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EIGHTH ASIA-PACIFIC WORKSHOP ON MULTISECTORAL COLLABORATION AT THE ANIMAL-HUMAN-ECOSYSTEMS INTERFACE

Bangkok, Thailand | 9-11 April 2019

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World Organisation for Animal Health
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Preparation of this document

The Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific (FAO RAP) led the preparation of this report in collaboration with the Regional Tripartite partners¹ and those who participated in the meeting of the *Eighth Asia-Pacific workshop on multisectoral collaboration at the animal-human-ecosystems interface* held in Bangkok, Thailand from 9-11 April 2019.

¹ World Organisation for Animal Health (OIE) Regional Representation for Asia and the Pacific; OIE Regional Representation for Asia and the Pacific; OIE Sub-Regional Representation for South East Asia; World Health Organization (WHO) Regional Office for Southeast Asia; and, WHO Regional Office for Western Pacific

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² FAO Regional Office for Asia and the Pacific

³ OIE Regional Representation for Asia and the Pacific; and, OIE Sub-Regional Representation for South-East Asia

⁴ WHO Regional Office for Southeast Asia; and, WHO Regional Office for Western Pacific

Abbreviations and acronyms

AI	Avian Influenza
AMR	Antimicrobial Resistance
AMRCO	AMR Coordinating Office
AMU	Antimicrobial use
APSED III	Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies
ARES	ASEAN Rabies Elimination Strategy
ASEAN	Association of Southeast Asian Nations
BARA	Bangladesh AMR Response Alliance
CCHF	Crimean Congo Haemorrhagic Fever
CDC	Centers for Disease Control and Prevention
CIRAD	French Agricultural Research Centre for International Development
CNRS	National Centre for Scientific Research, France
DDC	Department of Disease Control, Thailand
DLD	Department of Livestock Development, Thailand
ECTAD	Emergency Centre for Transboundary Animal Diseases
FAO	Food and Agriculture Organization of the United Nations
FAO RAP	FAO Regional Office for Asia and the Pacific
GAP	Global Action Plan
GARC	Global Alliance for Rabies Control
GAVI	Global Alliance for Vaccines and Immunisation
GF-TADs	Global Framework for Progressive Control of Transboundary Animal Diseases
GHSA	Global Health Security Agenda
GISRS	Global Influenza Surveillance and Response System
HAIRS	Human Animal Infections and Risk Surveillance
HPAI	highly pathogenic avian influenza
IEDCR	Institute of Epidemiology and Disease Control Research
IHR	International Health Regulations (2005)

IOM	International Organization for Migration
IPC	Infection Prevention and Control
JEE	Joint External Evaluation
JRA	Joint Risk Assessment
M&E	Monitoring and Evaluation
MCM	Multisectoral Coordination Mechanism
NAP	National Action Plan
NAPHS	National Action Plan for Health Security
NBW	National Bridging Workshop
NSAP	National Strategic Action Plan
NSP-AMR	National Strategic Plan on AMR
OFFLU	OIE-FAO Network of Expertise on Animal Influenza
OH APP	One Health Assessment for Planning and Performance
OH-SMART	One Health System Mapping and Analysis Resource Toolkit
OHZDP	One Health Zoonotic Disease Prioritization
OIE	World Organisation for Animal Health
PEP	Post-exposure prophylaxis
PHOVAPS	Pacific Heads of Veterinary and Animal Production Services
PPHSN	Pacific Public Health Surveillance Network
PVS	Performance of Veterinary Services
RACE	Rabies Action Center of Excellence
SAARC	South Asian Association for Regional Cooperation
SARE	Step-wise Approach to Rabies Elimination
SEAOHUN	Southeast Asia One Health University Network
SPC	Pacific Community
TADS	Transboundary Animal Diseases
TB	Tuberculosis
TZG	Tripartite Zoonoses Guide
UAR	United Against Rabies
UN	United Nations

UNDP	UN Development Programme
UNEP	UN Environment
UNGA	UN General Assembly
UNHCR	UN High Commissioner for Refugees
UNOPS	UN Office for Project Services
USAID	United States Agency for International Development
VCM	vaccine composition meeting
WAAW	World Antibiotics Awareness Week
WG	Working group
WHA	World Health Assembly
WHO	World Health Organization
WHO SEARO	WHO Southeast Asia Regional Office
WHO WPRO	WHO Regional Office for the Western Pacific
WRD	World Rabies Day

Executive summary

The 8th Asia Pacific workshop on multisectoral collaboration at the animal-human-ecosystems interface was held in Bangkok, Thailand from 9 to 11 April 2019. The Food and Agriculture Organization of the United Nations (FAO) hosted the workshop in collaboration with the Regional Tripartite, which included FAO, World Organisation for Animal Health (OIE) and the World Health Organization (WHO). A total of 142 participants attended this workshop including representatives from national governments of 28 countries in the Asia Pacific region, regional organizations, academic institutions, experts and development partners working on human health, animal health and wildlife issues.

Participants shared their experiences with implementing multisectoral collaboration using a One Health approach to manage infectious diseases and other threats such as antimicrobial resistance (AMR) at the country and regional levels. It was observed that much progress has been made by countries in establishing and operationalizing multisectoral collaboration for One Health since the first meeting held in 2010.

Various tools and frameworks were presented that aim to enhance multisectoral collaboration, and countries shared their experiences with the application of these tools as well as identified their interest and needs for future application of these tools.

Nevertheless, a number of constraints for multisectoral coordination and collaboration still prevail in countries and generally relate to lack of high-level commitment, human and financial resources and absence of a (legal) framework, structure or collaboration mechanism with clear roles and responsibilities.

Competing priorities and the lack of awareness hamper the operationalization of One Health leading to poor information sharing especially related to epidemiological data and joint risk assessment or coordinated disease prevention and control activities.

Communication of risks needs to be transparent and reliable. Language and format of communication needs to be adapted to suit the requirements of specific target groups. The use of new media such as web-based information systems and social media, as well as establishing linkages with the press need to be further explored for the timely and accurate delivery of health-related messages.

As most zoonotic diseases are transboundary in nature due to the movement of humans, animals (including wildlife) and animal products across regions, the importance of cross-border collaboration for One Health was recognized.

The proportion of female participants at this workshop was 48% which was higher than in the previous workshops. There was a good balance of human and animal health sectors represented, although the environment-biodiversity sector was underrepresented. Participants greatly appreciated this workshop as a multisectoral platform to review and update on progress made in operationalization of One Health. The majority of participants expressed their satisfaction with the organizational and technical contents of this workshop.

Introduction

One Health is an integrated approach for preventing and mitigating health threats at the animal-human-plant-environment interfaces with the objective of achieving public health, food and nutrition security, sustainable ecosystems and fair trade facilitation. Health threats have become more complex due various factors including globalisation, increasing population, climate change and deforestation. Majority (75%) of emerging and re-emerging infectious diseases are of animal origin and more than 70% of additional animal protein will be needed to feed the world by 2050. Hence, we are losing more than 20% of animal production in the world due to animal diseases. Furthermore, animal diseases pose a direct threat to incomes of rural communities that are dependent on livestock production. Considering the complexity of health threats, controlling health risk can only be addressed by multisectoral collaboration of functional health systems.

During the past several years, the multidisciplinary and intersectoral One Health approach is increasingly being adopted at the global, regional and country levels as a way to address common concerns on health threats covering animal-plant-human health with relevant environmental issues.

The Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE) and the World Health Organization (WHO) have institutionalised a Tripartite coordination mechanism to support countries with surveillance, prevention and control of emerging and re-emerging infectious diseases including zoonoses at the human, animal, plant and environmental interfaces. Regional Tripartite partners strengthened multisectoral collaboration in the Asia-Pacific region to define the way forward to further strengthen this collaboration and coordination by organising regular workshops since 2010.

The [8th Asia-Pacific Workshop on Multisectoral Collaboration at the Animal-Human-Ecosystems interface](#) was organized in Bangkok, Thailand to provide opportunities to reflect on achievements made as well as lessons learned through multisectoral collaboration on One Health issues beyond infectious diseases at country and regional levels. The workshop also touched on how multisectoral collaboration was utilised to address other relevant public health concerns taking the three Tripartite flagship topics as examples; rabies, zoonotic influenza and AMR. The Tripartite develops global strategies and tools to ensure a consistent, harmonised approach throughout the world, and to better coordinate human-animal-ecosystems health policies at the national, regional and global level. Therefore, the workshop delivered messages on focused area, but also expanded towards horizontal topics such as strengthening health systems as well as topics beyond infectious diseases. It also looked into what sustainable multisectoral coordination mechanisms exist at the regional and country levels.

Objectives of the workshop

1. Provide an update of emerging and re-emerging zoonotic diseases and other public health threats (including zoonotic influenza, rabies and AMR) at global, regional and country levels
2. Review progress made and challenges encountered in terms of multisectoral coordination, including information sharing, coordinated response and risk reduction, at regional and country levels
3. Make recommendations on further improved coordinated action at animal-human-ecosystems interface among different sectors

The three-day workshop included seven sessions applying various modalities, such as presentations, panel discussions, poster presentations, questionnaire surveys, plenary and group discussions.

Session 1: Opening and Introduction

Master of Ceremonies: Dr Tosapol Dejyong, FAO RAP

FAO

Ms Xiangjun Yao, Regional Programme Leader of FAO Regional Office for Asia and the Pacific (FAO RAP) delivered the welcome remarks on behalf of FAO emphasizing that multisectoral collaboration was the essence of achieving One Health to mitigate health threats at the animal-human-plant-ecosystems interface, which also led to achieve animal and public health, food and nutrition security, sustainable ecosystems and trade facilitation. She noted the progress made during last 10 years through the strong partnership between FAO, OIE and WHO to institutionalise Tripartite coordination mechanism to support countries with surveillance, prevention and control, and emergency preparedness and response. One Health is one of the regional priorities of FAO RAP and FAO is committed to collaborate with international partners and regional organizations in the region to make this approach work for the good of all. She expressed her wish that the workshop would give opportunities to reflect on achievements made and lessons learned in the region and to explore how multisectoral collaboration be further operationalized to address other relevant public health concerns including food safety issues, neglected tropical diseases or even the impact of climate change on health. Ms Yao also stressed that FAO works in reducing health risks from pesticides use or of air pollution caused by burning of agriculture residues. Viable policies are developed through the application of One Health, inter-ministerial collaboration and stakeholder consultation. FAO is also interested in engaging private sectors to solve emerging health threats.

WHO

Prof Tjandra Yoga Aditama, Senior Advisor of WHO Regional Office for South East Asia (WHO SEARO) delivered the message on behalf of WHO. He emphasized that more than 1 billion infections and 1 million human deaths occur every year due to zoonoses and over 75% of emerging infectious diseases are of animal origin. The Asia-Pacific region is at the epicentre of emergence; in particular, outbreaks of Middle-East respiratory syndrome Coronavirus, avian influenza (AI) and Nipah virus clearly demonstrated that new, highly infectious and/or pathogenic agents periodically emerge at the human-animal-ecosystems interface, this could continue also in the future. He stressed the need to strengthen collective preparedness and response capacities and to develop a common strategic direction at the country, regional and global levels. To this end, the Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED III) is an important initiative, especially given the need to fully implement the updated International Health Regulations (IHR). He also noted that the Tripartite's guidance and operational tools for zoonoses are particularly valuable and suggested all countries to make full use of them. Prof Aditama additionally emphasized the need to promote cross-border collaboration for the elimination of transboundary diseases like rabies and zoonotic influenza. He wished participants to gather ideas and experiences on how to strengthen multisectoral collaboration to deal with endemic, re-emerging and emerging zoonoses, alongside other health threats at the human-animal-ecosystems interface.

OIE

Dr Ronello Abila, Sub-Regional Representative of OIE Sub-regional Representation for Southeast Asia delivered the message on behalf of OIE. He noted that the regional Tripartite had come a long way in pursuing the One Health approach for enhancing capacities to prevent and control zoonoses and AMR since its inception in 2010. It has been a decade of developing roads and bridges to connect people and institutions, and building networks to further enhance cooperation and collaboration towards the common goal of preventing and controlling zoonoses, AMR and other health risks at the animal-human-ecosystems interface, since the publication of the Tripartite Concept Note in 2010 describing

their collaboration and objectives in the prevention and control of health risks at the human-animal-ecosystems interface. Since the Tripartite has provided multisectoral, collaborative leadership in addressing health challenges, he highlighted the importance of health systems strengthening in both human and animal health sectors.

Department of Livestock Development, Thailand

Dr Cheerasak Pipatpongsopon, Deputy Director General of the Department of Livestock Development (DLD) delivered the message on behalf of the DLD, Ministry of Agriculture and Cooperatives. He indicated that One Health community showed its potential for an integrated approach to deal with these complexities. With the dynamic changes of global socio-economic issues including increasing population and global consumption, change in land use, deforestation, and climate change, a multi-dimensional approach is essential. Therefore, a multidisciplinary approach is adopted to deal with complex issues in many fields. Dr Pipatpongsopon expressed that the knowledge, experience, and policy recommendations of experts would be significant for the One Health community to achieve public health, food and nutrition security, sustainable ecosystems and fair trade facilitation.

Ministry of Public Health (MOPH), Thailand

Dr Suwannachai Wattanayingcharoenchai, Director General of the Department of Disease Control (DDC) delivered the message on behalf of the Ministry of Public Health. He noted that One Health recognizes that the health of humans, animals and ecosystems are interconnected. It involves applying a coordinated, collaborative, multidisciplinary and cross-sectoral approach to address potential or existing risks that originate at the animal-human-ecosystems interface.

He also stated that the One Health approach should not be limited within the bounds of a single country, but should expand to related multinational and multilevel networks in order to powerfully mitigate the health impacts and economic loss within countries and across regions.

He noted that this three-day assembly of an outstanding group of experts is a tremendous opportunity to discuss and shape the direction particularly on three flagship topics: rabies, zoonotic influenza and AMR at national and regional levels. Finally, he warmly welcomed all participants and appreciated Tripartite partners for the organization of this workshop.

Short video summary of major accomplishment past decade

FAO RAP presented a [video summary](#) of major accomplishments of the Regional Tripartite collaboration since 2010, from concept to operationalisation of One Health at regional, sub-regional and country levels.

Dr Hirofumi Kugita, OIE Regional Representative for Asia and the Pacific and Dr Takeshi Kasai, WHO Regional Director for the Western Pacific kindly sent video messages to wish a fruitful and inspiring event.

In Dr Kugita's video message, he talked of the importance of animal and human health sectors working together to protect health and to ensure food safety and security. The One Health concept is a collaborative global approach to human, animal and ecosystem health. Dr Kugita emphasised the commitment of the OIE Regional Representation for Asia and the Pacific and the Sub-regional Representation for South East Asia towards the regional Tripartite vision of One Health in practice by strengthening collaborative mechanisms.

In his message, Dr Kasai traced the beginning of the workshop to 2010, when the first workshop on zoonoses coordination was hosted by Hokkaido University, in Sapporo Japan. At that time FAO, OIE and WHO were working hard but separately on avian influenza. The scope has since expanded to

include AMR, rabies and other zoonoses. However the principles of our collaboration and coordination remain the same, which is that each sector works to deepen understanding of the others and strengthens its systems and functions to be responsible to the needs of the others. This is how we translate One Health and turn it from concept to practice concrete action both at regional and country level.

Overview of workshop objectives and introduction of participants:

Dr Katinka De Balogh, Senior Animal Production and Health Officer, FAO RAP gave a brief overview of the workshop objectives and workshop format for the three days. She encouraged all participants to identify and post ideas on the board provided in the meeting room: 1) expectations for this workshop, 2) expectation for the Tripartite, and 3) recommendations from this workshop.

Dr Yooni Oh, Regional One Health Advisor, FAO RAP introduced a web-based Q&A and polling platform for the event which showed live results of polls and real-time questions to presenters. She led the pool by identifying clusters of participants by gender, sub-region, frequency of attending Tripartite workshop, sectors, institution, technical background, and main area of interests.

Session 2: Setting the scene

Chairs: Dr Louise Simone Fomua (Tonga) and Dr Marzuki Bin Zakaria (Malaysia)

One Health drivers and how to operationalise:

Dr Joseph Anelli, International One Health Consultant, Practical One Health Solutions started his presentation with a brief history of One Health dating back to 384 BCE when Aristotle compared human and animal anatomy. Humans are reactionary species and only change in response to catastrophic events so the only obstacle we have yet to overcome in operationalizing One Health is us (the human condition). While One Health is a more productive, economical and efficient way to work, he noted that we have not yet achieved a true collaborative state at the human, animal and environmental interface. We still need to look beyond the technical requirements of the work and spend time developing trust among the diverse teams to work collaboratively to achieve better outcome at lower costs.

As a result, operationalizing One Health approach requires us to promote a few concepts to inspire those not accepting One Health. The time for convincing people that One Health is imperative to our future is over. Going forward we must embrace change in management principles, embrace One Health ourselves, and engage anthropologist and sociologists to help us in the future. We need look no further than the Harvard Business Review⁵ to understand that “you can take the person out of the Stone Age, not the Stone Age out of the person”. He concluded by reminding all to be brave, to be bold and above all to be a One Health spokesperson and advocate.

Biodiversity on zoonotic emerging infectious diseases:

Dr Serge Morand, Research Director of CNRS-CIRAD and visiting professor at the Faculty of Veterinary Technology of Kasetsart University presented the likely interaction between biodiversity and zoonotic emergence. Using forestry as an example, he mentioned how tree species diversity regulates forest pest invasion and how pest diversity is inversely proportional to tree diversity in highly diversified forest. An example of the importance of biodiversity change in disease emergence was given by Nipah outbreaks in Malaysia following conversion of forests into palm tree plantations and increasing pig farming, which coincided with forest fires exacerbated by El Nino; all these events resulted from

⁵ How Hardwired Is Human Behavior? Nigel Nicholson 1998 (<https://hbr.org/1998/07/how-hardwired-is-human-behavior>)

human-disturbance associated with a global commodity market. With globalization, a country-specific epidemic can easily and rapidly become a global epidemic. Increasing industrial farming and converting forests to commodity crops mean that more wild species every year are lost, with biomass of cattle dramatically dominating over biomass of wild species (which are shrinking). Higher numbers of infectious diseases outbreaks are directly linked to the increasing pressure on biodiversity and biodiversity loss can contribute to easy survival of synanthropic species like rodents, which can enhance emergence of zoonotic diseases in human dominated and disturbed and simplified environments.

Globalization, change in land use and agricultural industrialization are further putting biodiversity under immense pressure which contributes to loss of natural disease regulation mechanism and therefore leads to higher incidences of disease emergence.

Journey of One Health in Bangladesh (2007-2019):

Professor Nitish Debnath, Professor and director from Chittagong Veterinary and Animal Sciences University shared experiences of Bangladesh as a regional champion in the field of One Health. Bangladesh is one of the most densely populated nations in the world in terms of human, livestock and poultry. It is also one of the fastest growing economies in the region and therefore urbanization and changes in land use are rapid. Regular outbreaks of zoonotic diseases and the challenge of feeding the poor in Bangladesh led to a realization of the need for a One Health platform in Bangladesh. One Health emerged as an informal discussion held at Chittagong Veterinary and Animal Sciences University in 2007 and a formal One Health platform for Bangladesh was created in March 2008 following Chittagong Declaration 2008. In 2012, One Health in Bangladesh was further strengthened when a One Health National Strategic Framework was developed jointly by relevant government agencies, UN organizations, development partners and One Health Bangladesh. This document was subsequently endorsed by three Ministries (Ministry of Health and Family Welfare, Ministry of Fisheries & Livestock and Ministry of Environment & Forestry) and based on this strategic framework and action plan, decision was made to establish One Health secretariat during inter-ministerial meeting on One Health in June 2016.

The One Health secretariat is hosted by the Institute of Epidemiology and Disease Control Research (IEDCR) and has been functioning with the support of the Department of Livestock Services, Directorate General of Health Services and Forestry Department. One Health Bangladesh has been functioning as a civil society movement and it has now more than 800 professional members and have been organizing regular meetings, discussions, seminars and conferences jointly with the One Health Secretariat, other government and non-government partners, UN agencies and development partners. Over the last decade, the number of outbreaks of zoonotic diseases such as avian influenza, Nipah, rabies and anthrax have reduced and overall coordinating mechanisms have improved. The One Health strategic plan is now being revised and One Health coordination will be expanded to district level. Also, a revised One Health strategic framework has recommended to include the Department of Agriculture Extension and Department of Fisheries in the coordination mechanism, a special focus is made on AMR and antimicrobial usage (AMU). The revised strategic framework and action plan has been approved in the One Health Inter-Ministerial Committee meeting held in February 2019.

Brief review of recommendations of the previous meeting (Manila 2017):

Dr Anthony Eshofonie, Epidemiologist, WHO Regional Office for the Western Pacific (WPRO) presented the recommendations of the previous meeting held at Manila in 2017. Member States were encouraged to maintain and advance multisectoral coordination mechanisms; and continue to document, evaluate and share experiences to improve responses to managing zoonoses outbreaks and addressing AMR. Member States had been encouraged to work together, contribute to technical working papers and engage in regional and national programmes on rabies and highly pathogenic avian

influenza (HPAI). Awareness and research initiatives on AMR besides development and implementation of National Action Plan (NAP) on AMR were recommended.

The Tripartite was requested to support the Member States, promote new tools and support the joint evaluation programmes. The Tripartite was also encouraged to advocate to Member States to invest in preparedness and guide and support multisectoral research.

Session 3: Update and Progress

Chairs: Dr Dipendra Raman Singh (Nepal) and Dr Hnin Thidar Myint (Myanmar)

The session started by updating the current situation and progress on three flagship topics (rabies, influenza and AMR). Presentations were prepared jointly by Tripartite including both animal and human health aspects.

Rabies:

Presentation was delivered jointly by Dr Gyanendra Gongal and Dr Kinzang Dukpa.

Dr Dukpa, Regional Project Officer, OIE Regional Representation for Asia and the Pacific updated the participants on the current situation of rabies in animals and its burden. The 'United Against Rabies (UAR) – Zero by 30' initiative of the Tripartite in partnership with Global Alliance for Rabies Control (GARC) was presented. Regional rabies initiatives and events undertaken in 2018 and upcoming Tripartite events and initiatives were summarized. OIE updated the chapters on rabies in the Terrestrial Animal Health Code and Manual of Diagnostic Tests and Vaccines for Terrestrial Animals in 2018. Regional and national capacity building workshops and events were also organized. FAO also worked on increasing collaboration between animal health and public health in rabies management, developed communication materials and organized capacity building workshops and trainings in the region.

Dr Gongal, Technical Officer, WHO SEARO presented WHO's position on rabies immunization and outlined how WHO is working to reduce the number of doses of rabies post-exposure prophylaxis (PEP) while increasing compliance rate. WHO published the 5th edition of online Laboratory techniques in rabies which was contributed to by more than 85 professionals around the world. Some of the WHO initiatives include promotion of comprehensive rabies control programmes, cost-effective intradermal rabies vaccination and generating evidence-based information for inclusion of human rabies vaccine in the portfolio of the Global Alliance for Vaccines and Immunisation (GAVI). The guidelines on human vaccination were revised in 2017 and human rabies data collection standardized. Political will in the countries to support national plans and education of public are important and the Tripartite needs to continue strengthening rabies surveillance, disseminate new techniques to achieve 70% vaccine coverage in dog populations including consideration of oral rabies vaccines and easy accessibility of quality rabies vaccine for humans and dogs.

Zoonotic Influenza:

Presentation was delivered jointly by Dr Aurelie Brioude and Dr Anthony Eshofonie.

Dr Brioude, Regional Surveillance Coordinator, FAO RAP updated the participants on the current global and regional situation and circulating strains of AI. Conducting active surveillance (to complement passive surveillance) is important for early detection of incursion of any new strain and close monitoring of the circulation of zoonotic influenza viruses across the region. Analyses of pig and poultry value chains is also essential to better understand the socio-economical drivers that determine the movements of animals and thus helps predicting the regional emergence and spread of zoonotic

influenza. Building regional anticipation capacity is important to take into account the likely drivers of risks at the human/livestock/wildlife and environment interface.

Dr Eshofonie presented WHO's Global Influenza Surveillance and Response System (GISRS) which monitors evolution of influenza viruses and prepares candidate vaccines in its reference laboratories around the world. There is a need to look at influenza at the human-animal interface due to the re-assortment potential of the virus and recent trends of other animal influenza with zoonotic or pandemic potential (H9N2, H7N9, H6N1, H10N8, H7N4, etc.). There is a growing public health concern of swine influenza due to the close relationship between human and porcine viruses. As zoonotic influenza viruses are continuously evolving, strict surveillance and better monitoring in poultry and pigs including at the human-animal interface is critical to reduction of potential cross-species adaptation and further spread of viruses.

Tripartite review of Antimicrobial Resistance (AMR) actions in the region:

Presentation was delivered jointly by Dr David Sutherland and Dr Mary Joy Gordoncillo.

Dr Sutherland, Technical Officer, WHO SEARO showed how AMR is a global One Health issue involving animal, human and environmental sectors and that it should be addressed through a One Health approach. But each sector also has its own specific settings, issues and concerns which need addressing by specialists within the sector. For AMR, there are many overlapping areas for which One Health is the most effective approach. Joint External Evaluation (JEE) findings on AMR capacities were presented showing various ranges of capacities and different levels of multi-sector involvement in the region.

Dr Gordoncillo, Regional Project Coordinator, FAO RAP emphasized ongoing AMR initiatives in the region across and between sectors particularly on: 1) improving awareness and understanding of AMR; 2) strengthening evidence through surveillance and research; 3) reducing infection through sanitation, hygiene and infection prevention and control (IPC); 4) optimizing antimicrobial usage; and 5) promoting good governance and sustainability. There is a synergy of the Tripartite partnership, as well as collaborations with other relevant agencies and stakeholders like UN Environment (UNEP). The One Health approach should be founded on strengthened systems that respective sectors should pursue.

Questionnaire analysis of OH mechanism:

Dr Yooni Oh, FAO RAP provided a summary of questionnaires received from all 28 participating countries prior to the workshop; 19 countries provided questionnaires prepared jointly by animal and human health sectors, while 9 countries provided questionnaires by single sector only. The majority of participating countries (24/28) already have National One Health coordination mechanisms in place covering overall One Health as well as topic specific, such as zoonoses or AMR. Sub-national levels of One Health coordination were in place in 16 countries. National One Health mechanism is legally recognised in 20 out of 28 countries, still formalization/legalization of national One Health mechanism was identified as challenges addressing One Health in countries along with high-level commitment. Most of the participating countries (> 80%) are receiving funding for One Health related meetings as well as activities where less than 50% of countries received funding in the previous workshop survey in 2015. Especially government funding has significantly increased from 39% (9/23) to 68% (19/28).

Poster Gallery:

Facilitator: Dr Kinzang Dukpa, OIE

To meet the objectives of this workshop, countries were requested to prepare posters. The posters included sections on: 1) zoonoses situation update, 2) AMR progress and update, 3) accomplishments

relevant to the recommendations from the 2017 workshop, and 4) the way forward for multisectoral collaboration.

Highlights of the discussion and a short summary of the elements outlined in the posters are:

1. Zoonoses update (Figures 1-3)
 - Disease trends: Rabies and AI are still major problems in the region
 - Issues and challenges included: lack of advocacy, surveillance and diagnosis, funding, and infrastructure
 - Lessons learnt: preparedness plan, joint risk assessment, strengthening capacity, multidisciplinary health systems, risk communication strategies, etc.

2. AMR progress and update (Figures 4-6)
 - Governance: NAPs developed and in various stages of implementation
 - Awareness: World Antibiotics Awareness Week (WAAW) celebration, activities targeting various stakeholders, use of social media, etc.
 - Evidence: residue monitoring for animal products, joint AMR and AMU monitoring reports, etc.
 - Issues and challenges: implementation of NAP, lack of AMR/AMU surveillance, lack of coordination among stakeholders, sustainability of funding resources, lack of high-level advocacy, etc.
 - Lessons learnt: coordination among all relevant stakeholders, building trust, etc.

3. Accomplishments since 2017 (Table 1)
 - Development of AMR NAPs and residue programmes
 - Use of several tools, such as IHR-PVS, JEE and JRA
 - Vaccination programmes, including dog rabies and avian influenza H7N9 vaccination
 - Increased political commitment for One Health
 - Many multisectoral coordination activities, joint simulations, joint trainings conducted
 - One Health education and training

4. Way forward for multisectoral collaboration
 - Constraints: competing priorities, lack of information sharing, lack of coordination, separate coordination bodies for each disease etc.
 - Next steps: generate evidence and share data, enhance laboratory capacity, advocate One Health policies at a higher political level, integrated tools for surveillance and early warning, networking between national, regional and global levels, etc.

Zoonoses update from countries

All participating countries provided posters indicating zoonoses updates.

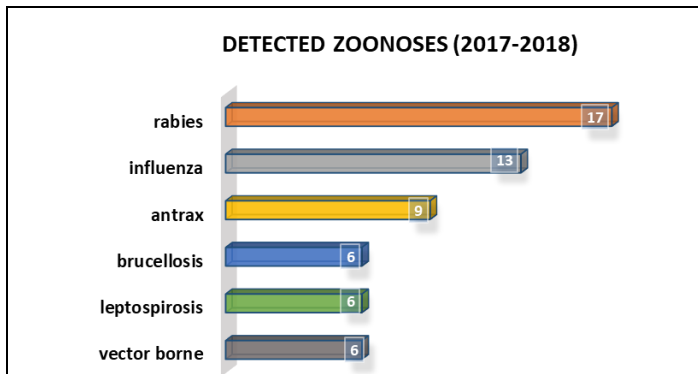


Figure 1. Zoonoses detected in the region over the past 2 years

As shown in the figure 1, rabies was the most frequently detected zoonoses followed by influenza and anthrax.

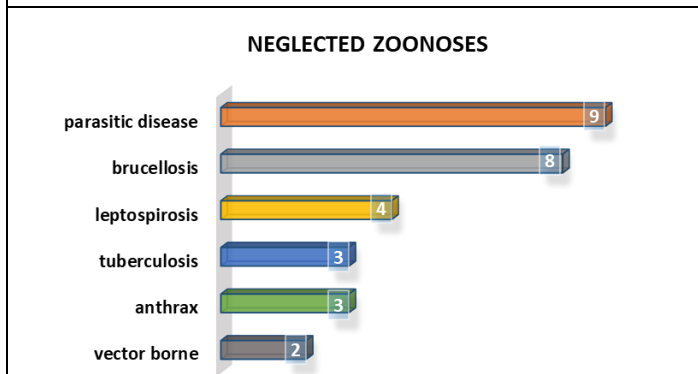


Figure 2. Identified most neglected zoonoses in the participating countries

Parasitic diseases, brucellosis and leptospirosis were identified as neglected zoonoses in the participating countries (Fig. 2).

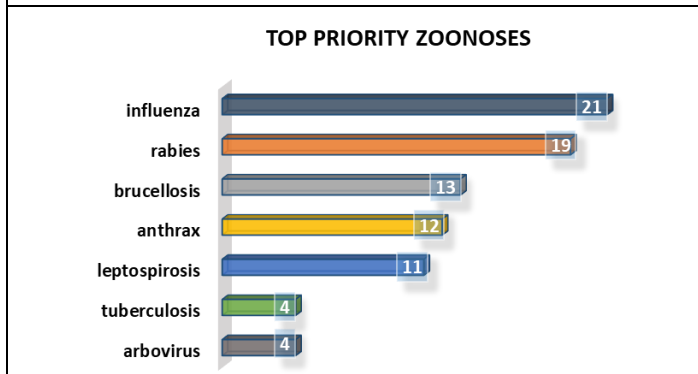


Figure 3. Top priority zoonoses in the participating countries

Top priority zoonotic diseases were identified in each country. Influenza was the most important disease in the region followed by rabies, brucellosis, anthrax and leptospirosis.

AMR progress and update from countries

All participating countries provided posters indicating AMR progress and update.

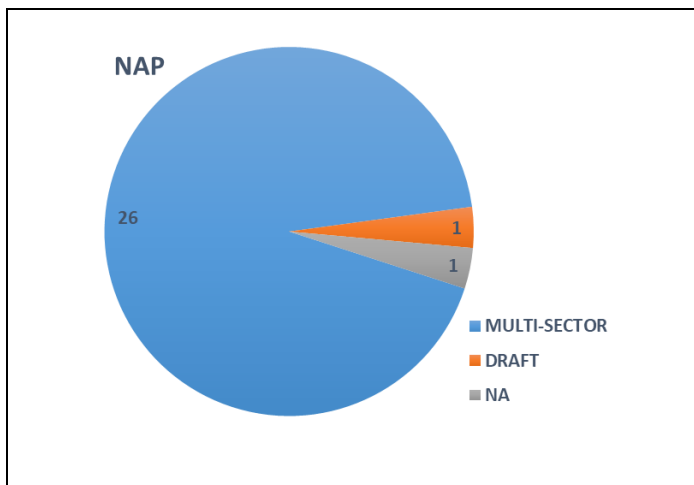


Figure 4. National Action Plan in countries

As shown in the figure 4, the majority of countries have already endorsed a multisectoral National Action Plan on AMR (26 countries), however one country has only drafted but not endorsed and another country doesn't have a National Action Plan on AMR.

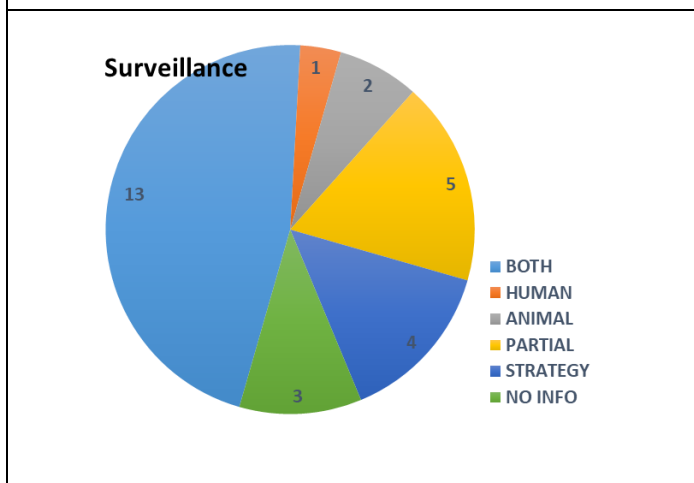


Figure 5. AMR surveillance

Surveillance for AMR was done jointly in 13 countries whereas in some countries it was only done by single sector or partially done. Four countries only have a strategic plan but have not started actual surveillance.

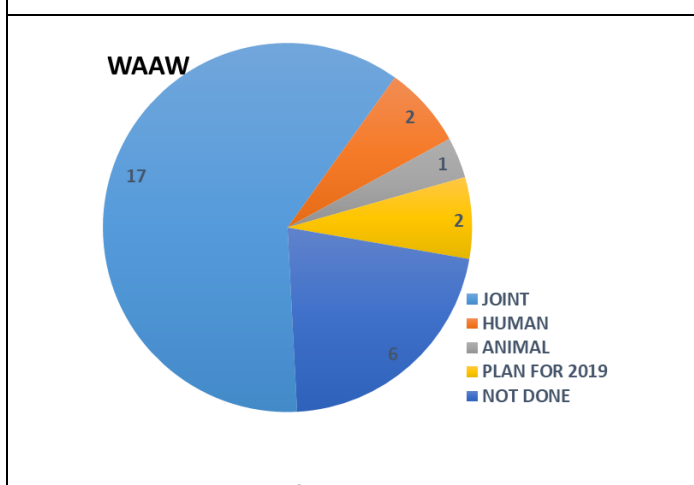


Figure 6. Celebration of World Antibiotics Awareness Week

World Antibiotics Awareness Week was jointly celebrated in 17 countries. Two out of 8 countries where WAAW was not previously celebrated are planning to do so this year. One country is celebrating not only a week but a whole month jointly.

Table 1. Green shades indicate accomplishments/progress made relevant to the 2017 workshop recommendations

COUNTRY	MCM	share expt	use tool	contribute TZG	flu	rabies	NAP
Afghanistan							
Australia							
Bangladesh							
Bhutan							
Brunei							
Cambodia							
China							
Fiji							
India							
Indonesia							
Japan							
Lao PDR							
Malaysia							
Maldives							
Mongolia							
Myanmar							
Nepal							
Pakistan							
PNG							
Philippines							
Samoa							
Singapore							
Sri Lanka							
Thailand							
Timor-Leste							
Tonga							
Vanuatu							
Viet Nam							

Session 4: Tools & frameworks for multisectoral collaboration

Facilitator: Dr Gyanendra Gongal, WHO-SEARO

Various tools and frameworks were introduced, and country experiences were shared during this session.

TRIPARTITE ZOOSES GUIDE (TZG) INCLUDING OPERATIONAL TOOL FOR MULTISECTORAL COORDINATION MECHANISM (MCM) AND FOR JOINT RISK ASSESSMENT (JRA):

Dr Elizabeth Mumford, Technical Officer from WHO Headquarters Geneva presented the 2019 Tripartite Zoonoses Guide (TZG) which provides guidance to countries wishing to take a One Health approach to addressing zoonotic diseases and other health threats at the human-animal-environment interface. One Health is not an effort to merge these sectors but to build bridges between the different sectors to strengthen national health systems and the capacity for collaboration among them. The TZG provides standard Tripartite guidance which includes country examples and experiences from all relevant sectors and guides “HOW” to build and strengthen multisectoral collaboration at the national and subnational levels. The TZG includes mapping the current situation of a country in order to build on existing infrastructures and mechanisms and guidance for monitoring and evaluation of activities undertaken. The TZG contains chapters on Multisectoral One Health Coordination Mechanisms (MCM) and Joint Risk Assessment (JRA), among many other topics. Operational Tools for these and all topic areas are currently being developed and piloted in countries by the Tripartite.

Dr Nguyen Thi Huong, Ministry of Health from Viet Nam shared her experience applying JRA in Viet Nam. Viet Nam had conducted many risk assessments since 2013 using different tools and methodologies. However, there had been many limitations in these exercises due to a lack of standard procedures, limited documentation and follow-up as well as a lack of proactiveness. The JRA was

conducted in February 2019 to assess the risk of influenza and other viruses with pandemic potential. Strong and weak points of the JRA were presented. The strong points related to providing a standard method and procedure, validity of the findings due to technical discussions and fostering ongoing intersectoral collaborations. Hence, the weak points were the need to gather a pool of experts especially when the disease is not present in the country, lack of quantitative assessment, the need for more details and criteria for developing risk assessment questions, and requiring more guidance on dealing with different likelihood estimates and on impact estimation.

Indonesia, as another piloting country for JRA, shared experiences on involving the human, animal and wildlife sectors in the JRA process. A JRA has been conducted at the sub-national level which paved the way for more funding through the sub-national budget for preparedness and response.

A question was raised on who will implement the findings of the JRA and the panellists indicated that leadership and implementation of the JRA would differ among countries depending on the country needs and context.

WHO EMRO experience showed the many challenges in some areas on implementing One Health and the need for capacity building and establishing collaborative mechanisms.

IHR-PVS NATIONAL BRIDGING WORKSHOP (NBW):

Dr Pasang Tshering from OIE RRAP presented about the IHR-PVS NBW which was designed based on the WHO-OIE operational framework for good governance at the human-animal-environment interface. Its primary objective is to identify the results of the OIE's Performance of Veterinary Services (PVS) Evaluation & Gap Analysis and WHO's IHR Monitoring and Evaluation Framework and find synergies and complementarities to develop priority joint activities. The key expected outputs of the NBW are to: 1) identify the current strengths and weaknesses in the collaboration between the animal and human; 2) map health services for 16 technical areas that are key for prevention, detection and response to health events at the human-animal interface; and 3) develop harmonized and realistic joint roadmap of activities. The workshop brings together 60 to 90 relevant stakeholders from key sectors of the country and follows an interactive methodology through use of various materials, case studies and group works or world café sessions. A logical step-by-step process divided into seven sessions is followed in the conduct of the workshop and the results of each session feed into the next session.

Dr Jambay Dorjee shared the experience of conducting the IHR-PVS NBW in Bhutan. A total of 69 participants were involved and had many group activities and brainstorming sessions. The objectives of the workshop were to jointly review the JEE and PVS assessments and also collaboration gaps; identify options and develop a roadmap to strengthen preparedness, detection and control of zoonotic diseases.

The strengths of the process were detailed as a comparative advantage for advocacy, the tool being a strategic planning tool, meeting One Health objectives and its operationalization and improvement of collaboration among sectors. Weaknesses were a mismatch of information between JEE and PVS reports, the existence of competing priorities, inadequate field representation, and bias in prioritization.

Bhutan also shared lessons learnt during the process including the strengthened and enhanced networking and information sharing across relevant sectors.

Significant outcomes resulted from the process, including gaining political support for One Health, mapping of resources and securing financial support for One Health activities.

Following the presentation, the facilitator mentioned that more than 21 countries completed IHR-PVS NBW and shared findings. The importance of repeating the JEE and PVS process every 3-5 years was noted to ensure valid findings for NBW.

ASIA PACIFIC STRATEGY FOR EMERGING DISEASES AND PUBLIC HEALTH EMERGENCIES (APSED III) FOR IHR & JOINT EXTERNAL EVALUATION (JEE):

Dr Anthony Eshofonie made a presentation on APSED III which is the bi-regional framework for health security in the Asia–Pacific region, established for the advancing the IHR. There are 8 focus areas of APSED III which include AMR, zoonotic diseases and food safety with strong One Health approaches. The recommendations of the 2016 and 2018 APSED included conducting IHR/APSED monitoring and evaluation activities and working together to develop and/or maintain IHR capacities towards health security.

One of the key components of the IHR M&E Framework is the JEE and countries in the two WHO regions (SEAR and WPR) that had conducted, or are in process of conducting, the JEE were presented. The JEE assesses capacities, measures status and progress in achieving targets, ensures sustained capacity improvements, identifies urgent needs, prioritizes opportunities and engages donors and partners. The lessons learnt from the many JEEs conducted were that JEE needs to be adapted to a specific country context (one size does not fit all), the process requires a good composition of JEE team, language barriers in some settings need attention, prioritization of recommendations is critical as gaps do not necessarily translate to priorities, identification of priority actions for IHR implementation and commitment for investment is needed. Key recommendations and follow-up actions are needed which include development/updating of National Action Plans for Health Security (NAPHS), investing in strengthening core systems, strengthening multi-sector coordination, coordinating especially with non-health sectors, ensuring sustainability and fostering M&E for continuous improvement. As of 5 April 2019, 95 countries had completed the JEE process and 52 countries has completed the NAPHS process.

Ms Sacha Bootsman, Technical Officer from WHO Philippines shared experiences from the JEE conducted in the Philippines from 10-14 September 2018 engaging with various technical experts from countries and global partners. Strengths of the JEE include high-level commitment as well as the ability to introspectively analyze existing weaknesses. The joint exercise allows for looking into collaborative approaches on how to improve the system. However, weaknesses include that high-level commitment not always translates into concrete actions. The JEE is very broad and looks at many different aspects with 49 indicators. Total process is quite long-term (1.5 year), which increases the risk of losing momentum. At the same time, there are no resources available to implement the 60 JEE recommendations.

Dr Sibounhom Archkhavongs, Deputy Director General, Ministry of Health, presented the results of the JEE and APSED III in Lao PDR. Relevant stakeholders were involved in the processes over the past years. Yet, there were challenges that included: 1) sustainable financing; 2) lack of commitment from non-health actors; 3) lack of coordination among partners in cross cutting areas; 4) not using a standard costing exercise; and 5) lengthy time required for official approval of laws, policies, SOPs and work plans. Next steps for Lao PDR relate to IHR advocacy to senior management, use of APSED III as a guide to strengthen health security and ensure sustainable financing for health security.

ONE HEALTH SYSTEMS MAPPING AND ANALYSIS RESOURCE TOOLKIT (OH-SMART™):

Dr Ong-Orn Prasarnphanich, Chief of One Health Branch, US Centers for Disease Control and Prevention (CDC) Southeast Asia Regional Office presented the One Health Systems Mapping and Analysis Resource Toolkit (OH-SMART™) which has been co-developed by the University of Minnesota and the US Department of Agriculture. Using real-life challenges like zoonotic disease surveillance and response, people from different disciplines work through a series of specific steps adapted from business process improvement and participatory leadership methods to create a visual representation, or map, of the system of communication and coordination across organizations – allowing the analysis of the One Health system. With a shared understanding, multisectoral teams can evaluate the system and together decide how to strengthen it. OH-SMART™ has supported One Health systems

strengthening in over 30 US states and 19 countries through more than 40 workshops, and has partnered with several national governments to tailor OH-SMART™ for their use.

ONE HEALTH ZOOONOTIC DISEASE PRIORITIZATION (OHZDP):

The US CDC developed One Health Zoonotic Disease Prioritization (OHZDP) Tool is used in a multisectoral approach to prioritize endemic and emerging zoonotic diseases of major public health concern. Identified diseases should be jointly addressed by human, animal, and environmental health sectors in a country/region. The OHZDP Workshop is a voluntary and collaborative process that allows countries/regions to:

- Identify their most urgent zoonotic disease threats
- More efficiently build lab capacity, conduct disease surveillance, plan outbreak response and preparedness activities, and create disease prevention strategies to reduce illness and death in people and animals
- Make plans to use a One Health approach to better prevent, detect, and respond to the newly prioritized diseases
- Engage with current and prospective partners to target resources effectively to address the priority zoonotic diseases
- Develop and strengthen One Health coordination mechanisms

OH ASSESSMENT FOR PERFORMANCE & PLANNING (OH APP):

Mr Robert Salerno, Director of DAI Global Health presented the One Health Assessment for Planning and Performance (OH-APP) tool which was developed by the Preparedness & Response project with support from USAID. The tool was developed to assist countries in self-assessing the capacity of their multisectoral coordination mechanism using a participatory process. The OH-APP is both a tool and a process which 14 countries have used to annually self-assess multisectoral coordination to inform planning, including requests for development assistance. The OH-APP complements the WHO JEE by providing more specific indicators to measure the maturity of a coordination mechanism and track its progress in sustaining multisectoral and multi-stakeholder collaboration for preparedness and response to public health threats.

The OH-APP is most appropriate for countries that have completed the JEE and have an existing government entity mandated to coordinate multisectoral preparedness and response to public health threats, including zoonoses and antimicrobial resistance. Trained government facilitators administer the tool during a two-day workshop using a participatory and evidence-based decision-making process. Results inform countries' decisions on joint planning, implementation, and response. The tool and a number of resources can be accessed at www.onehealthapp.org.

Thailand shared their experience applying the OHZDP tool and rabies and influenza were identified as priority diseases in the country. Thailand detailed that the tool is flexible and accommodates many aspects, including economics. Experience using OH-APP tool were shared and there is an interest to expand this tool to sub-national level to assess OH mechanism.

Pakistan also commented on being the first country to conduct the OHZDP with OH SMART and AI, rabies, Crimean Congo Haemorrhagic Fever (CCHF), Salmonella and anthrax were prioritized during the process.

Bangladesh stated that five diseases were prioritized following the process, which included anthrax, rabies, AI, zoonotic TB and Nipah after various consultations. Stronger collaboration is an added value of using some of these tools at the country level.

The above mentioned tools can be utilised depending on the requirement of the country. Though it was not required, if JEE and PVS had been performed in the country it was described as being helpful in using the tools for prioritization.

STEP-WISE APPROACH TO RABIES ELIMINATION TOOL (SARE):

Dr Katinka de Balogh stated that the Step-wise Approach towards Rabies Elimination (SARE) is a self-assessment and a practical guide to the development and implementation of national rabies control programmes. SARE is a Microsoft Excel based tool developed in 2012 in a joint effort between the GARC and FAO with other partners. SARE measures a country's progress in rabies control and prevention through its components that includes: 1) prevention and control; 2) data collection and analysis; 3) laboratory diagnosis; 4) dog population management; 5) information, education and communication; 6) legislation; and 7) cross-cutting issues. Through SARE, the country identifies and prioritizes existing gaps. FAO's new initiative, the Rabies Action Center of Excellence (RACE), was presented that aims at enhancing rabies control capacity, supporting "zero by 2030" and foster cooperation among sectors and partners.

Following the presentations and panel discussion, countries identified their interest and need for future application of the tools (Table 2).

Table 2. List of countries interested in applying tools

COUNTRY	APPLIED	INTERESTED	COUNTRY	APPLIED	INTERESTED
Afghanistan	JEE, NAPHS		Mongolia	JEE, NAPHS, APSED III	IHR-PVS, JRA, OH-SMART
Australia	JEE, NAPHS		Myanmar	JEE, NAPHS	JRA, IHR-PVS, OH-SMART
Bangladesh	JEE, IHR-PVS, OH-APP, 4WL	JRA	Nepal	JEE	NAPHS, IHR-PVS, JRA, OHZDP
Bhutan	JEE, NAPHS, IHR-PVS	JRA, OH-APP, OH-SMART	Pakistan	JEE, NAPHS, JRA, OHZDP	OH-APP, PVS Gap
Brunei	JEE		PNG	PVS, PVS Leg	JRA, OHZDP, NAPHS, JEE, IHR-PVS, OH-SMART, OH-APP
Cambodia	JEE, NAPHS, OH-SMART		Philippines	JEE	IHR-PVS, JRA, NAPHS, OHZDP
China	OHZDP (P)		Samoa	APSED III	JEE, NAPHS, JRA
Fiji	JEE		Singapore	JEE	
India			Sri Lanka	JEE, NAPHS	JRA
Indonesia	JEE, NAPHS, JRA, OHZDP, OH-APP, 4WL, OH-SMART	SARE	Thailand	JEE, OH-APP, OH-SMART, OHZDP	MCDA
Japan	JEE		Timor-Leste	JEE, NAPHS	
Lao PDR	JEE, NAPHS, OH-SMART, OH-APP		Tonga		JEE
Malaysia	JEE	IHR-PVS	Vanuatu	JEE	JRA, IHR-PVS, OH-SMART, OH-APP
Maldives	JEE	OHZDP, IHR-PVS	Viet Nam	JRA, JEE, 4WL, OH-APP	OH-SMART, SARE, IHR-PVS, OHZDP

Session 5: Operationalisation of multisectoral collaboration & upcoming opportunities

Chairs: Dr Asheena Khalakdina (WHO-Cambodia) and Dr Jambay Dorjee (Bhutan)

OFFLU-WHO NETWORKING:

Dr Gounalan Pavade, Chargé de Mission, OIE Headquarters stated that for preparedness to pandemics, WHO coordinates vaccine composition meetings (VCM) biannually to update vaccine recommendations based on influenza virus surveillance data from WHO GISRS and avian influenza data from the animal health sector. The OIE-FAO Network of expertise on animal influenza (OFFLU) collects data from various animal health laboratories and works closely with WHO to share zoonotic avian influenza data in VCM and the collaboration has proved successful for many years. Epidemiological, genetic and antigenic data sharing of animal health data has improved in recent years through the OFFLU network. There is technical collaboration at all levels between OFFLU and WHO at human – animal interface issues and he emphasised the importance of animal and public health sectors working together to strengthen this collaboration.

GLOBAL HEALTH SECURITY AGENDA (GHSA):

Dr Madhur Dhingra, Regional Project Coordinator, FAO RAP presented the Global Health Security Agenda (GHSA) as a showcase of the global level of multisectoral collaboration initiated by countries. GHSA was launched in Feb 2014 to advance a “world safe and secure from infectious disease threats”. As of now, 67 nations and various partners are participating and Tripartite is acting as permanent advisors. GHSA have revised the next 5-year roadmap towards 2024 which was agreed in the ministerial meeting in Bali 2018: 1) promote international frameworks for health security; 2) increase domestic and international partner financial support for strengthening and maintaining GHS capacity; 3) strengthen and support multisectoral engagement and commitment to health security; 4) improve sharing of best practices and lessons learned and support the use and development of relevant tools and mechanisms; and 5) strengthen accountability of all members, partners and commitment under GHSA. Also, the revised Action Packages reduced from 11 to 8 items and emphasises collaboration among different Action Packages. In the Asia Region, there are leading countries for three Action Packages: Zoonotic Diseases by Indonesia and Viet Nam and National Laboratory Systems and Workforce Development by Thailand.

REGIONAL COLLABORATION FOR GLOBAL DISEASE ERADICATION PLAN (RABIES ZERO BY 30):

Dr Katinka de Balogh presented the “Zero by 30 initiative” which is a unified global action plan to reach zero human rabies deaths mediated by dogs by 2030. This initiative puts countries at the center by supporting country led initiatives like national rabies elimination plans. The UAR collaboration is meant to be a catalytic bridge, working across sectors with countries to develop and implement their plans – and with other partners and stakeholders to encourage investment and maximize impact of activities. At the regional level, the ASEAN rabies elimination strategy (ARES) and Strategic Framework for Elimination of Human Rabies transmitted by dogs in South East Asia Region are being implemented.

COUNTRY LEVEL COLLABORATION FOR RABIES – PHILIPPINES:

Dr Samuel Joseph Castro, Veterinarian III, Bureau of Animal Industry presented the Philippines’ rabies experiences. The Philippines has identified sectors and focal points to draft a process flow involving all relevant stakeholders by describing who does what, where and when. Some of the strengths were clarity at the grassroots level; linking of all key stakeholders and covering actions at all levels. Some of the weaknesses relate to difficulties in finding time and engaging teams dedicated only to rabies as they have other duties to carry out.

COUNTRY LEVEL COLLABORATION FOR ANTIMICROBIAL RESISTANCE – JAPAN:

Dr Hazumu Kadowaki, Veterinary Officer, Ministry of Agriculture, Forestry and Fisheries presented AMR status and actions taken in Japan. The adoption of the Global Action Plan (GAP) on AMR by the WHO World Health Assembly (WHA), the Cabinet of Japan held the Ministerial Council on the 'Response to Infectious Diseases that Pose a Threat to Global Society' and recommended to develop a national action plan in 2015. The Japanese Prime Minister had stressed the need to advance effective measures for both animals and humans and requested all relevant sectors to collaborate. The NAP on AMR 2016-2020 was developed by the Ministerial Council, and the council has been publishing the Nippon AMR One Health Report which contains information on different monitoring and surveillance systems in animals and humans every year. Japan recognizes the gaps and challenges that constrain the implementation of AMR control measures and the need to consider more sophisticated coordination mechanisms among different sectors towards the development of the next national action plan.

COUNTRY LEVEL COLLABORATION FOR ANTIMICROBIAL RESISTANCE – SINGAPORE:

Dr Zi Yang Han, Senior Veterinarian, Animal and Veterinary Service, National Parks Board, showed how Singapore had adopted a One Health approach to combat AMR. In 2017, the AMR Working Group (WG) was formed comprising representatives from One Health agencies which currently comprise of the Singapore Food Agency, Ministry of Health, National Parks Board, National Environment Agency and the Public Utilities Board. The AMR WG reports to the One Health Coordinating Committee which is co-chaired by the One Health agencies. In 2018, the AMR Coordinating Office (AMRCO) was formed under the National Centre for Infectious Diseases as the national coordinating body for AMR. The AMRCO partners One Health agencies to align efforts in planning, implementing and shaping future work on AMR. Through this coordination mechanism, the One Health agencies have launched the National Strategic Action Plan (NSAP) in November 2017. With leadership, close working relationship and commitment of resources from the One Health agencies, Singapore is in the phase of implementing the NSAP. Singapore is looking towards achieving greater synergy in terms of surveillance in AMR and AMU, joint AMR research, and also public/stakeholders communications.

COUNTRY LEVEL COLLABORATION FOR ANTIMICROBIAL RESISTANCE – BANGLADESH:

Dr Golam Khabir, Upazila Livestock Officer, Department of Livestock Services presented the AMR strategy development workshop held in December 2016 which led to the Bangladesh AMR Response Alliance (BARA). Environmental experts are also included in BARA. BARA takes up AMR surveillance; improves AMU practices; has developed a mobile app for poultry practitioners; is working with the government on legislation around AMU; and is developing guidelines and implementing field projects on AMR and AMU at the human-animal-environment interface.

COUNTRY LEVEL COLLABORATION FOR ANTIMICROBIAL RESISTANCE – THAILAND:

Dr Nithima Sumpradit, Senior Pharmacist, Ministry of Public Health stated that both technical and political support are essential to address AMR challenges and gave examples of political support for developing and implementing the GAP-AMR such as Alliance of Champions against AMR since 2014 and the Political Declaration on AMR during the UN General Assembly (UNGA) in 2016. In Thailand, a multisectoral approach was taken to develop and implement the National Strategic Plan on AMR (NSP-AMR). The NSP-AMR has five goals and six strategies. The National Policy committee on AMR, chaired by the Deputy Prime Minister, and five sub-committees that work across multiple sectors including public, civil society and private sectors under the One Health approach. Global and national interface on AMR policy is very important in supporting national actions.

COUNTRY LEVEL COLLABORATION FOR RABIES – MALAYSIA:

Dr Norita Binti Shamsudin, Public Health Medicine Specialist, Ministry of Health stated that Malaysia had its last human case of rabies in 1998 and in July 2017, there were unexpected human rabies cases in Sarawak. During this outbreak, joint responses were undertaken, which strengthened collaboration and information sharing between public health and animal health sectors. Malaysia is developing a national strategic plan for zoonosis and manual for zoonosis response. Rabies control and preventive activities will be reviewed using SARE.

COUNTRY LEVEL COLLABORATION FOR OH MECHANISMS – INDIA:

Dr Simmi Rupana, Deputy Director, Department of Zoonotic Diseases and Coordination mentioned that India's national plans on One Health exist and are supported at the ministerial level. India developed guidelines for multisectoral collaboration on priority diseases and the AMR National Programme is in place. India contained a Nipah outbreak within 30 days in 2018. Some of the limitations within India are due to the complex administration and unpredictable funding while JRA and capacity building programmes are needed in the country. India will work on more technical guidelines and institutionalise mechanisms for intersectoral coordination.

After the short presentations, the session was followed by a panel discussion and questions from the floor.

- Wildlife is a key partner for disease control, therefore engaging wildlife on board is very important
- Cross-border coordination: establish protocol and having collaborative project to share information, having regular meeting with counterparts sharing borders, and vaccination/sterilization programme
- To overcome challenges encountered across different stakeholders: good communication materials are required by different target groups, identifying each stakeholders' needs, using routine communication to avoid duplication of work, using opportunities like global events such as World Rabies Day (WRD) or WAAW
- Coordination with migration sectors: India already has coordination mechanisms in place.

STRENGTHENING THE OPERATIONALIZATION OF ONE HEALTH:

Ms Afifah Rahman-Shepherd, Research Associate, Chatham House, UK provided an overview of the Centre on Global Health Security's One Health portfolio and two main strands of research: a systematic identification and analysis of One Health networks operating across Europe, Africa and Asia (N=100), and a qualitative analysis of 25 stakeholder interviews on the emergence and effectiveness of the One Health movement. Within the Asia Pacific region, 30 networks were identified: 97% focused on one of two activities (collaboration and communication, data and information sharing); 93% involved an academic stakeholder in their network; 63% of networks are headquartered in the Asia Pacific region; and 56% of networks engaged all three One Health 'sectors'. The stakeholder interviews highlighted a number of potential challenges to cross-sectoral collaboration, and a key recommendation was to increase training and educational initiatives in One Health. Finally, sharing experiences from the East Africa region, leadership and engagement at the regional, national and subnational levels were key to successful One Health collaborations.

Prof Dilys Morgan, Senior Consulting Fellow, Chatham House continued that Human Animal Infections and Risk Surveillance (HAIRS) group is a One Health model for horizon scanning and risk assessment for new and emerging Infections acting across Government and UK. The HAIRS group has members from the animal and human health Ministries and Agencies from the four countries in the UK and from the Food Standards Agency. It has met every month since 2004 and is responsible for new infections

or undiagnosed syndromes in UK or internationally and tends to deal with infections not responsibility of other groups.

Risk assessment is an important component of the work. The entire group signs up to the assessments, which are qualitative and used to rapidly communicate risk in a hierarchy of robust and consistent terms. Key points about intersectoral collaboration were highlighted and discussed.

World Café:

To discuss practical aspects of multisectoral collaboration to reduce and manage health risks, country participants and partners were divided into 4 groups and rotated stations to discuss on: 1) the most important drivers for One Health, 2) major constraints to address One Health, 3) available mechanisms for One Health, and 4) MCM for other issues

1. Drivers: funding, political/leadership, technical expertise, operational aspects
2. Constraints: low level of awareness, political willingness, finance, legal support, information sharing, priorities, etc.
3. Mechanisms: only zoonoses focused, need One Health mechanism with equal leadership
4. Other collaboration: disasters, climate change, non-communicable disease control, public-private-partnership, etc.

Session 6: One Health beyond infectious diseases

Chairs: Dr Teerasak Chuxnum, Thailand and Dr Ranjani Hettiarachchi, Sri Lanka

In this session, various topics were delivered on multisectoral collaborations other than three Tripartite flagship topics.

ROLE OF ACADEMIA IN THE CONTROL OF ZOOSES – INFLUENZA AS AN EXAMPLE:

Prof Hiroshi Kida, Head of Hokkaido University Research Center for Zoonoses Control stated that HPAI viruses should be completely eradicated from the world by using a stamping-out policy and without misuse of vaccine. Drastic improvement of seasonal influenza vaccine is of crucial importance in order to assure the effective preparedness for pandemic influenza.

Hokkaido University established a library of more than 3,000 low pathogenic avian influenza virus strains isolated from ducks with 144 combinations of 16 HA and 9 NA subtypes which can be used as pandemic influenza vaccine strain candidates and for diagnostic purposes (<http://virusdb.czc.hokudai.ac.jp/vdbportal/view/index.jsp>). Test vaccines prepared from H1N1, H5N1, H6N2, H7N7, H7N9 and H9N2 viruses in the library induced sufficient immune response to protect chickens, mice and monkeys from the challenge with virus isolates from birds and humans. Thus, there are vaccine strains for pandemic influenza.

Since current split vaccines prepared by ether- or detergent-disruption are poorly immunogenic, his team developed inactivated whole virus particle vaccines with potent immunogenicity and limited IL-6 induction that is now under phase II clinical studies.

Not all zoonoses are eradicable infectious diseases, since the causative pathogens are introduced from wildlife in nature. Such zoonotic infections, therefore, can be controlled only by taking pre-emptive measures to predict and prevent the outbreaks by identifying natural hosts carrying potential pathogens, and to elucidate the transmission routes and factors involved in the spread and pathogenesis of infections. In addition, there is a need to promote basic research on zoonotic diseases to develop effective measures for diagnosis, prophylaxis and therapy, to widely disseminate information and technology, and to train experts for the control of zoonoses. Hokkaido University

Research Center for Zoonosis Control, thus, carries out coherent scientific and educational activities for the control of zoonoses under the umbrella of the “One World, One Health” concept.

UN ENVIRONMENT AND TRIPARTITE COLLABORATION:

Ms Kakuko Nagatani-Yoshida, Regional Coordinator for Chemicals, Waste and Air Quality at UN Environment Asia and the Pacific stated that the fourth UN Environment Assembly (UNEA-4) held in Nairobi, 11–15 March 2019, adopted in Resolution UNEP/EA.4/L.25 welcomed the development of the Implementation Plan of the Executive Director “Towards a Pollution-free Planet” (UNEP/EA.4/3) and requested UNEP to coordinate and monitor the implementation of the plan. Action areas for addressing pollution challenges highlighted in the plan include: Knowledge (Science for evidence-based policy and action); Implementation (capacity, incentives and integrated policies); Infrastructure (technologies, innovation and circularity); Awareness (outreach, communication, education and consumer information), and Leadership (mobilization of stakeholders, leaders and partners to address different forms of pollution). The Asia-Pacific Regional Forum on Health and Environment and air quality and health assessment jointly carried out by the Pollution Control Department of the Ministry of Natural Resource and Environment and the Ministry of Public Health in Thailand are example of multisectoral collaborations. Awareness on issues such as air quality, chemicals management, and plastic pollution are on rise, and the leaderships in Asia and the Pacific are needed.

OH WORKFORCE FOR THE YOUNG GENERATION:

Dr Vipat Kuruchittham, Executive Director of SEAOHUN began his presentation by stating that the next generation of One Health workforce requires both technical as well as soft skills (e.g., communication, collaboration, critical thinking, and creativity) to thrive in the 21st century and to work together on One Health. The Southeast Asia One Health University Network (SEAOHUN), with the support of USAID, is a consortium of 67 universities in Indonesia, Malaysia, Thailand, and Vietnam collaborating to improve One Health workforce capacity with cross-sectoral competencies to prevent, detect, and respond to infectious disease threats efficiently and effectively. Target audiences are national trainers, faculty members, in-service and pre-service health professionals in the four countries plus Cambodia, Lao PDR, and Myanmar. SEAOHUN applies learner-centered activities when teaching One Health and transforms students from passive to active learners, and advocates multidisciplinary students to learn about One Health together and exchange their perspectives. Universities have a critical role in producing competent young health professionals to ensure sustainable health security systems.

MIGRANT INCLUSION IN ONE HEALTH:

Globally there are about 1 billion migrants and it keeps growing. Mr Patrick Duigan, Regional Migration Health Advisor from the International Organization for Migration (IOM) stated that migrants are not carriers of diseases and a burden to the health system but migrants are victims of diseases including zoonoses. Migrants who are weak, neglected by national health systems, stressed and not at their best immune status are vulnerable to zoonotic infections. Therefore, migrant health should be a part of One Health covering areas of prevention and vaccination, awareness, preparedness, health policy, accessibility to quality health services etc.

PACIFIC EXPERIENCE ON MULTISECTORAL COLLABORATION:

The health and wellbeing of Pacific countries is threatened by complex issues at the nexus of ecosystems-animal-human health, with biodiversity loss, climate change and land use change such as urbanization, fishery decline, and conversion of forest to agricultural land. Ms Iwona Piechowiak, Programme Leader explained that SPC is working on developing a SPC Pacific One Health Integrated Programme, to address the Pacific Countries priorities on multi-stakeholder collaboration for One Health through: 1) strengthening partnerships between the human, animal and ecosystems health

sectors in research, 2) empowering local education institutions to provide One Health research and training leadership appropriate to the Pacific context and 3) addressing vector control from ecosystems perspectives, including through better water and natural resources management. To facilitate implementation of the SPC Pacific One Health Integrated Programme, the following preliminary activities have been endorsed during the Heads of Health Meeting in April 2019: 1) establishment of legal and administrative arrangements to enable the relevant sectors to work and plan together and to mainstream a consolidated One Health vision into a routine sectoral dialogue, 2) provision of the necessary resources to enable joint decision-making and researches across sectors pertinent to health and environment and 3) mainstreaming communities leadership and local cultural knowledge as foundational and universally meaningful, and actively seek the engagement of community leaders in decision-making. SPC is currently developing Pacific One Health Integrated Programme supporting project, policies and platforms such as healthy forestry ecosystems, which is promoting multisectoral knowledge sharing and education. We offer a forum for discussion on state of animal health and production services under the SPC lead Pacific Heads of Veterinary and Animal Production Services (PHOVAPS) and on promotion of public health and improving public health surveillance and response to health emergencies in the Pacific under the SPC-WHO lead Pacific Public Health Surveillance Network (PPHSN) plus on promotion of plant health under the SPC lead Pacific Plant Protection forum.

ROLE OF WILDLIFE FOR EMERGING DISEASES: DR ANUWAT WIRATSUDAKUL

Dr Anuwat Wiratsudakul from Mahidol University, Thailand delivered a talk on the role of wildlife for emerging diseases. In the last 50 years, many emerging infectious diseases originated from the wildlife, some of which were climate change induced sensitive infectious diseases. Increasing trade and demand for exotic pets and habitat sharing increase probability of pathogen sharing. Illegal wildlife trade has been known as a driver for emergence of diseases like SARS. Some of the One Health surveillance undertaken in Thailand is in buffer zones on migratory birds for AI viruses; reptilian species (crocodiles) for Chlamydiosis and herpes; and wild boar for hepatitis E and African swine fever. Different sectors should work together on capacity building, resource sharing and control of disease emergence.

NEGLECTED PARASITIC ZOOSES:

Dr Aya Yajima, Technical Officer, WHO WPRO mentioned that neglected tropical diseases primarily affect populations living in poverty in tropical and sub-tropical areas justifying a global attention and response. In the Asia Pacific region, there are 15 neglected tropical diseases prioritized by WHO, six of which are zoonotic origin. Of particular importance are echinococcosis, foodborne trematodiasis, schistosomiasis, taeniasis and cysticercosis. As transmission of these diseases mainly occurs among zoonotic hosts, control and ultimate interruption of cycles for these diseases requires One Health approach. Enhancing cross-sectoral collaboration, capacity building, information sharing and political commitment to accelerate control of parasitic zoonoses should be priorities in the coming years.

ECHINOCOCCUS:

Dr Tuvshintur Chuluunbaatar, Officer from Ministry of Health shared Mongolian experience on control and prevention of echinococcosis. The traditional practices of animal rearing, slaughtering and meat trade as well as the presence of dogs (stray and owned) are major factors that sustain transmission of the parasite. Mongolia has developed a National Action Plan for Control of Echinococcosis (2019-2021) through a national intersectoral stakeholder workshop. The new action plan focuses on intersectoral collaboration, strengthening human and animal surveillance, implementation and M&E of One Health interventions and early case detection and management.

RESPONDING TO UNDIAGNOSED DISEASES:

Prof Dilys Morgan presented the issue of new emergence of diseases. In the summer of 2011, a mild disease was reported in cattle in Europe. This was subsequently found to be caused by Schmallenberg virus, a new animal infection. With the onset of the lambing season, this virus was found to have produced congenital malformations in lambs, goats and occasional calves. Whether humans could be infected with this virus and could cause disease was unknown for many months. This example was used to highlight the need of an urgent assessment to consider wider health effects of a new animal syndrome, because by the time a diagnosis is reached, time may have been lost in which preventative actions could have been introduced. Having a mechanism to deal with this is important because it is hard to contact a colleague on the 'other side' about an 'undiagnosed' condition unless you know them and already have a working relationship. Failure to take a One Health approach can lead to different messages across sectors resulting in uncertainty and loss of confidence. Professor Morgan stressed that it is therefore important to have systems in place which are flexible and can deal with uncertainty.

FOOD SAFETY EVENT/AFTER ACTION REVIEW:

Dr Thai Suvuth, Chief of Prevention and Control Bureau presented an outbreak of trichinellosis in Cambodia. He stated that neglected parasitic zoonotic diseases or new emerging zoonotic diseases may be overlooked by some key stakeholders. During the outbreak of trichinellosis, communication between human and animal sectors was inadequate and opportunities for joint outbreak investigations were missed. Communication materials from the stand-alone single sector (human health) to the media and public were not comprehensive to address human-animal-ecosystem interfaces. There is a need to strengthen inter-ministerial information sharing, coordination and communication for all disease outbreaks in Cambodia. Community awareness and participation in disease surveillance are important and these activities should be done with the relevant sectors coming together.

Session 7: Conclusions and Recommendations

Moderator: Dr de Balogh from FAO RAP.

The Eighth Asia-Pacific Workshop on Multisectoral Collaboration at the animal-human-ecosystems interface recommended that:

Member States are encouraged to;

1. Continue to seek **high level political commitment** for One Health.
2. Assess, improve, and further **institutionalize** national and sub-national mechanisms for multisectoral coordination of One Health Initiatives.
3. **Identify and prioritize** One Health needs, to use as the basis for developing, maintaining, synergizing and advancing multisectoral collaboration.
4. Develop **road maps with resourced work plans** for prioritized issues, containing clear roles and responsibilities.
5. adapt and apply relevant **tools and frameworks**, such as APSED III, IHR/PVS National Bridging Workshop, JEE, TZG, JRA, SARE, OH-SMART, OH-APP, OHZDP, etc., based on national One Health priority needs.
6. Following the principles of **good emergency practices**, prepare during "peace time" coordination mechanisms for emergencies and ensure sustainability of multisectoral collaboration beyond emergencies and/or availability of external funding sources.

7. Strengthen **collaboration with wildlife and environment sectors**, and raise One Health awareness and enhance understanding/engagement of other stakeholders (including social sciences and sectors such as disasters management, customs and border security, education, food regulatory, academia, etc.).
8. Continue to **document and share experiences** on best practices, lessons learnt, successes and failures of multisectoral collaboration mechanisms.
9. Develop **clear communication strategies** for better community engagement (especially school children, women and migrant populations and internally displaced people) and tailor messages and channels accordingly (such as web-based information systems and social media as well as establish linkage with the press).
10. Engage Ministries of Finance and Planning agencies **to allocate sufficient national budgets** for One Health coordination and activities.
11. Leverage **regional platforms** such as ASEAN, SAARC and SPC to develop regional approaches for prevention, control and elimination of prioritized zoonoses and other issues such as AMR including **cross-border collaboration** and information exchange.
12. **Consider evolving issues** such as urbanization, encroachment into forest areas in view of increasing wildlife-human conflict and emerging disease risks by involving relevant sectors.

Tripartite shall;

1. **Support Member States** in the implementation of above recommendations
2. Continue to **advocate for high level commitment** for One Health within their organizations and with Member States.
3. Develop **advocacy** materials/policy briefs that Member States can adapt to their country needs to engage policy makers.
4. Especially consider **Pacific countries** and territories for implementation of One Health and tools.
5. Strengthen **engagement with wildlife and the environment** sectors, and explore collaboration with organizations such as UNEP, IOM, UNHCR, UNDP, and UNOPS.
6. Organize a **Tripartite Award** for “**One Health Champion**” countries (mechanisms and criteria to be developed and disseminated).
7. Organize the 9th Asia Pacific workshop on multisectoral collaboration at the animal-human-ecosystems interface in 2021, to be hosted by OIE Sub-Regional Representation for Southeast Asia.

Annex 1: Agenda

9 April 2019

Time	Agenda	Resource person
08:30 – 09:00	Registration	
Session 1: Opening and Introduction		
09:00 – 09:30	Opening Ceremony FAO OIE WHO Host country (DLD) Host country (DDC)	Xiangjun Yao Ronello Abila Tjandra Aditama Cheerasak Pipatpongsopon Suwannachai Wattanayingcharoenchai
09:30 – 10:00	Video on summary of major accomplishment past decade Overview of Workshop objectives Introduction of participants	FAO
10:00 – 10:30	Group photo & Tea Break	
Session 2: Setting the scene		
10:30 – 12:00	Drivers for One Health and Multisectoral Collaboration Keynote speech: One Health drivers and how to operationalise Biodiversity on zoonotic emerging infectious diseases Share experience from Regional Champion, Bangladesh Brief review of recommendations of previous meeting (Manila 2017)	Joseph Anelli Serge Morand Nitish Debnath Anthony Eshofonie
12:00 – 13:00	Lunch Break	
Session 3: Update and Progress		
13:00 – 14:30	Updates on 3 flagship topics - Rabies - Zoonotic Influenza - AMR actions in the region Questionnaire analysis on OH mechanism Introduction of Poster Gallery	Gongal/Dukpa Brioudes/Eshofonie Sutherland/Gordoncillo Yooni Oh Kinzang Dukpa
14:30 – 15:30	Tea Break during gallery walk	
15:30 – 17:00	Country posters & gallery walk Countries to provide posters to highlight multisectoral coordination on flagship topics → indicate best practices and major constraints (address also pros & cons)	Interactive session All participants
18:00 – 20:00	Welcome dinner	

10 April 2019

08:30 – 09:00	Recap of Day 1 – including short highlights from gallery walk	
Session 4: Tools and frameworks for Multisectoral collaboration		
09:00 – 10:30	Tools and Frameworks for Multisectoral collaboration Introduction of tools/frameworks & countries experiences	Flash talk, followed by panel discussion
10:30 – 11:00	Tea Break	
11:00 – 12:00	Continued... Identify country needs; wall chart discussion	
12:00 – 13:00	Lunch Break	
Session 5: Operationalisation of Multisectoral Collaboration and Upcoming Opportunities		
13:00 – 14:30	Achievements and Constraints relevant to Multisectoral coordination mechanisms at Global/Regional/Country levels <ul style="list-style-type: none"> - Global level: OFFLU, GHSA - Regional level: Zero by 30 - Country level: <ul style="list-style-type: none"> • Rabies: Philippines, Malaysia • Influenza: Bangladesh • AMR: Japan, Singapore, Thailand • OH mechanism: India 	Short talk followed by panel discussion
14:30 – 15:00	Tea Break	
15:00 – 17:00	Strengthening the operationalization of One Health How world café works and how groups will be divided & the purpose of the world café World Café: <ul style="list-style-type: none"> - Most important drivers - Major constraints - Available mechanisms - MCM for other issues 	Chatham House Katinka de Balogh Facilitators

11 April 2019

08:30 – 09:00	Recap of Day 2 – including short highlights from world café	
Session 6: One Health beyond Infectious Diseases		
09:00 – 10:30	Sharing experiences with engaging multi sectors Hokkaido University; role of academia in the control of zoonoses UN Environment; including pesticide concerns SEAOHUN; OH workforce for young generation IOM; migrants posing risk for zoonoses SPC; Pacific experience on multisectoral collaboration Mahidol University; role of wildlife for emerging diseases	Hiroshi Kida Kakuko Yoshida Vipat Kuruchittham Patrick Duigan Iwona Peichowiak Anuwat Wiratsudakul
10:30 – 11:00	Tea Break	
11:00 – 12:00	Overarching issues to be addressed through One Health Neglected parasitic zoonoses Echinococcosis Responding to undiagnosed diseases Food safety event/After action review	Aya Yajima Tuvshintur Chuluunbaatar Dilys Morgan Thai Savuth
12:00 – 13:00	Lunch Break	
Session 7: Summary and Closing		
13:00 – 15:00	Conclusions and recommendations & Closing	
15:00 – 15:30	Tea Break	

Annex 2: List of Participants

PARTICIPANTS

Afghanistan

Said Majdood Raihan

Acting General Director of Livestock and Animal Health
Ministry of Agriculture, Irrigation and Livestock (MAIL)

Australia

Apinya Buakla

DAWR research officer
Australian Embassy

Bangladesh

Md Golam Kabir

Upazila Livestock Officer
Animal Health & Administration (Budget)
Department of Livestock Services

Bhutan

Jambay Dorjee

Regional Director
Department of Livestock
Regional Livestock Development Centre

Rinzin Kinga Jamtsho

Programme Officer
Zoonotic Disease and Avian Influenza Programme,
MoH Bhutan

Brunei

Sirajul Adli Jamaludin

Acting Senior Medical Officer
Department of Environmental Health Services

Cambodia

Thai Savuth

Chief of Prevention and Control Bureau
Department of Communicable Disease Control
Ministry of Health

China

Ma Shichun

Senior Veterinary Specialist
China Animal Disease Control Centre
Ministry of Agriculture and Rural Affairs

Chen Qiulan

Associate Research Fellow
Chinese Center for Disease Control and Prevention
Ministry of Health

Hong Kong SAR (China)

Siu Lun Law (Lucia Law)

Veterinary Officer
Agriculture, Fisheries and Conservation Department

Macao SAR (China)

Iek Hou Leong

Head
Unit for Communicable Disease Prevention and Diseases Surveillance
CDC-NDIV, Health Bureau

Fiji

Monika Devi

Veterinarian
Biosecurity Authority of Fiji

India

Pynhunlang Blahwar

Joint Commissioner (AH)
Department of Animal Husbandry, Dairying & Fisheries
Ministry of Agriculture & Farmers Welfare

Simmi Rupana

Deputy Director
National Centre for Diseases Control
Department of Zoonotic Diseases and Coordination

Indonesia

Arif Wicaksono

Head of Disease Control
Directorate of Animal Health
Directorate General of Livestock Services

Ikke Yuniherlina

Technical Officer
Directorate of Vector Borne and Zoonotic Disease Control

Director General of Disease Prevention and Control
Ministry of Health

Japan

Hazumu Kadowaki

Veterinary Officer
Animal Products Safety Division
Food Safety Affairs Bureau
Ministry of Agriculture, Forestry and Fisheries

Lao PDR

Paphaphone Xaysongkham

Deputy Director of Division of Veterinary Services
Department of Livestock and Fisheries

Sibounhom Archkhavongs

Deputy Director General
Department of Communicable Diseases Control
Ministry of Health

Malaysia

Marzuki Bin Zakaria

Senior Director, Biosecurity and SPS Management Division
Department of Veterinary Services,
Ministry of Agriculture and Agro-Based Industry

Norita binti Shamsudin

Public Health Medicine Specialist
Zoonosis Sector, Disease Control Division
Ministry of Health

Maldives

Aishath Azla

Veterinary Assistant
Ministry of Fisheries, Marine Resources and Agriculture

Aminath Aroosha

Senior Public Health Program Officer
Surveillance Unit / Health Protection Agency
Ministry of Health

Mongolia

Battsetseg Gonchigoo

"One health" project PI
Institute of Veterinary Medicine,

Mongolian State University of Agriculture (MULS)

Tuvshintur Chuluunbaatar

Officer, Division of Public Relations
Surveillance and Emergency Operations
Ministry of Health

Myanmar

Hnin Thidar Myint

Deputy Director
Department of Livestock Veterinary and Breeding

Eh Htoo Pe

Deputy Director
National Health Laboratory

Nepal

Ram Nandan Tiwari

Chief Veterinary Officer
Veterinary Standard and Drug Regulatory Laboratory

Dipendra Raman Singh

Chief
Quality Assurance and Regulation Division
Ministry of Health and Population

Pakistan

Muhammad Akram

Assistant Animal Husbandry Commissioner
Ministry of National Food Security and Research

Papua New Guinea

Orlando Mercado

Animal Health Program Manager
Laboratory Services
National Agriculture Quarantine and Inspection Authority (NAQIA)

Philippines

Samuel Joseph Castro

Veterinarian III
Officer-in-Charge, Animal Health and Welfare Division
Bureau of Animal Industry, Department of Agriculture

Ronaldo R. Quintana

Medical Officer IV & Program Manager
National Rabies Prevention and Control
Program

Infectious Disease Office, Disease Prevention
and Control Bureau
Department of Health

Samoa**Samuela Tatafu Hafoka Vi**

Senior Animal Health Officer
Ministry of Agriculture and Fisheries

Judith Simoata'a Gafa

Disease Surveillance Officer
Ministry of Health

Singapore**Zi Yang Han**

Senior Veterinarian
National Parks Board, Animal and Veterinary
Service

Sri Lanka**Ranjani Hettiarachchi**

Additional Director General (Veterinary
Research)
Department of Animal Production & Health

L D Kithsiri

Director/ Public Health Veterinary Services
Ministry of Health

S M Arnold

Director Quarantine
Ministry of Health,

Thailand**Khemmapat Boonyo**

Veterinarian, Senior Professional Level
Bureau of Disease Control and Veterinary
Services
Department of Livestock Development (DLD)

Julaporn Srinha

Veterinarian, Senior professional level,
Division of Animal Feed and Veterinary
Products Control, Department of Livestock
Development

Arphaphorn Dokphut

Medical Scientist of Virology Laboratory,
National Institute of Animal Health, DLD

Nithima Sumpradit

Senior Pharmacist
Bureau of Drug Control
Food and Drug Administration
Ministry of Public Health

Onphirul Yurachai

Veterinarian
Ministry of Public Health

Ratanaporn Tangwangvivat

Manager of one health coordinating center
Ministry of Public Health

Teerasak Chuxnum

Bureau of Epidemiology
Ministry of Public Health

Timor-Leste**Feliciano da Conceicao**

Chief of Veterinary Diagnostic Laboratory
Ministry of Agriculture and Fisheries

Francisco Abel Viana

Focal Point for Zoonoses Prevention and
Control
Ministry of Health

Tonga**Ana Vunipola**

Head of Livestock Division
Ministry of Agriculture, Food and Forests
(MAFF)

Louise Simone Fonua

Senior Medical Officer
Communicable Diseases
Ministry of Health

Vanuatu**Ian Ronald Peebles**

Principal Veterinary Officer
Biosecurity Vanuatu

Vanua Sikon

Senior Emergency & Disaster Response Officer
Ministry of Health

Viet Nam

Thai Duy Phuong

Deputy Chief of the Epidemiology section
Regional Animal Health Office No VI (RAHO6),
Department of Animal Health of Viet Nam
(DAH)

Nguyen Thi Huong

Zoonoses Management Officer
Division of Communicable Diseases Control
General Department of Preventive Medicine
Ministry of Health

EXPERT

Joseph F. Anelli

International One Health Consultant
Practical One Health Solutions, LLC

Nitish C Debnath

Professor and Director
Teaching and Training Pet Hospital and
Research Center
Chittagong Veterinary and Animal Sciences
University (CVASU)

Serge Morand

Directeur de Recherche
CNRS – CIRAD
CIRAD – Faculty of Veterinary Technology,
Kasetsart University

OBSERVERS

Armed Forces Research Institute of Medical Sciences (AFRIMS), WHO Collaborating Centre for Research and Training on EIDs

Jariyanart Gaywee

Director of Research Division
Armed Forces Research Institute of Medical
Sciences (AFRIMS)
Royal Thai Army, Ministry of Defence
Thailand

Centers for Disease Control and Prevention (CDC)

Ong-orn Prasarnphanich

Chief, One Health Branch
Centers for Disease Control and Prevention

Chatham House (The Royal Institute of International Affairs)

Afifah Rahman-Shepherd

Research Associate
Chatham House (The Royal Institute of
International Affairs)

Dilys Morgan

Senior Consulting Fellow
Chatham House and Chair of the UK Human
Animal Infections and Risk Surveillance
(HAIRS) group
The Royal Institute of International Affairs
Chatham House

Chulalongkorn University, WHO Collaborating Centre for Research and Training on Viral Zoonoses

Supaporn Wacharapluesadee

Chulalongkorn University, WHO Collaborating
Centre for Research and Training on Viral
Zoonoses

Pasin Hemachudha

Chulalongkorn University, WHO Collaborating
Centre for Research and Training on Viral
Zoonoses

CIRAD

Michel de Garine-Wichatitsky

Senior Researcher
CIRAD/GREASE/Kasetsart University Faculty
Veterinary Medicine
Kasetsart University, Bangkok, Thailand

Véronique Chevalier

Veterinary Epidemiologist
CIRAD, UMR CIRAD-INRA ASTRE
Institut Pasteur du Cambodge

DAI Global Health

Robert Salerno

Director – Health Systems
DAI Global Health

Department of Foreign Affairs and Trade (DFAT)

Richard Lee

Regional Program Manager
Australian Mission to ASEAN – Department of
Foreign Affairs and Trade, Australian Embassy

Defense Threat Reduction Agency (DTRA)

Martha Stokes

Southeast Asia Regional Science Manager
Thailand Country Project Officer
Defense Threat Reduction Agency (DTRA)
Biological Threat Reduction Program (BTRP)

**Fleming Fund Management Agent, Mott
MacDonald**

Anthony Huszar

Regional Coordinator
Fleming Fund Management Agent

Darunee Tuntasuvan

Regional One Health Specialist
Fleming Fund Management Agent

Hokkaido University

Hiroshi Kida

University Professor, Head
Hokkaido University Research Center for
Zoonosis Control

Institut Pasteur du Cambodge

Philippe Dussart

Head of Virology Unit

**International Organization for Migration
(IOM)**

Patrick Duigan

Regional Migration Health Advisor
Sr. Regional Thematic Specialist on Migration
Health,
IOM Asia and Pacific

Montira Inkochasan

Regional Migration Health Program Support
Officer
International Organization for Migration (IOM)

Thea Siphokazi De Gruchy

Regional Migration Health Intern
International Organization for Migration (IOM)

**Mahidol University, FAO Reference Centre
for Zoonotic and Wildlife Diseases**

Walasinee Sakcamduang

Dean
Faculty of Veterinary Science

Witthawat Wiriyarat

Deputy Dean for Research, Networking and
Kanchanaburi Campus
Faculty of Veterinary Science

Sarin Suwanpakdee

Instructor
The Monitoring and Surveillance Center for
Zoonotic Diseases in Wildlife and Exotic
Animals (MoZWE)
Faculty of Veterinary Science

Anuwat Wiratsudakul

Instructor
The Monitoring and Surveillance Center for
Zoonotic Diseases in Wildlife and Exotic
Animals (MoZWE)
Faculty of Veterinary Science

Nareerat Sangkachai

Veterinarian
The Monitoring and Surveillance Center for
Zoonotic Diseases in Wildlife and Exotic
Animals (MoZWE)
Faculty of Veterinary Science

Peerawat Wongluechai

Veterinarian
The Monitoring and Surveillance Center for
Zoonotic Diseases in Wildlife and Exotic
Animals (MoZWE)
Faculty of Veterinary Science

Pacific Community (SPC)

Iwona Piechowiak

Programme Leader- Sustainable Forests and
Landscapes, LRD
Pacific Community (SPC)
Land Resources Division

Elenoa Salele

Animal Health and Production Technician –
LRD
Pacific Community (SPC)
Land Resources Division

**Southeast Asia One Health University
Network (SEAOHUN)**

Vipat Kuruchittham

Executive Director of SEAOHUN

Ratsuda Poolsuk
Operations Manager
Southeast Asia One Health University Network
(SEAOHUN)

UN Environment

Kakuko Nagatani Yoshida
Regional Coordinator for Chemicals, Waste
and Air Quality
UN Environment Asia and the Pacific

Montira Pongsiri
Senior Science Policy Adviser
Oxford University

USAID-RDMA

Daniel Schar
Senior Regional Emerging Infectious Diseases
Advisor
United States Agency for International
Development (USAID)

Sudarat Damrongwatanapokin
Regional Animal Health Advisor
Office of Public Health
USAID Regional Development Mission for Asia

**USDA Animal and Plant Health Inspection
Service (APHIS)**

Jitlada Vasuvat
Agricultural Specialist
USDA APHIS

World Bank

Sutayut Osornprasop
Senior Human Development Specialist
Global Practice on Health, Nutrition, and
Population
World Bank

TRIPARTITE

OIE Headquarters (HQs)

Gounalan Pavade
Chargé de Mission
World Organisation for Animal Health (OIE)

**OIE Regional Representation for Asia and the
Pacific (RR-AP)**

Kinzang Dukpa
Regional Project Officer

Lesa Thompson
Regional Project Officer

Pasang Tshering
Consultant

**OIE OIE Sub-Regional Representation for
South-East Asia (SRR-SEA)**

Ronello Abila
Sub-Regional Representative

WHO Headquarters (HQs)

Elizabeth Mumford
Technical Officer
Capacity Assessment, Monitoring and
Evaluation in One Health Operations Team
Country Health Emergency Preparedness
& IHR
WHO Health Emergencies Programme

**WHO Regional Office for Eastern
Mediterranean (EMRO)**

Nhu Nguyen TRAN MINH
Medical Officer
Infectious Hazard Management
Health Emergencies Department

**WHO Regional Office for South East Asia
(SEARO)**

Tjandra Yoga Aditama
Senior Advisor

Gyanendra Gongal

Technical Officer
National Action Plans and Core Capacity
Building
Country Emergency Preparedness and IHR
World Health Emergency Programme

David Sutherland

WHO Liaison officer
FAO/OIE/WHO Tripartite Secretariat in Asia-
Pacific
FAO Regional Office for Asia and the Pacific

**WHO Regional Office for the Western Pacific
(WPRO)**

Anthony Eshofonie
Epidemiologist
Country Health Emergency Preparedness &
International Health Regulations

WHO Health Emergency Programme

Aya Yajima

Technical Officer
(Neglected Tropical Diseases and Programme
Integration)
Malaria, other Vectorborne and Parasitic
Diseases (MVP)
Division of Communicable Diseases

Emmanuel Eraly

Technical Officer
Essential Medicines and Health Technologies
Division of Health Systems

WHO Bangladesh

Hammam El Sakka

Senior Medical Epidemiologist
Team Leader, Health Security and Emergency
(HSE)

WHO Bhutan

Ugyen Wangchuk

National Professional Officer (Admin)

WHO Cambodia

Asheena Khalakdina

Team Leader

WHO Indonesia

Dr. Endang Widuri Wulandari

National Professional Officer

WHO Lao PDR

May Chiew

Technical Officer (Epidemiologist)

WHO Myanmar

Mushfiqur Rahman

Technical Officer

WHO Mongolia

Ariuntuya Ochirpurev

Technical Officer
Emerging Disease Surveillance and Response

WHO Nepal

Rajan Bikram Rayamajhi

National Professional Officer
World Health Emergency Programmer

WHO Papua New Guinea

Zhang Zaixing

Team Coordinator

WHO Philippines

Sacha Bootsma

Technical Officer

WHO Sri-Lanka

Wagawatta Liyanage Sugandhika Padmini

PERERA

National Professional Officer
Emergency Preparedness

WHO-Timor Leste

Dongbao YU

Medical Officer (Epidemiologist)

WHO Thailand

Phiangjai Boonsuk

National Professional Officer

FAO Bangladesh

Eric Brum

Team Leader - Bangladesh
FAO-ECTAD Bangladesh

FAO Indonesia

James McGrane

Team Leader, Emergency Centre for
Transboundary Animal Disease (ECTAD)
Emerging Pandemic Threats Programme- EPT2

FAO Myanmar

David Hadrill

FAO-ECTAD Myanmar Team Leader

FAO Nepal

Arjun Singh Thapa Chhetri

Programme Officer/OH Focal point

FAO Viet Nam

Nguyen Thuy Hang

One Health Advocacy and Communication
Coordinator
Emergency Centre for Transboundary Animal
Diseases (ECTAD)

FAO RAP

Katinka de Balogh

Senior Animal Production and Health Officer

Yooni Oh

Regional One Health Advisor

Ian Dacre

Deputy Regional Manager

Aurelie Brioudes

Regional Surveillance Coordinator

Madhur Dhingra

Regional Project Coordinator

Mary Joy Gordoncillo

Regional Project Coordinator

Domingo Caro III

Regional Advocacy and Development
Communications Coordinator

Frank Pumipuntu

Regional Monitoring and Evaluation Expert

Nadia Husam Al-Jasem

Regional M&E and Reporting Specialist

Tosapol Dejyong

International Animal Health and Livestock
Value Chain Specialist

Agnes Agunos

Antimicrobial Resistance Project Coordinator
(UK Fleming Fund)

Songling Chen

UN University Volunteer in Value Chain
Analysis for Animal Disease Risk Management

Sonevilay Nampanya

Livestock Development Officer

Norma Sofisa Hurif

Junior Professional Officer (Antimicrobial
Resistance - AMR)

Yoenten Phuentshok

Junior Professional Officer (One Health)

