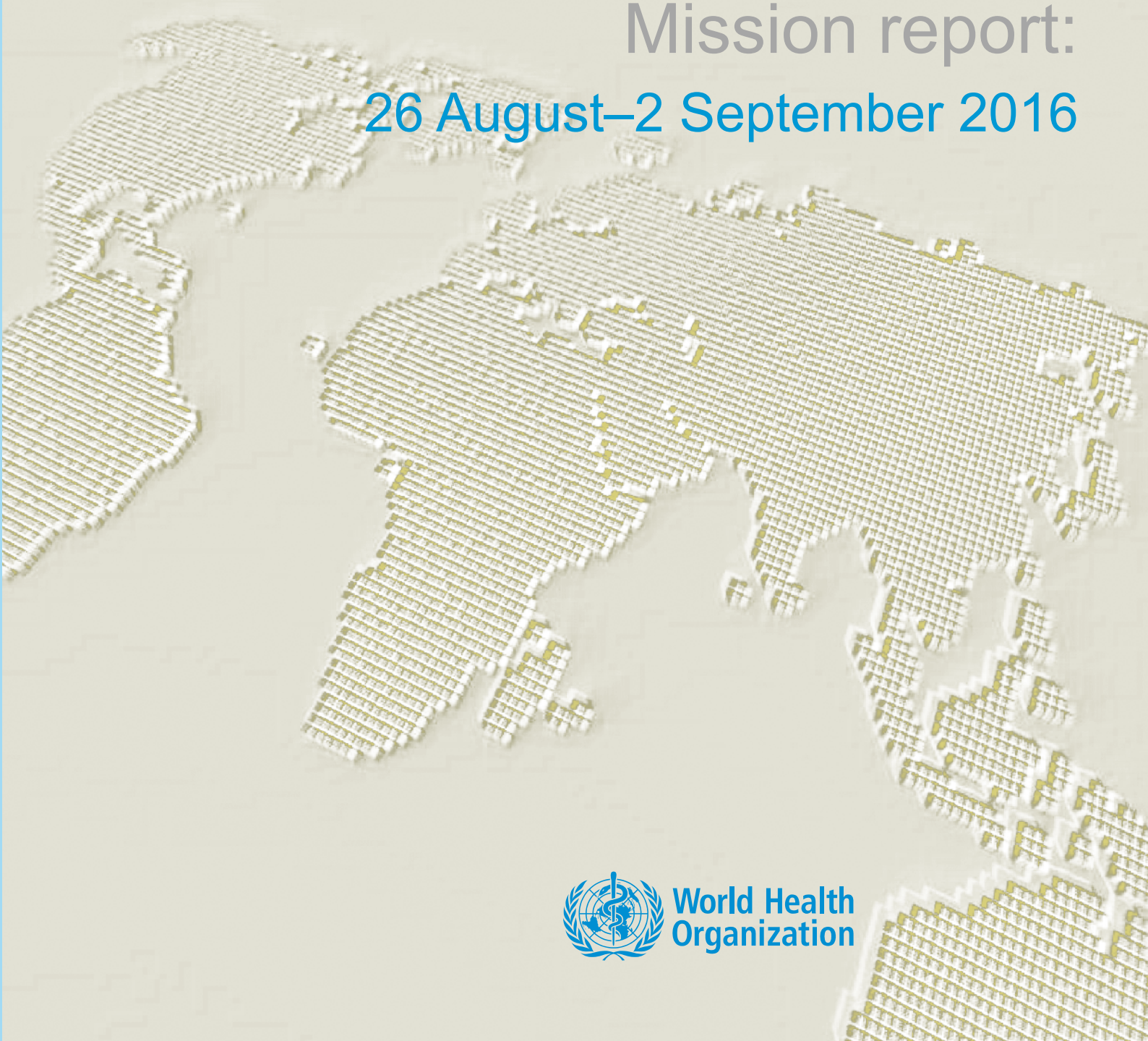
JOINT EXTERNAL EVALUATION OF IHR CORE CAPACITIES

of

THE KINGDOM OF CAMBODIA

Mission report:

26 August–2 September 2016



World Health Organization

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- Global Health Security Agenda for their collaboration and support.

Contents

Abbreviations

AET	Applied Epidemiology Training (Cambodia's version of mFETP)
APSED	Asia Pacific Strategy for Emerging Diseases
AFRIMS	Armed Forces Research Institute of Medical Sciences
AMR	Antimicrobial Resistance
CamEWARN	Cambodia early warning response network
CamLIS	Cambodia Laboratory Information System
CBRN	Chemical, Biological, Radiological, and Nuclear
CDC	Department of Communicable Diseases Control, Ministry of Health
DHS	Department of Hospital Service
EBS	Event-based Surveillance
EOC	Emergency Operations Centre
EQA	External Quality Assurance
EVD	Ebola Virus Disease
FAO	Food and Agriculture Organization of the United Nations
GHSA	Global Health Security Agenda
IBS	Indicator-based Surveillance
IHR (2005)	International Health Regulations (2005)
IPC	Infection Prevention and Control
IMS	Incident Management System
JEE	Joint External Evaluation
OIE	World Organisation for Animal Health
MERS	Middle East respiratory syndrome
mFETP	modified Field Epidemiology Training
NAMRU II	Naval Medical Research Unit II
NFP	National IHR Focal Point
PoE	Points of Entry
RRT	Rapid Response Team
SNRA	Strategic National Risk Assessment
SOPs	Standard Operation Procedures
THIRA	Threat and Hazard Identification and Risk Assessment
TWG	Technical Working Group
USAID	United States Agency for International Development
USCDC	United States Centers for Disease Control and Prevention
WHO	World Health Organization

EXECUTIVE SUMMARY

Background

This report is the product of a joint external evaluation (JEE) of the Kingdom of Cambodia's capacity to prevent, detect and rapidly respond to public health threats of a natural, deliberate or accidental nature. The assessment used the World Health Organization (WHO) International Health Regulations (IHR) (2005) JEE tool (2016).

Cambodia is the first Member State in the Western Pacific Region to voluntarily conduct a JEE of IHR (2005) core capacities. Over the past decade, Cambodia has used the Asia Pacific Strategy for Emerging Diseases (APSED) as a common framework for action to guide the development and implementation of its national work plan for the achievement of IHR (2005) core capacities. This work plan outlines the efforts required to progress toward full implementation of IHR (2005). The outcomes of the JEE will contribute to the identification and revision of priority activities of the Cambodian National Work Plan for Emerging Diseases and Public Health Emergencies to Achieve IHR Core Capacities 2016–2020. The updated national plan is expected to serve as a common framework to coordinate health security activities under various projects and initiatives, including the Global Health Security Agenda (GHSA).

The JEE process started with Cambodia undertaking a self-assessment of capacities using the JEE tool from 25 April to 6 May 2016. A multisectoral team of technical specialists from the host country, peer Member States and WHO, jointly conducted a review of Cambodia's relevant capacities from 26 August to 2 September 2016. The team visited key public health facilities in Phnom Penh, Sihanoukville Port and Takeo province.

The primary purpose of this joint evaluation was to assess Cambodia's capacities and capabilities relevant to the 19 technical areas of the JEE tool in order to provide baseline data and recommendations to support efforts to improve national public health security. This open and transparent process promoted multisectoral commitment for improving Cambodia's health security as well as enhanced national and international confidence in the status of Cambodia's IHR (2005) core capacity achievement.

Main findings

While Cambodia has enjoyed great success in improving health outcomes in recent decades, many technical capacities that relate to detecting, preventing and rapidly responding to emerging diseases and public health emergencies remain under development. Cambodia's capacities in the majority of technical areas evaluated were categorized as limited (46%) or developed (29%) under the JEE categorization system. There was demonstrated capacity for 12.5% (8/48) of the JEE indicators. The most notable strengths were in the areas of "IHR (2005) coordination, communication and advocacy", "event-based surveillance" and "immunization". The evaluation identified several overarching challenges, including significant funding gaps, human resources capacity, intersectoral collaboration and coordination, formalization and documentation of procedures, and the application of monitoring and evaluation mechanisms to inform improvements in systems and processes.

Recommended priority actions

Cambodia has taken many positive steps to enhance national capacity to prevent, detect and respond to public health threats. However, to sustain this progress and IHR (2005) core capacity achievements, government financing of both routine and emergency public health activities will need to be addressed. The incorporation of health security considerations into the national Health Sector Strategic Plan 2016–2020, mapping of associated budget requirements and development of a medium-term strategy for sustainable

government funding, would contribute to the sustainability of national health security.

Insufficient human resources and training to fulfil public health functions pose a challenge to the implementation of the IHR (2005). While Cambodia's Health Workforce Development Plan 2016–2020 focuses on staffing for curative services, public health professions are not identified as a separate workforce category. Consideration of key public health disciplines in the national Health Workforce Development Strategy and inclusion of these disciplines in the Ministry of Health's Human Resources for Health database may help address the shortage of epidemiological and veterinary staff capacities.

Mechanisms have been developed to foster intersectoral collaboration in key areas such as antimicrobial resistance, food safety and zoonotic diseases control. However, intersectoral collaboration remains a challenge. Regular intersectoral communications and information sharing, including the sharing of outbreak investigation reports between human health and animal health sectors, does not occur routinely. Future efforts are needed to strengthen the existing interministerial, intersectoral operations-level working group, which includes development partners, to further strengthen IHR (2005) capacity.

In several technical capacity areas, policies, plans and procedures have not been developed, documented or finalized. Such documentation is important to ensure clarity of roles and responsibilities, consistent and effective response to public health events and continuity of work in the face of staff turnover. Communication and coordination is often based on informal networks and information exchange between agencies and sectors occurs as a result of individual professional judgement rather than an adherence to standard policies or procedures. A risk assessment of public health threats and hazards would inform the identification of priority national policies, plans and procedures for finalization. The regular testing and training of staff in such plans and procedures is important for improved functioning of response mechanisms.

Cambodia has demonstrated commitment to monitoring and evaluation through the completion of the IHR JEE process and the convening of annual workshops to review and revise the national work plan for emerging diseases and public health emergencies. Nevertheless, the monitoring and evaluation system for health security could be strengthened, as recommended by IHR (2005) and APSED, through increased support to the annual stakeholders' planning and review meeting, simulations, after-action reviews (such as, outbreak reviews) and subsequent JEEs every five years.

These technical recommendations of this JEE should be incorporated into the Cambodian National Work Plan for Emerging Diseases and Public Health Emergencies to Achieve IHR Core Capacities 2016–2020.

Kingdom of Cambodia - Technical capacity scores

Score	Description	Number of indicators (%)
5	Sustainable Capacity	0 (0.0)
4	Demonstrated Capacity	6 (12.5)
3	Developed Capacity	14 (29.0)
2	Limited Capacity	22 (46.0)
1	No Capacity	6 (12.5)

Cambodia: scores

Technical areas	Indicators	Score
National legislation, policy and financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR (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)	3
IHR coordination, communication and advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR (2005)	4
Antimicrobial resistance	P.3.1 Antimicrobial resistance detection	3
	P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens	2
	P.3.3 Health care associated infection prevention and control programmes	2
	P.3.4 Antimicrobial stewardship activities	2
Zoonotic diseases	P.4.1 Surveillance systems are in place for priority zoonotic diseases/pathogens	2
	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
Food safety	P.5.1 Mechanisms for multisectoral collaboration are established to ensure rapid response to food safety emergencies and outbreaks of foodborne diseases	2
Biosafety and biosecurity	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
Immunization	P.7.1 Vaccine coverage (measles) as part of national programme	4
	P.7.2 National vaccine access and delivery	4
National laboratory system	D.1.1 Laboratory testing for detection of priority diseases	4
	D.1.2 Specimen referral and transport system	2
	D.1.3 Effective modern point-of-care and laboratory-based diagnostics	2
	D.1.4 Laboratory quality system	2
Real-time surveillance	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	3
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to FAO, OIE and WHO	3
	D.3.2 Reporting network and protocols in country	2
Workforce development	D.4.1 Human resources are available to implement IHR (2005) core capacity requirements	2
	D.4.2 FETP[1] or other applied epidemiology training programme is in place	3
	D.4.3 Workforce strategy	2

Preparedness	R.1.1 National multi-hazard public health emergency preparedness and response plan is developed and implemented	**1**
	R.1.2 Priority public health risks and resources are mapped and utilized	**1**
Emergency response operations	R.2.1 Capacity to activate emergency operations	**2**
	R.2.2 Emergency operations centre operating procedures and plans	**1**
	R.2.3 Emergency operations programme	**1**
	R.2.4 Case management procedures are implemented for IHR (2005) relevant hazards	**1**
Linking public health and security authorities	R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) are linked during a suspected or confirmed biological event	**2**
Medical countermeasures and personnel deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	**2**
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	**2**
Risk communication	R.5.1 Risk communication systems (such as plans, mechanisms)	**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	**3**
Points of entry	PoE.1 Routine capacities are established at points of entry	**3**
	PoE.2 Effective public health response at points of entry	**2**
Chemical events	CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	**2**
	CE.2 Enabling environment is in place for management of chemical events	**1**
Radiation emergencies	RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	**2**
	RE.2 Enabling environment is in place for management of radiation emergencies	**2**

Note on scoring of technical areas of the JEE tool

The JEE process is a peer-to-peer review and a collaborative effort between host country experts and JEE team members. As a component of the preparations for the JEE, Cambodia completed the self-evaluation, the first step in the JEE process, and provided information on national capabilities based on the indicators and technical questions included in the JEE tool.

The host country may score their self-evaluation or propose a score during the onsite visit with the JEE team. The entire external evaluation, including discussions around the score, strengths and good practices, the areas which need strengthening and challenges, and recommended priority actions, is done in a collaborative manner, with JEE team members and host country experts seeking agreement.

PREVENT

National legislation, policy and financing

Introduction

The IHR (2005) provide obligations and rights for States Parties. In some States Parties, implementation of 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 (2005) 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. See detailed guidance on IHR (2005) implementation in national legislation at 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.

Cambodia level of capabilities

After IHR (2005) came into force in 2007, Cambodia carried out reviews of laws governing different areas of public health. The earliest review was in 2008 on a law covering communicable disease control, which eventually did not get enacted. The Law on Animal Health and Production, which was also reviewed, was enacted in December 2015 and passed by the Cambodian Senate in January 2016. Where specific laws are not available, certain administrative arrangements or policies have been drawn up, such as the Sub-Decree on Health Measures to Prevent and Respond to Public Health Emergency of International Concern at Points of Entry, 2015. However, Cambodia has demonstrated an ability to execute necessary public health actions during public health emergencies (such as the quarantine of persons exposed to pandemic influenza in 2009), via administrative mechanisms. Laws and other administrative arrangements or policies have not been enacted or documented to cover every IHR (2005) capacity. There is also a lack of government financing to ensure long-term sustainability of domestic IHR (2005) core capacities.

Recommendations for priority actions

- Document and publish administrative arrangements and policies to ensure consistency of application.
- Work towards sustainable and greater government financing to maintain and strengthen IHR (2005) core capacities.

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

- Cambodia has adopted a practical approach to implement IHR (2005) by enacting a number of relevant laws, and otherwise relying on administrative arrangements.
- Cambodia has ensured that IHR (2005) core capacities can be implemented (for example, it was able to quarantine persons during the 2009 influenza pandemic).

Areas that need strengthening/challenges

- Documentation of policies and administrative arrangements are required.
- Consistent and complete legislation across all IHR capacity areas should be ensured.
- Adequate financing needs should be met for long-term sustainability.

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) – Score 3

Strengths/best practices

- Cambodia has ensured that IHR (2005) core capacities can be implemented through laws or other administrative arrangements.

Areas that need strengthening /challenges

- Documentation of policies and administrative arrangements are required.
- Adequate needs should be met financing for long-term sustainability.

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 (2005) 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.

Cambodia level of capabilities

Cambodia has coordination and communication mechanisms in place for IHR (2005) implementation. The national IHR focal point has played an active and strong coordination role in planning, monitoring and evaluating IHR (2005) implementation. The national IHR focal point is additionally active in supporting multisectoral collaborative actions to manage emerging diseases, especially zoonotic diseases, and participating in the regional outbreak preparedness, alert and response system (including an annual World Health Organization (WHO)-coordinated regional IHR communication exercise).

Several mechanisms are in place for coordinating and integrating relevant sectors for the implementation of IHR (2005). The annual review of the National Work Plan for Emerging Diseases and Public Health Emergencies to Achieve IHR Core Capacities (2016–2020) has brought together stakeholders involved in IHR (2005) core capacities for several years. The existing inter-ministerial, intersectoral operations-level working group to further strengthen IHR (2005) capacity, which includes development partners such as the Asian Development Bank (ADB), the GHSA, the United Nations Children's Fund (UNICEF), World Bank (WB) and WHO, requires further strengthening. Multisectoral technical working groups are in place for zoonotic diseases, antimicrobial resistance and foodborne disease outbreak responses. However, these working groups vary in their ability and resources to guide capacity development in their area of responsibility.

There are currently no standard operating procedures (SOPs) or written guidance for coordination between the national IHR focal point and other relevant sectors. While such documentation is important for the continuity and sustainability of processes, informal communications and networking by the national IHR focal point appear to be effective and valuable. It is further noted that Cambodia has advanced its means of communications through the application of new information technology to support timely operational and media communications.

Several disease outbreaks and acute public health events, including human infection with avian influenza, enterovirus 71 infection and foodborne disease outbreaks have tested the effectiveness of the existing IHR (2005) communication and coordination mechanisms, including IHR (2005) communications with WHO and partners. Cambodia has not experienced any large-scale complex communicable diseases outbreaks and/or public health emergencies. It is unclear (untested) if some of the existing multisectoral coordination mechanisms (such as the national disaster management system for natural hazards) would effectively support a coordinated response to potential future large-scale public health emergencies.

Recommendations for priority actions

- Sustain Cambodia's functional monitoring and evaluation system for health security as recommended by APSED/IHR, including the annual stakeholders' planning and review meeting, outbreak review, exercises and JEE.
- Consider developing flexible written procedures/guidance for the national IHR focal point's communication and coordination with various stakeholders while continuing functional informal communications.
- Maintain and further improve existing IHR (2005) communication and coordination mechanisms for managing all acute public health events and emergencies, including through scenario-based exercises to test complex outbreaks.
- Strengthen inter-ministerial, intersectoral, operations-level working group, which includes development partners to further strengthen IHR capacity.

Indicators and scores

P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR (2005) – Score 4

Strengths/best practices

- A number of functional communication and coordination mechanisms for IHR (2005) implementation are in place.
- Good use of information technology for timely and effective communication (such as WhatsApp application).
- National level monitoring and evaluation mechanisms for IHR (2005) are established and functional, as recommended by APSED. These include annual stakeholders' planning and review meeting and outbreak review.
- Active participation of Cambodia national IHR focal point in the regional surveillance and risk assessment system, including event-based surveillance, the annual regional APSED Technical Advisory Group meeting and the annual IHR Exercise Crystal.

Areas that need strengthening/challenges

- Written SOPs for communication and coordination for national IHR focal point have not been developed.
- Scenario-based communication and coordination exercises have not tested the use of existing mechanisms (such as disaster response coordination) for managing large-scale public health emergencies.
- Financial investment in health security is unstable and advocacy for sustainable investment is needed.

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 the FAO, OIE and WHO for developing an integrated and global package of activities to combat AMR, spanning human, animal, agricultural, food and environmental aspects (such as a One Health approach). This would include: (i) having a national comprehensive plan for each country to combat AMR; (ii) strengthening of surveillance and laboratory capacity at the national and international levels following agreed upon international standards developed in 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 with systems to preserve new antibiotics.

Cambodia level of capabilities

Cambodia has developed several plans and strategies that incorporate aspects of antimicrobial resistance. The national policy to combat antimicrobial resistance was developed in 2015 and is supported by the three-year National Strategy to Combat Antimicrobial Resistance (2015–2017). This strategy includes activities for laboratory strengthening. In addition, the five-year National Laboratory Strategy (2015–2020) was developed and includes activities to progressively strengthen microbiology testing and antimicrobial susceptibility testing. Microbiology laboratories have the capacity to routinely test for bacterial pathogens, including WHO priority pathogens. In 2012, an antimicrobial resistance technical working group (AMR-TWG) was created to provide a forum for information sharing between laboratories and broader stakeholders, including the agricultural sector. Future priority efforts should emphasize implementation of these existing plans, including through effective coordination of development assistance towards achieving antimicrobial resistance goals.

While national polices and strategies are in place to combat antimicrobial resistance, their scope does not comprehensively cover all aspects of resistance in human, animal and environmental areas. The national strategy is not yet fully implemented and data on antimicrobial resistance are sparse. Initial baseline studies in the food and veterinary sectors are generating preliminary data revealing high resistance to commonly prescribed antibiotics. Greater efforts are needed to communicate the threat posed by antimicrobial resistance to the various stakeholders, such as policy-makers, clinicians, pharmacists, farmers, veterinarians and consumers, including private sector operators.

In addition to the above, Cambodia has developed a number of infection prevention and control guidance documents: the National Strategic Plan For Infection Prevention and Control In Health-Care Facilities 2016 – 2020; National Infection Control Policy (2009); Revised National Guidelines For Infection Prevention and Control (2016, draft); in-service and pre-service training curricula for health science students and health-

care facility staff, respectively; and disease specific SOPs. However, the components of infection prevention and control outlined in the strategic plan have not been fully implemented, there is currently a lack of infection prevention and control professionals in the country and no system to evaluate the effectiveness of infection prevention and control measures in the health-care setting.

Recommendations for priority actions

- Establish surveillance programme for monitoring of antimicrobial use in human health and animal health sectors; and eventually integrate antimicrobial resistance and antimicrobial use surveillance data/programmes.
- Develop national guidelines on appropriate antimicrobial use in animals, food and humans.
- Reinforce stewardship practices, awareness of antimicrobial resistance and understanding of appropriate and rational use of antibiotics across sectors.
- Invest in the higher education of infection prevention and control specialists.
- Develop a system to evaluate the effectiveness of infection prevention and control measures in the health care setting.
- Develop and maintain a surveillance system for health care acquired infections.

Indicators and scores

P.3.1 Antimicrobial resistance detection – Score 3

Strengths/best practices

- Antimicrobial resistance detection for bacterial pathogens is conducted at 13 laboratories and seven laboratories report results to the antimicrobial resistance technical working group.
- Infection prevention and control is included in the curriculum of the University of Health Sciences.
- A list of priority antimicrobial-resistant pathogens and associated surveillance reporting forms will be distributed to participating hospitals and laboratories that include laboratories and hospitals designated in September 2016.
- Monthly reports by the Diagnostic Microbiology Development Programme (DMDP)-supported laboratories are shared with the Ministry of Health and stakeholders, including the Department of Communicable Diseases Control Ministry of Health (CDC) and the Department of Hospital Service (DHS).

Areas that need strengthening / challenges

- Reporting of antimicrobial resistance data to the antimicrobial resistance technical working group.is not done through an official surveillance structure but is submitted by the DMDP on a monthly basis. Ministry of Health leadership for the strengthening of antimicrobial resistance reporting would facilitate timely reporting of antimicrobial resistance data through the Cambodia Laboratory Information System (CamLIS) database.
- The sizable private sector does not yet participate in the surveillance system.

P.3.2 Surveillance of infections caused by antimicrobial-resistant pathogens – Score 3

Strengths/best practices

- An antimicrobial resistance technical working group presents aggregate results and trend analyses to clinicians on a monthly basis.

Areas that need strengthening / challenges

- There is a need to strengthen the system for sharing case-based antimicrobial resistance test results, their interpretation and recommended therapeutic practices with clinicians.
- A timely, standardized data collection and information-sharing system linked to hospital antimicrobial stewardship programmes is needed to inform prescription practices and infection prevention and control.
- Antimicrobial resistance surveillance is not linked between human, food and animal sectors and there are no sentinel sites in the animal and food sectors.

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

Strengths/best practices

- The National Strategic Plan For Infection Prevention and Control In Health-Care Facilities 2016 – 2020 has been approved and implementation initiated.
- There are infection prevention and control SOPs for outbreaks and emergencies, and individuals at government hospitals have been trained in these SOPs as part of Ebola virus disease (EVD) and Middle East respiratory syndrome (MERS) preparedness.
- The quality assurance office is in the process of establishing a law for accreditation of health-care facilities and may include infection prevention and control practices and infrastructure as an indicator.
- Infection prevention and control materials have been introduced on the essential medicines list to facilitate their procurement.

Areas that need strengthening / challenges

- There is partial implementation of infection prevention and control guidelines.
- No system is in place to evaluate the effectiveness of infection prevention and control measures in health-care settings.
- Isolation rooms and equipment are often inadequate and not up to standard.
- Specific pre-service and in-service infection prevention and control training programmes for infection prevention and control specialist professionals are needed

P.3.4 Antimicrobial stewardship activities – Score 2

Strengths/best practices

- A national campaign to raise awareness of antibiotic resistance and promote behavioural change has commenced.
- Some stewardship activities in health care settings are underway and an external evaluation on antimicrobial stewardship was conducted in 2015.

Areas that need strengthening / challenges

- While the antimicrobial resistance action plan in the health sector has been approved, it is under-resourced.
- There is need for regulation of antimicrobial complementary action plans for antimicrobial resistance in animal, food and agriculture sectors.
- A feedback system for antimicrobial resistance testing results and their interpretation to clinicians is needed to inform treatment of infections.
- Engagement of private clinicians is needed in implementing best practices and their inclusion in antimicrobial stewardship activities.

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 transmitted by animals, insects or inanimate vectors. Approximately 75% of recently emerging infectious diseases affecting humans are of animal origin and approximately 60% of all human pathogens are zoonotic.

Target

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

Cambodia level of capabilities

Zoonotic disease threats of particular concern in Cambodia include avian influenza, rabies, leptospirosis, brucellosis and anthrax. While Cambodia does not have a formal policy for One Health, various plans strategies, and mechanisms have been developed to address these threats, such as a national Strategic Plan for Zoonoses Control and several disease-specific control and elimination strategies. A cross-sectoral Zoonosis Technical Working Group meets regularly and provides a forum for information sharing, as well as for agenda and priority setting. In addition, cross-training opportunities for professionals in human health and animal health sectors are available through the Applied Epidemiology Training (AET) and the Cambodian Applied Veterinary Epidemiological Training (CAVET) programmes and should be capitalized upon to strengthen coordination in surveillance and response between the human health and animal health sectors.

Nevertheless, challenges remain in leading and coordinating activities and exchanges between the human health and animal health sectors. A shortage of trained veterinarians poses an added challenge to zoonotic diseases control efforts. Animal health surveillance is primarily based on time-limited surveys and although provincial animal disease reports are disseminated on a monthly basis, uncompensated culling policies create disincentives to report animal events.

Recommendations for priority actions

- Improve mechanisms for timely sharing of information and coordination of risk assessment, response and communication across sectors, including clarifying where the ultimate decision-making authority for zoonotic diseases outbreaks lie.
- Continue to build veterinary capacity in prevention, detection, risk assessment and response.
- Consider developing policies for compensation for culling of animals, such as replacement of chicks.
- Develop and implement SOPs for joint or coordinated surveillance activities for priority zoonotic diseases.
- Train rapid response teams (human sector), task forces (animal sector) and wildlife-responsible authorities for a coordinated response.

Indicators and scores

P.4.1 Surveillance systems are in place for priority zoonotic diseases/pathogens – Score 2

Strengths/best practices

- A Zoonosis Technical Working Group facilitates dialogue between sectors but its active participation could be improved.
- A priority diseases list has been created and includes influenza A (H5N1), anthrax, leptospirosis, brucellosis and rabies as well as other unknown diseases.

Areas that need strengthening/challenges

- Risk assessment and reduction would be better informed by formalizing processes for systematic and timely information exchange and agreement on pathogens for early warning.
- Animal health surveys are done on short term and have not yet been scaled up to routine surveillance.
- SOPs for joint or coordinated surveillance activities in humans and animals for priority zoonotic diseases are not yet developed.
- A surveillance system for wildlife has not been established.
- The Zoonosis Technical Working Group needs to be strengthened and authorities for decision making clarified.

P.4.2 Veterinary or animal health workforce – Score 3

Strengths/best practices

- Opportunities for training of both human health and animal health specialists in zoonotic diseases and for strengthening coordination between human health and animal health sectors in surveillance and response are available through AET and CAVET.
- The Royal University of Agriculture, established in 2012 may help to address human resource shortages in the veterinary sector.

Areas that need strengthening/challenges

- There is an acute need for more training and recruitment of veterinary officers and paraprofessionals.
- Strategies to promote engagement of private sector veterinarians and paraprofessionals in zoonotic diseases surveillance and risk reduction are needed.
- Wildlife health capacity is limited.

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

Strengths/best practices

- SOPs for joint investigation of avian influenza outbreaks have been developed and exercised.
- Training and workshops have been conducted in response to EVD and MERS.

Areas that need strengthening/challenges

- Lack of trained rapid response teams (human health) and task forces (animal health) for joint risk reduction, especially at the provincial level.
- Commitment to outbreak response differs across sectors.
- Limited resourcing of rapid response teams hinders outbreak response.
- Intersectoral authorities for coordinating zoonotic outbreak responses could be better clarified, including strengthening of implementation of roles within the Zoonosis Technical Working Group.

Food safety

Introduction

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

Target

State Parties to have surveillance and response capacity for risk or events related to food- and water-borne diseases, with effective communication and collaboration among the sectors responsible for food safety and safe water and sanitation.

Cambodia level of capabilities

Cambodia has four laws related to food safety: (i) Law on the Management of Quality and Safety of Products and Services (2000); (ii) Law on Fishery (2006); (iii) Law on Cambodia Standards (2007); and (iv) Law on the Management of Pesticides and Fertilizers (2012). In addition, a number of voluntary and mandatory standards are in place, managed by the Institute of Standards of Cambodia (ISC). Cambodia has a draft law on food safety that establishes a Food Safety Authority to lead the coordination and harmonization of food control activities at all stages of food production. Training programmes for food inspectors are required by national legislation. Several ministries and stakeholders are engaged in various aspects of food safety. A formal collaboration mechanism is under discussion among the authorities responsible for the different aspects of food safety, hospital departments, and public-sector laboratories, as well as with Food and Agriculture Organization (FAO) and WHO. Nevertheless, coordination and information sharing mechanisms for foodborne disease risk assessment, management and communication are considered inadequate. Testing capacity for food safety is split across various laboratories belonging to the different ministries, which poses challenges in coordinating testing.

Recommendations for priority actions

- Finalize and implement the draft food law, food safety policy, food safety strategy and national plan.
- Establish mechanisms to share information and coordinate food safety risk assessment, risk management and communication, linking to strategies for antimicrobial-resistant pathogens and zoonotic diseases, where applicable.
- Develop and implement legal requirements for the production, processing, handling, distribution and sale of food.
- Implement food safety assurance systems in food businesses.
- Continue to build capacity in foodborne disease outbreak response, food inspection, monitoring and laboratory testing to mitigate foodborne risks.

Indicators and scores

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

Strengths/best practices

- Foodborne disease outbreaks trigger investigation and response.
- Surveillance for foodborne disease outbreaks appears to be adequate as evidenced by the substantial proportion (62%) of foodborne outbreaks reported out of all reported outbreaks.
- Department of Communicable Disease Control and the Department of Drugs and Foods are members of the International Network of Food Safety Authorities (INFOSAN).
- A laboratory and foodborne disease surveillance assessment tool and a foodborne disease outbreak and emergency management and response tool are available.
- Some training of food inspectors has been conducted.
- Ministry of Commerce and the Ministry of Industry and Handicraft conduct regular inspections for chemical contamination in food.
- National Centre for Health Promotion (NCHP) provides food safety training and conducts food safety awareness raising activities.
- Ministry of Health Prakas on Free Sales and Health Certification for Food Products was issued in March 2016.

Areas that need strengthening/challenges

- There is limited sharing of outbreak reports between human health and animal health sectors.
- Partial implementation of SOPs for foodborne disease outbreaks results in suboptimal coordination and communication among ministries that manage food safety.
- Limited multisectoral teams for foodborne outbreaks operate at the provincial level.
- SOPs for surveillance of foodborne hazards and risk profiling have not been developed.
- SOP for food sample collection is being developed.
- There is no food recall system in place.

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

Cambodia level of capabilities

An assessment of the national laboratory system in 2013 indicated a critical gap in the implementation of biosafety and biosecurity principles. A national biosafety committee has since been established and national biosafety guidelines were finalized in 2016. A network of biosafety professionals is being developed and officers are present in 25 laboratories. The officers have attended training on biorisk management and shipping of infectious substances. In addition, a system for biosafety cabinet inspection and maintenance has been established and two national staff are undergoing training to service the cabinets. Procedures for testing of emerging pathogens at a biosafety level (BLS)-3 facility (Institut Pasteur du Cambodge) have been established. However, there are currently no national biosafety or biosecurity regulations and no national curriculum for training exists. Additionally, infrastructural needs to ensure the containment of dangerous pathogens and a national inventory of such pathogens have not yet been compiled. To ensure development of sustained capacity, training of national staff should be continued and laboratory mentorship necessitated for the implementation of biosafety and biosecurity practices. Cambodia should also begin working towards a clear regulatory environment based on the national guidelines. Till date, improvements in capabilities have occurred through external funding and technical support, and initiatives may therefore be unsustainable.

Recommendations for priority actions

- Develop and keep up-to-date a complete inventory of dangerous pathogens stored at facilities.
- Improve facilities to ensure physical containment of dangerous pathogens.
- Develop and roll out a national training curriculum for biosafety and biosecurity.
- Invest in maintenance and servicing of biosafety cabinets, including through training of staff locally.

Indicators and scores

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

Strengths/best practices

- Biosafety officers are in place at national and provincial level laboratories.
- BSL-3 laboratory for dangerous pathogens testing is in place at the Institut Pasteur du Cambodge.
- National biosafety guidelines have been developed.

Areas that need strengthening/challenges

- A complete inventory of dangerous pathogens stored at facilities requires further development and regular updates.
- Facilities require improvements to ensure physical containment of dangerous pathogens.
- Biosafety officers require further training to gain familiarity with biosafety guidelines and related SOPs, including ensuring an appropriate focus on waste management, disinfection and sterilization.

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

Strengths/best practices

- A small number of staff have participated in international biosafety and biosecurity trainings.
- In-country trainings have resulted in a group of laboratory staff certified in shipping of infectious substances.
- Biosafety cabinets are serviced regularly and a few local staff are trained to perform servicing.

Areas that need strengthening/challenges

- A national training curriculum for biosafety and biosecurity has not been developed, nor is it clear where such a training curriculum would be institutionalized.
- Limited number of staff available for the servicing of biosafety cabinets.

Immunization

Introduction

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

Target

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

Cambodia level of capabilities

Cambodia has a functional national vaccine delivery system that has demonstrated its capability to respond to new vaccine-preventable disease threats. An expanded programme on immunization was established in Cambodia in 1986 and achieved national coverage for basic vaccines by 1989. The National Immunization Program (NIP) began in 2000 and Cambodia was declared polio-free the same year and achieved measles-free and maternal and neonatal tetanus-free status in 2015. The NIP currently provides 11 vaccines that are administered through more than 1141 health centres, 81 health posts and maternity wards in 99 referral hospitals. Access to vaccinations is additionally supplemented by mobile outreach activities. Six new and underutilized vaccines have been introduced into the routine immunization programme since 2005, of which three were introduced in the past two years.

Vaccination coverage in Cambodia is good, but more work is needed to ensure that geographic and wealth disparities in coverage are minimized. However, the vaccine programme is heavily dependent on external funding. The most recent Cambodian Demographic and Health Survey (2014) found that 73% of children (age 12–23 months) are fully vaccinated. In 2015, WHO and the United Nations Children's Fund (UNICEF) estimated the coverage for three doses of diphtheria-tetanus-pertussis vaccine to be 89%. Data indicate that the first-dose measles-containing vaccine (MCV) coverage for one-year-old children is 95%. Recent importations of measles into Cambodia have resulted in local transmission. Communities with low immunization coverage tend to be in unregistered villages or remote locations, have high numbers of ethnic minority households, or have a greater proportion of mobile workers, and their families are often located in urban settings. The current multiyear national immunization strategy has plans in place to expand immunization services in these high-risk communities.

There are strong cold-chain management systems in place. NIP maintains a detailed database of cold chain equipment nationwide, including the facility, equipment make and model, purchase date and type of electricity supply. About two thirds of the equipment is now over 10 years old but there are plans and donor funds available to replace them in the next five years.

Cambodia's capacity to successfully conduct mass vaccination campaigns in response to health threats is noteworthy. In March 2016, the government, with financial support from Gavi, the Vaccine Alliance launched a Japanese encephalitis vaccination programme targeting 4.1 million children in the nine months to 14 years age group. A total of 4 171 429 doses of the Japanese encephalitis vaccine were administered over the month-long programme and rapid coverage assessments in all provinces found the overall coverage in the target population to be 92%.

As Cambodia's immunization programme matures, it will become increasingly important to strengthen the quality of surveillance and response to suspected clusters of vaccine-preventable diseases. At present the quality of vaccine-preventable disease surveillance and outbreak investigation at the subnational level is variable.

Recommendations for priority actions

- Increase immunization coverage in high-risk communities using high quality microplanning and Village Health Support Group (VHSG) volunteers, as appropriate.
- Provide subnational surveillance and outbreak investigation training to strengthen capacity for a rapid response to reported clusters of suspected high-threat vaccine preventable diseases.
- Migrate cold-chain and vaccine inventory databases online and provide additional training to allow national and subnational staff to more effectively monitor stocks and replace old equipment that are at increased risk of failure.

Indicators and scores

P.7.1 Vaccine coverage (measles) as part of national programme – Score 4

Strengths/best practices

- Cambodia has a well-established immunization programme, guided by a comprehensive five-year strategic plan, which aligns to the WHO Global Vaccine Action Plan.
- Since 2000, the immunization programme has maintained its polio-free status, and in 2015 Cambodia was verified as achieving elimination of measles, and maternal and neonatal tetanus.
- Measles vaccine coverage estimates, based on administrative data, exceed 90%.
- The programme has repeatedly demonstrated an ability to mount a successful mass vaccination campaign in response to public health threats (pandemic influenza vaccine in 2010, measles-rubella vaccine in 2013 and Japanese encephalitis vaccine in 2016).

Areas that need strengthening/challenges

- Greater efforts are needed to provide both routine and targeted outreach services to pockets at high risk of under-vaccination, including communities of ethnic minorities, mobile workers, the urban poor and persons in remote settlements.
- The effectiveness and cost-effectiveness of immunization outreach efforts in various settings should be continually monitored, with the information used to set priorities and improve programme operations.
- The quality of vaccine-preventable disease surveillance and outbreak investigation is variable at the subnational level and should be strengthened.

P.7.2 National vaccine access and delivery – Score 4

Strengths/best practices

- Vaccine stock-outs are rare and are the result of short-term financial issues rather than problems in vaccine management or distribution.
- All operational districts and health centres have functional cold-chain equipment.
- Effective Vaccine Management (EVM) assessments are done every three years and result in EVM improvement plans.
- There is a detailed nationwide database of cold-chain equipment, by facility, equipment model and purchase date.

Areas that need strengthening/challenges

- Intermittent interruptions in payment for vaccines have resulted in occasional short-term stocks outs at subnational levels. Timely payments to UNICEF, and other steps, should be taken to prevent this in the future.
- About two thirds of the vaccine cold-chain equipment is over 10 years old and will need monitoring and eventual replacement.
- There is a need to strengthen cold chain and vaccine inventory management systems to avoid potential interruptions to immunization services.

DETECT

National laboratory system

Introduction

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

Target

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

Cambodia level of capabilities

Cambodia's laboratory system consists of 94 public laboratories (of which eight are national laboratories) at different levels of the health care system. Aside from laboratories supporting disease-specific programmes (such as HIV/AIDS, tuberculosis and malaria), Cambodia's National Institute for Public Health supports surveillance and outbreak response for emerging infectious diseases (with technical support from Institut Pasteur du Cambodge, such as when BSL-3 laboratory conditions are required). Key strengths of the national laboratory system are related to quality and biosafety through implementation of laboratory quality management systems, including participation in external quality assessment (EQA) programmes, training of biosafety officers and attention to proper functioning of biosafety cabinets. However, many of these important initiatives are dependent on external funding or technical support, which affects their sustainability. Availability of quality laboratory reagents and specimen referral from intermediate level/district laboratories remain a challenge.

Recommendations for priority actions

- Invest in strengthening and maintaining laboratory fundamentals and laboratory quality management systems.
- Develop a mechanism for standardized procurement of equipment and supplies.
- Describe and test functionality of the specimen referral and transport system, and provide corrective actions.

Indicators and scores

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

Strengths/best practices

- Polymerase chain reaction for influenza.
- Serology for HIV.

- Microscopy for Mycobacterium tuberculosis.
- Rapid diagnostic test for Plasmodium spp.
- Bacterial culture for Salmonella Typhimurium.

Areas that need strengthening/challenges

- Core tests are required for priority diseases.
- Training in modern and conventional diagnostics, as well as a clearer educational pathway for laboratory and microbiology professionals are needed.
- A national system for procurement and quality assurance is not in place.

D.1.2 Specimen referral and transport system – Score 4

Strengths/best practices

- SOPs are available for specimen collection, packaging and transport.
- Several independent disease-specific referral networks are in place, such as for HIV/AIDS, malaria, tuberculosis, severe acute respiratory infections, influenza-like-illness; and on an ad hoc basis during outbreak response.
- National laboratories participate in international laboratory networks, such as the Global Influenza Surveillance and Response System (GISRS).

Areas that need strengthening/challenges

- Approval and endorsement of, and staff training in SOPs for specimen collection, packaging and transport are needed to increase specimen referral from intermediate level/district laboratories.

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

Strengths/best practices

- Tier-specific testing strategy is available (National Guidelines on the Complementary Package of Activities for Referral Hospital Development 2006–2010).
- There is a specific unit responsible for procurement, including media and reagents for laboratory diagnostics.
- Point-of-care diagnostics are available at the peripheral level across the country for conditions, such as HIV/AIDS, malaria, syphilis, hepatitis B and C. There are 64 GeneXpert instrument systems present in 48 sites with plans to increase numbers.

Areas that need strengthening/challenges

- Tier-specific testing strategy needs to be updated.
- Availability of high quality laboratory reagents is a challenge.

D.1.4 Laboratory quality system – Score 2

Strengths/best practices

- National laboratory quality standards are available.
- Several laboratories have implemented laboratory quality management systems.
- National EQA programmes are in place.
- Laboratories participate in international EQA programmes.

Areas that need strengthening/challenges

- Accreditation of national public health laboratories is needed.
- Participation and coordination of EQA programmes depends on the availability of external funding, making participation unsustainable.
- Mechanisms to ensure corrective action following EQA programmes are needed.

Real-time surveillance

Introduction

The purpose of real-time surveillance is to ensure the timely detection of acute public health events to facilitate rapid assessment and response, thereby advancing national safety, security and resilience.

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, national and international levels of authority regarding surveillance of events of public health significance; and improved country and regional capacity to analyse and link data from and between strengthened, real-time surveillance systems, incorporating interoperable, interconnected electronic reporting systems. 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 IHR (2005) and OIE standards.

Cambodia level of capabilities

Cambodia has substantial capacity for human disease surveillance. Over the past 13 years both indicator- and event-based systems have been created and reviewed periodically. In 2004, the Department of Communicable Diseases, in the Ministry of Health established a system of rapid response teams with at least one team member located in every health centre, operational district and provincial health department, as well as at the central level. Rapid response team members are responsible for reporting public health events to the Cambodia Early Warning Response Network (CamEWARN) and for responding to public health threats. Additionally, AET produces five graduates annually who will strengthen the rapid response system.

CamEWARN encompasses both indicator-based surveillance and event-based surveillance. The aim of the system is to detect outbreaks, unusual trends and other potential public health events early, to facilitate rapid investigation and response.

The indicator-based surveillance component of CamEWARN entails weekly reporting (including zero reporting) of 10 syndromes from all health centres, district referral hospitals and provincial hospitals. The incidents reported are clinical cases without laboratory confirmation. The current list of conditions under surveillance in CamEWARN includes acute diarrhoea, acute haemorrhagic fever, meningitis or encephalitis, acute jaundice, fever with rash, severe respiratory Infection, acute flaccid paralysis, diphtheria, rabies and neonatal tetanus. All data originate from health centre logbooks and in-patient department logbooks in hospitals. There are pre-established weekly thresholds built into CamEWARN. This ensures that if the number of cases for a given condition goes above the baseline, rapid response team staff at the central, provincial health department and/or operational district levels initiate an investigation.

The Department of Communicable Disease Control has developed an innovative method for collecting timely indicator-based surveillance data from public health facilities throughout the country. Each week rapid response team members telephone a toll free national number (115) to initiate a report. Software programmes embedded in the 115 sites recognize the rapid response team member telephone numbers and prompt the caller to sequentially enter weekly case counts for the conditions under surveillance. The data are automatically written into a database accessible via the Internet. The rapid response team/

surveillance officers at the operational district can then log into the database and approve the transfer of reports from health centres in their district onto the CamEWARN national database. Once uploaded, central, provisional and operational district staff can access indicator-based surveillance data by using any web-enabled device in any area with Internet access.

A previous assessment of the CamEWARN indicator-based surveillance system found that 88% of health centres report each week and that 90% of the reports were submitted on time. However, in February 2016 WHO and Department of Communicable Disease Control conducted a joint review of the programme and identified several limitations that could adversely affect data quality. These included: (i) complicated and poorly understood case definitions and limited compliance; (ii) suboptimal training and supervision of front-line reporters; (iii) limited capacity for data analysis and interpretation at subnational level; and (iv) inadequate structured feedback. It is also important to note that test results from the Cambodia Laboratory Information System (CamLIS) are not directly integrated into the indicator-based surveillance system operated by CDC.

Another significant challenge in developing an integrated, interoperable surveillance in Cambodia is the many "stand-alone" indicator-based programmes running in parallel to CamEWARN. Some of these programmes are operated by other government departments (such as the National Immunization Programme, National Centre for Malaria Control, National Centre for Tuberculosis and Leprosy Control, National Centre for HIV/AIDS, Dermatology and STDs) and other external partner agencies (such as the Naval Medical Research Unit II, Armed Forces Research Institute of Medical Sciences, Institut Pasteur du Cambodge).

A further concern is that an estimated two thirds of clinical care is provided by the private sector but participation of private health facilities in disease surveillance is extremely limited. This creates a potential "blind-side" in the existing indicator-based disease surveillance system that could result in delayed detection of an outbreak.

Event-based surveillance

Sources of information used in event-based surveillance include rapid response team members, village health support groups, laboratories, members of the public and ad hoc media monitoring. Persons can report suspected events of potential public health significance to the Department of Communicable Disease Control in person, via email or telephone. Department of Communicable Disease Control staff monitor three hotlines 24 hours a day, seven days a week. Members of the public who call the 115 hotline number (their numbers are not recognized by the CamEWARN indicator-based surveillance system) receive automated voice prompts inquiring if they wish to report a public health event. If a staff member of the Department of Communicable Disease Control is not immediately available, the caller can leave a message and the staff is alerted about a message that needs attention. The Department of Communicable Disease Control maintains a database of all reported events at the central level that can be reviewed and analysed.

In terms of ability to rapidly detect significant threats, a robust event-based surveillance system has the capacity to indirectly compensate for limitations in the existing indicator-based surveillance in Cambodia. Past experience in Cambodia indicates that event-based surveillance detects substantially more potential public health threats than indicator-based surveillance. Given that in the near future it is unlikely that Cambodia will be able to effectively integrate the myriad of separate ongoing surveillance programmes, or be able to engage a significant proportion of the private sector in surveillance, further strengthening of the event-based surveillance system should be a priority. This could involve fostering reporting from new surveillance partners (such as private hospitals, animal health and pharmacies), enhancing media monitoring and exploring opportunities to increase monitoring and reporting through social media. Comprehensive event-based surveillance should be routinely coupled to systematic risk assessments, which involve multidisciplinary teams, as warranted by the event, to rapidly determine the most appropriate response.

For information on the animal disease surveillance programme see the "zoonotic diseases" and "food safety" technical capacity areas.

Recommendations for priority actions

- Develop a single database system to record public health events.
- Strengthen event-based surveillance by formalizing monitoring of media/Internet sources, promoting active public reporting using new technologies (such as smartphones, social media) and fostering reports from new partners, including health care workers in private facilities and laboratories.
- Expand the capacity for, and routine practice of, event- and indicator-based surveillance data analysis and risk assessment at the provincial level, and where feasible, operational districts.
- Improve the quality of indicator-based surveillance data by providing ongoing training to reporters on the use of syndromic case definitions and rigorous, systematic assessments of data capture at the local level.
- Incorporate key private sector health facilities into existing surveillance programmes.
- Enhance collaboration between the human health, animal health and other relevant (outside of health) sectors by augmenting participation in joint training and exercises, and establishing a regular schedule for combined reviews of zoonotic diseases surveillance data.

Indicators and scores

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

Strengths/best practices

- Surveillance data is reported from front-line health facilities.
- An indicator-based surveillance system is operational (CamEWARN) in virtually all public sector health facilities throughout the country.
- Functional event-based surveillance has demonstrated ability to detect potential public health threats.
- There is a national toll-free number for reporting suspected events of public health significance as part of event-based surveillance.
- There is widespread adoption of new technological approaches in the ongoing effort to improve surveillance and response (such as toll-free hotlines, automated voice recognition, web-based reporting, smart phone apps).
- Systematic risk assessments have been embraced as routine practice at the national level.
- A functioning influenza-related sentinel surveillance system is in place.

Areas that need strengthening/challenges

- While the timeliness and completeness of indicator-based surveillance reporting are good, there is a need to assess data quality at reporting sites and address deficiencies.
- CamEWARN thresholds are currently count-based rather than rate-based, which presents a challenge in interpretation for public health decision making, especially if data are incomplete.
- Recommendations for improving surveillance generated in previous reviews have not always been implemented.
- Surveillance systems need to be able to adjust to novel pathogens and syndromes.
- The private sector is providing a significant amount (60%–70%) of clinical care, but they are not materially engaged in public health disease surveillance.

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

Strengths/best practices

- Surveillance reports are produced regularly and distributed.
- Some surveillance reports incorporate information from multiple surveillance partners (such as Naval Medical Research Unit II, Armed Forces Research institute of Medical Sciences, Institut Pasteur du Cambodge).
- Web-based reporting functionality has been expanded in the CamEWARN system into subnational levels where possible.

Areas that need strengthening/challenges

- There are many separate, stand-alone, surveillance programmes in operation.
- In some surveillance programmes, review and/or dissemination of the data occurs infrequently (i.e. at monthly intervals and not in real time).
- The public and/or private health clinical laboratory system is not incorporated into existing electronic disease surveillance systems.
- Evidence of coordination, collaboration and information sharing between human disease and animal disease surveillance is lacking.

D.2.3 Integration and analysis of surveillance data – Score 3

Strengths/best practices

- The Department of Communicable Disease Control has adopted a standardized risk assessment approach for addressing potential threats to public health.

Areas that need strengthening/challenges

- Capacity to perform effective risk assessments is limited outside the national level.
- The ability to analyze and interpret data needs strengthening at all levels.

D.2.4 Syndromic surveillance systems – Score 4

Strengths/best practices

- Syndromic surveillance systems are well established.
- The syndromes under surveillance are appropriate for detecting important potential threats to public health in this region.

Areas that need strengthening/challenges

- Experience indicates that comprehension and consistent application of syndromic case definitions is suboptimal, particularly at subnational levels.

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.

Cambodia level of capabilities

Cambodia has proven its capacity to report potential public health threats of international concern to WHO as evidenced by real-life events, such as avian influenza. There are also mechanisms in place for cross-border sharing of threat information with neighbouring countries on a voluntarily basis.

What is lacking are legislation and SOPs to institutionalize IHR reporting processes within the country. In addition, existing collaboration between the human and animal health IHR focal points appears to be largely based on personal relationships and thus may be vulnerable to staff changes or absences. Response capacity would benefit by: (i) formalizing the IHR reporting procedures within Cambodia; (ii) ensuring there are sufficient alternatives to assume reporting responsibilities if required in an emergency; and (iii) combined training of IHR and FAO/World Organisation for Animal Health (OIE) focal points supplemented by ongoing, periodic exercises to strengthen interagency collaboration in the long term.

Recommendations for priority actions

- Formalize IHR reporting processes through development of SOPs and supporting legislation as necessary.
- Train and exercise human and animal health IHR focal points on reporting under IHR, and ensure adequate staffing to maintain this capacity during staff absences.

Indicators and scores

D.3.1 System for efficient reporting to FAO, OIE and WHO – Score 3

Strengths/best practices

- Cambodia has a proven track record of reporting public health threats of international concern to WHO (such as influenza A (H5N1)).
- There is a cross-border mechanism for voluntarily sharing of threat information through the Mekong Basin Disease Surveillance (MBDS) programme (includes China, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam) and Communicable Disease Control Project, Asian Development Bank in the Greater Mekong Sub-Region (CDC-ADB-GMS).

Areas that need strengthening/challenges

- There is limited or no joint training of the national IHR focal point and FAO/OIE counterparts.
- Limited opportunities exist for the national IHR focal point and FAO/OIE counterparts to practice reporting potential public health emergencies of international concern.
- Need to create depth in the capacity to report under IHR by training additional staff who could serve as the focal point/ FAO/OIE counterpart if required.
- Need to share public health events in a timely manner between border provinces of Cambodia and partner provinces of neighbouring countries.

D.3.2 Reporting network and protocols in country – Score 2

Strengths/best practices

- Despite the lack of formal SOPs, a functional communication network exists as evidenced by prior experience in reporting influenza A (H5N1) to WHO.

Areas that need strengthening/challenges

- There are no SOPs for reporting public health events to WHO.
- There is need to conduct exercises to test the communication between human health and animal health sectors under IHR.

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

State Parties to have skilled and competent health personnel for sustainable and functional public health surveillance and response at all levels of the health system and the effective implementation of the IHR (2005). Workforce to include physicians, veterinarians, biostatisticians, laboratory scientists, farming/ livestock professionals, with an optimal target of one trained field epidemiologist (or equivalent) per 200 000 population, who can systematically cooperate to meet relevant IHR and Performance of Veterinary Services core competencies.

Cambodia level of capabilities

Cambodia has a detailed health workforce development plan for 2016–2020 that focuses on staffing for curative services. It however does not include public health professions (such as epidemiologists). The involvement of the military and its public health and medical staffing needs are also insufficiently articulated in the plan. These are major oversights that need to be remedied if Cambodia is to develop a sustainable public health system capable of effectively implementing the IHR.

Given the lack of public health professionals in workforce planning it is perhaps not surprising that Cambodia has limited epidemiologic staff capacity. There are currently 23 public health field epidemiologists in the country, i.e. one epidemiologist per 200 000 population. It would be optimal if Cambodia's workforce development plan defined a 'field epidemiologist' in the Cambodian context and recommended, on that basis, how many more needed to be trained.

Efforts are underway to increase the number of public health epidemiologists working in the country. With technical support from WHO and the United States Centers for Disease Control and Prevention (US CDC), an AET foundation course (Cambodia's version of the FETP) has been conducted since 2011. The course is for six months with a month-long Introductory AET that aims to train 20 students each year. Capable students from this course are chosen to complete the full AET course. Graduates of the AET work in 15 of 25 provinces and are not always supported to practice epidemiology or participate in outbreak response. Ongoing professional development is provided to AET graduates through quarterly day sessions called AET Plus and graduates from the CAVET are encouraged to participate in these events. A detailed strategic plan for strengthening the AET for 2016–2020 has been developed. AET graduates are treated as a national resource that can be mobilized across the country when needed; but this process still needs to be formalized.

Staff capacity for veterinary medicine is also very limited. An OIE Performance of Veterinary Service (PVS) gap analysis conducted in 2011 estimated that approximately 2000 veterinarians are needed for the country. While there are currently about 850 individuals available with animal health training, most of them would not be considered qualified veterinary doctors.

Recommendations for priority actions

- Include public health professions in all future human resources workforce planning and set targets to ensure adequate staffing for multidisciplinary teams that are necessary to fulfil obligations under IHR.
- Consider ways to strengthen the AET foundation course, including increasing the duration of the training to one year, continuing to improve supervision, and providing access to Khmer speaking mentors.
- Ensure AET and CAVET graduates are employed in positions that allow them to practice their epidemiological skills and regularly participate in field-level responses to potential public health threats.

Indicators and scores

D.4.1 Human resources are available to implement IHR (2005) core capacity requirements – Score 2

Strengths/best practices

- Human resources for implementing IHR (2005) core capacity exist at the national level.
- The Ministry of Health has many active public health partners, such as WHO, Institut Pasteur du Cambodge, Naval Medical Research Unit No. 2, US CDC and Cambodia Armed Forces Research Institute of Medical Sciences. The staff at these agencies help to augment capacity for meeting IHR (2005) requirements.

Areas that need strengthening/challenges

- Epidemiologic staff capacity within the country is limited and not always deployed to the highest priority places.
- There is limited capacity for veterinary medicine and animal health epidemiology.
- Military medical staffing needs are not adequately understood.

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

Strengths/best practices

- Cambodia has a six-month long AET programme and graduates a cohort of five students each year.
- There is also a month-long introductory AET that trains up to 20 students annually.
- Periodic continuing professional development sessions are offered to AET graduates quarterly (AET Plus) and animal health professionals (CAVET) are invited to participate.
- There is a multiyear strategic plan for improving the AET course.

Areas that need strengthening/challenges

- A six-month course is unlikely to provide adequate opportunity to develop all core skills necessary to function as a field epidemiologist.
- Approximately one third of provinces do not have an AET graduate working as an epidemiologist.
- The quality of supervision for AET graduates is variable and should be strengthened.

D.4.3 Workforce strategy – Score 2

Strengths/best practices

- There is a health workforce development plan 2016–2020.

Areas that need strengthening/challenges

- Public health professions, such as epidemiologists, are not included in the health workforce development plan 2016–2020.
- Coordination among the different authorities and preservice training providers is required, including for tracking of graduates.
- Military and veterinary workforce need to be more clearly coordinated.
- Long-term institutionalization of One Health related learning and skill development is required.

RESPOND

Preparedness

Introduction

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

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.

Cambodia level of capabilities

Cambodia has developed several national response plans: (i) natural hazard contingency plans to cover events such as flooding, droughts and storms; (ii) strategic plans for specific communicable disease programmes, such as HIV, dengue and tuberculosis; and (iii) SOPs for specific activities addressing individual threats, such as EVD and MERS. However, Cambodia has not put in place a national multi-hazard public health response plan. The absence of any national-level risk assessment to identify priority threats, such as through a Strategic National Risk Assessment (SNRA) or through a Threat and Hazard Identification and Risk Assessment (THIRA process), and the current draft (unapproved) status of the laboratory reportable disease list, hinder the development of such a generic, all-hazards plan. As a result of this gap, no national level risk and resource mapping has been conducted. The nascent formalization and documentation of interministerial coordination around public health issues further challenges the development of such plans in a multisectoral environment.

Recommendations for priority actions

- Conduct a national SNRA or THIRA to prioritize public health threats, identify resource requirements for response activities, map the resulting public health risks and resources, and identify Critical Information Requirements (correlated to nationally notifiable diseases) for the national Public Health Emergency Operations Centre to monitor on a daily basis.
- Continue to engage the interministerial, intersectoral operations-level working group, which includes development partners, in developing a national public health response plan that reflects a whole-of-government approach to responding to priority public health threats.

Indicators and scores

R.1.1 National multi-hazard public health emergency preparedness and response plan is developed and implemented – Score 1

Strengths/best practices

- Discussion with relevant sectors on the development of public health emergency response plans has been initiated by the interministerial, intersectoral operations-level working group, which includes development partners coordinated by the Department of Preventive Medicine as the Secretariat.

Areas that need strengthening/challenges

- A whole-of-government approach to contingency planning for emergency response to identified priority threats to public health is needed. Such an approach would include a timetable for planning efforts, training and exercises for staff in the resulting plan, the development of a continuous improvement programme to maintain the plan, as well as the pursuit of resource mobilization to implement the plan.

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

Strengths/best practices

- Plans exist for some key resources, such as antivirals and personal protective equipment, but preparedness and response activities would be better supported through an overarching national public health risk map and national resource map.

Areas that need strengthening/challenges

- The identification of priority threats and their risk to public health is needed to inform subnational planning and resourcing. The mapping of an inventory of relevant resources with the national plan is needed to inform response management.

Emergency response operations

Introduction

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

Target

Country with public health emergency operations centre (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 trained EOC staff capable of activating a coordinated emergency response within 120 minutes of the identification of a public health emergency.

Cambodia level of capabilities

The Department of Communicable Disease Control has a designated Emergency Operations Centre (EOC) that is available for the management of infectious disease outbreaks. This facility is a 10 by 5 metre conference room with two display screens, high speed Internet connectivity and a video camera/speaker system. The Department of Communicable Disease Control Director and key staff use the teleconferencing system and smart phones to facilitate information exchange and decision-making, often through the transmission of photographed documents sent via the WhatsApp application. No central emergency management information system and/or data store is used to facilitate continuity of emergency management or to support post hoc analyses of the responses undertaken using this facility.

Several flowcharts of key actions are posted within this facility. A risk-based algorithm is used in decision-making to deploy a rapid response team for the purpose of conducting field investigations and to activate the EOC for the purpose of managing a response centrally; however, no formal activations of the EOC following this algorithm have yet occurred.

Five key staff are identified by name within the Department of Communicable Disease Control to function in a decision-making role for the deployment of a national rapid response team; however, no Incident Management System (IMS) structure following the WHO guidelines contained in the Framework for a Public Health Emergency Operations Centre has been established, and staff have neither been rostered for specific IMS roles nor given either generic IMS training or IMS position-specific training to enable them to effectively carry out these IMS roles. Routine administrative relationships with other parts of the Ministry of Health are used when managing a public health emergency response rather than subsuming these functions under the control of an appointed Incident Manager.

Although the Director of the Department of Communicable Disease Control has the authority to decide when the EOC is to be activated, it is not clear what criteria are used for activation, or what authorities the EOC has (if any) upon activation, especially with respect to the acquisition and usage of resources from the Ministry of Health, including surge staffing and emergency response funding. SOPs allow for information exchange with other ministries, but no liaisons have been identified.

In addition, while extensive coordination across jurisdictional levels occurs via the provincial, district and community committees for disaster management, this coordination management structure is a civil

defence mechanism that includes public health considerations, and is not exclusively focused on public health emergencies. Physicians requiring consultations can use a central hotline, which is also shared with the general public and linked to two cellular phones used by the Department of Communicable Disease Control staff.

Recommendations for priority actions

- Finalize and train staff in an EOC activation SOP (that includes clear criteria to determine when activation is justified) and an on-call roster of staff to guide the response upon activation.
- Identify roster staff from both the Department of Communicable Disease Control and other parts of the Ministry of Health to perform emergency management functions upon activation of the EOC. Staff (both those working in the EOC under an IMS structure and those rostered for field operations such as on rapid response teams) should receive both basic IMS training as well as position-specific training.
- Develop an EOC plan (handbook) providing an overarching framework for all contingency plans and SOPs related to the management of public health responses. The EOC Plan should clarify the EOC's authorities and the terms of reference for all IMS positions identified for use in the contingency plans.
- Develop a comprehensive, multiyear public health emergency management training and exercise programme that is regularly evaluated (such as through after-action reviews), to allow for continuous improvement.
- Develop case management guidelines for all priority threats identified through the THIRA process (see indicators R.1.1 and R.1.2)) and include these guidelines in the EOC plan and disseminate to all appropriate jurisdictions.

Indicators and scores

R.2.1 Capacity to activate emergency operations – Score 2

Strengths/best practices

- An SOP has been drafted for EOC operation that describes multiple activation levels.
- Five key individuals have been identified as having responsibility for investigation of potential outbreaks.
- The Cambodian Department of Communicable Disease Control has taken an innovative approach to communicate among its staff and senior leaders during public health events and emergencies by using a popular messaging application (WhatsApp) to share images of documents and discussions leading to potential activations. However, the limited archiving capability of this application is not conducive to post hoc analyses of responses.

Areas that need strengthening/challenges

- While the Department of Communicable Disease Control Director has the authority to activate the EOC, and is usually available 24 hours, seven days a week, there are no clear criteria for EOC activation, nor are back up staff identified in the event the principal is not available.
- Staff have not been identified to fill WHO-recognized IMS positions or trained in either IMS principles or in position-specific IMS responsibilities.

R.2.2 Emergency operations centre operating procedures and plans – Score 1

Strengths/best practices

- SOPs to identify the functions to be performed during a response are available.

Areas that need strengthening/challenges

- An EOC plan that describes the IMS structure for responses and provides a framework for SOPs has not yet been developed.
- Those performing response functions are not identified before an event or trained in their responsibilities, and are not under the supervision of the designated Incident Manager. They function in their regular administrative positions and execute their routine duties, rather than being accountable to the Incident Manager executing emergency functions.
- No emergency authorities are included in draft EOC SOPs and reporting conducted by the EOC appears to be routine, so it is not clear what is done differently during an emergency compared to a routine response. No Critical Information Requirements have been identified, which would trigger immediate notifications or other EOC activities. In addition, existing SOPs do not address the mechanisms of coordination with other sectors.
- Although there are some threat-specific plans in place, such as for HIV, no SNRA or national THIRA has been conducted (see indicators R.1.1 and R.1.2) to identify priority risks. The EOC plan does not contain the entirety of the threat-specific contingency plan annexes that would be required.

R.2.3 Emergency operations programme – Score 1

Strengths/best practices

- Cambodia has routinely participated in an annual WHO-coordinated exercise series for national IHR focal point communication (Exercise Crystal).

Areas that need strengthening/challenges

- There is no emergency management programme within the Ministry of Health, under which the EOC operates, which includes the lack of a training and exercise programme for emergency management staff.
- The EOC has not been activated since its creation, and although there have been three outbreak reviews conducted to date by the Foodborne Outbreak Response Team, there is no comprehensive after-action review or outbreak review process in place to assess the performance of exercises and activations of the EOC.

R.2.4 Case management procedures are implemented for IHR (2005) relevant hazards – Score 1

Strengths/best practices

- Several case management guidelines and related SOPs exist for diseases such as cholera, EVD and MERS, but these are not based on the priorities identified by a THIRA process (see indicators R.1.1 and R.1.2).
- National guidelines for Infection prevention and control (IPC) exist, which includes general case management and transport of infectious patients at the local level, but no dedicated transportation resources exist through which to conduct such transport.

Areas that need strengthening/challenges

- A compendium of case management guidelines for priority threats needs to be developed, along with appropriate identification of the resources required (which should be contained in the associated contingency plans), and with inclusion of training for clinical staff on the resulting guidelines.

Linking public health and security authorities

Introduction

Public health emergencies pose special challenges for law enforcement, whether the threat is manmade, such as the anthrax terrorist attacks, or naturally occurring (influenza pandemics for example). 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.

Cambodia level of capabilities

A number of agencies are engaged in various security functions relevant to public health, including the Ministry of Interior, Ministry of Agriculture, Forestry and Fisheries, and the Ministry of National Defence. Of these agencies, the Ministry of Interior is the principal interlocutor with the International Criminal Police Organization (INTERPOL). The Ministry of Health has several agreements with other ministries but they are not specific to routine exchange of information related to security or law enforcement functions. While informal communication mechanisms exist, both among Cambodian government agencies as well as with neighbouring countries, formal focal points have not been appointed and appropriate information sharing mechanisms have not yet been established. The decision to exchange information is usually based on professional judgement rather than on standard policies or procedures and is usually done through informal channels.

Recommendations for priority actions

- Develop an intersectoral information sharing, a memorandum of understanding (MoU), and associated SOP that defines:
  - official focal points for each sector (including the National Committee for Disaster Management (NCDM) and the national combined joint Chemical, Biological, Radiological, and Nuclear (CBRN) Task Force), as well as focal points for neighbouring countries;
  - criteria/triggers for routine and emergency intersectoral reporting; and
  - mechanisms and formats for reporting.
- Train and exercise these focal points on relevant sharing of information between health and security domains as part of a broader public health emergency management training and exercise programme.
- Clarify (and if necessary expand) authorities for detention of personnel for public health purposes, beyond existing authorities at points of entry.

Indicators and scores

R.3.1 Public health and security authorities (e.g. law enforcement, border control and customs), are linked during a suspect or confirmed biological event – Score 2

Strengths/best practices

- Ministry of Interior conducts formal communications with INTERPOL and intersectoral communication occurs on an ad hoc basis at the initiative of individuals.
- Though they may not cover all relevant stakeholders and sectors, initial contact lists have been developed to enable information sharing among the various sectors.

Areas that need strengthening/challenges

- There are no documented, formal agreements or MoUs for the sharing of information between the various stakeholders (such as security organizations in bordering countries), and no formal liaison between the Ministry of Health and INTERPOL.
- There are no SOPs or training available in procedures for sharing information between public health and security forces. Such SOPs are necessary to define the risk assessment process, triggers, channels, mechanisms and formats for information sharing, as well as the specific information elements to be shared.

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 for response in case of a public health emergency.

Target

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

Cambodia level of capabilities

At its current level of development, it is more relevant for Cambodia to receive medical countermeasures and health personnel. The Central Medical Store has an SOP in place to import medical countermeasures for emergency use. Effective mechanisms are in place at the Ministry of Health to receive health personnel despite the lack of a specific SOP. This was evidenced by the rapid receipt and deployment of WHO experts during the enterovirus 71 outbreak involving a large number of deaths of young children in 2012. Exercises (whether tabletop or simulation) on these capabilities have not been carried out. As public health emergencies are relatively rare, it will be important to conduct regular exercises to ensure that relevant persons are familiar with their roles and responsibilities and that procedures are updated and effective.

Recommendations for priority actions

- Conduct annual exercises (either tabletop or simulation) to demonstrate and strengthen capabilities.

Indicators and scores

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

Strengths/best practices

- Effective mechanisms and SOPs are in place to receive medical countermeasures as evidenced by receipt of antivirals and personal protective equipment during the 2009 influenza pandemic.

Areas that need strengthening/challenges

- Conduct simulation exercises to practice and test the system to receive medical countermeasures.

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

Strengths/best practices

- Able to rely on effective mechanisms to receive health personnel as evidenced by receipt of WHO experts during major outbreak of enterovirus 71 in 2012.

Areas that need strengthening/challenges

- Conduct simulation exercises to practice and test the system to receive health personnel.

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 promoting the capacity to cope with an unfolding public health emergency. An essential part of risk communication is the dissemination of information to the public about health risks and events, such as disease outbreaks. For any communication about risk caused by a specific event to be effective, the social, religious, cultural, political and economic aspects associated with the event should be taken into account, including the voice of the affected population.

Communications of this kind promote the establishment of appropriate prevention and control action through community-based interventions at individual, family and community levels. Disseminating the information through 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 should be tested and updated as needed.

Target

State Parties use multilevel and multifaceted risk communication capacity. Real-time exchange of information, advice and opinions between experts and officials or people who face a threat or hazard (health or economic or social wellbeing) to their survival, so that informed decisions can be made to mitigate the effects of the threat or hazard and protective and preventive action can be taken. This includes a mix of communication and engagement strategies, such as media and social media communications, mass awareness campaigns, health promotion, social mobilization, stakeholder engagement and community engagement.

Cambodia level of capabilities

The Department of Communicable Disease Control in the Ministry of Health has a dedicated risk communications unit. However, this unit does not support the work of other departments in the Ministry of Health. A risk communications strategy document (comprising risk communications principles, practice and SOPs) has been drafted with the help of WHO and is awaiting approval. The Ministry of Health has functioning systems to share information with internal stakeholders, such as on emerging infectious diseases. In the event of public health emergencies, spokespersons have been identified. The Ministry of Health's communications capabilities cover not just mainstream media but also social media. It communicates with the public through its own Facebook page. The Ministry of Health has developed a functioning decentralized system, involving staff at the provincial and district levels, who can reach out to affected local communities. The Ministry of Health monitors rumours and shares information rapidly via mobile phone applications.

Recommendations for priority actions

- Ensure that a risk communication system for public health preparedness and response is in place that coordinates work across ministries before and during public health events.
- Establish a dedicated communications unit in the Ministry of Health, covering all areas of work.
- Implement the risk communications strategy that has been drafted together with WHO.

Indicators and scores

R.5.1 Risk communication systems (such as plans and mechanisms) – Score 2

Strengths/best practices

- Risk communication staff have been identified in the Department of Communicable Disease Control in the event of public health emergencies.
- Simulation exercises have been performed at both national and provincial levels for the past three years but is dependent on funds.
- The Department of Communicable Disease Control Director maintains a good relationship with the media.

Areas that need strengthening/challenges

- The Ministry of Health and its departments do not have a dedicated and common communication unit.

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

Strengths/best practices

- Functional, formal and informal systems of communication with internal stakeholders and partners is in place.
- Updated information is regularly disseminated to stakeholders, including doctors and hospitals.

Areas that need strengthening/challenges

- Risk communication exercises are not conducted with other agencies.

R.5.3 Public communication – Score 3

Strengths/best practices

- The Department of Communicable Disease Control Director has a good relationship with the media.
- The Department of Communicable Disease Control Director maintains a dedicated Facebook page through which to disseminate public health messages.
- The Department of Communicable Disease Control holds regular media briefings on emerging infectious diseases.
- The Department of Communicable Disease Control communicates proactively with the public.

Areas that need strengthening/challenges

- Risk communication training should be strengthened at all levels.

R.5.4 Communication engagement with affected communities – Score 3

Strengths/best practices

- There is a decentralized system to reach out to affected communities.
- Outreach activities target specific communities (such as to Muslim communities for MERS-CoV and to affected villages for avian influenza).
- Feedback from affected communities is used to shape messages and communication strategies, such as for avian influenza.

Areas that need strengthening/challenges

- Training in risk communication at both national and subnational levels should be strengthened to provide practical or applied experience.

R.5.5 Dynamic listening and rumour management – Score 3

Strengths/best practices

- Mainstream and social media are routinely monitored.
- Smart phone applications are used to rapidly share information.

Areas that need strengthening/challenges

- The effectiveness of rumour management is not evaluated to inform improvements.

OTHER IHR-RELATED HAZARDS AND POINTS OF ENTRY

Points of entry

Introduction

All core capacities and potential hazards apply to PoE 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

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

Cambodia level of capabilities

Cambodia has 30 points of entry – three airports, two ports and 25 ground crossings (with the Lao People's Democratic Republic, Thailand and Viet Nam). Cambodia has two IHR (2005) designated points of entry, namely Phnom Penh International Airport and Sihanoukville Port. In 2015, measures to prevent and control the transmission of disease at points of entry were formalized through the sub-decree on health measures to prevent and respond to public health emergencies of international concern at points of entry and sub-decree for quarantine officers. In addition, bilateral MoUs with China, the Lao People's Democratic Republic, Singapore and Viet Nam concerning prevention and control of transmission of disease have been established. Stakeholders at the designated points of entry have been identified and routinely cooperate with public health authorities.

Recommendations for priority actions

- Identify roles and responsibilities of competent authorities and stakeholders at designated points of entry and strengthen routine public health functions at points of entry at all times.
- Develop and exercise a multisectoral public health emergency contingency plan at points of entry in the context of the national public health emergency response structure.

Indicators and scores

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

Strengths/best practices

- Department of Communicable Disease Control has established strong collaboration with the port authorities at points of entry.
- Quarantine officers are trained for inspection of ships and issuance of ship sanitation certificates.

- Provincial hospitals have been identified as reference facilities and have the capacity to provide services.
- There are some inspection programmes and protocols in place to ensure a safe environment at all points of entry.
- Points of entry have equipment, personnel and SOPs to transport ill travellers.
- Appropriate medical services, such as isolation rooms, medical staff and a referral system are in place at all points of entry.

Areas that need strengthening/challenges

- Activities to ensure a safe environment at points of entry – vector surveillance and control, solid and liquid waste management and measures to ensure water safety – are not in place.
- The national event-based surveillance system has not incorporated public health events related to points of entry.
- Routine communications and information sharing among stakeholders is not in place.

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

Strengths/best practices

- Legislation is in place for implementing quarantine and the other health measures to prevent and respond to public health emergencies of international concern at points of entry.
- Bilateral MoUs are in place with neighbouring countries to share information and experience on prevention and control of disease transmission.
- SOPs to manage the risk posed by public health emergencies, such as outbreaks of EVD and MERS have been completed for Phnom Penh airport.
- The public health emergency contingency plan at Sihanoukville Port has been finalized.

Areas that need strengthening/challenges

- Public health emergency contingency plans have been not been developed or tested with stakeholders at points of entry.
- Procedures and SOPs concerning disinfection and other control measures have not been developed for points of entry.

Chemical events

Introduction

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

Target

State Parties to have surveillance and response capacity for chemical risks or events, with effective communication and collaboration among the sectors responsible for chemical safety, industries, transportation and safe disposal.

Cambodia level of capabilities

Cambodia has prepared a National Profile on Chemicals Management that identifies a sizable source of potential chemical risk within the country. Since the preparation of this profile a decade ago, a national baseline assessment of previously identified chemical threats and hazards has not been conducted. While there have been several chemical poisoning events within the country, a public health assessment of chemical safety to inform the development and delivery of appropriate public health intervention initiatives has not yet been conducted.

With the exception of the Chemical Weapons Convention, Cambodia is not a signatory to most of the major international conventions related to chemical safety. Consequently, while Cambodia has a national CBRN Task Force focused on intervention from a counter-proliferation perspective, it does not currently have the multisectoral mechanisms developed to mount a public health response to a chemical event impacting public health on a large scale. Most of the capacity currently in place is within the military forces of the country, and focused on chemical warfare agents.

Recommendations for priority actions

- Develop a chemical response annex to the national public health emergency plan based on a comprehensive assessment of priority public health threats.
- Finalize, and where appropriate, develop SOPs for chemical registration, management, transport, surveillance and response in accordance with the developed chemical response annex.
- Develop appropriate case management guidelines for priority chemical public health threats.

Indicators and scores

Department of Communicable Disease Control Strengths/best practices

- Cambodia has a demonstrated record of investigations of chemical contamination of foodstuffs.
- Event-based surveillance is used for early detection of possible chemical events, and standard public health risk assessment is used to trigger response actions.
- Interministerial communication occurs around chemical events albeit on an ad hoc basis, and the national CBRN Task Force coordinates chemical safety.

Areas that need strengthening/challenges

- While the national CBRN Task Force has the power to convene various other organs of the Cambodian government, it does not have the resources needed to be effective and does not routinely exercise its convening authority.
- The identified national chemical response unit under this Task Force lacks trained staff and equipment.
- No deliberate chemical sentinel surveillance or occupational health surveillance is currently conducted and no SOPs for such activities exist.
- The selection of conditions for which clinical management guidelines need to be developed is not based on risk assessment or prioritization process.
- No national health care reference facility has been identified.
- No national poison control centre exists.

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

Strengths/best practices

- A national multisectoral profile of chemical threats has been compiled, but has not been updated in over 10 years.
- The national CBRN Task Force has the mandate to serve as a coordinating body for chemical safety, but does not proactively exercise this authority.
- The Ministry of Environment registers hazardous chemical sites, but a national registry is not readily available to the Ministry of Health.

Areas that need strengthening/challenges

- National risk assessment and mapping of identified chemical threats has not been carried out.
- A national chemical response plan to guide the management of responses has not been developed.
- Interministerial mechanisms do not exist to coordinate funding of multisectoral chemical responses.
- There is no legislation for chemical event surveillance and response.
- The national IHR focal point is not represented on the national CBRN Task Force.
- A multisectoral public health response plan is yet to be developed.
- No exercise or evaluation system is in place to test the effectiveness of response to chemical events.
- Linkages to international networks need strengthening.
- There is no chemicals database available.

Radiation emergencies

Introduction

State Parties should have surveillance and response capacity for radionuclear hazards/events/emergencies. It requires effective communication and collaboration among the sectors responsible for radionuclear 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.

Cambodia level of capabilities

Similar to the chemical sector, the radiation emergency sector has basic components of capacity in place across several ministries but faces challenges in coordinating the implementation of these components. While Cambodia is a signatory to several international agreements related to radionuclear threats and is a member of the International Atomic Energy Agency, there have not been any major radiation emergencies in recent history and there are no significant radionuclear threats in the country. However, in the event of a radiation emergency, response personnel would be inadequate to manage the event because radiation emergency exercises and an associated improvement plan are not in place. There is routine monitoring and reporting on radiation threats from ports of entry, but it is not clear where these reports are sent and what actions, if any, they may generate.

Recommendations for priority actions

- Based on a comprehensive THIRA assessment of priority public health threats, develop a radiation response annex to the national public health emergency plan.
- Finalize, and where appropriate, develop new SOPs for radiation source identification, management, transport, surveillance and response in accordance with the developed radiation response annex.
- Develop appropriate case management guidelines for priority radiation public health threats.

Indicators and scores

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

Strengths/best practices

- The Ministry of Mines and Energy has the primary responsibility for regulation of radiation sources in the country. Responsibilities include generating guidance on exposure, use of radiation sources, and security and disposal practices.
- Radiation portal monitors are in use at seaports, and risk assessment is done at these ports of entry and basic reporting is in place.

Areas that need strengthening/challenges

- No national radiation safety baseline assessment has been conducted.
- Guidelines for detection and management of radiation events do not exist.
- Monitoring of consumer products for radiation hazards does not occur.
- Although procedures for radiation transport have been drafted, they have not yet been disseminated.
- The national CBRN Action Plan contains equipment but shortages and training shortfalls restrict the CBRN Task Force from taking a more active role in radiation emergencies.
- There are identified shortages in personal protection equipment and decontamination capacity for radiation events, and no list of available experts exists to draw upon during a response.
- Laboratory capacity for radiation threats is limited. No national health care facility for radiation events has been identified, no case management guidelines for exposures exist, and the capacity to manage medical radiological waste is limited.

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

Strengths/best practices

- Cambodia is a signatory to the Non-Proliferation of Nuclear Weapons Treaty, as well as the Convention on the Physical Protection of Nuclear Material.
- The national CBRN Task Force exists to advise and coordinate response management activities, but is primarily a military organization focused on counter-proliferation activities.
- The national CBRN Action Plan has been drafted and approval is pending.
- Procedures for transport of radioactive materials have been prepared, but have not been disseminated or enforced.

Areas that need strengthening/challenges

- The national IHR focal point is not a member of the national CBRN Task Force.
- Training of radiation response personnel is lacking.
- No multisectoral emergency response plan for radiation events exists, and no radiation exercises have been held, beyond one conducted by the national counter-terrorism unit (which did not include participation by the Ministry of Health, and which was not linked to a national multisectoral evaluation system for radiation events).
- There is no dedicated response funding for radiation events.
- Laboratory capacity for radionuclide analysis requires strengthening.
- First responders have limited to no experience, since there has never been a reported case of a radiation emergency in the country, and few staff have ever received training in response procedures to radiation events.
- There is no health facility designated for treatment of radiation exposure cases.

Appendix 1: IHR (2005) and JEE tool

In May 2005, the Fifty-eighth World Health Assembly (WHA) adopted the International Health Regulations (IHR) (2005), which subsequently entered into force on 15 June 2007. The purpose and scope of the IHR (2005) are "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade". All States Parties are required by the IHR (2005) to develop certain minimum core public health capacities.

IHR capacity requirements are defined as "the capacity to detect, assess, notify and report events" in Article 5, Annex 1A on "Core capacity requirements for surveillance and response", and Annex 1B on "Core capacity requirements for designated airports, ports and ground crossings". In addition, the IHR Core Capacity Monitoring Framework has a checklist and indicators that should be used for monitoring progress in the development of IHR core capacities in States Parties (http://www.who.int/ihr/publications/checklist/en/).

As stated in Annex 1A.2, each State Party shall assess the ability of existing national structures and resources to meet the minimum requirements described in Annex 1. On the basis of such assessments, States Parties shall develop and implement plans of action to ensure that these core capacities are present and functioning throughout their territories.

In 2012, the WHA (WHA65.23) urged States Parties to take necessary steps to prepare and carry out appropriate national implementation plans in order to ensure the required strengthening, development and maintenance of core public health capacities as provided for in the IHR (2005).

The IHR Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation (WHA 68/22 Add.1) suggested that "… and with a longer term vision, the Secretariat should develop through regional consultative mechanisms options to move from exclusive self-evaluation to approaches that combine self-evaluation, peer review and voluntary external evaluations involving a combination of domestic and independent experts. These additional approaches should consider, amongst other things, strategic and operational aspects of the IHR, such as the need for high level political commitment, and whole of government/multisectoral engagement. Any new monitoring and evaluation scheme should be developed with the active involvement of WHO regional offices and subsequently proposed to all States Parties through the WHO governing bodies' process."

The call for the move from "exclusive self-evaluation" to external evaluation comes from the recognition that transparency and mutual accountability in the international community are essential in implementing IHR collectively. A technical consultation meeting on the IHR Monitoring and Evaluation Framework, organized in Lyon in October 2015, suggested the development of processes and a tool to conduct a "joint" external evaluation.

The tool is organized according to the following core elements:

- Preventing and reducing the likelihood of outbreaks and other public health hazards and events defined by IHR (2005) is essential.
- Detecting threats early can save lives.
- Rapid and effective response requires multisectoral, national and international coordination and communication.

Appendix 2: JEE purpose and process

Purpose of the JEE

The JEE tool is intended to assess country capacity to prevent, detect and rapidly respond to public health threats independently of whether they are naturally occurring, deliberate or accidental. The purpose of the external evaluation process is to measure country-specific status and progress in achieving the targets. This will require a sustainable and flexible process to allow for additional countries to participate and regular evaluation visits. The first external evaluation will establish a baseline measurement of the country's capacity and capabilities, and subsequent evaluations will help to identify the progress made and ensure that any improvements in capacity are sustained.

JEEs share a number of important features including: voluntary country participation; a multisectoral approach by both the external teams and the host countries; transparency and openness of data and information sharing; and the public release of reports. It also refers to the joint process during an external evaluation (envisioned to take place approximately every five years) where a team of national experts first prepares a self-assessment that is supplied to the external team prior to the onsite visit. The external team uses the same tool for their independent evaluation, working together with the national team in interactive sessions.

The external evaluation allows countries to identify the most urgent needs within their health security system, to prioritize opportunities for enhanced preparedness, response and action, and to engage with current and prospective donors and partners to target resources effectively. Transparency is an important element for attracting and directing resources to where they are needed the most.

Process

The first stage of the evaluation is a country survey completed by the country using self-reported data for the various indicators on the JEE tool. This information is then given to the JEE team comprising national and international subject matter experts. Review of this self-assessment data provides the team members with an understanding of the country's baseline health security capabilities. These subject matter experts will then visit the country for facilitated in-depth discussions of the self-reported data and participate in structured site visits and meetings organized by the host country. The evaluation team will use the findings of various relevant evaluations and assessments such as the World Organisation for Animal Health Performance of Veterinary Services (OIE PVS) pathway, monitoring and evaluation of disaster risk reduction and others.

After conducting the evaluation visit, the JEE team will draft a report to identify status levels for each indicator, and present an analysis of the country's capabilities, gaps, opportunities and challenges. This information will be shared with the host country, and with permission of the host country disseminated to various other stakeholders in order to facilitate international support of country implementation efforts, share best practices and lessons learned, promote international accountability, engage stakeholders, and inform and guide IHR implementation both in the host country and internationally.[2]

Format

Every indicator in the JEE tool has attributes that reflect various levels of capacity, which are identified with scores of "1" (indicating that implementation has not occurred) to "5" (indicating that implementation has occurred, is tested, reviewed and exercised, and that the country has a high level of capability for the indicator). For each indicator, a country will receive a single score based on their current capacity. The

[2] In the WHO African Region, IHR implementation is within the context of Integrated Disease Surveillance and Response Strategy and in Asia Pacific (South-East Asia Region and Western Pacific Region), IHR implementation is in the context of Asia-Pacific Strategy for Emerging Diseases.

"technical area questions" will help the evaluators determine the appropriate score. Most of the measures are descriptive and qualitative. Countries will be asked to provide documentation for some of these items in addition to the responses. The documentation and responses will be reviewed by the evaluators, and will then be discussed during the external assessment. The final report will include scores as well as a narrative identifying existing capacities, gaps and challenges.

The JEE tool was developed to provide an external mechanism to evaluate a country's IHR capacity for ensuring health security. This tool draws on the original IHR core capacities and incorporates valuable content and lessons learned from tested external assessment tools and processes of several other multilateral and multisectoral initiatives that supported the building of capacity to prevent, detect and respond to infectious disease threats.

Colour scoring system

While overlaps exist among the capacity sections of the tool, each are considered separately in the evaluation exercise. The implementation status of each core capacity will be delineated by a level of advancement or scoring that reflects the country's capacity to institutionalize and make it sustainable. The following describes the level of advancement or scoring with colour coding.

1. **No Capacity :** Attributes of a capacity are not in place Colour Code:

Red

2. **Limited Capacity :** Attributes of a capacity are in development stage (some are achieved and some are undergoing; however, the implementation has started). Colour Code:

Yellow

3. **Developed Capacity :** Attributes of a capacity are in place; however, there is the issue of sustainability and measured by lack of inclusion in the operational plan in National Health Sector Planning (NHSP) and/or secure funding. Colour Code:

Yellow

4. **Demonstrated Capacity :** Attributes are in place, sustainable for a few more years and can be measured by the inclusion of attributes or IHR (2005) core capacities in the national health sector plan. Colour Code:

Green

5. **Sustainable Capacity :** Attributes are functional, sustainable and the country is supporting other countries in its implementation. This is the highest level of the achievement of implementation of IHR (2005) core capacities. Colour Code:

Green

1. Without the achievement of all attributes at prior capacity levels, a country cannot advance to the next adjacent level, for example in order to reach "demonstrated" capacity, it has to meet all the attributes of "developed" and "demonstrated" capacity.
2. All responses should be supported by documentable evidence.

Appendix 3: Cambodia assessment background

Mission place and dates

Phnom Penh, Cambodia: 26 August–2 September, 2016

Mission team members

International experts

- Graham Rady, WHO Senior Consultant (International Team Leader)
- Jeffery Cutter, Director, Ministry of Health, Singapore
- Paul Effler, Medical Coordinator, Department of Health of Western Australia, Australia
- Peter Rzeszotarski, Operations Branch Chief, Centers for Disease Control and Prevention, USA
- Jianning Zheng, Director, WHO Collaborating Centre, China
- Ailan Li, Director, Division of Health Security and Emergencies, WHO Regional Office for the Western Pacific
- Bernadette Abela-Ridder, Team Leader, Department of the Control of Neglected Tropical Diseases, World Health Organization
- Frank Konings, Technical Officer, Division of Health Security and Emergencies, WHO Regional Office for the Western Pacific

National experts

- Ly Sovann, Director, Communicable Disease Control (CDC), Ministry of Health, Cambodia (National Team Leader)
- Sok Srun, Director, Department of Hospital Services (DHS), Ministry of Health, Cambodia
- Lo Vesnakiry, Director, Department of Planning and Health Information, Ministry of Health, Cambodia
- Chhea Chhorvann, Director, National Institute of Public Health, Cambodia
- Kheng Sim, Deputy Director, Department of Communicable Disease Control, Ministry of Health, Cambodia
- Bun Sreng, Deputy Director, Department of Communicable Disease Control, Ministry of Health, Cambodia
- Teng Srey, Deputy Director, CDC, Ministry of Health, Cambodia
- Sok Samnang, Deputy Director, Department of Communicable Disease Control, Ministry of Health, Cambodia
- Sau Sokunna, Deputy Director, Department of Hospital Services (DHS), Ministry of Health, Cambodia
- Heng Morany, Deputy Director, Department of Animal Health Production (DAHP), Ministry of Ministry of Agriculture, Forestry and Fisheries, Cambodia
- Seng Sovann, Deputy Secretary General of General Secretariat, and OIE Delegate, Ministry of Agriculture, Forestry and Fisheries, Cambodia
- Kol Hero, Deputy Director, Department of Preventive Medicine, Ministry of Health, Cambodia

- H.E. Gen. Ke Da, Deputy Secretary General, National Authority for the Prohibition of Chemical, Nuclear, Biological and Radiological Weapons of Cambodia (NACW), Cambodia
- Vong Vannchan, Chief of Quarantine Bureau, Department Of Communicable Disease Control, Ministry of Health, Cambodia
- Chhy Sokhom, Vice Chief of Quarantine Bureau, Department Of Communicable Disease Control, Ministry of Health, Cambodia
- Tek Bunchheong, Technical Officer, Department Of Communicable Disease Control, Ministry of Health, Cambodia
- Ngun Sokha, Department of Drug and Food, Ministry of Health, Cambodia
- Seng Heng, Chief of Surveillance Bureau, Department Of Communicable Disease Control, Ministry of Health, Cambodia
- Hok Srun, Aing Hoksrun, Chief of Food Safety Bureau, Department of Drug and Food, Ministry of Health, Cambodia
- Ork Vichit, Manager, National Immunization Program, Cambodia
- Yong Vuthikol, Deputy Manager, National Immunization Program, Cambodia
- Krang Sidonn, Vice Chief, Prevention and Control Bureau, Department Of Communicable Disease Control, Cambodia

Peer observer

- Narangerel Dorj, Mongolia, Ministry of Health (Peer observer)

WHO technical staff

- Reiko Tsuyuoka, Team Leader, Emerging Disease Surveillance and Response, WHO Cambodia
- Amy Parry, Technical officer (Information Systems), Emerging Disease Surveillance and Response, WHO Cambodia
- Orla Condell, Consultant, Emerging Disease Surveillance and Response, WHO Cambodia
- Vanra Leng, Technical officer (Surveillance and Infection control) WHO Cambodia
- Vannda Kab, Technical Officer, Emerging Disease Surveillance and Response, WHO Cambodia
- Vicky Houssiere, Consultant, Emerging Disease Surveillance and Response, WHO Cambodia
- Sarah Hamid, Technical Officer, Division of Health Security and Emergencies, WHO Regional Office for the Western Pacific

Objective

To assess Cambodia's capacities and capabilities relevant for the 19 technical areas of the JEE tool in order to provide baseline data to support Cambodia's efforts to improve its national public health security, and to meet its obligations under the WHO IHR (2005).

Preparation and implementation of the mission

Cambodia voluntarily requested a JEE as part of their commitment to achieving IHR (2005) core capacities. From 25 April to 6 May 2016, Cambodia 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 26 August 2016 with a briefing between government ministries and international experts of the JEE team. Between 29 and 31 August 2016, national and international experts jointly reviewed national capacities in the 19 technical areas of the JEE tool. Field visits to national laboratories (National Institute of Public Health and Institut Pasteur du Cambodge), Sihanoukville Port, and a provincial level 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 Cambodia's preparedness were presented to the Secretary of State for Health, H.E. Professor Eng Huot, and stakeholders from other ministries and agencies in Phnom Penh, Cambodia on 2 September 2016.

Limitations and assumptions

- The evaluation spanned one week, which limited the amount and depth of information that could be managed.
- It is assumed that the results of this evaluation will be made available publically.
- This evaluation is not an audit but a joint review. While information provided by Cambodia was not independently verified, it was discussed and the evaluation rating was mutually agreed by the joint evaluation team.

Key host country participants and institutions

Participating national institutions

- Ministry of Health
  - Department of Communicable Disease Control
  - Department of Hospital Services
  - Department of Human Resources
  - Department of International Cooperation
  - Department of Legislation
  - Department of Planning and Health Information
  - Department of Preventive Medicine
  - Department of Drugs and Food
  - National Centre for Malaria Control, Parasitology and Entomology
  - National Centre for Tuberculosis and Leprosy Control
  - National Centre for HIV/AIDS, Dermatology and STDs
  - National Immunization Program
  - National Institute of Public Health
- Ministry of Agriculture, Ministry of Agriculture, Forestry and Fisheries, Department of Animal Health Production

- Ministry of Commerce
- Ministry of National Defense
- Ministry of Economy and Finance
- Ministry of Environment
- National Authority for the Prohibition of Chemical, Nuclear, Biological and Radiological Weapons
- National Chemical, Biological, Radiological and Nuclear (CBRN) Task Force
- National Committee for Disaster Management (NCDM)
- Ministry of Interior
- Ministry of Industry and Handicrafts
- Ministry of Tourism
- University of Health Sciences
- Point of entry authorities

Partner observers

- Armed Forces Research Institute of Medical Sciences (AFRIMS)
- Institut Pasteur du Cambodge (IPC)
- Diagnostic Microbiology Development Programme (DMDP)
- Food and Agriculture Organization (FAO)
- United National Children's Fund (UNICEF)
- Wildlife Conservation Society (WCS)
- United States Centers for Disease Control and Prevention (US CDC)
- United States Office of Defense, US Embassy
- United States Agency for International Development (USAID)
- Naval Medical Research Unit No. 2 (NAMRU-2)
- South Asia Field Epidemiology and Technology Network (SAFETYNET)

Supporting documentation

General documents

- International Health Regulations – Joint external evaluation of Cambodia, self-assessment report, May 2016
- Cambodia – WHO Country Cooperation Strategy 2016–2020. Philippines: Regional Office for the Western Pacific, World Health Organization, 2016 (http://apps.who.int/iris/bitstream/10665/246102/1/WPRO_2016_DPM_004_eng.pdf, accessed 27 January 2017)
- Cambodia Strategic Framework for Health Financing 2008–2015. Department of Planning & Health Information, Kingdom of Cambodia, 2008 (http://www.who.int/health_financing/documents/cam_frmwrk.pdf, accessed 27 January 2017)
- Health sector analysis. Cambodia Third Health Strategic Plan 2016–2020, 2015

- Draft Cambodian National Work Plan for Emerging Diseases and Public Health Emergencies to Achieve IHR (2005) Core Capacities 2016–2020

National legislation, policy and financing

- Sub-Decree on Health Measures to Prevent and Respond to Public Health Emergency of International Concern at Points of Entry, 2015 (Khmer and English)
- Law on Animal Health and Production, December 2015
- Law on the Management of Quality and Safety of Products and Services, 2000
- Interministerial Prakas 868 on the Implementation and Institutional Arrangements on Food Safety Based on the Farm to Table Approach (Khmer and English)
- Report on Communicable Disease Control law legal assessment

IHR (2005) coordination, communication and advocacy

- Cambodia IHR monitoring questionnaire, May, 2015

Antimicrobial resistance

- Cambodia AMR country situation analysis (CSA) report, November 2013
- Cambodia National Policy to Combat AMR, 2015
- Cambodia Strategy to Combat AMR, 2015-2018
- Nomination of AMR Working Group-1
- Nomination of AMR Working Group-2

Infection prevention and control – IPC

- National Infection Control Policy, 2009
- National Strategic Plan for IPC in health care facilities 2016–2020
- National IPC Guidelines, 2010 (under revision)
- IPC in-service training curriculum, 2012
- Health care Waste Management Policy, 2009 and Guideline, 2011
- National Injection Safety Guideline, 2013

Zoonotic diseases

- MoU between the Ministry of Health and the Ministry of Agriculture, Forestry and Fisheries
- OIE country performance of veterinary services report (English)
- OIE country performance of veterinary services. Gap analysis report (English)
- Census of agriculture 2013 (English)
- Zoonotic Disease Strategic Framework for Cambodia 2012 (English)
- Strategic Plan for Zoonosis Control in Cambodia – Work plan 2014 (English)
- Law on Animal Health and Production 2015

- National HPAI Comprehensive Plan 2007
- Provincial monthly animal diseases surveillance report – Ex May 2016 (Khmer)
- Sub-Decree 108 on the Management of Slaughterhouse and Sanitary Inspection for Meat and Animal Products
- Live Bird Market (LVB), 2011
- Avian Influenza (AI)
- Rabies Elimination Strategy and Action Plan (draft)
- Veterinary Law
- Wildlife Law (draft)
- Description of existing zoonotic disease surveillance systems
- List of priority zoonotic disease pathogens for public health (MoU)
- Avian Influenza Control Policy

Food Safety

- Food Safety Law (draft)
- Food Safety Policy (draft)
- Interministerial Prakas 868 on the Implementation and Institutional Arrangements on Food Safety Based on the Farm to Table Approach (Khmer and English)
- ASEAN GAP – Good agricultural practices for production of fresh fruit and vegetables in the ASEAN region
- Prakas 331 for adapting 331 Codex Standard
- Prakas on Free Sales and Health Certification for Food Products, March 2016
- Pursat outbreak review December 2015
- SOP for Foodborne Diseases: Intersectoral Outbreak Investigations and Response 2015
- Assessment report of Capacities of Cambodia Food Testing Laboratories 2014

Biosafety and biosecurity

- Analysis of the National Laboratory Assessment Results in Cambodia: 2015, January 2016
- National Medical Laboratory Biosafety Guidelines, March 2016
- Cambodian Laboratory Assessments Report. Part 1: Group Comparison Summary, November 2015
- Assessment of the National Laboratory System and Facilities in Cambodia: Gap Analysis
- Assessment of the National Laboratory System in Cambodia, 2013
- National Policy for Medical Laboratory Services, September 2009

Immunization

- Cambodia National Immunization Program Strategic Plan (Comprehensive Multi-Year Plan) 2016–2020
- Report on the Japanese Encephalitis Campaign 2016
- Cambodia – WHO Country Cooperation Strategy 2016–2020

- Annual Report on Immunization Performance, 2015, from Ministry of Health to WHO/UNICEF
- GAVI Country Fact Sheet: Cambodia http://www.gavi.org/country/cambodia/

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- Analysis of the National Laboratory Assessment Results in Cambodia: 2015, January 2016
- Medical Laboratory Biosafety Guidelines, December 2015
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- Assessment of the National Laboratory System and Facilities in Cambodia: Gap Analysis
- Assessment of the National Laboratory System in Cambodia, 2013
- National Policy for Medical Laboratory Services, September 2009

Real-time surveillance

- Review of Early Warning Surveillance in Cambodia, 11–12 February 2016 meeting report, DEPARTMENT OF COMMUNICABLE DISEASE CONTROL , Ministry of Health
- Influenza-like-illness Sentinel Surveillance First Quarterly Report for 2015, DEPARTMENT OF COMMUNICABLE DISEASE CONTROL , Ministry of Health
- National Respiratory Disease and Influenza Bulletin, March 2016, Volume 8, No. 3, Ministry of Health
- CamEWARN Case Based Surveillance Report, Week 29, DEPARTMENT OF COMMUNICABLE DISEASE CONTROL , Ministry of Health
- Surveillance Focal Point and Rapid Response Team Guide to Communicable Disease Surveillance and Outbreak Investigations, August 2013, DEPARTMENT OF COMMUNICABLE DISEASE CONTROL , Ministry of Health

Workforce development

- Health Workforce Development Plan 2016–2020. Ministry of Health, March 2016
- Applied Epidemiology Training Programme Curriculum, draft version 1, Cambodia
- Applied Epidemiology Training Programme Strategic Plan 2016–2020, Draft August 2015

Linking public health and security authorities

- MOU between the Ministry of Health and the Ministry of Agriculture Forestry and Fisheries 2012
- Interministerial Prakas 868 on the Implementation and Institutional Arrangements on Food Safety Based on the Farm to Table Approach (Khmer and English)
- Sub-decree on Health Measures to Prevent and Respond to Public Health Emergency of International Concern at Points of Entry (Khmer and English)
- SOPs for foodborne disease outbreak response 2015

Preparedness

- National Action Plan for Disaster Risk Reduction 2014–2018, National Committee for Disaster Management (NCDM)

- Ebola Virus Disease hospital response, standard operating procedure, March 2015
- Severe Acute Respiratory Infection Hospital Response, standard operating procedure, June 2015

Medical countermeasures and personnel deployment

- Central Medical Store SOP
- Cambodia National Comprehensive Avian and Human Influenza Plan, 2007

Risk communication

- Cambodia National Comprehensive Avian and Human Influenza Plan, 2007
- Risk Communication Strategy – draft, 2014 (Khmer and English)
- Simulation exercise report, 2015
- Outbreak investigation report

Points of entry

- Sub-decree on Health Measures to Prevent and Respond to Public Health Emergency of International Concern at Points of Entry (Royal Government of Cambodia No. 129)
- Sub-decree on Health Measures to Prevent and Respond to Public Health Emergency of International Concern at Points of Entry (Khmer and English)
- Points of entry checklist: Core Capacity Requirements Assessment Tools for Designated Airports, Ports and Ground Crossings: http://www.who.int/ihr/ports_airports/PoE/en/index.html.

Chemical events

- National Profile on Chemicals Management in Cambodia prepared by the Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention, under the Ministry of Environment, 2004
- The Law on the Management of Quality and Safety of Products and Services (2000)
- Interministerial Prakas 868 on the Implementation and Institutional Arrangements on Food Safety Based on the Farm to Table Approach (Khmer and English)
- Sub-decree on Environment Impact Assessment Process, 1999
- Draft Law on Environment Impact Assessment, draft as of February 2015
- Sub-decree on Solid Waste Management, 1999
- Sub-decree on Water Pollution Control, 1999
- Establishment of Chemical, Biological, Radiological and Nuclear Task Force, 2011 (Khmer and English)
- List of CBRN Task Force members

Radiation emergencies

- Establishment of Chemical, Biological, Radiological and Nuclear Task Force, 2011 (Khmer and English)
- List of CBRN Task Force members
- Law on the Prohibition of Chemical, Nuclear, Biological and Radiological Weapons, 2009
- Constitution Article 54 to prohibit the importation and use of chemical, nuclear, biological and radiological weapons

- Collection of law documents, General Secretariat of National Authority of Chemical, Nuclear, Biological and Radiological Weapons, 2011 (Cover page)

Presentations

- Presentation on the Cambodian self-assessment
- Presentation on overview of the Cambodian public health system
- Presentations on each of the 19 JEE technical areas

Appendix 4: Opening Address of His Excellency Professor Eng Huot

Summary

Opening Address of His Excellency Professor Eng Huot, Secretary of State for Health to Plenary Session of International Health Regulations (IHR) Joint External Evaluation (JEE) 2nd September 2016: Feedback and closing sessions

- Respect to Dr Li Ailan, Director, Division of Health Security and Emergency, WPRO
- Respect to Dr Robert Newman, Director, US CDC Cambodia
- Respect to Mr Graham Rady, JEE Co-Team Leader
- Respect to excellencies, ladies and gentlemen and WHO

Following the advent of a new methodology for monitoring and evaluation of requisite IHR core capacities, Cambodia became the first Member State in the Western Pacific Region to voluntarily undertake a Joint External Evaluation (JEE) using the standard JEE tool. Cambodia is also a Global Health Security Agenda (GHSA) Phase 2 country and has developed a roadmap to build national capacity and encourage progress to achieve the requirements of IHR and other related frameworks.

Cambodia developed its National Work Plan for Emerging Diseases and Public Health Emergencies 2016–2020 to achieve IHR core capacities simultaneously and in coherence with the Cambodia Health Strategic Plan 2016–2020 (HSP3).

The important consultations with international partners on health security ensure the consistency of the National Work Plan 2016–2020 with the health security agenda in the region. The results of consolidation and planning exercises will contribute to the development of the next 5-year GHSA roadmap of Cambodia and the Sub-Mekong, Mekong Health Security Projects as well as the national plans for 2016–20 in order to achieve the common goal of building a safer region.

The JEE provides the Ministry of Health and implementing partners with crucial information about Cambodia's capacities and represents the baseline for future IHR core capacity development. We believe that the Cambodia 5-year National Workplan will serve as roadmap to achieve the required core capacities for the successful development of IHR using the APSED III mechanism. This plan must continue to ensure sustainability of the IHR core capacities already achieved and strengthen the other necessary IHR core capacities, including multisectoral and interministerial cooperation.

With technical support from WHO and other concerned organizations, I hope that the JEE led to an extensive review, identifying strong and weak areas to guide our joint improvement of required IHR capacities. I would like to request the donors, national and international organizations continue to provide technical and financial support to collectively achieve IHR core capacities.

I would also like to ask the department of COMMUNICABLE DISEASE CONTROL and other departments and concerned ministries to continue working together to achieve the work plan objectives in cooperation with development partners, national and international organizations.

Finally I wish the chair, excellencies, ladies and gentlemen a healthy and successful meeting today.

WHO/WHE/CPI/2017.11