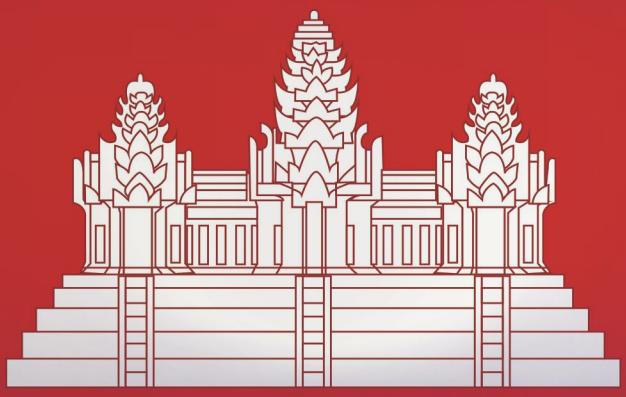
Workshop Summary

Prioritizing Zoonotic Diseases for Multisectoral One Health Collaboration in Cambodia



Sihanoukville, Cambodia

CDC

HEALTH SECURITY PARTNERS

CS 350684-A January 22, 2025

Photo 1. Cambodian woman selling flowers on a local market in Siem Reap, Cambodia.

DISCLAIMER

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention.

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Photo 2. Fig root tree covers Prasat Pram Temple in Cambodia.

EXECUTIVE SUMMARY

Photo 3. Participants from the One Health Zoonotic Disease Prioritization Workshop in Cambodia.

The purpose of the One Health Zoonotic Disease Prioritization workshop for Cambodia was to prioritize zoonotic diseases of greatest concern using a multisectoral, One Health approach with equal input from representatives of human, animal (livestock and wildlife), and environmental health sectors and other relevant partners.

The specific workshop goals were to use a multisectoral, One Health approach to:

1. Prioritize zoonotic diseases of greatest concern for Cambodia, and
2. Develop next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners.

During the workshop, participants developed a list of zoonotic diseases for prioritization for Cambodia, defined the criteria for prioritization, and determined questions and weights relevant to each criterion. A total of five zoonotic diseases were identified as a priority by participants using a mixed methods prioritization process, the One Health Zoonotic Disease Prioritization (OZHDP) process, developed by the U.S. Centers for Disease Control and Prevention (CDC) (Appendix A).

After the participants selected the priority zoonotic diseases, they developed next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners.

The priority zoonotic diseases (Table 1) for multisectoral, One Health collaboration for Cambodia are:

- Zoonotic avian influenza
- Nipah virus infection
- COVID-19
- Japanese encephalitis
- Rabies

This report summarizes the OHZDP process used to prioritize zoonotic diseases of greatest concern for Cambodia, as well as next steps and action plans to jointly address these zoonotic diseases using a multisectoral, One Health approach including human, animal, and environmental health ministries and other relevant sectors.

PARTICIPATING ORGANIZATIONS

- Ministry of Health (MoH)
- Ministry of Agriculture, Forestry, and Fisheries (MAFF)
- Office of Habitats Management and Nature Based Tourism (OHMNBT)
- Department of Wildlife and Biodiversity (DWB)
- General Directorate of Animal Health and Production (GDAHP)
- National Animal Health and Production Research Institute (NAHPRI)
- Forestry Administration (FA)
- Ministry of Environment (MoE)
- Department of Fresh Water Wetlands Conservation/MOE
- National Institute of Public Health (NIPH)
- Royal University of Agriculture (RUA)
- Institut Pasteur du Cambodge (IPC)
- Health Security Partners (HSP)
- Communicable Diseases Control Department, Cambodia (CDC)
- U.S. Centers for Disease Control and Prevention (US-CDC)
- Food and Agriculture Organization of the United Nations (FAO)
- World Health Organization (WHO)
- World Organization for Animal Health (WOAH)
- United Nations Environment Program (UNEP)
- Wildlife Conservation Society (WCS)
- United States Agency for International Development (USAID)
- German Agency for International Cooperation (GIZ)

Photo 4. Panorama of Angkor Wat, a famous Cambodian landmark.

Photo 5. Cardamom Mountains, Koh Kong, Cambodia.

Table 1. Priority zoonotic diseases selected by participants in Cambodia's OHZDP workshop, conducted May 23–25, 2023

Zoonotic Disease	Agent	Human Disease Burden	Animal Disease Burden	Availability of Diagnostics, Treatment, and Prevention
Zoonotic Avian Influenza	Influenza A viruses	By February 2023, 58 cases including 38 deaths (case fatality rate 66%) were reported in country.[1]	By March 2023, 61 outbreaks on poultry/ wildlife have been reported in country.[2]	Treatment for humans is mainly supportive. Influenza surveillance exists in country.
Nipah	Nipah virus	No human cases were reported as of February 2022 in country. According to WHO, case fatality rate is estimated at 40 to 75%.[3]	No information reported for livestock but bat seropositivity is reported at 11.5%.[4]	There are no vaccines or specific treatments to prevent or cure Nipah virus infection.[5]
COVID-19	SARS-CoV-2	As 22 May 2023, 138,744 cases (3,056 deaths; case fatality rate 2.20%) were reported in country.[6]	In Cambodia, SARS-CoV-2 has not been detected in animals. Beta-coronaviruses have been detected in rodents (2.5%, 4/159), bats (0.9%, 3/568), and bat feces (1.3%, 14/1,005).[7]	An available and effective vaccine for people exists. Early detection and targeted response with surveillance has been implemented; public health and social measures continue; human vaccination is ongoing.
Japanese Encephalitis	Japanese encephalitis virus	Incidence was estimated at 3.7 per 100,000 among all ages in 2018. 6–11 cases per 100,000 children annually.[9]	More than 95% of 36,709 trapped mosquitoes were potential vectors.[7]	Available vaccine exists for people.
Rabies	Lyssavirus	From 1998–2018, of 87 suspect rabies cases, approximately 73% were confirmed positive. Over 400 human deaths from canine rabies annually.[9]	Between 2000–2021, 54.2% of dogs tested for rabies were positive, with an average of 201 dogs being tested each year.[7]	Effective animal vaccine exists. Post-bite management for people is very effective and available. Vaccine is available for both people and animals. Post-bite management for people is effective and available.

INTRODUCTION AND BACKGROUND

Zoonotic diseases are diseases that spread between animals and people. Sixty percent of infectious diseases and about 3 in every 4 newly emerging infectious diseases are zoonotic. Of the estimated five new diseases that appear every year, three are of animal origin. Additionally, 80% of agents with bioterrorism potential are zoonotic, making zoonotic diseases important pathogens on which to focus.[10]

Photo 6. Tropical beach with turquoise clean water, blue sky and white sand. Saracen Bay, Koh Rong Samloem, Cambodia.

Geography and Population

Cambodia is a country in the southern Indochinese Peninsula in Southeast Asia, spanning an area of 181,035 km^2. The country borders Thailand to the northwest, Laos to the north, Vietnam to the east, and the Gulf of Thailand to the southwest. Cambodia shares the Mekong River basin with China, Myanmar, Thailand, Lao PDR, and Viet Nam. Tonle Sap Lake, a main water source in Cambodia, increases in size from 2,600 km^2 to more than 10,000 km^2 during monsoon or rainy season.[11] The capital and largest city is Phnom Penh. The country's geography mainly consists of low-lying central plains and mountain ranges. The central plain includes the Tonle Sap Basin, the lower Mekong River floodplains and the Bassac River plain.[12] The Tonle Sap Lake and the Mekong River contribute to the diverse and productive ecosystem that spans the country.[12] Cambodia has a subtropical climate with variation in temperature throughout the year. There are two main seasons: rainy season (May–October) and dry season (November–April).[11] In 2019, the estimated population of Cambodia was 15.55 million. Approximately 40% of the Cambodian population lives in urban areas and 60% in rural areas. Approximately 92% of Cambodia's population is under 60 years of age.[13]

Agriculture

The Cambodian economy is based on agriculture; however, the industry and service sectors are growing.[14] Crops contributed 57.10%, animal production 11.30%, fisheries 24.70%, and forest 6.90% in national gross domestic product.[14] The expansion of agriculture and Cambodia's rich biodiversity increase the country's vulnerability to the effects of zoonotic diseases. In terms of livestock, ranching is an important economic activity, particularly in the lowlands. Cattle and buffalos are raised throughout Cambodia, as well as pigs and poultry. Additionally, dairying occurs in some of the regions. Fishing takes place mainly in rivers and sea.

One Health in Cambodia

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent. The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development.

Efforts to organize and implement One Health activities were made among ministries during the avian influenza outbreak in Cambodia in 2006. Later, a zoonotic disease technical working group (Zoo-TWG) was established to prevent and respond to zoonotic diseases, which included the CDC, GDAHP, FA, WHO, FAO and IPC. In 2012, the Zoo-TWG had identified priority zoonotic diseases including Anthrax, Avian Influenza, Rabies, Leptospirosis, and other unknown zoonotic disease in Cambodia. Furthermore, an antimicrobial resistance technical working group (AMR-TWG) was established among ministries in October 2017. Joint collaboration of the country's university network, Cambodia One Health University Network (CAMBOHUN), was also established in 2019 to build the pre-service and in-service capacity of health professionals to solve One Health issues in Cambodia.

Photo 7. Beautiful, colorful boats on a lake, Lotus Farm, Phnom Krom in Cambodia.

Zoonotic diseases

Zoonotic diseases are a threat to health security and can have many impacts. It is estimated that zoonotic diseases cause 2.5 billion illnesses and 2.7 million deaths globally each year.[15] Additionally, zoonotic diseases are not only a public health problem, but they also reduce animal production capacity and impact wildlife health, impact food safety and international trade, and result in economic losses.[16] Factors such as climate change, urbanization, animal migration and trade, travel and tourism, vector biology, anthropogenic factors, and natural factors have greatly influenced the emergence, re-emergence, distribution, and patterns of zoonotic diseases.[16]

Zoonotic diseases that occur in large numbers can impact society in three main ways. Specifically, they:

- Threaten the health of animals resulting in illness, loss of productivity, and death.
- Threaten the livelihood of the population dependent on livestock as a major source of income.
- Threaten the health of people, with ability to cause illness and death, which is associated with significant social and economic losses.

To best address zoonotic disease threats, a multisectoral, One Health approach is needed.

To begin addressing zoonotic disease challenges in Cambodia, an OHZDP workshop was held on May 23–25, 2023 at the Sokha Hotel in Sihanoukville, Cambodia. The purpose of the workshop was to prioritize zoonotic diseases of greatest concern using a multisectoral, One Health approach with equal input from representatives of human, animal (livestock and wildlife), and environmental health sectors and other relevant partners.

The specific workshop goals were to use a multisectoral, One Health approach to:

1. Prioritize zoonotic diseases of greatest concern for Cambodia, and
2. Develop next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners.

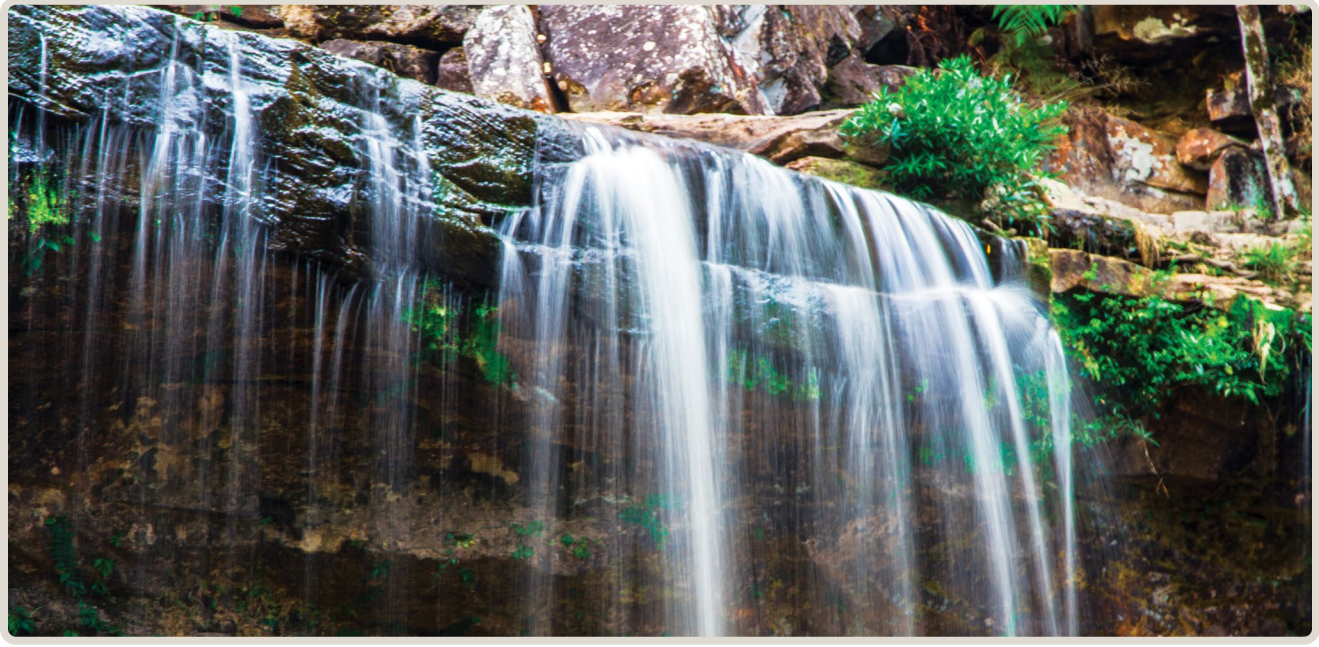

Photo 8. Popokvil Waterfall, Kampot, Cambodia.

WORKSHOP METHODS

The OHZDP process uses a mixed methods prioritization approach developed by the U.S. Centers for Disease Control and Prevention's (CDC) One Health Office. The methods have been previously described in detail (Appendix A). Workshop organizers began to prepare and plan for this workshop months in advance. During the workshop, participants first reviewed the initial zoonotic disease list to focus on for prioritization. A zoonotic disease was selected if it was known to be spread between humans and animals of concern for Cambodia. Zoonotic diseases on human or animal reportable disease lists were included on the initial list. A list of 19 zoonotic diseases, shown in Table 2 of Appendix C, were considered during the workshop.

Photo 9. Cambodian women selling fresh fruits and vegetables in the local market.

During the workshop, participants developed five criteria for ranking the 19 zoonotic diseases. Once the five criteria were developed, one categorical question was developed for each criterion through group discussion. The questions were developed to best measure each criterion. All questions had ordinal, binomial or multinomial answers. The ordinal nature is necessary for the scoring process and each answer choice was given a score, which was determined by the participants. Voting members then individually ranked their preferences for the relative importance of each criterion. Each individual voting member's ranking were then inputted into the OHZDP Tool by a facilitator and a group weight for each criterion was calculated. Facilitators and participants answered each question for each zoonotic disease using data that were identified through an extensive literature search, as well as information from the World Health Organization (WHO), the World Organisation for Animal Health (WOAH), Cambodia's Ministry of Health, GDAHP/MAFF, PubMED, and other relevant resources. Data on severity, pandemic and epidemic potential, prevention and control, and outbreak information were collected for each zoonotic disease. If information for a particular zoonotic disease was not available for Cambodia, regional or global data were used.

Hundreds of articles were collected with zoonotic disease-specific information on severity, pandemic and epidemic potential, prevention and control, and outbreak information for the country, region, and globally. These references were compiled and shared with all workshop participants.

After scoring all zoonotic diseases, decision tree analysis was used to determine the ranked zoonotic disease list. Each weighted criterion was applied across each question's answers for each zoonotic disease. The scores for all five questions for each zoonotic disease were summed. The largest raw score was then normalized giving that zoonotic disease a normalized score of 1. See Appendix C for a complete listing of raw and normalized scores for all zoonotic diseases that were considered for prioritization.

The zoonotic diseases with their raw and normalized scores were presented to the participants for discussion. Workshop participants then used the ranked OHZDP list to discuss and decide on a final priority list of five zoonotic diseases (Table 1). After the participants decided on the priority zoonotic diseases, they developed next steps and action plans to address the priority zoonotic diseases.

CRITERIA AND QUESTION DESCRIPTIONS DEVELOPED

The criteria for ranking zoonotic diseases selected by the voting members in Cambodia are listed in order of importance below. A description of how the questions assessed the criteria are listed below. For the full question and answer choices, see Appendix D.

Rank	Criteria	Weight	Question Description
1	Severity of Disease	0.27	What is the case fatality rate in humans and animals?
2	Transmission Potential	0.26	What is the incidence rate in humans and animals?
3	One Health Collaboration	0.14	How many of the three ministries have a joint action plan in place to respond to the disease?
4	Socioeconomic Impact	0.06	How many of the following are impacted by an outbreak of the disease? Tourism, Border Restrictions, Quarantine, Closing of Facilities, Decrease Livestock Production, Product Supply Chain, Trade Restrictions
5	Environmental Impact	0.09	Will the disease contaminate/be present in these elements in its infectious state? Air, Water, Soil

PRIORITY ZOONOTIC DISEASE LIST FOR CAMBODIA

The five priority zoonotic diseases (Table 1) for multisectoral, One Health collaboration for Cambodia are:

- Zoonotic avian influenza
- Nipah virus infection
- COVID-19
- Japanese encephalitis
- Rabies

Photo 10. Cambodian fisherman working near a small herd of water buffalo.

Photo 11. Farm workers sorting and selecting fresh peppercorns on a plantation in Kampot, Cambodia.

NEXT STEPS AND ACTION PLANS

After finalizing the list of priority zoonotic diseases, workshop participants discussed next steps and action plans to address the priority zoonotic diseases using a multisectoral, One Health approach.

A summary of the recommendations organized by theme follows:

One Health Coordination

Goal: Create a functional One Health Coordination Committee

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Development of Cambodia One Health Strategic Plan	Endorsed Cambodia One Health Strategic Plan	MAFF, MOE, MOH Quadripartite (FAO, WHO, WOAH, UNEP) and partners (USAID, WB, ADB, US CDC, KFW, etc.)
Establishment of a One Health Coordination Committee (including TORs, responsibilities, structure, communication flow, meeting frequency, and secretary role)	Meeting Frequency Report of meeting shared	MAFF, MOE, MOH Quadripartite (FAO, WHO, WOAH, UNEP) and partners (USAID, WB, ADB, US CDC, KFW, etc.)
Development of information sharing platform (outbreak, surveillance, event)	Outbreak, surveillance, event information routinely shared	MAFF, MOE, MOH Quadripartite (FAO, WHO, WOAH, UNEP) and partners (USAID, WB, ADB, US CDC, KFW, etc.)
Timeframe for Progress Check	1 year	

Workforce

Goal: Establish One Health Rapid Response Teams (OHRRT)s

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop and review One Health curriculum	Standard operating procedures, Guideline, Training manual (Annual review)	MAFF, MOE, MOH Development partners
Training and supervision: to complete the One Health Rapid Response Team (OHRRT) pilot, Cambodia Applied Veterinary Epidemiology Training (CAVET), Field Epidemiology Training Program (FETP) (national, subnational, community levels); evaluation	Training: • OHRRT: Five times per year • CAVET: Two times per year • FETP: Two times per year • Three ministries: Three times per year • Supervision: Monthly • Evaluation: Yearly	MAFF, MOE, MOH Development partners
Exchange program	Study tour (Once a year) Field visit (US-CDC) (Once a year)	MAFF, MOE, MOH Development partners
Simulation Exercise (SimEx)	Three times per year	MAFF, MOE, MOH
Timeframe for Progress Check	1 year	

Public Communication

Goal: Ensure the public is informed and well-aware of the priority zoonotic diseases and how to prevent those diseases

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop a public communication plan for One Health and the priority zoonotic diseases	A finalized plan for public communication	MAFF, MOE, MOH
Establish a One Health taskforce for the public communication	A taskforce of One Health established	MAFF, MOE, MOH
Map relevant stakeholders and identify resources to support the public communication plan	Identified stakeholders and resource mobilization	MAFF, MOE, MOH
Develop information, education, and communications (IECs) materials and disseminate (e.g., sharing on social media, TV, Facebook, Radio)	Developed IECs materials	MAFF, MOE, MOH
Develop One Health communication channels (e.g., website or webpage or social media)	Developed website or webpage for One Health	MAFF, MOE, MOH
Monitor and evaluate the communication plan (e.g., assessment of effectiveness of public communication on rabies awareness)	Progress reports (monthly or quarterly or annually)	MAFF, MOE, MOH
Timeframe for Progress Check	2 years	

Preparedness and Planning

Goal: Cambodian strategic and action plan for prevention and control of the priority zoonotic diseases

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop a preparedness strategic and action plan for the priority zoonotic diseases	A finalized strategic and action plan for the prioritized zoonoses	MAFF, MOE, MOH
Identify and mobilize resources from stakeholders to implement the preparedness strategic plan and action plan for the priority zoonotic diseases	Identified resources and estimated funding, and contingent funding	MAFF, MOE, MOH
Test the preparedness strategic plan and action plan for the priority zoonotic diseases	A simulation exercise joint by One Health ministries	MAFF, MOE, MOH
Periodically revise and update the preparedness strategic plan and action plan for the priority zoonotic diseases	A periodically updated version of the strategic and action plan	MAFF, MOE, MOH
Timeframe for Progress Check	2–3 years	

Research

Goal: To better understanding the burden of the priority zoonotic diseases for control and prevention

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Conduct prevalence study of the priority zoonotic diseases (Two years research)	Yes	MAFF, MOE, MOH
Conduct Knowledge, Attitudes, and Practices (KAP) study of the priority zoonotic diseases (One year)	Yes	MAFF, MOE, MOH
Scientific journal publication (One year)	Yes	MAFF, MOE, MOH
Dissemination of the research finding (Six months)	Yes	MAFF, MOE, MOH
Timeframe for Progress Check	6 months	

Technology

Goal: Best use of data storing, analyzing, and sharing

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Information sharing: Two year Develop website Reporting system Application	Yes	Development partners/ consultant
Data storage: • Develop web-based platform (One year) • Cloud (Purchase)	Yes	Development partners/ consultant

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Data collection: • Develop application tool (One year) • Use existing application tools	Yes	Development partners/ consultant
Data analysis: • Use existing statistics tools	Yes	Development partners/ consultant
Administration material: • Computer laptop, internet, mobile phone device, GPS, Camera	Yes	Development partners/ consultant
Communication: • Develop or/and set up hotline • Application	Yes	Development partners/ consultant
Training for three ministries: (Three times per year) • QGIS • Data entry • Data analysis • Application tools	Yes	Development partners/ consultant
Timeframe for Progress Check	Yearly	

Outbreak Response

Goal: Early detection and rapid response

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop Standard Operating Procedures (SOP) for outbreak response for OHRRT	SOP was developed	MAFF, MOE, MOH
Train the trainees on the SOP for the OHRRT	SOP trained	MAFF, MOE, MOH
Simulation exercises	At least 3 simulations	MAFF, MOE, MOH
Conduct risk communication	All outbreaks	MAFF, MOE, MOH
After action review	All outbreaks	MAFF, MOE, MOH
Procure logistic (PPE, IEC material, disinfectants, drugs, vaccines, etc.)	Technical and administrations prepared	MAFF, MOE, MOH
Timeframe for Progress Check	Yearly	

Laboratory Capacity

Goal: Detection for the priority zoonotic diseases

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop SOP for serology, molecular and sequencing analysis Nipah and rabies (MoH) Rabies and Japanese encephalitis (GDAHP) MoE needs for all priority zoonoses	SOP developed among the sectors	NIPH, NAHPRI and MOE lab

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Updated/Review SOP for Nipah, rabies, Japanese encephalitis (NAHPRI/GDAHP)	SOP updated and reviewed	NAHPRI/GDAHP
Organize trainings on Nipah and rabies, and Japanese encephalitis detection (serology, molecular, and sequencing analysis)	At least 2 technical staff per each sector are trained	NIPH, NAHPRI and MOE lab
Conduct staff competency assessment on Nipah, rabies, and Japanese encephalitis testing performance	All staff performing the test are passed staff competency	NIPH, NAHPRI and MOE lab
Participate in External Quality Assurance (EQA) program for the priority zoonoses	All labs participated EQA program one time/year	NIPH, NAHPRI and MOE lab
Procure equipment, reagents, and consumables for the priority zoonotic diseases	Equipment, reagents, and consumables are available place for performing the tests	NIPH, NAHPRI and MOE lab
Maintenance and calibrate all main equipment	All main equipment for priority zoonoses testing are annually maintained and calibrated	NIPH, NAHPRI and MOE lab
Provide pre-exposure prophylaxis (PrEP), including rabies and influenza vaccine, to all lab staff involved	All involved staff received PrEP for rabies and influenza	NIPH, NAHPRI and MOE lab
Timeframe for Progress Check	6 months	

Surveillance Capacity

Goal: Functional coordinated surveillance on the priority zoonotic diseases for early detection and effective response

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Design a coordinated surveillance protocol (sampling, lab algorithm, data management) Field testing and simulation SOP training	Surveillance protocol endorsed by MAFF, MOE, MOH	MAFF, MOE, MOH Quadripartite (FAO, WHO, WOAH, UNEP) and partners (USAID, WB, ADB, US.CDC, KFW…)
Conduct longitudinal coordinated surveillance for the priority zoonotic diseases in province	Publication for national, regional and global	MAFF, MOE, MOH
Submit a budget for Surveillance from the government annual allocation	Funding for surveillance is provided annually and sufficiently	MAFF, MOE, MOH Quadripartite (FAO, WHO, WOAH, UNEP) and partners (USAID, WB, ADB, US.CDC, KFW…)
Enhance and expand the existing surveillance system	Timely shared surveillance results Number of surveillance sites increased	MAFF, MOE, MOH
Timeframe for Progress Check	Yearly	

Prevention and Control

Goal: Effectively prevent and control the priority zoonotic diseases occurring in Cambodia

Next Steps	Indicators to measure when the next steps are achieved	Sector(s) Responsible
Develop prevention and control plan for the priority zoonotic diseases	Developed action plan for prevention and control of the prioritized zoonoses	MAFF, MOE, MOH
Develop prevention and control SOP for the priority zoonotic diseases	SOPs and guidelines developed	MAFF, MOE, MOH
Identify stakeholders and resources for prevention and control	Identified and established taskforce for prevention and control	MAFF, MOE, MOH
Establish facilities, ensure availability of medicines, vaccines, equipment, PPE for prevention and control	Established the facilities, available medicines, vaccines, equipment, PPE, etc.	MAFF, MOE, MOH
Test the prevention and control of the priority zoonotic diseases	Conducted SimEx testing on prevention and control	MAFF, MOE, MOH
Timeframe for Progress Check	Yearly	

Photo 12. A family of monkeys atop an ancient temple.

APPENDIX A: Overview of the One Health Zoonotic Disease Prioritization Process

U.S. Centers for Disease Control and Prevention: Overview of the One Health Zoonotic Disease Prioritization Workshop https://www.cdc.gov/onehealth/what-we-do/zoonotic-disease-prioritization/

ONE HEALTH ZOONOTIC DISEASE PRIORITIZATION PROCESS OVERVIEW

Goals of the One Health Zoonotic Disease Prioritization Process

- To use a multisectoral, One Health approach to
  1. Prioritize zoonotic diseases of greatest concern
  2. Develop next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners

OHZDP Workshop Process

BEFORE THE WORKSHOP

Prepare and Plan for the Workshop

- Contact the CDC One Health Office at least 3 months before scheduling a workshop.
- Identify Core Planning Team and obtain financial resources to accommodate for workshop logistics, venue, materials, travel, and translation.
- Identify workshop participants (facilitators, voting members, advisors) from human, animal, and environmental health sectors and other related partners.
- Generate an initial list of zoonotic diseases to be considered for prioritization using reportable disease lists, literature, and input from all represented One Health sectors.
- Conduct a literature review on the initial list of zoonotic diseases by reviewing publications, reports, grey literature, etc.

DURING THE WORKSHOP

Develop Criteria

- 5 criteria will be used to prioritize the list of zoonotic diseases; criteria are locally appropriate and address the needs of each unique location.

Develop Questions

- 1 categorical question will be developed to measure each criteria.

Rank Criteria

- Each voting member will rank criteria in their preferred order, allowing each sector to address their sector's priorities and needs. Individual rankings are combined to produce a combined ranked list of criteria.

Prioritize Zoonotic Diseases

- Score each zoonotic disease by answering the categorical questions for each weighted criterion and entering this data into the OHZDP Tool.
- The ranked zoonotic disease list from the OHZDP Tool is used to facilitate discussion among the participants to finalize the priority zoonotic disease list.

Discuss Next Steps and Action Plans for Multisectoral, One Health Engagement

- Discuss next steps and action plans for identifying areas for One Health engagement for prevention and control of the prioritized zoonotic diseases.

AFTER THE WORKSHOP

- Stakeholders advocate and implement recommended next steps and action plans to implement a One Health approach for the priority zoonotic diseases.

OHZDP Workshop Outcomes

- A list of priority zoonotic diseases of greatest concern agreed upon by all represented One Health sectors
- Recommendations for next steps and action plans for multisectoral, One Health engagement to address the priority zoonotic diseases
- Understanding of the roles and responsibilities of all represented One Health sectors
- The creation or strengthening of multisectoral, One Health coordination mechanisms and networks
- A report highlighting the outcomes of the workshop to help advocate for One Health priorities

www.cdc.gov/onehealth/global-activities/prioritization.html

APPENDIX B: One Health Zoonotic Disease Prioritization Workshop Participants for Cambodia

Voting Members

Name	Organization	Title/Position
Ly Sovann	Ministry of Health	Director of CDC Department
Yi Sengdoeurn	Ministry of Health	Deputy Director of CDC Department
Seng Sopheavy	Ministry of Health	Health officer of CDC Department
Chau Darapheak	Ministry of Health	Lab chief of National Institute of Public Health
Sorn San	Ministry of Agriculture, Forestry and Fisheries	Deputy Director General of General Directorate of Animal Health and Production
Chheang Dany	Ministry of Agriculture, Forestry and Fisheries	Deputy Director General of Forestry Administration
Chheav Sopheaktra	Ministry of Agriculture, Forestry and Fisheries	Deputy Director of Department of Wildlife and Biodiversity
Chuorp Chansophal	Ministry of Environment	Deputy Director of Department of Fresh Water Wetlands Conservation
Son Virak	Ministry of Environment	Vice Chief of Technical Office of Department of Fresh Water Wetlands Conservation
Chea Puthea	Ministry of Environment	Vice Chief of Technical Office of Department of Fresh Water Wetlands Conservation
Prum Sambath	Ministry of Environment	Technical Officer of Department of Fresh Water Wetlands Conservation
Chhim Vutha	Ministry of Agriculture, Forestry and Fisheries	Chief Office of Epidemiology and Information Analysis, National Animal Health and Production Research Institute, General Directorate of Animal Health and Production

Advisors/Observers

Name	Organization	Title/Position
Sao Sovann	Ministry of Health	Health officer of CDC Department
Cheab Sunheng	Ministry of Health	Health officer of CDC Department
Ung Bunsong	Ministry of Agriculture, Forestry and Fisheries	CAVET manager, General Directorate of Animal Health and Production
Sin Grandy	Ministry of Agriculture, Forestry and Fisheries	Vice Chief of Office of Investigation, Surveillance and Control of Zoonoses, General Directorate of Animal Health and Production
Theng Kouch	Royal University of Agriculture	Vice Dean of Faculty of Veterinary Medicine
Janin Nouhin	Institut Pasteur du Cambodge (IPC)	Senior Scientist
Lim Huy	U.S. Centers for Disease Control and Prevention, Cambodia	Public Health Specialist
Um Bunna	U.S. Centers for Disease Control and Prevention, Cambodia	Veterinary—Health Specialist
Nop Sotheara	USAID	Project Management Specialist for Infectious Diseases

Name	Organization	Title/Position
Hak Makara	FAO Cambodia	Vice Chief of Technical Office of Department of Fresh Water Wetlands Conservation
Chea Sokha	Wildlife Conservation Society	Health Team Manager, OH policy
Ieng Vanra	World Health Organization	Technical Officer of Information Systems and Surveillance, Health Emergencies Programme
Chantanee Buranathai	World Organization of Animal Health	One Health Coordinator
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Photo 13. A village fisherman works hard for his daily catch on the banks of the Tonle Sap in Cambodia.

APPENDIX C: Ranked Zoonotic Disease List in Cambodia from the One Health Zoonotic Prioritization Tool

Rank#	Zoonotic Disease	Zoonotic Disease	Raw Score	Final Score
1	Zoonotic avian influenza	Influenza A virus (H5N1, H9N2)	1.091	1.000
2	Nipah	Nipah virus	0.968	0.887
3	COVID-19	SARS-CoV-2	0.954	0.874
4	Japanese encephalitis	Japanese encephalitis virus	0.811	0.743
5	Rabies	Rabies virus	0.808	0.741
6	Hanta	Hantavirus	0.807	0.740
7	Trichinellosis	*Trichinella spp.*	0.801	0.734
8	Streptococcosis	*Streptococcus suis*	0.793	0.727
9	Ebola	Ebolavirus	0.776	0.712
10	Anthrax	*Bacillus anthracis*	0.761	0.698
11	Leptospirosis	*Leptospira spp.*	0.626	0.574
12	Salmonellosis	*Salmonella spp.*	0.567	0.520
13	Cystercercosis	*Taenia solium*	0.548	0.502
14	Staphylococcosis	*Staphylococcus aureus*	0.533	0.488
15	Zika	Zika virus	0.528	0.484
16	Mpox	Mpox virus	0.497	0.455
17	Brucellosis	*Brucella spp.*	0.481	0.441
18	Zoonotic tuberculosis	*Mycobacterium bovis*	0.434	0.398
19	Q fever	*Coxiella burnetii*	0.361	0.331

Photo 14. Sunset over Phnom Penh, viewed from eastern side of Tonle Sap river, Cambodia.

APPENDIX D: Criteria, Criteria Weights, and Questions Developed

1. **Severity of Diseases (Criterion weight = 0.28)**

   Question: What is the case fatality rate in animals and humans in Cambodia

   Answer:

   - ☐ High both in humans and animals (4)
   - ☐ High in humans but low in animals (3)
   - ☐ Low in human but high in animals (2)
   - ☐ Low both in humans and animals (1)

   Priority should be given to data from Cambodia, otherwise regional/global data can be taken. Lethality defined with treatment in Cambodia. If the disease or diagnosis does not exist, we use regional/global data.

2. **Transmission Potential (Criterion weight = 0.27)**

   Question: What is the incidence of the disease in animals and humans?

   Answer:

   - ☐ High in both animals and human (4)
   - ☐ High in humans, low in animals (3)
   - ☐ High in animals, low in humans (2)
   - ☐ Low in both animals and humans (1)

3. **One Health collaboration (Criterion weight = 0.26)**

   Question: How many of the three ministries/sectors implement the zoonotic disease control?

   Answer:

   - ☐ 3 ministries (4)
   - ☐ 2 ministries (3)
   - ☐ 1 ministry (2)
   - ☐ None of the 3 ministries (1)

4. **Socioeconomic impact (Criterion weight = 0.14)**

   Question: How many factors are impacted by the diseases?

   Factors: Tourism, border restrictions, quarantine, closing of public facilities, decrease livestock production, trade restrictions, product supply chain

   Answer:

   - ☐ All factors (5)
   - ☐ 5 or 6 factors (4)
   - ☐ 3 or 4 factors (3)
   - ☐ 1 or 2 factors (2)
   - ☐ None (1)

5. Environmental impact (Criterion weight = 0.06)

Question: What are the socioeconomic or environmental impact of the disease?

Answer:

- ☐ 3 of 3 (4)
- ☐ 2 of 3 (3)
- ☐ 1 of 3 (2)
- ☐ None (1)

Photo 15. Happy Cambodian children riding an ox cart in a village near Siem Reap, Cambodia.

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Photo 16. Cambodian school children standing in a doorway of a classroom in a small village.

http://www.cdc.gov/onehealth