technical area will carry over to other areas. The JEE team identified several areas where these cross-cutting issues were particularly important. Promoting sustainable financing, strengthening legislation and improving coordination of human and animal health sectors would enhance capacities across all JEE technical areas.

### **Financing**

Sustainable financing is a major challenge across the spectrum of 19 core capacities. Government financing of both routine and emergency public health activities will need to be addressed in order to sustain progress

and IHR (2005) core capacity achievements. The development of a strategy for sustainable government financing for essential public health functions such as surveillance and response would contribute to the sustainability of national health security.

### ***Legislation***

Although Lao People's Democratic Republic has strong expertise and capacity in many technical areas, there is a need to strengthen the legal basis for many good practices in order to facilitate and institutionalize IHR implementation. The review or finalization of draft laws, policies and procedures would improve the clarity of roles and responsibilities and ensure the consistency and continuity of established systems.

### ***Human-animal-environment interface***

Using a One Health approach that spans human, animal, agricultural, food and environmental aspects is critical to many areas including zoonotic diseases, AMR, food safety, detection and response to novel diseases. Mechanisms have been developed to foster intersectoral collaboration. However, routine intersectoral collaboration remains a challenge. Future efforts are needed to implement functional measures for multiple sectors to collaborate, coordinate and communicate on preparedness and response to all public health emergencies.

# Lao People's Democratic Republic scores

## Overall

Score	Description	Number of indicators	% of total indicators
5	Sustainable capacity	0	0%
4	Demonstrated capacity	10	21%
3	Developed capacity	16	33%
2	Limited capacity	15	31%
1	No capacity	7	15%

## Technical areas

Technical area	Indicators	Score
<b>National legislation, policy and financing</b>	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (2005)	3
	P.1.2 The State can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with IHR (2005)	4
<b>IHR coordination, communication and advocacy</b>	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR (2005)	4
<b>Antimicrobial resistance</b>	P.3.1 Antimicrobial resistance detection	2
	P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens	1
	P.3.3 Health care-associated infection prevention and control programmes	3
	P.3.4 Antimicrobial stewardship activities	1
<b>Zoonotic diseases</b>	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or animal health workforce	3
	P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases are established and functional	3
<b>Food safety</b>	P.5.1 Mechanisms for multisectoral collaboration are established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases	2
<b>Biosafety and biosecurity</b>	P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal and agriculture facilities	2
	P.6.2 Biosafety and biosecurity training and practices	2
<b>Immunization</b>	P.7.1 Vaccine coverage (measles) as part of national programme	3
	P.7.2 National vaccine access and delivery	4
<b>National laboratory system</b>	D.1.1 Laboratory testing for detection of priority diseases	4
	D.1.2 Specimen referral and transport system	3
	D.1.3 Effective modern point-of-care and laboratory-based diagnostics	3
	D.1.4 Laboratory quality system	2

<b>Real-time surveillance</b>	D.2.1 Indicator- and event-based surveillance systems	4
	D.2.2 Interoperable, interconnected, electronic real-time reporting system	3
	D.2.3 Integration and analysis of surveillance data	4
	D.2.4 Syndromic surveillance systems	4
<b>Reporting</b>	D.3.1 System for efficient reporting to FAO, OIE and WHO	4
	D.3.2 Reporting network and protocols in country	4
<b>Workforce development</b>	D.4.1 Human resources available to implement IHR core capacity requirements	3
	D.4.2 Field Epidemiology Training Programme or other applied epidemiology training programme in place	3
	D.4.3 Workforce strategy	2
<b>Preparedness</b>	R.1.1 National multi-hazard public health emergency preparedness and response plan is developed and implemented	2
	R.1.2 Priority public health risks and resources are mapped and utilized	2
<b>Emergency response operations</b>	R.2.1 Capacity to activate emergency operations	2
	R.2.2 EOC operating procedures and plans	1
	R.2.3 Emergency operations programme	3
	R.2.4 Case management procedures implemented for IHR relevant hazards.	2
<b>Linking public health and security authorities</b>	R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspect or confirmed biological event	4
<b>Medical countermeasures and personnel deployment</b>	R.4.1 System in place for sending and receiving medical countermeasures during a public health emergency	2
	R.4.2 System in place for sending and receiving health personnel during a public health emergency	2
<b>Risk communication</b>	R.5.1 Risk communication systems (plans, mechanisms, etc.)	2
	R.5.2 Internal and partner communication and coordination	3
	R.5.3 Public communication	3
	R.5.4 Communication engagement with affected communities	3
	R.5.5 Dynamic listening and rumour management	2
<b>Points of entry</b>	PoE.1 Routine capacities established at points of entry	3
	PoE.2 Effective public health response at points of entry	2
<b>Chemical events</b>	CE.1 Mechanisms established and functioning for detecting and responding to chemical events or emergencies	1
	CE.2 Enabling environment in place for management of chemical events	1
<b>Radiation emergencies</b>	RE.1 Mechanisms established and functioning for detecting and responding to radiological and nuclear emergencies	1
	RE.2 Enabling environment in place for management of radiation emergencies	1

# PREVENT

## National legislation, policy and financing

### Introduction

The International Health Regulations (IHR) (2005) provide obligations and rights for States Parties. In some States Parties, implementation of the IHR (2005) may require new or modified legislation. Even if a new or revised legislation may not be specifically required, States may still choose to revise some regulations or other instruments in order to facilitate IHR implementation and maintenance in a more effective manner. Implementing legislation could serve to institutionalize and strengthen the role of IHR (2005) and operations within the State Party. It can also facilitate coordination among the different entities involved in their implementation. The World Health Organization (WHO) provides detailed guidance on IHR (2005) implementation in national legislation at ([http://www.who.int/ihr/legal\\_issues/legislation/en/index.html](http://www.who.int/ihr/legal_issues/legislation/en/index.html)). In addition, policies that identify national structures and responsibilities as well as the allocation of adequate financial resources are also important.

### Target

*Adequate legal framework for States Parties to support and enable the implementation of all their obligations, and rights to comply with and implement the IHR (2005). New or modified legislation in some States Parties for implementation of the IHR (2005). Where new or revised legislation may not be specifically required under the State Party's legal system, States may revise some legislation, regulations or other instruments in order to facilitate their implementation and maintenance in a more efficient, effective or beneficial manner. States Parties ensure provision of adequate funding for IHR implementation through the national budget or other mechanism.*

### Lao People's Democratic Republic level of capabilities

A brief review of available legislative documents, decrees and memoranda of understanding suggests that a framework to enable compliance with and implementation of the IHR (2005) is in place.

The Constitution of Lao People's Democratic Republic includes the obligations of the Government to protect the health, welfare and security of the population. Other legal documents (e.g. the Law on Health Care and the Decree on establishment of the National Committee for Communicable Disease Control) provide a legal basis to respond to public health emergencies and implement the IHR (2005). In addition, specific memoranda of understanding with other public sectors such as the Department of Civil Aviation and the Ministry of National Defence provide mechanisms for coordination and compliance with the IHR (2005).

However, the legal basis for complying with Article 31 (Health measures relating to entry of travellers) and Article 32 (Treatment of travellers) of the IHR (2005) is still under development as a quarantine law.

The Government assumes the responsibility of financing IHR (2005) compliance, including funds that are available by government decree for emergency use.

### Recommendations for priority actions

- Prepare and enact an executive instrument (e.g. decree, policy statement) to establish short-term compliance with IHR articles 31 and 32; and develop and promulgate a legal instrument to replace the short-term compliance instrument.

- Establish procedures, both short-term and longer term, when a response to a public health emergency is initiated including instant access to sufficient funding.

## Indicators and scores

### **P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (2005) – Score 3**

#### *Strengths/best practices*

- A basic legal framework to implement the IHR (2005) is in place.

#### *Areas that need strengthening and challenges*

- To facilitate compliance with IHR (2005) articles 31 and 32 in the short term, an instrument (such as a policy statement or decree) to establish compliance with the provisions of these articles should be prepared and enacted as soon as possible. In the longer term, a legal basis (e.g. a quarantine or detention law) for compliance should be developed and promulgated.
- The short- and longer term solutions for complying with IHR (2005) articles should take into consideration international standards and obligations.

### **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 4**

#### *Strengths/best practices*

- A compilation of legal instruments and memoranda of understanding is in place.

#### *Areas that need strengthening and challenges*

- See above for P.1.1

# IHR coordination, communication and advocacy

## Introduction

The effective implementation of IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for efficient alert and response systems. Coordination of nationwide resources, including the designation of a national IHR focal point, is a key requisite for IHR (2005) implementation.

### Target

*Multisectoral/multidisciplinary approaches through national partnerships that allow efficient, alert and responsive systems for effective implementation of the IHR (2005). Coordinate nationwide resources, including sustainable functioning of a national IHR focal point – a national centre for IHR (2005) communications which is a key requisite for IHR (2005) implementation – that is accessible at all times. States Parties provide WHO with contact details of national IHR focal points, continuously update and annually confirm them.*

## Lao People's Democratic Republic level of capabilities

The Department of Communicable Disease Control, Ministry of Health has been designated as the national IHR focal point for Lao People's Democratic Republic. Standard operating procedures (SOPs) for reporting and a roster of IHR duty officers are in place. Key events such as pandemic influenza A(H1N1), human infection with avian influenza A(H5N1) and circulating vaccine-derived poliovirus (cVDPV) have been notified to WHO by the national IHR focal point within 24 hours of confirmation.

There are robust coordination and communication mechanisms in place to manage public health emergencies through the National Committee for Communicable Disease Control (NCCDC) and the National Disaster Committee Management, involving relevant agencies and chaired by the Prime Minister. Lao People's Democratic Republic has also established the National Emerging Infectious Disease Coordination Office to coordinate health with other sectors to prepare for and respond to public health events.

In 2013, Lao People's Democratic Republic established a national emergency operations centre (EOC) to coordinate public health response to emergencies. The EOC has been activated to manage major events such as the 2013 dengue outbreak and the 2015–2016 cVDPV outbreak. The EOC is also used to monitor other emergencies such as flooding. Guidelines are in place to guide coordination and communication with other sectors.

A memorandum of understanding between the Ministry of Health and the Ministry of Agriculture and Forestry guides the coordination mechanism between the human and animal health sectors. The memorandum of understanding covers information-sharing arrangements including surveillance data and laboratory findings for priority zoonotic diseases such as avian influenza and rabies. There is also a memorandum of understanding between the Ministry of Health and Department of Civil Aviation to coordinate response.

Joint exercises have been conducted including an Ebola simulation exercise in 2014, a Middle East respiratory syndrome coronavirus (MERS-CoV) simulation exercise in 2015 that also included activation of the EOC, an influenza A(H7N9) table-top exercise in 2014 and a food safety exercise in 2015. Lao People's Democratic Republic has also consistently participated in Exercise Crystal, the annual Region-wide exercise to test IHR communication functions, managed by the WHO Regional Office for the Western Pacific.

Lao People's Democratic Republic has conducted an annual review of its progress in IHR (2005) implementation since 2007. The gaps and lessons learned from this process feed into the multisectoral National Work Plan for Emerging Infectious Diseases and Public Health Emergencies developed using the Asia Pacific Strategy for Emerging Diseases (APSED) framework.

## Recommendations for priority actions

- Maintain and advance the functions of the national IHR focal point and existing IHR coordination mechanisms, including communication and information sharing on all acute public health events, coordination of IHR monitoring and evaluation such as joint external evaluation (JEE), and the annual stakeholders' planning and review process as recommended in the third Asia Pacific Strategy for Emerging Diseases (APSED III).
- Review, test and continually strengthen the functions of existing multisectoral communication, coordination and partnership mechanisms for public health emergency preparedness and response, including the management of large-scale disease outbreaks and public health emergencies.
- Advocate and strengthen sustainable investment in health security as an integral part of country actions towards universal health coverage and the Sustainable Development Goals (SDGs).

## 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 4

#### *Strengths/best practices*

- Lao People's Democratic Republic, through its designated national IHR focal point, has consistently used the IHR mechanism to notify WHO of major public health events such as pandemic influenza A(H1N1), human infection with avian influenza A(H5N1) and cVDPV infections within 24 hours of confirmation.
- Multisectoral coordination and partnership mechanisms are in place and regularly tested through exercises including an Ebola simulation exercise in 2014, MERS-CoV simulation exercise in 2015 that also included activation of the EOC, an influenza A(H7N9) table-top exercise in 2014 and a food safety exercise in 2015. Lao People's Democratic Republic also participates in the annual Region-wide Exercise Crystal to test IHR communication mechanisms.
- Lao People's Democratic Republic conducts an annual IHR review process, and uses the results and lessons learned to inform multi-stakeholder public health emergency planning.
- Note: some elements of Score 5 are also in place, such as reviews of IHR implementation progress that have been conducted annually since 2007. The gaps and lessons learned from this process feed into the multisectoral National Work Plan for Emerging Infectious Diseases and Public Health Emergencies developed using the APSED framework.

#### *Areas that need strengthening and challenges*

- The mandate of the national IHR focal point for event communication, routine information sharing, multisectoral coordination and partnership for public health emergencies should be identified in the National Health Sector Plan.
- A formal mechanism should be established for the national IHR focal point to report or communicate with non-health sectors, such as communication with OIE (animal health) or the International Network of Food Safety Authorities (INFOSAN) (food safety).
- Integration of health security and IHR functions into national plans towards the SDGs and universal health coverage needs to be done.

# 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. Antimicrobial resistance (AMR) is evolving at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security and national security.

### Target

*Support work coordinated by FAO, OIE and WHO to develop an integrated global package of activities to combat AMR, spanning human, animal, agricultural, food and environmental aspects (i.e. a One Health approach). Each country has: (i) its own national comprehensive plan to combat AMR; (ii) strengthened surveillance and laboratory capacity at the national and international levels following international standards developed as per the framework of the Global Action Plan; and (iii) improved 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.*

## Lao People's Democratic Republic level of capabilities

Since 2015, AMR has gained significant attention at a high level in Lao People's Democratic Republic, underpinned by external advocacy by international partners. The AMR Surveillance and Control Committee was set up in 2015 to move the AMR agenda forward, noting that AMR is a complex issue which requires multiple sectors and stakeholders at all levels to work together. Lao People's Democratic Republic has capacity to detect some antimicrobial-resistant pathogens at various institutions and some regulatory frameworks exist to manage antibiotic use in humans. A health care-associated infection prevention and control (IPC) programme exists, with IPC strategies, committees, SOPs and guidelines available at national and subnational levels, as well as at health care facilities. A national action plan on AMR in the Lao People's Democratic Republic was drafted in November 2016. The draft plan includes a number of priority actions that will address the above-mentioned gaps, especially the proposal to develop various national plans for AMR detection, surveillance of antimicrobial-resistant pathogens and infections caused by them, and antimicrobial stewardship.

There is an urgent need to accelerate the adoption of the national action plan on AMR and the implementation thereof. In particular, Lao People's Democratic Republic should make available necessary plans at national level to improve understanding of the overall system of antibiotic importation, production, distribution and consumption, as well as the stakeholders involved. As the level of awareness of key actors such as physicians, veterinarians, farmers and pharmacists is unknown, it is difficult to target antimicrobial stewardship activities. There are varying degrees of IPC programme compliance at health care facilities, but no programme to monitor IPC implementation. Importantly, there is a lack of similar regulatory frameworks to manage antibiotic use in animals, both for therapeutic and non-therapeutic purposes (which account for an estimated 70% of total antibiotics used in the country).

## Recommendations for priority actions

- Accelerate the finalization and adoption of the national action plan on AMR, and the implementation thereof, taking into consideration the following priority actions:
  - develop national plans for detection, surveillance and monitoring of antimicrobial use and AMR including assessment of the need to establish a centralized information system for AMR surveillance and monitoring;
  - review (and develop) regulatory frameworks for appropriate management of antibiotic use in animals;
  - conduct a national system and situation analysis of antimicrobial use and AMR including consolidation and analysis of existing data and information, and stakeholder analysis;
  - based on the information from the system and situation analysis, conduct awareness-raising activities among key priority stakeholders (practitioners, farmers, regulators) on antimicrobial use and AMR;
  - encourage implementation of IPC practices through the development of monitoring and evaluation frameworks, including SOPs and monitoring tools, which will guide monitoring and evaluation of IPC programmes at health care facilities.

## Indicators and scores

### P.3.1 Antimicrobial resistance detection – Score 2

#### *Strengths/best practices*

- Technical capacities for testing of all priority antimicrobial-resistant pathogens exist in both animal and human health laboratories. Human health laboratories at provincial level also have capacities to test for some antimicrobial-resistant pathogens, but quality assurance is often an issue.
- The National Center for Laboratory and Epidemiology (NCLE) conducts detection and reporting of specific priority antimicrobial-resistant pathogens in humans. The national laboratory and Lao-Oxford-Mahosot Hospital-Wellcome Trust Research Unit (LOMWRU) have good capacity for antimicrobial susceptibility testing, with quality assurance by the United Kingdom National External Quality Assessment Service.
- There are plans for detection of specific pathogens by specific institutions, such as NCLE and major hospitals for nosocomial infection, the National TB Centre for tuberculosis-related detection, and the Center for Malaria, Parasitology and Entomology for antimalarial drug efficacy.
- A national plan for detection of priority antimicrobial-resistant pathogens is currently being developed and will soon be available.

#### *Areas that need strengthening and challenges*

- There is no national plan for detection and reporting of priority antimicrobial-resistant pathogens.
- There are no designated national AMR laboratories.
- The National Animal Health Laboratory is not currently conducting detection and reporting of priority antimicrobial-resistant pathogens, nor testing for the presence of antibiotic residues in animals or animal products.
- There is no mechanism for systematic data sharing among laboratories and between sectors on priority antimicrobial-resistant pathogens.

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

#### *Strengths/best practices*

- Some surveillance for infections caused by antimicrobial-resistant pathogens is conducted in some national institutions, particularly in human health sectors.
- NCLE conducts diarrhoea surveillance in eight sentinel sites and nosocomial infection detection on an ad hoc basis.
- NCLE receives antibiotic sensitivity testing information from major hospitals including LOMWRU, and information is shared as requested between certain national institutions and the NCLE on specific AMR surveillance.

#### *Areas that need strengthening and challenges*

- There is no national plan for surveillance of infections caused by antimicrobial-resistant pathogens.
- There is no antimicrobial residual surveillance in animals and animal products.
- Coordination for information sharing on surveillance for AMR between laboratories is limited and there is no systematic and regular sharing of surveillance information.

### P.3.3 Health care-associated infection prevention and control programmes – Score 3

#### *Strengths/best practices*

- National IPC committee and subsequent subnational and hospital IPC committees have been established.
- National IPC strategy and SOPs are available and distributed to major health care facilities.
- There are trained IPC professionals in all tertiary hospitals, and subsequent IPC trainings for health care workers in some hospitals.

#### *Areas that need strengthening and challenges*

- There is no national programme to monitor compliance with IPC programme.
- There is no dedicated IPC unit at hospital level to facilitate IPC programme implementation.

### P.3.4 Antimicrobial stewardship activities – Score 1

#### *Strengths/best practices*

- Regulatory frameworks exist to control antibiotic use in humans, and some systems are in place to enforce compliance under drug regulatory authorities and the Bureau of Food and Drug Inspection, which supervise pre- and post-marketing inspections.
- National guidelines exist for treatment of specific diseases.

#### *Areas that need strengthening and challenges*

- There is no national plan for antimicrobial stewardship; this has been identified as a priority in the draft national action plan on AMR.
- There is no regulatory framework to control antibiotic use in animals, which accounts for about 70% of total antibiotic use in Lao People's Democratic Republic (and high tendency toward subtherapeutic use and misuse of antibiotics in animals).
- There are multiple channels for procurement of antibiotics for human use, and over-the-counter sale is widely available; therefore, the availability, source and quality of antibiotics are not always well-documented.

- The level of stakeholder (practitioners, farmers and resellers) awareness of AMR is unknown (although anecdotal information indicates that awareness is low).
- There are ongoing challenges to enforcing existing regulatory frameworks to control antibiotic use in humans.
- There is limited information on systems for antibiotic importation, production, distribution and consumption, such as volumes received, stakeholders, existing regulatory frameworks and their significance in terms of antibiotic misuse.

# Zoonotic diseases

## Introduction

Zoonotic diseases are communicable diseases that can spread between animals and humans. These diseases are caused by viruses, bacteria, parasites and fungi carried by animals, insects or inanimate vectors that aid in transmission. Approximately 75% of recently emerging infectious diseases affecting humans is 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.*

### Lao People's Democratic Republic level of capabilities

Lao People's Democratic Republic's capacity to prevent, detect and respond to zoonotic diseases has increased considerably following the emergence of highly pathogenic avian influenza. Built on strong multisectoral collaboration to address highly pathogenic avian influenza, the country has expanded collaboration to deal with other important zoonotic diseases. A memorandum of understanding between the Ministry of Agriculture and Forestry and the Ministry of Health exists to govern information sharing. The National Zoonotic Diseases Coordination Mechanism for the Health and Animal Sectors (the Green Book) has been developed to provide operational guidelines on multisectoral coordination, underpinned by strong personal relationships. SOPs for specific zoonotic diseases are available, and training events and exercises have been conducted at both national and subnational levels. National and some subnational laboratories have capacities to detect priority zoonotic diseases in both humans and animals. Surveillance systems are in place for some priority zoonotic diseases.

Despite considerable improvement, there remain fundamental challenges. There is a critical lack of sufficient workforce in the animal health sector, especially at subnational levels. Despite the detection capacity at national level, there is no systematic surveillance system for some priority zoonotic diseases and other unknown zoonotic diseases in the animal health sector. Sharing of information between animal health and human health sectors occurs largely during outbreaks and is mostly ad hoc (i.e. not routine). The existing coordination mechanism is not fully operational and faces challenges sustaining its functions and relevance.

### Recommendations for priority actions

- Review existing (and previous) multisectoral coordination mechanisms, including memoranda of understanding and the national list of priority zoonotic diseases, to identify practical and appropriate ways to implement existing policies.
- Establish a policy framework to address the shortage of qualified animal health workforce by:
  - developing a national plan to increase number of animal health workforce in government sector;
  - accelerating training of veterinary field epidemiologists for surveillance and outbreak response.
- Develop and implement plans to conduct coordinated surveillance, and timely and systematic sharing of information among relevant sectors, for priority zoonotic diseases.

## Indicators and scores

### P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens – Score 3

#### *Strengths/best practices*

- There is a memorandum of understanding in place between the Ministry of Agriculture and Forestry and Ministry of Health for sharing of information on priority and other zoonotic diseases.
- Priority zoonotic diseases have been jointly identified and coordinated surveillance systems are in place for some priority zoonotic diseases, especially (avian) influenza.
- Both animal and human health sectors have diagnostic capacity to detect all of the priority zoonotic diseases.
- Surveillance information is regularly shared from human health to animal health sector, and from animal to human health sector, during outbreaks.

#### *Areas that need strengthening and challenges*

- There is no systematic and routine surveillance system for some priority zoonotic diseases (rabies, anthrax, leptospirosis and trichinellosis) in animals. Syndromic surveillance in humans captures zoonotic diseases, but could be strengthened.
- There is no routine and systematic sharing of surveillance information between animal to human health sector.
- There is a need to objectively review and update the list of priority zoonotic diseases, taking into consideration information on disease burden.

### P.4.2 Veterinary or animal health workforce – Score 3

#### *Strengths/best practices*

- The animal health workforce allows for core basic veterinary and technical functions to be undertaken at national, provincial and district levels.
- There is regular in-service training (Field Epidemiology Training Programme [FETP], Field Epidemiology Training Programme for Veterinarians [FETPV]) and ad hoc in-service training for the animal health workforce to continue to strengthen their capabilities.

#### *Areas that need strengthening and challenges*

- There continues to be a critical shortage of qualified animal health workforce within the Department of Livestock and Fisheries, the Provincial Agriculture and Forestry Office, and the District Agriculture and Forestry Office. One of several reasons for this is a lack of policy support for improving and sustaining animal health workforce.
- Before the National University's Faculty of Agriculture in Nabong produced its first veterinary graduates in 2014, there was no veterinary education in Lao People's Democratic Republic and the Government still lacks a plan to recruit newly graduated veterinarians to public service.
- Although animal health workers participate in each cohort of FETP and FETPV, their numbers are inadequate to meaningfully contribute to surveillance and response to zoonotic diseases, especially at provincial and district levels.

### **P.4.3 Mechanisms for responding to infectious and potential zoonotic diseases established and functional – Score 3**

#### ***Strengths/best practices***

- The National Zoonotic Diseases Coordination Mechanism for the Health and Animal Sectors provides operational guidelines on multisectoral coordination.
- Animal and human health personnel have very good personal relationships at working level.
- SOPs for specific zoonotic diseases exist, and training events and exercises have been conducted at both national and subnational levels.
- There are good examples of joint investigation and response to priority zoonotic diseases in the past 5 years.

#### ***Areas that need strengthening and challenges***

- The existing coordination mechanism is not fully operational and faces challenges sustaining its functions and relevance.
- The coordination mechanism does not extend to environmental health and other sectors.
- Information sharing between relevant sectors for timely response is not systematic.

# 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

*Surveillance and response capacity among States Parties for food- and waterborne disease risks or events by strengthening effective communication and collaboration among the sectors responsible for food safety, and safe water and sanitation.*

## Lao People's Democratic Republic level of capabilities

Food safety is an important aspect of the consumers' protection programme in the Seventh Five-Year Health Sector Development Plan (2011–2015) and the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies. The country has developed food safety legislation, guidelines and SOPs for food control activities including the National Food Safety Policy 2009, Revised Food Law 2013, Food Safety Regulations and Standards, and the National Food Safety Emergency Response Plan. However, full implementation and enforcement of the legislation is still pending.

The inspection body (Bureau of Food and Drug Inspection) for monitoring and surveillance was established in 2011. SOPs for food inspection, control and standards have been developed by the inspection body. The country participates in INFOSAN and has attended several regional INFOSAN meetings. The INFOSAN emergency contact point is based in the Food and Drug Department in the Ministry of Health. Additional INFOSAN focal points are based in the Food and Drug Department and the Bureau of Food and Drug Inspection, as well as with the Ministry of Agriculture and Forestry (Agricultural Regulatory Division). In 2014, Lao People's Democratic Republic participated in an IHR-INFOSAN communication exercise to validate the accessibility of national IHR focal points and INFOSAN emergency contact points, and to facilitate communication and collaboration between them during a foodborne disease emergency event.

In terms of IHR core capacities to prevent, detect and respond to food safety incidents and emergencies, the necessary basic elements are in place including legislation, a surveillance system with a case definition for food poisoning, and an organizational structure for coordination and collaboration across sectors and with the INFOSAN Secretariat. However, capacity is still limited and there is a need for outbreak investigation training, laboratory capacity and public awareness of food safety risks.

## Recommendations for priority actions

- Hold joint trainings on foodborne disease outbreak investigation between the Food and Drug Department, Bureau of Food and Drug Inspection and human health (Department of Communicable Disease Control, NCLE) sectors in order to reach a common understanding on specific data needed for action and division of roles and responsibilities between the actors.

- Improve surveillance specificity and source identification in foodborne disease outbreaks through enhanced laboratory capacity and analytic epidemiology (focusing on staff training) to inform evidence-based response.
- Build trust in government actions on food safety management (through increased transparency and risk communication) to anticipate increasing public awareness of food safety **issues**.

## Indicators and scores

### **P.5.1 Mechanisms for multisectoral collaboration established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases – Score 2**

#### *Strengths/best practices*

- National food safety legislation, policy and regulations have recently been developed.
- Housing the Food and Drug Department and NCLE under the Ministry of Health facilitates coordination and information sharing between food regulators, epidemiologists and laboratorians.
- The surveillance system includes potential foodborne diseases, and events are detected with reasonable sensitivity at different administrative levels.
- Outbreak and Event Investigation and Response Manual contains appropriate case investigation forms, guidance on food sampling and control/prevention options.

#### *Areas that need strengthening and challenges*

- Interdepartmental and interagency collaboration are in need of improvement, especially between the Food and Drug Department and Department of Communicable Disease Control/NCLE. Formal mechanisms (e.g. memorandum of understanding) for collaboration between the Ministry of Agriculture and Forestry and the Ministry of Health have not been developed.
- There is limited laboratory capacity for foodborne disease investigation, both in terms of equipment and staff.
- Although the laboratory of the national Food and Drug Quality Control Centre has capacity to conduct physical, chemical and microbiological analysis of food, and can conduct quality assessments and issue certificates of analysis to food processors, food safety risk profiling and routine food testing capacity remain limited.
- Surveillance and monitoring data are rarely used for action, and outbreak investigations are not appropriately documented (which should include lessons learned and recommendations for preventing future outbreaks).
- Food and Drug Department and Bureau of Food and Drug Inspection staff need training on foodborne disease outbreak investigation and response.

# Biosafety and biosecurity

## Introduction

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

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

### Target

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

## Lao People's Democratic Republic level of capabilities

Biosafety and biosecurity are critical aspects of good laboratory practice that have been highlighted in recent years, and broad efforts have been made to improve awareness and manage concerns. The National Biosafety Framework was developed in 2004, but it is focused exclusively on genetically modified organisms. The National Healthcare Waste Management Decision and its associated training manual were developed in 2016; waste management practices at laboratories follow the Healthcare Waste Management Decision. The WHO laboratory biosafety manual addressing general laboratory safety issues has been translated into the Lao language and was disseminated in a recent meeting by NCLE. A national biosafety manual was developed in 2016, but has not yet been disseminated.

In addition, there are infection control committees at the central and provincial hospital levels. The Ministry of Health, together with international development partners (e.g. Asian Development Bank, WHO and World Bank), are supporting the infrastructure and supplies necessary to implement the National Healthcare Waste Management Decision in health care facilities. The main public health laboratories such as NCLE, Center for Malaria, Parasitology and Entomology, National Tuberculosis Reference Laboratory and National Animal Health Laboratory, as well as international foundation laboratories in Lao People's Democratic Republic (Centre d'Infectiologie Christophe Mérieux du Laos, Institut Pasteur du Laos and LOMWRU), have active biosafety and biosecurity management programmes and supporting documents are available that include biosafety, biosecurity and incident response plans. Most of these laboratories have been assessed on biosafety and biosecurity by independent third parties. Biosafety officers for some health care facilities at the central and provincial levels have been designated with terms of reference.

Two facilities (Institut Pasteur du Laos and LOMWRU) actively monitor and update inventory records of stored pathogens and processed samples. NCLE has a full monitoring system and inventory for influenza, Japanese encephalitis, measles and rubella samples. The National Animal Health Laboratory has a full monitoring system and inventory for rabies, avian influenza and anthrax samples.

## Recommendations for priority actions

- Establish a national licensing and regulating body for biosafety and biosecurity. In addition to facility management regulations, this body should create national standards and guidelines for packaging and transportation of samples (both domestically and internationally); training and certification; assessment and inspection; and administration of occupational health programmes for laboratorians.
- Conduct a national inventory of dangerous pathogens across all human and animal health laboratories, using a list of select agents specifically identified for Lao People's Democratic Republic, and update laboratory-specific risk assessments as appropriate following this inventory.
- Identify, train and accredit biosafety/biosecurity officers and security managers for all regulated human and animal health laboratory facilities throughout the country.

## Indicators and scores

### P.6.1 Whole-of-government biosafety and biosecurity system in place for human, animal and agriculture facilities – Score 2

#### *Strengths/best practices*

- A national biosafety manual has been developed addressing general biosafety issues in laboratories.
- A National Biosafety Framework and a National Healthcare Waste Management Decision with associated training manual have been developed and disseminated.
- International guidance and technical materials have been translated into the local language.
- The main national public health laboratories provide capability to test for multiple pathogens at different laboratory biosafety levels (maximum biosafety level 3 at LOMWRU).
- The main national public health laboratories have biosafety and biosecurity management programmes with incident response and emergency plans. Some health care facilities at the provincial and central levels have designated biosafety officers with terms of reference.
- The national public health laboratories (NCLE, LOMWRU, Institut Pasteur du Laos and the National Animal Health Laboratory) have started to monitor and update their records of stored pathogens and toxins.
- The National Strategy on IPC for all Health Care Facilities was developed in 2014. IPC committees exist at the central and provincial hospital levels and IPC guidelines are in place.

#### *Areas that need strengthening and challenges*

- No biosafety and biosecurity legislation, regulations, policy or regulatory body are in place; there is only the National Biosafety Framework developed in 2004, which focuses on genetically modified organisms. There are no dangerous pathogen and toxin control measures.
- There is no comprehensive national inventory identifying what and in which facilities dangerous pathogens and toxins are housed.
- There is no national plan to consolidate dangerous pathogens and toxins to a minimum number of facilities.
- Insufficient national budget and human resources exist to ensure the sustainability of biosafety and biosecurity personnel programmes or the maintenance of safe and secure laboratory facilities and equipment.
- Coordination between the human health sector, animal health and other relevant sectors on biosafety and biosecurity programmes and activities is lacking.

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

### *Strengths/best practices*

- NCLE and the biosafety technical working group have developed a common biosafety and biosecurity training curriculum for all facilities housing or working with dangerous pathogens in health care facilities. This common curriculum is available and is being actively used by Institut Pasteur du Laos and NCLE; the curriculum uses WHO guidelines as the underlying standard. Selected central and provincial level staff, including military hospital staff who maintain/work with dangerous pathogens and toxins, have been trained on biosafety and biosecurity by Institut Pasteur du Laos and NCLE.
- A training-of-trainers programme on biosafety and biosecurity is in place for select laboratories; this programme is conducted by NCLE and Institut Pasteur du Laos for selected central and provincial hospitals. NCLE and Institut Pasteur du Laos have assisted selected central and provincial hospitals in implementing their biosafety and biosecurity programmes.

### *Areas that need strengthening and challenges*

- No comprehensive needs assessment for biosafety and biosecurity training has been conducted.
- Induction and refresher training is conducted for most laboratory staff at national and some provincial level facilities, but district and community level staff have very limited training.
- No credentialing or database of trained personnel exists for biosafety/biosecurity officers and security managers.
- Occupational health services exist for international foundation laboratories, but are limited for government-run facilities.

# Immunization

## Introduction

Immunizations are estimated to prevent more than 2 million deaths a year globally. Immunization is one of the most successful global health interventions and cost-effective ways to save lives and prevent disease.

### Target

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

## Lao People's Democratic Republic level of capabilities

The Expanded Programme on Immunization (EPI) was launched in 1979 in Lao People's Democratic Republic with six vaccines (bacille Calmette-Guérin, diphtheria, pertussis, tetanus, poliomyelitis [polio] and measles). The programme has gradually introduced new vaccines and capabilities have been improved over time at the national level. As of 2016, the programme has added hepatitis B, Haemophilus influenzae type B, Japanese encephalitis, rubella, pneumococcal conjugate and inactivated polio vaccine to prevent a total of 11 diseases. Lao People's Democratic Republic provides vaccination against diseases covered under the National Immunization Programme (NIP) free of charge and immunization is one of the country's key priority maternal and child health programmes. The NIP has developed a comprehensive multi-year plan for immunization.

Lao People's Democratic Republic has a nationwide system for vaccine demand forecasting and distribution from national to provincial, provincial to district, and district to health centre level. The NIP provides technical and administrative support for the implementation of EPI through a network of 18 provinces, 148 districts, approximately 1000 health centres and more than 9000 villages. The NIP leads and coordinates the immunization programme at national level, supported by a regulatory system that describes procedures and standards for providing immunization services and maintaining cold chain equipment. There is a system in place to update cold chain equipment inventories and to maintain cold chain throughout the vaccine delivery and storage process, from the NIP to health centres.

Routine immunization coverage (as measured by third-dose pentavalent vaccine coverage) increased from 75% in 2010 to 89% in 2015, while first-dose measles-containing vaccine coverage increased from 65% to 88% over the same period. However, coverage varies widely between districts and provinces. Only 30% of all districts achieved more than 90% coverage of third-dose pentavalent vaccine and measles-rubella vaccine, while some districts showed coverage lower than 70%. In the past few years, Lao People's Democratic Republic has experienced outbreaks of vaccine-preventable diseases including measles, diphtheria, pertussis and cVDPV type 1. The NIP conducted a total of 10 rounds of polio vaccination supplementary immunization campaigns across the country to respond to the cVDPV outbreak that started in 2015. The most recent outbreak response immunization campaign (the 10th round) was conducted in January 2017 at national level and included oral polio vaccine and measles-rubella vaccine targeting children aged under 5 years and 9–59 months, respectively.

In 2015, a coverage cluster survey was conducted using a recent WHO guideline. The survey targeted 60 000 households across all provinces to check the immunization status of 5981 children aged 12–23 months. While the official measles-rubella vaccine coverage of children aged 9 months–10 years was 89% in 2014, the EPI coverage survey showed coverage of children aged 12–23 months was 81.4% (based on vaccination records at health facilities and caretaker recall).

## Recommendations for priority actions

- Expand NIP management capacity at subnational levels, including increased efforts to close coverage gaps in routine immunization and surveillance for vaccine-preventable diseases and promotion of fixed site sessions complemented by appropriate outreach sessions.
- Conduct refresher and on-the-job training to health staff on vaccine management, interpersonal communication, adverse events following immunization and monitoring and evaluation as part of the NIP operational plan.
- Ensure implementation of high-quality microplans for outreach sessions to hard-to-reach populations.
- Prioritize communication strategies in the NIP, including communicating with ethnic minorities.
- Consider planning a comprehensive EPI review in 2017–2018 in collaboration with WHO and the United Nations Children's Fund.

## Indicators and scores

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

#### *Strengths/best practices*

- The EPI has a long-term, national-level immunization plan and annual operational plan that are updated regularly based on changing situations and needs.
- Vaccination coverage of all antigens has increased in recent years. All immunizations under the NIP are provided free-of-charge.
- An immunization law is underdevelopment and will be endorsed at the end of 2017/early 2018.
- The NIP currently targets 11 diseases, with vaccines for rubella, Japanese encephalitis and polio recently included. It is planned to introduce a second dose of measles vaccine to the NIP during 2017. Annual operational planning is conducted for the NIP, and a network exists in all provinces, districts and health centres.
- A national EPI review was last conducted in 2012 and a comprehensive multi-year plan for immunization has been developed for 2016–2020.

#### *Areas that need strengthening and challenges*

- Vaccine coverage is uneven and in some areas is below 70%. Only 30% of all districts have achieved more than 90% coverage of third-dose pentavalent vaccine and measles-rubella vaccine, while some districts show coverage less than 70%. In recent years, Lao People's Democratic Republic has experienced repeated outbreaks of vaccine-preventable diseases including measles, diphtheria, pertussis, and cVDPV type 1. Low coverage can be partly attributed to incomplete microplanning and lack of access to some hard-to-reach areas during the rainy and farming seasons.
- Some health centres face a shortage of human resources (e.g. 2–3 health workers per centre), and there is high staff turnover and a lack of technical EPI training for new health workers.
- Transportation of vaccines remains challenging, particularly from districts to health centres and from health centres to outreach villages.
- Social mobilization is limited in routine immunization sessions and there are insufficient information, education and communication materials (in quantity, and availability in local languages) to provide to communities. This has been recognised as a priority. There is limited budget for activities using media such as television and radio.

- Demand for vaccination is low due to a lack of knowledge about its importance, especially among ethnic minorities living in remote areas such as the Hmong community. Cultural beliefs, language barriers between health workers and communities, and low community ownership of immunization services are all possible factors.

## **P.7.2 National vaccine access and delivery – Score 4**

### ***Strengths/best practices***

- The NIP has its own network in all provinces, districts and health centres. Provincial and district levels have a minimum of 1–2 staff to support immunization services. Many staff at all levels have received comprehensive training on immunization. Immunization services are provided at fixed sites, outreach sites and mobile sites.
- According to NIP estimates, all provincial and district EPI stores are equipped with cold chain equipment and approximately 90% of health centres have functional cold chain equipment.
- Efforts have been made to increase community awareness and improve the demand for vaccination, especially among ethnic populations. Several methods have been used during recent polio vaccination campaigns including community meetings, “frequently asked questions” leaflets and promotion of the “166” hotline established for event-based surveillance.

### ***Areas that need strengthening and challenges***

- Vaccination coverage is low in some areas, and could be increased by promoting fixed site sessions complemented by appropriate use of outreach sessions. Ensuring the use of microplanning guidelines in each health centre can also improve coverage.
- Health staff would benefit from refresher and on-the-job training on vaccine management, interpersonal communication and handling of adverse events following immunization.
- Communication and social mobilization with ethnic communities is challenging, and can be supported by information, education and communication materials, television and radio spots – particularly in local languages.
- Overall NIP monitoring and supervision requires improvement by conducting regular supportive supervision at all levels, using and strengthening existing supervision tools.

# 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.*

### Lao People's Democratic Republic level of capabilities

Public health laboratories in Lao People's Democratic Republic play an essential role in supporting clinical diagnosis as well as disease control and prevention programmes. The NCLE is the main public health laboratory. Several other national laboratories and international research laboratories play an important part in the public health laboratory system. Hospital laboratories are located at central and regional levels and in all provinces providing diagnostic services to all administrative levels. In 2012, a National Policy for Health Laboratories was developed to strengthen laboratory services and standardize laboratory capacity across the country.

Laboratory capacity to detect priority infectious diseases is demonstrated by the ability of national laboratories to perform 9 out of 10 core tests identified by the IHR (poliovirus testing is conducted at an overseas laboratory). A documented system for laboratory networking and specimen referral has been in place since 2015. The Operational Guidelines for Health Laboratory Networking in Lao People's Democratic Republic cover the transportation of specimens from the peripheral level to national laboratories. The country participates in many international laboratory networks, including those of FAO and WHO, and a specimen transport and referral system has been developed to ship specimens overseas when tests cannot be performed in country. Capacity to carry out classical diagnostic techniques, such as polymerase chain reaction (PCR), is developed and specific diagnostic SOPs are in place (e.g. influenza real-time PCR [RT-PCR], dengue RT-PCR, Japanese encephalitis immunoglobulin M [IgM] testing by ELISA, and measles and rubella IgM testing by ELISA). Lao People's Democratic Republic participates in several international external quality assurance (EQA) programmes and NCLE has been accredited by WHO for testing of priority diseases such as influenza, measles, rubella and Japanese encephalitis. National laboratory quality standards have also been drafted.

While capacity for key aspects of national laboratory systems have been developed and demonstrated, finalizing procedures, guidelines and standards, and ensuring their enforcement, remain to be done. Coordination between animal and human health laboratories is also an area in need of strengthening. Ensuring the sustainability of capacities is challenging as financing is often dependent on external partners and funding shortfalls periodically result in stock outs.

## Recommendations for priority actions

- Strengthen collaboration between NCLE, Institut Pasteur du Laos, LOMWRU, WHO and other partners to rapidly respond to outbreaks and identify pathogens as quickly as possible by defining clear roles and responsibilities.
- Finalize and implement laboratory quality standards, including quality assurance and quality control at subnational level laboratories, and designate a national officer to coordinate quality control activities at all laboratory facilities.
- Strengthen laboratory capacity for food poisoning and antimicrobial-resistant pathogens at central laboratories, including NCLE.
- Establish regular coordination mechanisms between human and animal health laboratories using a One Health approach.
- Ensure sustainability of laboratory testing by securing reagents, supplies, key equipment and maintenance contracts.

## Indicators and scores

### D.1.1 Laboratory testing for detection of priority diseases – Score 4

#### *Strengths/best practices*

- The national laboratory system is capable of conducting 9 of the 10 core tests identified by the IHR (2005) (for influenza, HIV, tuberculosis, malaria [*Plasmodium* spp.], typhoid fever [*Salmonella typhi*], dengue, measles and rubella, diarrhoea and Japanese encephalitis). Testing for poliovirus is conducted in an overseas reference laboratory.
- The National Strategic Plan on Health Laboratory 2013–2020 provides operational guidelines for implementing priority activities to strengthen laboratories, as mandated in the National Policy for Health Laboratories. This strategic plan describes implementation of the National Policy by identifying key objectives and activities required to promote the establishment of a sustainable and coherent framework for developing and expanding laboratory services as well as regulatory mechanisms.
- National diagnostic algorithms are aligned with international standards (e.g. the Clinical and Laboratory Standards Institute, OIE and WHO) for many core laboratory tests.
- NCLE coordinates with Institut Pasteur du Laos and LOMWRU to identify pathogens and rapidly respond to outbreaks. For example, Institut Pasteur du Laos is designated for Ebola virus identification and NCLE, Institut Pasteur du Laos and LOMWRU closely collaborate on dengue testing.
- There is official agreement with overseas laboratories for the performance of specialized testing that is not available in the country, such as poliovirus testing and molecular confirmation of measles and rubella.

#### *Areas that need strengthening and challenges*

- The maintenance of essential laboratory equipment is challenging as there is limited back-up equipment. Maintenance contracts for key equipment are not in place for all facilities.
- Operational costs for some core laboratory testing are externally supported.
- There is minimal capability for testing novel or emerging pathogens.

### D.1.2 Specimen referral and transport system – Score 3

#### *Strengths/best practices*

- There is a specimen referral network documented in the Operational Guidelines for Health Laboratory Networking in Lao People's Democratic Republic for each of the tests necessary to detect and confirm etiologies of all country priority diseases including influenza, dengue, diarrhoea, measles and rubella, Japanese encephalitis and multidrug-resistant tuberculosis.
- Specimen transportation and packaging specifications are in compliance with United Nations standards.
- There are standardized SOPs in place for specimen collection, packaging and transport.
- Lao People's Democratic Republic participates in international laboratory networks such as ASEAN, FAO, the Global Influenza Surveillance and Response System, Institut de Recherche pour le Développement, Institut Pasteur du Laos, Centre d'Infectiologie Lao-Christophe Mérieux du Laos, KIT-Royal Tropical Institute, Netherlands and WHO.

#### *Areas that need strengthening and challenges*

- The sustainability of the laboratory referral system is vulnerable as the majority of specimen transportation costs are supported by external partners.

### D.1.3 Effective modern point-of-care and laboratory-based diagnostics – Score 3

#### *Strengths/best practices*

- There are plans in place to improve the availability of point-of-care diagnostics at clinical sites in the country, such as the Center for Malaria, Parasitology and Entomology plan to expand G6PD testing in their network; and the Center for HIV/AIDS and STI plan to expand HIV testing to district voluntary counselling and testing sites.
- There is in-country production of haemoculture media.

#### *Areas that need strengthening and challenges*

- Laboratory diagnostic capacities do not meet the targets laid out in the National Laboratory Norms and Standards Guidelines developed in 2015.

### D.1.4 Laboratory quality system – Score 2

#### *Strengths/best practices*

- National laboratory quality standards were drafted in 2016.
- The Laboratory Quality Management System has been implemented in five provincial laboratories and selected central laboratories using the Laboratory Quality Stepwise Implementation tool.
- Although Lao People's Democratic Republic does not have a national laboratory certification or accreditation system, it participates in international EQA programmes; NCLE has WHO accreditation for disease-specific testing including influenza, measles, rubella and Japanese encephalitis.
- There are several national EQA programmes organized by each responsible centre.

#### *Areas that need strengthening and challenges*

- There is no national body responsible for laboratory licensing, inspection, certification and accreditation.
- There is no national regulatory authority responsible for in vitro diagnostic device qualification or registration.
- No laboratories have valid ISO 17025, 15189 or 17025 accreditation.

- There is no policy for the control of dangerous pathogens across human and animal health laboratories in the country.
- Although laboratory quality officers have been designated at some facilities, they are not coordinated and their effectiveness varies.

# 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; improved communication and collaboration across sectors and between subnational (local and intermediate), national and international levels of authority regarding surveillance of events of public health significance; improved country and intermediate level regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This would 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.*

## Lao People's Democratic Republic level of capabilities

The NCLE has established indicator-based surveillance and event-based surveillance systems with demonstrated capacity to detect public health threats. These surveillance systems are closely linked to human resource development through participation of FEPT fellows in surveillance and response functions. Information generated through the surveillance system is shared between Ministry of Health departments, administrative levels, sectors and partners to inform public health action.

The indicator-based surveillance system, the Lao Early Warning Alert and Response Network (Lao EWARN), has been in place since 2008 and reports data on 17 notifiable diseases and syndromes from the provinces to the central level on a weekly basis. The flexibility of the system was demonstrated through the introduction of daily reporting during a dengue outbreak in 2013. While the current indicator-based surveillance system does not transfer data from the district or provincial levels to the central level in real-time, the reporting system is considered appropriate given limitations in information technology infrastructure, especially at the local level. Urgent events are communicated by telephone, otherwise reporting is on a weekly basis. However, several vertical indicator-based surveillance programmes, such as those for tuberculosis, malaria and HIV, use electronic real-time reporting systems from district level.

Lao People's Democratic Republic has demonstrated capacity to analyse surveillance data. The Lao EWARN system automatically calculates alert thresholds for several diseases and syndromes; and public health staff at both central and provincial levels have the basic skills needed to analyse surveillance data. At the central level, the NCLE validates and analyses data provided by provincial surveillance units and alerts high-level officials when response is required.

## Recommendations for priority actions

- Further develop a skilled workforce for surveillance and response across sectors (e.g. animal and human health) and administrative levels.
- Strengthen coordination, communication and information sharing with stakeholders across sectors.
- Identify additional sources of health information for risk assessment, such as risk perception assessments, vaccine coverage, laboratory data and community-based reporting.

## Indicators and scores

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

#### *Strengths/best practices*

- The indicator-based surveillance system produces weekly reports covering the entire country.
- The event-based surveillance system gathers information from both health care providers and community members using the NCLE hotline and a toll-free hotline (166) that allows for rapid reporting of unusual events.

#### *Areas that need strengthening and challenges*

- Limited human resource capacity, especially in remote areas, impacts the sensitivity of indicator-based and event-based surveillance.

### D.2.2 Interoperable, interconnected, electronic real-time reporting system – Score 3

#### *Strengths/best practices*

- NCLE analyses the data from the subnational level in a timely manner and provides feedback by email.
- Lao EWARN automatically calculates weekly alert thresholds to facilitate detection of any unusual activity.
- The Ministry of Health shares weekly surveillance reports with relevant departments, Ministry of Agriculture and Forestry, development partners (e.g. Asian Development Bank, Institut Pasteur du Laos, United States Centers for Disease Prevention and Control and WHO) and international nongovernmental organizations.

#### *Areas that need strengthening and challenges*

- Indicator-based surveillance reports from province to districts are paper-based, which adversely impacts timeliness.
- Limited information technology infrastructure and technical capacity for database management pose a challenge to the implementation of electronic real-time reporting systems that could increase the timeliness of reporting.
- Information sharing from the animal sector to the human sector is limited, although a memorandum of understanding is in place between human and animal health sectors to share information.

### D.2.3 Integration and analysis of surveillance data – Score 4

#### *Strengths/best practices*

- FETP graduates working at national and provincial levels have the skills to analyse surveillance data to generate information needed for decision-making.
- In addition to being circulated via weekly surveillance reports, laboratory and sentinel surveillance data are rapidly shared with relevant stakeholders during outbreaks.
- NCLE provides key epidemiological information to the EOC during emergencies.

#### *Areas that need strengthening and challenges*

- Limited data from clinical or reference microbiological laboratories are available.
- Data analysis and risk assessment capacity at provincial level are variable.
- Risk assessments for public health events are not conducted systematically at the provincial level.

## D.2.4 Syndromic surveillance systems – Score 4

### *Strengths/best practices*

- 17 syndromes/diseases are reported from the lowest level of the public health system to the national level.
- Laboratory-based surveillance is in place for some syndromes such as influenza-like illness, and fever and rash (measles/rubella).
- Standardized forms are available to collect syndromic data.

### *Areas that need strengthening and challenges*

- Insufficient laboratory capacity limits the ability to detect public health events.

# Reporting

## Introduction

Health threats at the human–animal–ecosystem interface have increased over the past 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 diseases at the interfaces between them.

### Target

*Timely and accurate disease reporting according to WHO requirements and consistent coordination with FAO and OIE.*

## Lao People's Democratic Republic level of capabilities

Lao People's Democratic Republic has demonstrated capacity to report potential public health emergencies of international concern and relevant zoonotic diseases to FAO, OIE and WHO. The country has a designated national IHR focal point and an INFOSAN focal point in the Ministry of Health, as well as an OIE focal person in the Ministry of Agriculture and Forestry who reports to OIE quarterly. The national IHR focal point has been trained in IHR (2005) regulations.

The IHR require countries to report certain disease outbreaks and public health events to WHO. In Lao People's Democratic Republic, the reporting system collects weekly reports from the 18 provinces and has established thresholds for the reporting of notifiable diseases to international agencies (INFOSAN, OIE, World Animal Health Information System, WHO). However, no formal mechanism is established for exchange of information between the different relevant sectors either within the country or with neighbouring countries.

## Recommendations for priority actions

- Empower the national IHR focal point functions, as defined in the IHR (2005):
  - develop provincial multilateral and bilateral arrangements for information sharing;
  - review routine reporting procedures within sectors and across sectors.
- Enhance risk assessment of public health events of unknown origin, chemical events and radiation emergencies:
  - conduct simulation exercises to test the capacity for early detection, risk assessment and timely reporting of chemical and radiation events to WHO through the national IHR focal point.
- Strengthen the timeliness of reporting to international authorities once an event is confirmed.
- Ensure sufficient human resource capacity to carry out risk assessments for events of unknown origin, particularly nuclear and radiological events.
- Provide training in the use of the decision instrument (Annex 2 of IHR) to identify potential public health emergencies of international concern.

## Indicators and scores

### D.3.1 System for efficient reporting to FAO, OIE and WHO – Score 4

#### *Strengths/best practices*

- There is a designated national IHR focal point with a mechanism for information exchange based on type of event for notifiable infectious diseases.
- Lao People's Democratic Republic has established criteria for reporting to international agencies (INFOSAN, OIE, WHO) in accordance with the IHR (2005).
- There is a notifiable disease list and weekly reporting from 18 provinces. Reports are shared with multiple sectors (Ministry of Agriculture and Forestry, Ministry of National Defence, Ministry of Science and Technology) via email.
- Lao People's Democratic Republic has multilateral regional and bilateral reporting agreements with neighbouring countries through the Mekong Basin Disease Surveillance consortium.
- Ministry of Agriculture and Forestry reports to OIE quarterly and food safety issues are reported to INFOSAN.

#### *Areas that need strengthening and challenges*

- There is no structured mechanism to ensure routine information exchange between the national IHR focal point and OIE contact point outside of emergencies.
- Reporting is not consistent across agencies and subnational health departments.
- There is no policy on international event reporting, which is detrimental to overall coordination among reporting entities.
- National human resources capacity is insufficient to conduct risk assessments for public health events of chemical and radiation origin and events of unknown origin.
- Universal, full understanding of the IHR (2005) does not exist among all provinces and line ministries.

### D.3.2 Reporting network and protocols in country – Score 4

#### *Strengths/best practices*

- IHR Article 8, on consultation with WHO in circumstances not requiring notification, is used regularly by the national IHR focal point (e.g. for Zika virus).
- Simulation exercises have been conducted as part of a Mekong Basin Disease Surveillance project.

#### *Areas that need strengthening and challenges*

- Understanding of FAO, OIE and WHO reporting requirements needs to be improved.
- Timeliness of rapid laboratory confirmation of priority zoonotic diseases and reporting to OIE require strengthening.
- Limited opportunities for interagency dialogue, training, exercises and communication across all administrative levels impede strong multisectoral coordination.

# Workforce development

## Introduction

Workforce development is important in order to develop a sustainable public health system over time by developing and maintaining a highly qualified public health workforce with appropriate technical training, scientific skills and subject-matter expertise.

### Target

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

## Lao People's Democratic Republic level of capabilities

Lao People's Democratic Republic established a 1-year modified FETP in February 2009. Each year, eight trainees from national and provincial levels are selected to participate in the programme from human health, animal health and other related sectors. The FETP alumni network now has 55 graduates, including at least one graduate from each of the 18 provinces of Lao People's Democratic Republic.

FETP graduates are recognized by senior public health officials at central and provincial levels for their technical competency. Graduates are drawn on to provide surge capacity to support outbreak response and investigation activities in provinces. However, the management and operational costs of the programme (such as travel and training) are largely dependent on donor support and there are still inadequate numbers of staff to manage the programme.

Multidisciplinary rapid response teams (including members with public health, animal health, laboratory, clinical and environmental expertise) are trained using case-based scenarios and table-top exercises on public health concerns and can be deployed to the field. Surveillance officers take a short (3-week) epidemiology course. However, these short courses are reliant on donor funding and thus sustainability is an issue.

## Recommendations for priority actions

- Enhance capacity development through an expanded FETP, especially at provincial level, and utilize FETP graduates to develop the public health workforce (e.g. rapid response team, surveillance officers) especially at district levels.
- Integrate multidisciplinary public health skills into existing and future health workforce development plans, including the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies and the National Health Workforce Strategy 2016–2020.
- Ensure sustainability of the FETP/rapid response teams, including financial sustainability.

## Indicators and scores

### D.4.1 Human resources available to implement IHR core capacity requirements – Score 3

#### Strengths/best practices

- There are 55 FETP graduates (at least one per province) who play a key role in implementing IHR capacities at peripheral levels.

- Current FETP fellows and alumni are drawn on to provide surge capacity for major public health events.
- Rapid response teams exist at central, provincial and district levels, and training is conducted regularly.
- NCLE can diagnose all major infectious diseases including emerging infectious diseases.

#### *Areas that need strengthening and challenges*

- Response capacity at national and subnational levels continues to be built mainly through the FETP. The programme accepts trainees from all public health-related fields (including animal health, vector-borne disease, immunization, military health, police health); however there are limitations with regard to preparing appropriate field sites and mentors for multisectoral training.
- Human resources needed to maintain IHR core capacities are available and have been built through the FETP, but epidemiological and multidisciplinary response capacities remain limited at all levels.
- Staff turnover has adversely affected personnel development plans.
- The government budget for outbreak investigation and response is limited. Contingency funds for outbreak response rely heavily on support from development partners.

### **D.4.2 FETP or other applied epidemiology training programme in place – Score 3**

#### *Strengths/best practices*

- The FETP has produced a competent workforce for public health surveillance at both national and provincial levels. FETP graduates are placed in all provinces and as well as in the NCLE and in six districts.

#### *Areas that need strengthening and challenges*

- The Lao People's Democratic Republic FETP is a 1-year modified programme. While it provides additional short courses after graduation, graduates do not develop an advanced skill set. However, if considering expansion of the programme to a full 2-year FETP, careful consideration of both the needs and the costs are necessary as additional resources would be required.
- The Ministry of Health funds one permanent position to contribute to the FETP. However, the programme and operational costs (such as travel) are borne by international donors and additional staff (one technical and one administrative) are required to manage the programme. The current FETP coordinator is WHO staff.

### **D.4.3 Workforce strategy – Score 2**

#### *Strengths/best practices*

- The National Health Workforce Strategy 2016–2020 and road map for implementation are in place.
- The Department of Communicable Disease Control has developed a 5-year emerging infectious diseases work plan and conducts annual reviews to track progress in all areas, including workforce development.

#### *Areas that need strengthening and challenges*

- The above-mentioned 5-year health workforce strategy and emerging infectious diseases work plan are not fully implemented.
- There is no incentive mechanism in place to maintain the existing public health workforce.
- Additional government support to the FETP is required to ensure sustainability.

# RESPOND

## Preparedness

### Introduction

The effective implementation of the IHR (2005) requires multisectoral/multidisciplinary approaches through national partnerships for effective alert and response systems. Coordination of nationwide resources, including the sustainable functioning of a national IHR focal point, which is a national centre for IHR communications, is a key requisite for IHR (2005) implementation. The national IHR focal points should be accessible at all times 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 national IHR focal points, continuously update and annually confirm them.

#### Target

*Development and maintenance of national, intermediate (district) and local/primary 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/primary levels during a public health emergency.*

### Lao People's Democratic Republic level of capabilities

In 2015, Lao People's Democratic Republic revised its National Work Plan for Emerging Infectious Diseases and Public Health Emergencies to build sustainable national capacities to manage emerging diseases and other acute public health risks or events. The National Work Plan includes eight key areas including public health emergency preparedness using a multisectoral approach. In addition, Lao People's Democratic Republic has developed a series of disease-specific preparedness and response plans, including plans addressing Ebola virus disease, MERS-CoV, Zika virus, meningitis, pandemic influenza, avian influenza and dengue. Lao People's Democratic Republic has also developed a public health emergency plan on IHR-related hazards at the designated IHR point of entry. All of these plans take a whole-of-government and a whole-of-society approach. They have been implemented, tested by simulation exercises, drills and real events, and have been updated regularly.

Lao People's Democratic Republic has a draft health emergency risk management plan (2014) and a draft all-hazards/multi-hazard national health emergency response plan. Even though a series of consultations have been conducted, these plans have not been formally approved. A process for mapping priority public health risks and resources has not been conducted; however relevant guidance for public health response and clinical management has been developed for key priority diseases. A national risk assessment has been conducted on potential urgent public health events including flooding, avian influenza and other emerging diseases, which have been identified as the top three potential urgent public health events in Lao People's Democratic Republic.

National disaster stockpiles exist including medical supplies, medicines, equipment and personal protection equipment, and are updated annually. They are prepositioned in several parts of the country, with possibility to mobilize them at short notice. Funds are available for urgent emergency response from the central government to the Ministry of Health and different levels of local government. In addition, regional stockpiles exist and can be mobilized, including the ASEAN stockpile in Malaysia.

## Recommendations for priority actions

- Develop a national public health EOC handbook, as recommended by the WHO Framework for a Public Health Emergency Operations Centre, which consolidates all relevant documentation for emergency authorities: the concept of operations for public health emergency management and the public health components of multisectoral emergencies; the roles and responsibilities between government agencies; comprehensive risk assessments; plans; and procedures for emergency management functions.
- Complete the initiated comprehensive national risk assessment and map the resulting risks and available resources to inform subsequent planning processes.
- Develop a risk-based national all-hazards response plan with annexes to address newly identified threats and IHR-specified hazards, incorporating (and updating/finalizing as necessary) existing disease-specific plans.

## Indicators and scores

### R.1.1 National multi-hazard public health emergency preparedness and response plan developed and implemented – Score 2

#### *Strengths/best practices*

- A number of documents already exist, including several disease-specific plans (see Supporting documentation in Appendix 2).
- National stockpiles are available and emergency funds are in place at different levels of government.
- Mechanisms are in place to mobilize surge capacity for emergency response.

#### *Areas that need strengthening and challenges*

- Although drafted, many of the existing documents have not been finalized and hence not operationalized. These documents need to be completed, approved and distributed throughout the national response structure so that staff can be trained in their use and the documents can be exercised.
- Current preparedness and response plans only address specific disease threats. Based on a comprehensive national risk assessment (see Indicator R.1.2), threat-specific plans should be consolidated under an integrated all-hazards/multi-hazards response plan (as part of an overarching public health emergency operations centre handbook) to comply with Article 2 and Annex 1A of the IHR (2005). This would also enhance capacity to manage a wider range of public health emergencies, such as natural disasters and food safety events, as called for under the IHR (2005) and supported by APSED III.

### R.1.2 Priority public health risks and resources mapped and utilized – Score 2

#### *Strengths/best practices*

- Risk assessments have been conducted at national level, although only for specific diseases.
- Lao People's Democratic Republic has access to the regional ASEAN stockpile maintained in Malaysia.

#### *Areas that need strengthening and challenges*

- Although the WHO Strategic Risk Assessment tool has been used, not all potential threats to public health have been considered, and the results have not been mapped to identify areas at highest risk.
- There is no comprehensive inventory of the resources needed to respond to public health threats (as identified through a comprehensive risk assessment), and no mapping of available domestic and international resources to inform response planning processes and resource mobilization requirements.

# Emergency response operations

## Introduction

The Incident Management System (IMS) provides the principles and tools for the effective and strategic management of the people, resources, funds and time required to address a public health emergency. A public health emergency operations centre (EOC) is a central location for the activation of the IMS. Emergency operations centres provide the physical facilities for the coordination of the human resources, tools and services needed by the IMS 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

*Country with a public health emergency plan that incorporates an IMS (or equivalent management system) and a public health EOC functioning according to minimum common standards; maintaining trained, functioning, multisectoral rapid response teams and "real-time" biosurveillance laboratory networks and information systems; as well as IMS trained staff familiar with the standard operating procedures of the EOC and capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.*

## Lao People's Democratic Republic level of capabilities

An operational EOC has been established, but a comprehensive manual with SOPs that detail measures such as delegation of authority, activation level criteria, generic organizational structure, roles and responsibilities of participating personnel etc., is still under development. The use of IMS principles and concepts is not fully evident, including an absence of clearly defined requirements for training of personnel who may be called upon to participate in an emergency response.

Exercises are important tools to reinforce formal training in the IMS and use of the EOC. Both IMS training and an established programme of exercises/simulations are needed. Since the EOC was established in 2014, a limited number of exercises/simulations have been conducted with "after action" reports, but have not necessarily tested IMS functions. Although a successful Ebola exercise was conducted in 2014 (based on a fictional scenario of virus introduction), the after-action report focused almost exclusively on the strengths and limitations of the clinical management of a suspected patient. The report did not address the effectiveness of the IMS (if used) or the utility of the EOC. An IMS organizational chart was not included in the report.

## Recommendations for priority actions

- Identify an IMS structure to be used for public health emergencies, including terms of reference for each position and clear relationships between the Ministry of Health and involved government ministries and agencies.
- Complete EOC SOPs for response operations and daily functions (including activation criteria, event-based surveillance, data collection from multiple sources and analysis, conduct of risk assessments, dissemination of situation reports).
- Identify dedicated core staff to manage the EOC on a daily basis and serve in key management roles when the EOC is activated.
- Prepare a roster of surge staff to serve in IMS roles upon activation.

- Establish a formal multi-year training programme in IMS principles and concepts for core and surge staff with position-specific training (as defined in terms of reference), and a progressive exercise sequence to test EOC plans and procedures.
- Conduct at least one table-top and one functional exercise per year to reinforce IMS personnel training, skills and EOC operations.

## Indicators and scores

### R.2.1 Capacity to activate emergency operations – Score 2

#### *Strengths/best practices*

- EOC established and functioning since 2014.
- Reliable EOC communications structure.
- EOC activated to manage major public health events (e.g. dengue outbreak in 2016, cVDPV outbreak from October 2015).
- EOC Secretariat supports operations during an event.
- Ministerial level contacts are available 24/7 to provide guidance and decisions.

#### *Areas that need strengthening and challenges*

- Although EOC activations have taken place, the lack of approved SOPs for EOC activation is a serious limitation which needs to be addressed to fully achieve the capacities required for a score of 2 for this indicator.
- Although Secretariat staff provide services to the EOC upon activation and support routine meetings held in the EOC, no dedicated staff exist to work in the EOC.

### R.2.2 EOC operating procedures and plans – Score 1

#### *Strengths/best practices*

- The high-level NCCDC provides a mechanism to convene essential partners from health and other sectors to the EOC for a multisectoral response.
- Ministry of Health cabinet coordinates all health emergency responses at national, regional and subnational levels.
- Multiple departments and agencies are involved in EOC activities during health emergencies.
- EOC produces and disseminates regular technical reports during emergencies.

#### *Areas that need strengthening and challenges*

- Evidence illustrating the use of the IMS is not available (e.g. IMS organizational charts for past public health emergencies are not documented).
- Formal training for all personnel who may be involved in the activation of the IMS to respond to a public health emergency should be implemented.
- Coordination and response during disease outbreaks and public health emergencies should be strengthened, including information technology systems, logistics and mobilization of surge capacity.
- The EOC should link with other ministries and the National Disaster Management Office at high levels through the NCCDC, as well as at operational levels.

### R.2.3 Emergency operations programme – Score 3

#### *Strengths/best practices*

- Ebola table-top exercise conducted in November 2014 to test EOC functionality.
- Ebola preparedness and avian influenza exercises conducted with an airport as point of entry.
- EOC activated for all major emergencies (e.g. dengue outbreaks in 2016, cVDPV outbreak from October 2015).

#### *Areas that need strengthening and challenges*

- Exercises have not fully addressed response coordination aspects.
- No specific training programme for EOC staff.

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

#### *Strengths/best practices*

- Case management guidelines for priority epidemic-prone diseases are available (dengue, Ebola virus disease, MERS-CoV, severe acute respiratory infections, influenza A(H1N1), avian influenza, polio, diphtheria and cholera).
- Case management guidelines are disseminated to health workers at all levels.
- Dedicated staff and ambulance are in place to transport suspected cases from the designated IHR point of entry (Wattay International Airport, Vientiane) to designated health facilities for IHR-related events.

#### *Areas that need strengthening and challenges*

- Case management guidelines are not available for chemical and radiological hazards.
- Case management guidelines should take an all-hazards approach to respond to unknown pathogens and case management should be integrated into the IMS.

# Linking public health and security authorities

## Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade (e.g. the anthrax terrorist attacks) or naturally occurring (e.g. flu pandemics). In a public health emergency, law enforcement will need to quickly coordinate its response with public health and medical officials.

### Target

*Country conducts a rapid, multisectoral response in case of a biological event of suspected or confirmed deliberate origin, including the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance, such as to investigate alleged use events.*

## Lao People's Democratic Republic level of capabilities

The NCCDC, composed of a variable number of relevant ministries as needed and chaired by Prime Minister, was established in 2005. The NCCDC facilitates the sharing of information and the coordination of responses to public health events within all convened ministries, including the Ministry of National Defence and Ministry of Public Security. It is intended to be the national coordinating mechanism to ensure ministries work together during a suspected or confirmed biological event. While there is no memorandum of understanding in place between the Ministry of Health, Ministry of National Defence and the Ministry of Public Security, the decree which established the NCCDC is the equivalent reference document used by the Ministry of Health to facilitate the initiation of communications with the Ministry of National Defence and the Ministry of Public Security regarding public health events.

In addition, guidelines and SOPs have been established at points of entry, with identified points of contact and triggers for the sharing of public health information between public health, animal health and security authorities. However, SOPs for the sharing of law enforcement and security information with the Ministry of Health do not exist.

The Ministry of Health has a good collaborative relationship with the other ministries, as evidenced by past activities such as joint training on disease surveillance and response, joint training on clinical management of priority infectious diseases, collaboration in outbreak response management to several diseases, and the conduct of a number of joint exercises for diseases such as Ebola virus disease, MERS-CoV, and human infections with avian influenza A(H7N9).

In addition, there is a draft chemical, biological, radiological and nuclear plan that addresses response to biological attacks. There is also a draft Communicable Disease Prevention and Control Law" which incorporates all elements and requirements of the IHR (2005), including links between the public health and law enforcement/security sectors.

## Recommendations for priority actions

- Develop and finalize formal, documented agreements and processes for the coordination of ministries and agencies during emergency responses including, but not limited to, SOPs for:
  - detecting and identifying public health threats from information sources relevant to the early warning of public health threats, including from law enforcement and security sources;
  - conducting and tracking sector-specific response activities coordinated by the NCCDC, including forensic and legal investigations.

- Incorporate scenarios that involve intentional release of biological agents in exercises to test linkages between the public health and law enforcement/security sectors.
- Consider expanding the use of the national Public Health EOC from information sharing only during responses to routine real-time information sharing between the public health and law enforcement/security sectors.

## Indicators and scores

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

#### *Strengths/best practices*

- The NCCDC is an existing mechanism through which multiple ministries outside the Ministry of Health can be brought to collaborate on public health emergencies.
- Guidelines and SOPs exist at points of entry, with identified points of contact and triggers for information sharing between public health, animal health and security authorities.
- Although the Ministry of Health does not have a memorandum of understanding with the Ministry of National Defence and the Ministry of Public Security, it does have good relationships and a history of joint operations with these two ministries. Past joint activities include:
  - training on disease surveillance and response as part of the modified FETP;
  - training on clinical management of dengue, malaria, etc.;
  - outbreak response to dengue, malaria and cVDPV1;
  - reporting of disease outbreaks such dengue, malaria and avian influenza;
  - simulation and table-top exercises for Ebola virus disease, MERS-CoV and human infections with avian influenza A(H7N9).

#### *Areas that need strengthening and challenges*

- Although relationships between the ministries are strong through the NCCDC mechanism, several operational gaps still need to be addressed:
  - SOPs should be developed for the efficient sharing of both public health data as well as law enforcement/security data among the Ministry of Health, Ministry of National Defence, Ministry of Public Security and other relevant organizations;
  - protocols for rapid detection, identification and mobilization of a joint response to a deliberately caused public health emergency currently do not exist.
- The opportunity exists to use the EOC for all-source early warning by making it the hub for receipt, triage and reporting in near real-time of relevant information from not only public health sources (human and animal), but also from law enforcement, security and other sectors that may inform the early detection and rapid mobilization of responses to deliberately caused public health emergencies.

# 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 for response.

### Target

*National framework for transferring (sending and receiving) medical countermeasures, and public health and medical personnel from international partners during public health emergencies.*

## Lao People's Democratic Republic level of capabilities

Agreements with private sector suppliers are in place to rapidly deliver medications in support of emergency responses that require medical countermeasures. However, the available medications should be balanced against any specific medication needs that may be identified by a risk assessment. There are six regional stockpiles of medical countermeasures in the region, although their inventories and how to access them are not clear. It is also unclear if a formal stockpile management system exists in Lao People's Democratic Republic to link central, provincial, programme and international stockpiles. Such a system should include a computerized inventory, replacement schedules and SOPs for rapid mobilization and transport of items and people.

Some existing medical countermeasure capacities are incorporated in outbreak response plans for specific infectious diseases. Designated infectious disease control programmes (e.g. malaria, tuberculosis, vaccine-preventable diseases) maintain their own limited supplies.

National personnel can be mobilized and deployed to an emergency based on ministerial decree. During major public health emergencies, medical assistance from foreign sources may be required. In collaboration with the Ministry of Foreign Affairs, a procedure is in place to accept foreign medical support. However, additional measures to accredit the quality and capacity of foreign medical personnel may be needed.

## Recommendations for priority actions

- Analyse examples of minimal to comprehensive national stockpile policies and contents prepared by both developing and developed nations.
- Create a national stockpile system to link to and access national and international stockpiles.
- Develop a plan to receive, assess and process foreign medical personnel and supplies for deployment during major public health emergencies.

## Indicators and scores

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

#### Strengths/best practices

- The Ministry of Health has agreements with two pharmaceutical companies to deliver basic emergency medicines within 24 hours during an emergency.

### *Areas that need strengthening and challenges*

- There are no specific stockpiles of medical countermeasures to respond to public health emergencies at different government levels. Although there are six regional stockpiles, it is unclear if or how they are linked to an inventory system in Lao People's Democratic Republic.
- There is currently no formal stockpile management system in place to assess inventories and coordinate deployment of existing stockpiles. A stockpile management system should be supported by standards and procedures such as specified types of delivery system (e.g. surface, air or water transport), time standards for delivery, deployment criteria and maintenance/resupply criteria.
- There is no formal system in place to send or receive medical countermeasures internationally.
- Procurement systems and delivery times of supplies to the field should be tested by table-top or functional exercises.

### **R.4.2 System in place for sending and receiving health personnel during a public health emergency – Score 2**

#### *Strengths/best practices*

- The Ministry of Health makes decisions to accept surge support of foreign personnel during emergencies.

#### *Areas that need strengthening and challenges*

- During a large-scale emergency (e.g. a major disaster caused by a natural hazard) deployment of national and international personnel can quickly become complex and chaotic. Systems should be put in place to support this function, such as processes to send and receive health personnel, and procedures to accredit foreign medical and public health personnel.
- Procedures to confirm, accredit and process foreign medical and public health personnel should be tested by table-top exercises.
- The new Accreditation of Health Professionals initiative for foreign health personnel should be implemented.

# Risk communication

## Introduction

Risk communication should be a multilevel and multifaceted process which aims to help stakeholders define risks, identify hazards, assess vulnerabilities and promote community resilience, thereby improving the capacity to cope with an unfolding public health emergency. An essential part of risk communication is dissemination of information and two-way exchanges with the affected 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 taken into account, 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. Ensuring that basic information is accessible 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 should have risk communication capacity which is 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 make 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.*

## Lao People's Democratic Republic level of capabilities

A mechanism for risk communication for public health emergencies in Lao People's Democratic Republic is in place, managed by the Centre of Information and Education for Health (CIEH). A National Risk Communication Strategy and Action Plan 2016–2020 and SOPs are in place to guide the actions of trained risk communication officers at central, provincial and district levels. Risk communication is integrated in the national emergency preparedness and response plans where activities, budget, responsible bodies and partners are also identified.

Risk communication has been a key response measure in recent real-life events such as outbreaks of dengue in 2013 and cVDPV in 2015/2016.

Lao People's Democratic Republic has mapped its stakeholders and partners for risk communication and community engagement. International partners and civil society organizations such as the Lao Women's Union, Lao Front for National Construction and others have consistently supported health authorities on risk communication. These relationships, however, need to be sustained not only during emergencies but also for routine and preparedness activities.

Public communication is coordinated at both the technical (CIEH) and strategic level (Ministry of Health cabinet) with designated spokespersons, supported by the Ministry of Information, Culture and Tourism, for media engagements during emergencies. New media, including social media and mobile-based applications, are increasingly used for public communication. Analysis of audience needs and access to information is an area of work that needs further enhancement.

A robust mechanism for community engagement is in place. The Ministry of Health, through provincial and district level health counterparts, works with village health volunteers, village heads, religious leaders, teachers and youth for community engagement. Evaluation of the effectiveness of community engagement approaches needs to be conducted to generate lessons for further improvement.

Although done on ad hoc basis, there exists a mechanism for dynamic listening and rumour management using the existing hotline (166) and occasional media monitoring. Given the increasing access to new media in Lao People's Democratic Republic, development of a system to regularly manage rumours and integrate risk perception assessment into risk assessment processes and response mechanisms is critical.

## Recommendations for priority actions

- Develop a multisectoral and multi-stakeholder strategy for risk communication and community engagement, with a shared work plan for health emergency preparedness and response that is regularly tested and used for routine activities.
- Sustain and strengthen human resources for risk communication, with basic capacity and skills to prepare for and respond to public health emergencies as recommended under APSED III. These capacities include using both traditional forms of communication as well as new media.
- Develop a system for rumour management and risk perception assessment, especially on the use of new media, including social media and mobile-based applications.
- Work with partners to develop a mechanism to evaluate risk communication and community engagement approaches.

## Indicators and scores

### R.5.1 Risk communication systems (plans, mechanisms, etc.) – Score 2

#### *Strengths/best practices*

- There is a formal arrangement for risk communication at the central level, managed by trained risk communication staff guided by SOPs.
- There is a national risk communication strategy and action plan that has been tested in simulation exercises, such as during an Ebola virus disease exercise in 2014 and a MERS-CoV exercise in 2015.
- Risk communication is integrated into national emergency preparedness and response plans where activities, budget and responsible partners have been identified.

#### *Areas that need strengthening and challenges*

- Sustaining implementation of the national work plan and risk communication strategy, including ensuring allocation of human and financial resources, is a key challenge.
- Multisectoral coordination for communication both for emergencies and routine activities should be maintained, especially with the animal health sector.
- There is a need to update the skills and capacities for risk communication at all levels of the government using both traditional and new media.

### R.5.2 Internal and partner communication and coordination – Score 3

#### *Strengths/best practices*

- Stakeholders for risk communication are identified in the national emergency preparedness and response plans, with defined roles and responsibilities that have been tested in both exercises and real-life events.

- Key partners have been mapped, such as United Nations agencies, as well as civil society organizations such as the Lao Women's Union, Lao Front for National Construction and others.

#### *Areas that need strengthening and challenges*

- There is a need to sustain partner engagement not only during emergencies but also for routine and preparedness activities.
- There is minimal documentation on partner engagement during previous responses to public health events and emergencies.

### **R.5.3 Public communication – Score 3**

#### *Strengths/best practices*

- Public communication is coordinated at both the technical (CIEH) and strategic level (Ministry of Health cabinet), with designated spokespersons.
- Media engagement is done through the Ministry of Information, Culture and Tourism using multiple platforms such as television, radio, newspapers, community loud speakers, etc.
- There is capacity to translate communication materials to ethnic languages such as Hmong and Khmu during emergencies, as done during the cVDPV outbreak in 2015.

#### *Areas that need strengthening and challenges*

- There is a lack of evidence on the effectiveness of public communication to guide future communication interventions.
- Audience analysis has not been conducted to understand evolving audience needs, preferred sources of information and trusted media channels, including social media.
- Capacity to use new media, including social media and mobile telephones, should be developed given the increasing demand to use these platforms for public health.

### **R.5.4 Communication engagement with affected communities – Score 3**

#### *Strengths/best practices*

- The CIEH has conducted a mapping of stakeholders and partner organizations with programmes on community engagement at national and local levels.
- The Ministry of Health, through its provincial and district level health authorities, has a mechanism to tap into village health volunteers, village heads, religious leaders, teachers and youth for community engagement.
- A system for developing information, education and communication materials is in place and coordinated centrally, with mechanisms for local-level dissemination.

#### *Areas that need strengthening and challenges*

- Evaluation of community engagement interventions is not regularly conducted to ascertain effectiveness of communication at the community level.
- Engagement with and addressing information needs of diverse audiences such as ethnic groups, migrants and cross-border communities should be strengthened in order to develop and maintain trust.

### **R.5.5 Dynamic listening and rumour management – Score 2**

#### *Strengths/best practices*

- There is an existing hotline (166) used to respond to public health concerns, push health messages and gather reports and rumours from the community (although on an ad hoc basis).

- Media monitoring is conducted by the CIEH on an ad hoc basis, although no process is in place to manage media monitoring systematically.
- A mobile-based application for risk communication has recently been released and provides a good opportunity for rumour management.

#### ***Areas that need strengthening and challenges***

- There is a need to develop a system to regularly manage rumours and integrate risk perception assessment into risk assessment processes and response mechanisms.
- The use of new media should be explored, including mobile-based applications for dynamic listening and rumour management.

# OTHER IHR-RELATED HAZARDS AND POINTS OF ENTRY

## Points of entry

### Introduction

All core capacities and potential hazards apply to points of entry and thus enable the effective application of health measures to prevent international spread of diseases. States Parties are required to maintain core capacities at designated international airports and ports (and 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 ground crossings) that implement specific public health measures required to manage a variety of public health risks.*

### Lao People's Democratic Republic level of capabilities

Lao People's Democratic Republic has four international airports, 23 ground crossings (including five "friendship" bridges) and no sea ports. The four international airports are located in Vientiane, Luang Prabang, Savannakhet and Pakse. So far, only Wattay International Airport in Vientiane has been designated as a point of entry under the IHR (2005).

Wattay International Airport is the principal airport in Lao People's Democratic Republic. It is located 5 kilometres from the centre of Vientiane Capital and provides connections to regional centres as well as international destinations across the Asia Pacific region. Several international and domestic airlines operate scheduled flights from Wattay International Airport including Lao Airlines, AirAsia (Thailand), AirAsia (Malaysia), China Eastern Airlines, Bangkok Airways, SilkAir, Thai Airways, T'way Airlines, Jin Air and Vietnam Airlines. There are around 40 international and 12 domestic flights operating (inbound and outbound) daily. The airport has one 3000 metre runway, and a bonded warehouse for air cargo.

Wattay International Airport consists of an international terminal and domestic terminal. The terminals provide various shopping, dining, information, currency exchange, ATM and transport services. The facility is operated by Lao-Japan Airport Terminal Service Co. Ltd.. The airport is under renovation, which is expected to be completed by mid-2018. Wattay International Airport was designated as an IHR (2005) point of entry in 2012. A Point of Entry Work Plan 2016–2020, Public Health Emergency Contingency Plan, SOPs for Public Health Emergencies of International Concern, and Pandemic Preparedness and Response Plan are in place. Under agreement by the Minister of Health, two health staff from the Vientiane Capital Health Department work at the point of entry during business hours, and on-call assistance is available after office hours. Mechanisms are in place for prompt assessment and care of ill travellers at the point of entry. Surge capacity for emergency medical care is also in place and is provided by Sikhottabong District Hospital. A thermal scanner is located at the international arrival hall for fever screening to detect potentially ill/infectious travellers.

There are no mechanisms or SOPs in place for preparedness or response to multi-hazard events at the point of entry. However, point of entry and guidance materials for Wattay International Airport have been recently finalised. Lao People's Democratic Republic does not have trained human resources to manage travellers or airport workers contaminated by a radiation, chemical or nuclear event. However, the Department of Civil Aviation, Ministry of Public Works and Transport, and Department of Communicable Disease Control, Ministry of Health will further collaborate in developing an emergency response plan for public health.

Routine public health functions to ensure a safe environment for travellers, as stipulated in Annex 1 of the IHR (2005), are not in place such as vector surveillance and control; aircraft disinsection; aircraft inspection; solid and liquid waste management; safety of water supply; food safety inspection; eating establishments, flight catering facilities and environmental sanitation. There are no staff trained, qualified or available to implement and monitor routine public health functions at the point of entry.

A multisectoral coordination mechanism, supported by a memorandum of understanding signed in 2016, is in place between the Department of Civil Aviation, Ministry of Public Works and Transport, and Department of Communicable Disease Control, Ministry of Health. Lao People's Democratic Republic joined the Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation Asia Pacific in 2016 to further improve public health protection at the airport.

## Recommendations for priority actions

- Develop sustainable capacity for routine public health preparedness activities and response to multi-hazard public health emergencies at the point of entry through multisectoral communication, coordination and collaboration, as well as the development of competent human resources, SOPs and infrastructure.
- Develop and implement mechanisms to establish short-term compliance with IHR (2005) articles and legal instruments for long-term compliance (e.g. quarantine procedures for travellers and aircraft disinsection procedures).
- Work with stakeholders and partners to develop a dedicated space or facilities for screening and isolation of potentially contaminated/infected travellers, either on site or through liaison with local public health services, as well as facilities for assessment and quarantine of suspect travellers.

## Indicators and scores

### PoE.1 Routine capacities established at points of entry – Score 3

#### *Strengths/best practices*

- Agreements are in place with Vientiane Capital Health Department and designated central hospitals for prompt assessment and treatment of ill travellers detected at the point of entry.
- The designated point of entry has basic equipment and personnel to transport ill travellers to designated hospitals. Arrangements for laboratory testing and confirmation are in place at the referral hospital and NCLE.
- An ambulance is available at the point of entry from the airport fire and rescue services and can be used to transfer ill travellers to health facilities.
- Surge capacity for emergency medical care is in place, provided by Sikhottabong District Hospital.
- Routine communications and information sharing among stakeholders is in place.

#### *Areas that need strengthening and challenges*

- Routine public health functions at the point of entry as stipulated in the IHR (2005) for surveillance, prevention and control measures have not been established, such as vector surveillance and control;

aircraft disinsection; aircraft inspection; solid and liquid waste management; safety of water supply; food safety inspection; eating establishments, flight catering facilities and environmental sanitation.

- Procedures and SOPs concerning routine public health functions at the point of entry have not been developed.
- Trained and competent human resources to implement and monitor routine public health functions have not been arranged or dedicated.

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

### *Strengths/best practices*

- The designated point of entry has basic equipment, personnel and SOPs for transport of ill travellers.
- The designated point of entry has functioning mechanism in place to transport ill travellers from airport to designated hospitals.
- Surge capacity for emergency medical care is in place provided by Sikhottabong District Hospital.
- A national multisectoral Public Health Emergency Contingency Plan for preparedness and response at the point of entry has been developed and disseminated, and approved by the Director General of the Department of Communicable Disease Control, Ministry of Health. The plan is currently being revised to include dedicated areas for screening, quarantine or isolation of potentially contaminated/ infected travellers.
- Point of entry activities were tested during an Ebola simulation exercise in 2014.
- Multisectoral communication and collaboration are established and demonstrated. The multisectoral communication and collaboration mechanism was tested during the 2014 Ebola simulation exercise.
- Dedicated areas for traveller health assessment and quarantine procedures have been prioritised by airport authorities in the Wattay International Airport expansion plan, scheduled for completion in 2018.

### *Areas that need strengthening and challenges*

- The revision of the national multisectoral Public Health Emergency Contingency Plan for preparedness and response at the point of entry has not been finalized. Exit measures may play an important role and are proposed for consideration in the revision of the SOPs. The finalized document should be approved, disseminated and regularly tested, and staff trained in its use.
- SOPs for preparedness and response to multi-hazard events (e.g. chemical, nuclear or radiation contamination) at point of entry have not been developed. A lead agency for command, control and coordination of multi-hazard events, as well as multisectoral roles and responsibilities, need to be identified, documented, disseminated and tested regularly, and staff need to be trained in implementation.
- There is no dedicated space or facilities for screening, isolation, assessment or quarantine of potentially contaminated/infected travellers or animals either on site or through liaison with local public health services.
- There are limited trained or competent human resources to respond to public health emergencies at the point of entry, including a lack of human resource capacity to manage travellers or airport workers affected by radiation, chemical or nuclear events.
- National legislation has not been developed to implement and comply with IHR (2005) articles at the point of entry (e.g. quarantine for travellers and aircraft, disinsection of aircraft).

# Chemical events

## Introduction

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

### Target

*States Parties with 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.*

## Lao People's Democratic Republic level of capabilities

Chemicals are used in various sectors across Lao People's Democratic Republic. However, chemical management within the country is divided and based on the roles and responsibilities of multiple ministries. A national Law on Chemicals was approved by Parliament in November 2016, and is currently awaiting promulgation. The Law applies to human health, animal health and environmental protection, and identifies ministries with a stake in chemical activities, naming the Ministry of Industry and Commerce as the principal stakeholder.

The Law calls on ministries to take actions to prevent, mitigate and respond to chemical releases. Most significantly, the Law addresses the coordination needed among the key ministries, creates a National Chemical Committee to coordinate chemical activities, and identifies responsibilities for chemical management at all levels of government.

However, despite the significant progress made in chemical management through the approval of this Law, responsibilities for national chemical event surveillance, alert and response are not identified. Likewise, no guidelines or manuals currently exist on the surveillance, assessment and management of chemical events, no case management guidelines for chemical exposures exist, and national laboratory capacity to detect and identify chemical threats is very limited.

## Recommendations for priority actions

- Conduct a national hazard inventory and relevant resource mapping as part of a national risk assessment and develop appropriate chemical event response plans as part of an integrated national all-hazards response plan (see Recommendations for priority actions under Preparedness).
- Document sectoral roles and responsibilities for chemical regulation, event surveillance, reporting and response under the coordination of the NCCDC (see Linking public health and security authorities, Indicator R.3.1). Consider designating the national EOC as the focal point for data gathering, analysis, event reporting and response management of all national-level chemical events.
- Develop case management guidelines for relevant chemical threats within the country (see Emergency response operations, Indicator R.2.4).
- Expand the capacity of laboratories (human, animal, environmental and food safety) to analyse priority chemical threats. Define the roles and responsibilities of laboratories assigned to conduct such chemical analyses and develop procedures for appropriate referral of samples to international laboratories as needed.

## Indicators and scores

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

#### *Strengths/best practices*

- There is some limited capacity for the detection, analysis, and management of chemical events at the Ministry of National Defence. There has been training and an exercise conducted within the military sector.

#### *Areas that need strengthening and challenges*

- Chemical surveillance activities are not currently conducted by the relevant ministries; no guidelines for such activities exist.
- Chemical laboratory analysis capacity is currently limited to food and drug testing at the chemical laboratory under the Ministry of National Defence (to which there is limited public access); the Ministry of Health does not have a mandate to monitor chemicals of public health importance.
- Training to enhance analytic competencies for detection of chemical threats is limited.
- There is no routine data sharing between the relevant ministries regarding chemical releases or exposures, or the risks of such releases.
- No national poison control centre exists, nor is there access to one regionally.

### CE.2 Enabling environment in place for management of chemical events – Score 1

#### *Strengths/best practices*

- Although the national Law on Chemicals exists, the Ministry of Science and Technology and other ministries have yet to publish any operational policies or plans for chemical event surveillance, alert and response.

#### *Areas that need strengthening and challenges*

- There are currently no national policies, plans or legislation for chemical event surveillance and response, no established coordination mechanism for systematic information sharing between sectors involved in chemical monitoring or chemical exposure surveillance, and no participation in international chemical/toxicological networks.
- There is currently no national inventory of chemical hazards.
- There is currently no emergency response plan that defines the roles and responsibilities of all relevant agencies.
- There are currently no specific national provisions for chemical waste management.
- A national level agency/authority for chemical management is not yet established.
- A specific chemical emergency response plan and emergency management procedures for chemical events are not yet established.

# Radiation emergencies

## Introduction

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

### Target

*States Parties with surveillance and response capacity for radiological and nuclear hazards/events/emergencies. This requires effective communication and collaboration among the sectors responsible for radiological and nuclear emergency management.*

## Lao People's Democratic Republic level of capabilities

There are no nuclear facilities in Lao People's Democratic Republic; however, there is wide use of radioactive sources in medical, industrial, construction and mining activities. Most of the sources of radiation and equipment are imported.

As Lao People's Democratic Republic does not have a national radionuclear regulatory authority, there is no registration process for radiation sources. No nuclear legislation, regulations or guidelines are available. Radiological emergency preparedness and response plans have not been developed and there is low general capacity in this area.

Limited response capacity exists in the Ministry of National Defence where a specialized team has been trained and equipped, and has dealt with some self-contained radioactive sources that are not under regulatory control. The Ministry of Science and Technology intends to draft legislation in cooperation with the International Atomic Energy Agency, and to strengthen threat detection capacity of the existing Ministry of Science and Technology technical team.

## Recommendations for priority actions

- Conduct a national hazard inventory and relevant resource mapping as part of a national risk assessment, and develop appropriate radiological emergency response plans as part of an integrated national all-hazards response plan (see Recommendations for priority actions under Preparedness).
- Document sectoral roles and responsibilities for regulation, radiological event surveillance, reporting and response under a national coordinating body (see Linking public health and security authorities, Indicator R.3.1). Consider designating the national EOC as the focal point for data gathering, data analysis, event reporting and response management of all national-level radiological emergencies.
- Develop case management guidelines for relevant radionuclear threats within the country (see Emergency response operations, Indicator R.2.4).
- Establish a national training programme for basic radionuclear safety and security practices for hospitals (addressing clinical radiation sources) for clinical management of radiation exposure cases, for rapid response team activities in a radionuclear emergency, and for appropriate integration of law enforcement and security sector activities into radiation emergency response.
- Expand analysis capacity across laboratory networks (human, animal, environmental and food safety) for priority radiological threats. Define the roles and responsibilities of laboratories assigned to conduct radioisotope analyses and develop procedures for appropriate referral of samples to international laboratories as needed.

## Indicators and scores

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

#### *Strengths/best practices*

- Good working relationships exist among identified stakeholders, despite the lack of a formal mechanism to coordinate their activities.
- This area is a priority for the Ministry of Science and Technology.

#### *Areas that need strengthening and challenges*

- There is a limited number of radiation safety or health physics experts in Lao People's Democratic Republic.
- There are no SOPs, national policies, strategies or plans to guide detection, assessment and response to radiation emergencies.
- No radiation safety infrastructure or source inventory programme are in place.
- There is no radiation monitoring system in place and there is limited capacity for detection, response, inspection and laboratory analysis of radioisotopes.

### RE.2 Enabling environment in place for management of radiation emergencies – Score 1

#### *Strengths/best practices*

- An educational programme on nuclear and radiation safety has recently commenced at the National University of Laos, within the Faculty of Natural Science.
- The Ministry of Science and Technology has a small team available to participate in radiation emergencies, with some basic detection equipment.

#### *Areas that need strengthening and challenges*

- There is no national regulatory body to register and monitor radioactive sources, nor a national coordination body to facilitate inter-ministerial radionuclear event response activities.
- There is no emergency response plan for radiation emergencies.
- No national guidelines, regulations or legislation related to radiation safety and security exist.
- There is a need to train more experts and technical officers on radiation and nuclear safety.
- There is a need to install radiation detection systems at border control points and to improve the capacity of detection equipment available for both health care and radiation event management.

# Appendix 1: JEE background

## Mission place and dates

Vientiane, Lao People's Democratic Republic: 17–24 February 2017.

## Mission team members

### International experts

- Professor John Mackenzie, Curtin University, Australia
- Dr Youngmee Jee, Korea Centers for Disease Control and Prevention, Republic of Korea
- Dr Tamano Matsui, National Institute of Infectious Diseases, Japan
- Dr Norhayati Binti Rusli, Ministry of Health, Malaysia
- Mr Peter Rzeszotarski, Centers for Disease Control and Prevention, United States of America
- Dr Jussi Sane, National Institute for Health and Welfare, Finland
- Dr Ronald St. John, Senior Consultant, Canada
- Dr Kachen Wongsathapornchai, Food and Agriculture Organization of the United Nations
- Dr Li Ailan, WHO Regional Office for the Western Pacific
- Ms Joy Caminade, WHO Regional Office for the Western Pacific
- Dr Rajesh Sreedharan, World Health Organization

### National experts

- Dr Bounlay Phommasack, Ministry of Health
- Dr Somphone Phangmanyxay, Ministry of Health
- Dr Bounnak Saysanasongkham, Ministry of Health
- Dr Sibounhome Archkhavong, Ministry of Health
- Dr Sithong Phiphakkhavong, Ministry of Agriculture and Forestry
- Dr Sivong Sengaloundeth, Ministry of Health
- Dr Sivilay Naphayvong, Ministry of Health
- Dr Onechanh Keosavanh, National Centre for Laboratory and Epidemiology
- Dr Darouny Phonekeo, Institut Pasteur du Laos
- Mr Phoumy Bodhisane, Ministry of Health
- Mr Inpone Nakhonesy, Ministry of Information and Culture
- Dr Phat Keungsaneth, Ministry of Health
- Dr Anonh Xeuatvongsa, National Immunization Programme
- Dr Rattanaxay Phetsouvanh, Ministry of Health
- Dr Phengta Vongphrachanh, National Center for Laboratory and Epidemiology

- Dr Kongmany Southalak, National Center for Laboratory and Epidemiology
- Dr Bounfeng Phoummalaysith, Ministry of Health
- Dr Nao Boutta, Ministry of Health
- Dr Sisavath Southaniraxay, Ministry of Health
- Dr Phonepaseuth Ounaphom, Vientiane Capital Health Department
- Mr Kongxaysy Nammavong, Ministry of Sciences and Technology

### Peer observer

- Dr Inmyung Song, Korea Centers for Disease Control and Prevention, Republic of Korea

### WHO technical staff

- Ms Sarah Hamid, WHO Regional Office for the Western Pacific
- Ms Qiu Yi Khut, WHO Regional Office for the Western Pacific
- Ms Phetdavanh Leuangvilay, WHO Country Office, Lao People's Democratic Republic
- Dr Dapeng Luo, WHO Country Office, Lao People's Democratic Republic
- Ms Jennie Musto, WHO Country Office, Lao People's Democratic Republic

### Objective

To assess Lao People's Democratic Republic's capacities and capabilities relevant to the 19 technical areas of the JEE tool to support efforts to reform and improve the country's public health security.

### The JEE process

The JEE process is a peer-to-peer review. The entire external evaluation, including discussions around the scores, strengths, areas that need strengthening, best practices, challenges and priority actions were collaborative, with international and national JEE team members seeking full agreement on all aspects of the final report findings and recommendations.

### Preparation and implementation of the mission

Lao People's Democratic Republic voluntarily requested a JEE as part of their commitment to achieving IHR (2005) core capacities. In June 2016, Lao People's Democratic Republic conducted a self-evaluation using the JEE tool. The report of this self-evaluation and supporting documentation were shared with the JEE team prior to the mission.

The mission began on 17 February 2017 with a briefing between government ministries and international experts of the JEE team. Between 20 and 24 February 2017, national and international experts jointly reviewed national capacities in the 19 technical areas of the JEE tool. Field visits to national laboratories (National Center for Laboratory and Epidemiology, National Animal Health Laboratory, Lao-Oxford-Mahosot Hospital-Wellcome Trust Research Unit, Institut Pasteur du Laos), Wattay International Airport and a provincial health department provided opportunity for more in-depth discussions and verification of capacities.

The mission concluded with a joint review of JEE scores; discussion of the integration of findings and recommended priority actions into national planning; and a JEE team debriefing to discuss lessons learned from the process as a whole. The results of the assessment and observations of Lao People's Democratic Republic's preparedness were presented to the Deputy Prime Minister, H.E. Mr Asang Laoly; the Minister

of Health, Dr Bounkong Syhavong; and stakeholders from other ministries and agencies in Vientiane, Lao People's Democratic Republic on 24 February 2017.

### Limitations and assumptions

- The evaluation was limited to 1 week, which restricted the amount and depth of information that could be managed.
- It is assumed that the results of this evaluation will be publically available.
- The evaluation was not an audit but peer-to-peer review. Information provided by Lao People's Democratic Republic was not independently verified, but was discussed and the evaluation rating mutually agreed by national and international members of the evaluation team.

### Key host country participants and institutions

#### Lao People's Democratic Republic lead representative

- Dr Bounlay Phommasack, Director General, Department of Communicable Disease Control, Ministry of Health, Lao People's Democratic Republic

#### Participating institutions

- Ministry of Health, Lao People's Democratic Republic
- Ministry of Agriculture and Forestry, Lao People's Democratic Republic
- Ministry of Labour and Social Welfare, Lao People's Democratic Republic
- Ministry of Science and Technology, Lao People's Democratic Republic
- Ministry of Industry and Commerce, Lao People's Democratic Republic
- Ministry of National Defence, Lao People's Democratic Republic
- Ministry of Education and Sports, Lao People's Democratic Republic
- Ministry of Foreign Affairs, Lao People's Democratic Republic
- Ministry of Energy and Mines, Lao People's Democratic Republic
- Ministry of Natural Resources and Environment, Lao People's Democratic Republic
- Ministry of Public Security, Lao People's Democratic Republic
- Ministry of Public Works and Transport, Lao People's Democratic Republic

#### Partner observers

- Asian Development Bank
- Food and Agriculture Organization of the United Nations
- Institut Pasteur du Laos
- Korea Foundation for International Healthcare
- Lao-Oxford-Mahosot Hospital-Wellcome Trust Research Unit
- Centre d'Infectiologie Christophe Mérieux du Laos
- United Nations Children's Fund
- United States Agency for International Development

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- United States Centers for Disease Prevention and Control
  - Defense Threat Reduction Agency
  - World Bank

## Appendix 2: Supporting documentation

### General documents

- National Work Plan for Emerging Infectious Diseases and Public Health Emergencies 2016–2020, Lao People's Democratic Republic
- Agreement between Ministry of Health and Ministry of Agriculture on information exchange of zoonotic diseases
- Report of Annual Review of the National Work Plan for Emerging Infectious Diseases and Public Health Emergencies, May 2014–May 2015
- Lao People's Democratic Republic Country Profile

### National legislation, policy and financing

- Constitution of Lao People's Democratic Republic
- Law on Health Care (amended)
- Decree on establishment communicable disease control committees at national, provincial and district levels
- Memorandum of understanding between Ministry of Health and Department of Civil Aviation on implementing activity at point of entry
- Memorandum of understanding between health ministries of the six Mekong Basin countries on the Mekong Basin Disease Surveillance consortium (Cambodia, China, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam)
- Lao People's Democratic Republic Health System Review
- National Policy on Communicable Diseases Surveillance and Control
- Lao People's Democratic Republic Health Sector Reform 2013–2025
- Agreement on the establishment of the Committee for the Implementation of the Health Sector Reform Strategy

### IHR (2005) coordination, communication and advocacy

- National Zoonotic Disease Coordination Mechanism for Health and Animal Sectors of Lao People's Democratic Republic
- Report on Ebola simulation exercise
- Report on H5N6 simulation exercise
- Report on Mekong Basin Disease Surveillance simulation exercise
- Draft SOPs on IHR communication in Lao People's Democratic Republic
- National Policy on Communicable Diseases Surveillance and Control

### Antimicrobial resistance

- National action plan on antimicrobial resistance (draft)
- Ministerial Agreement on the Establishment of the Committee for AMR Surveillance and Control (translated)

- National Standard Treatment Guidelines
- Manual for using indicators to monitor compliance of therapeutic and rational use of drugs (in Lao language)
- National Strategy on Infection Prevention and Control for all Health Care Facilities 2013–2016
- General Infection Prevention and Control Guidelines for Lao Health Care Facilities
- Ministerial Decree on Appointment of the Infection Control Committee (translated)
- Operational Guidelines for Health Laboratory Networking in Lao People's Democratic Republic

### **Zoonotic diseases**

- National Zoonotic Disease Coordination Mechanism for the Health and Animal Sectors of Lao People's Democratic Republic
- OIE Performance of Veterinary Services – Evaluation Mission Report (2007), Follow-up Report (2011) and Gap Analysis Report (2012)
- Ministry of Agriculture and Forestry's SOPs for control of avian influenza (in Lao language)
- Law on Livestock Production and Veterinary Matters
- Strategic Plan for Rabies Prevention and Control 2016 – 2020 (in Lao language)
- Joint National Preparedness and Contingency Plan for Avian Influenza H7N9 and H5N1, Lao People's Democratic Republic
- Anthrax Guideline for Joint Outbreak Investigation and Response

### **Food safety**

- Food Law
- Food Safety Profile of Lao People's Democratic Republic
- Food Safety Authorities Structure in Lao People's Democratic Republic
- National Work Plan Review, 2015
- Outbreak and Event Investigation and Response Manual
- Report on hepatitis A outbreak investigation
- Field visits in Bolikhamxay province (provincial, district and health centre level)

### **Biosafety and biosecurity**

- Operational Guidelines For Health Laboratory Networking in Lao People's Democratic Republic, 2015
- National laboratory safety manual (draft)
- National Biosafety Training Agenda
- National Healthcare Waste Management Decision
- WHO Laboratory Biosafety Manual (3rd edition, Lao language, translated version)
- Biosafety posters

### **Immunization**

- National policy on immunization (draft)

- National Immunization Survey 2015
- Comprehensive Multi-Year Plan for Immunization 2016–2020
- Estimates of immunization coverage: Lao People’s Democratic Republic
- Lao People’s Democratic Republic Effective Vaccine Management Assessment
- International review of the Expanded Programme on Immunization
- Vaccination card
- Progress Report on Maintaining Poliomyelitis-Free Status, 2015
- National Polio Outbreak Preparedness and Response Plan
- Vaccines and Logistics Distribution Plan
- Cold chain inventory
- Lao People’s Democratic Republic Immunization Data Quality Assessment

### **National laboratory system**

- National Zoonotic Disease Coordination Mechanism for the Health and Animal Sectors of Lao People’s Democratic Republic
- Clinical laboratory interpretation manual
- Malaria treatment guidelines for provincial and district hospitals
- Standard Treatment Guidelines
- Control of Communicable Diseases Manual
- Diagnosis and Treatment in District Hospitals
- NCLE key ring for 17 notifiable diseases
- Standards for health laboratories in Lao People’s Democratic Republic
- WHO Laboratory Biosafety Manual
- Laboratory quality standards
- Healthcare Waste Management Manual
- National Biosafety Manual, approved by Ministry of Health
- (Expired) ISO 17025 certificate for drug testing of Food and Drug Quality Control Centre
- Laboratory Quality Stepwise Implementation tool
- Certificate of External Assessment of Malaria Microscopy, Center for Malaria, Parasitology and Entomology
- External Quality Assessment of Malaria Microscopy

### **Real-time surveillance**

- Lao Early Warning Alert and Response Surveillance Guidelines
- District and Health Centre Surveillance Manual for Notifiable Diseases
- Outbreak and Event Investigation and Response Manual
- Rapid response team deployment SOPs for central and provincial levels

- Risk assessment SOPs for public health events
- National Surveillance System for Notifiable Diseases (Key ring)
- Event-based surveillance poster for health care workers
- Dengue Haemorrhagic Fever Guidelines 2010
- Progress Report on Maintaining Poliomyelitis-Free Status, 2015
- National Polio Outbreak Preparedness and Response Plan
- International Review of Vaccine Preventable Disease Surveillance in Lao People's Democratic Republic
- National Work Plan for Emerging Infectious Diseases and Public Health Emergencies 2016–2020: Focus area –Surveillance, risk assessment and response

### Reporting

- Protocol on IHR communications and reporting needs (draft)
- Memorandum of understanding among the health ministries of the six Mekong Basin countries on the Mekong Basin Disease Surveillance consortium

### Workforce development

- National Health Workforce Strategy 2016–2020

### Preparedness

- National Health Response Plan (draft), 2010
- Joint National Preparedness and Contingency Plan for Avian Influenza H7N9 and H5N1 for Lao People's Democratic Republic, 2016
- Ebola Virus Disease Preparedness and Response Manual, November 2014
- Interim Guidance for MERS-CoV, 2015
- Interim Guidance for Zika virus, 2016
- Lao National Plan on Emergency Risk Management on Health Related to Natural Hazards, 2014
- Reduction in the Adverse Effects on Human Health from Environmental Factors; National Health Policy on Environmental Health Linkage, 2008
- National Environmental Health Action Plan 2008–2012
- National Health Information System Strategic Plan 2009–2015

### Emergency response operations

- Decree on Organizational structure, Role and Responsibility of EOC
- Public Health Incident Action Plan – template
- EOC Issues Log – template

### Linking public health and security authorities

- Memorandum of understanding between Ministry of Health and Department of Civil Aviation on implementing activity at points of entry
- Decree establishing the NCCDC

## Medical countermeasures and personnel deployment

- SOPs for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations

## Risk communications

- National Risk Communications Strategy and Action Plan 2016–2020
- SOPs for risk communication
- Policy book
- Rule of advertising

## Points of entry

- List of stakeholders for designated point of entry at airport
- Terms of reference of non-health sectors
- Terms of reference of public health sector at Wattay International Airport
- Public Health Emergency Contingency Plan
- Pandemic Preparedness and Response Plan at Designated International Airport
- SOPs for public health emergency of international concern at point of entry
- National Public Health Policy at Point of Entry
- List of quarantinable diseases
- Airport Emergency Plan
- Memorandum of understanding on implementation of public health activities at the point of entry, Wattay International Airport, between Department of Communicable Disease Control, Ministry of Health, Department of Civil Aviation, and Ministry of Public Works and Transportation, 2014
- Points of Entry Work Plan 2016–2020

## Chemical events

- Agreement on Management of Chemical Substances, 2012
- Lao People's Democratic Republic National Implementation Plan under the Stockholm Convention, 2016
- National chemical, biological, radiological and nuclear action plan 2017–2020 (draft), 2016
- Agreement on technical committee for chemical, biological, radiological and nuclear project, 2015
- Law on Chemicals
- Chemicals list, Ministry of Industry and Commerce
- Ministerial Instructions on Hazardous Waste Management, 2015

## Radiation emergencies

- See General documents

