ASEAN Strategy for Exotic, Emerging, Re-emerging Diseases and Animal Health Emergencies

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Executive Summary

The challenges facing the veterinary and animal health community in the South East Asia region in effectively preparing for animal health and veterinary public health emergency are real. The dynamic of the hazard nature as well as the risk pathways for the introduction are occurring. Globally and regionally there have been recent outbreaks of avian influenza, Ebola virus disease, Middle East respiratory syndrome (MERS), ASF, PPR, LSD and Covid-19. Additionally, animal and human populations live in ever-closer proximity in the South East Asia region, allowing cross-species transmission of viruses with pandemic potential, such as avian influenza. The presence of newer threats such as environmental and uncommon patterns of antimicrobial resistance (AMR) add to our regional vulnerability.

Member States have used lessons learnt from past events to update animal health emergency plans, strengthen their preparedness to respond to new and recurring animal health security threats, and ultimately strengthen the collective readiness of the South East Asia region to respond. The lessons have also illustrated the need for Member States to strengthen resilience to animal health security threats by investing sustainably in preparedness, especially during the period between emergencies. In an interdependent world, preparedness will be enhanced through improved coordination, communication and information-sharing among countries, sectors and stakeholders.

This strategic framework, Emergency preparedness and response, reflects all hazards related to biological threats approach adopted by the region and incorporates the lessons learnt from actual events. Extensive consultations with Member States, technical experts and partners reiterated the relevance of this strategy as the common framework for action for working towards core capacities and building national capacity to prevent, detect, respond to and mitigate animal health security threats.

The direction and structure of this document reflects the findings and recommendations of the implementation of emergency response and preparedness in the region and aims to further enhance the core animal health systems and regional collaboration and connectedness, as a priority for effective management of animal health emergency preparedness (AHEP) and response through adoption of incident management systems for all hazards.

The vision for this strategy is ASEAN region able to prevent, detect and respond to animal health emergencies through collective responsibility for animal health security. The goal is to strengthen AHEP and response capacity by improving core public health systems, increasing regional connectivity and coordination, and investing in ongoing performance improvement.

This document contributes to animal health system strengthening by focusing on nine essential animal health functional areas necessary for AHEP, risk mitigation and response operations. Furthermore, this document is designed to enable harmonization with other national and international frameworks and initiatives within region and globally such as ACCAHZ, AVEG, AIGA, ALDF, ANFPPV, and GAHP, GFTADS, GHSA and APHCA to address the importance of further enhancing collaboration on zoonoses using the One Health approach.

Abbreviations

ACCAHZ	ASEAN Coordinating Centre for Animal Health and Zoonosis
ALDF	ASEAN Laboratory Directors' Forum
AIGA	Avian Influenza Group in ASEAN
AMU	Antimicrobial Use
AMR	Antimicrobial Resistance
AMS	ASEAN Member State
APSED	Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies
ASEAN	Association of South East Asian Nations
ASF	African Swine Fever
ASWGL	ASEAN Sectoral Working Group on Livestock
AVEG	ASEAN Ad-Hoc Veterinary Epidemiology Group
APHCA	Animal Production and Health Commission for Asia and the Pacific
BSE	Bovine Spongiform Encephalopathy
COVID-19	Coronavirus Disease 2019
EIDs	Emerging Infectious Diseases
EQA	external quality assessment
FAO	Food and Agriculture Organization of the United Nation
FETPV-SEA	Field Epidemiology Training Program for Veterinarian-Southeast Asia
GFTADS	Global Framework for the progressive control of Transboundary Animal Diseases
GHSA	Global Health Security Agenda
HPAI	Highly Pathogenic Avian Influenza
LDCC	Local Disease Control Centre
LEGS	Livestock Emergency Guidelines and Standards
M&E	Monitoring and Evaluation
NADEPC	National Animal Disease Emergency Planning Committee
NDCC	National Disease Control Centre
NEC	National Emergency Committee
NGOs	Non-Government Organizations
OIE	World Organisation for Animal Health (OIE)
SEA	South-East Asia
SOPs	Standard Operating Procedures

PPE	Personal Protection Equipment
PVS	Performance of Veterinary Services
RRTs	Rapid Response Teams
TADs	Trans-Boundary Animal Diseases
TAG	Technical advisory group
WHO	World Health Organization of the United Nation

Contents

ASEAN Strategy

Background

ASEAN (The Association of Southeast Asian Nations) is a Southeast Asia region intergovernmental organization aimed primarily at promoting economic growth and regional stability among its members.

Statistically, ASEAN is the 6th largest economy in the world and the 3rd largest economy in Asia[1]. All the member countries are at a high pace of economic growth and projected to be part of the 4th largest economy in the world in 2030[2]. ASEAN has the 3rd largest population in the world (629 million in 2015) with more than half of the population at age thirty. The total trade of ASEAN member countries is increased by 700 billion US$ with the largest share coming from inter-ASEAN member countries.

However, with all those statistics numbers, there are challenges to be faced by all ASEAN member countries. Growing populations, rising disposable incomes, and progressive urbanization in this region have spurred rapid growth in the consumption of animal-based food.

This region plus China has generated more than half the gains in global livestock production since the early 1990s and this growth is expected to continue in the foreseeable future. However, the manner of supply growth has also imposed considerable social, health, and ecological costs.

Transboundary animal diseases are highly contagious epidemic diseases that can spread extremely rapidly, irrespective of national borders. They cause high rates of death and disease in animals, thereby having serious socio-economic and sometimes public health consequences while constituting a constant threat to the livelihoods of livestock farmers.

Rapid increases in the global population of people and farm animals, intensification of farming systems, huge increases in the amount of meat, milk and eggs consumed, especially in developing countries, and enormous increases in the international movement of people, animals and livestock products exposes our planet to increased risk of outbreak of epizootic and zoonotic diseases, including potentially catastrophic of pandemics. Estimated more than 60% of all infectious diseases that affect people are zoonotic-that is they can be transmitted to people from animals and three from five of newly emerging diseases are from animals, thus the animal disease outbreak has also potential risk of public health emergencies.

Moreover, the Southeast Asia region frequently experiences outbreaks of epizootic and zoonotic diseases also food safety and public health emergencies in the aftermath of natural hazards, such as extreme weather events and earthquakes. Not only will the risk of future events continue, but they are likely to become more complex due to a changing social, environmental and economic landscape as well as forecasted significant climate change that may potentially magnify the devastating health, political and economic impacts of these events.

[1] ASEAN Economic Community at glance 2016. ASEAN Secretariat

[2] 9 things you need to know about ASEAN-Deutsche Bank. Access on 17th May 2020. https://www.db.com/newsroom_news/2019/9-things-you-need-to-know-about-asean-en-11469.htm

In term of risk mitigation, emergency preparedness and response are essential. This is a mechanism to ensure that certain countries and region are prepared to detect, respond to and recover when an emergency occurs against an animal diseases or zoonosis outbreak.

Recognizing the importance of the emergency preparedness, the most fundamental component is the contingency plan in the regional level and country level. Animal Disease Emergency Preparedness that is preparedness planning and increasing the ability of a region or a country to detect early on a animal disease and zoonosis outbreak. Adequate preparation before an emergency event of a disease outbreak is essential to ensure that the region or a country has sufficient capacity, resources, and legislative support to carry out activities that are included in the emergency response plan. Some comprehensive manuals / guidelines for emergency preparedness and emergency response planning are available and initiated by international organization as guidance for countries and regions to develop their own plan.

The animal health and public health threats, particularly outbreaks of emerging diseases, can rapidly expand to affect multiple countries. This common vulnerability highlights the need for collective preparedness and response, and a common strategic direction nationally, regionally and globally. Capacities and systems need to be strengthened in order to anticipate risks and act early in response to identified threats. This will increase the resilience and sustainability of animal health and public health systems.

Currently, there are zoonotic, new emerging, re-emerging and exotic disease outbreaks that have potential risk causing major impacts such as animal and human mortality, morbidity, economic loses and livestock losses due to disease outbreaks. This document is the 1st document for ASEAN Regions as ASEAN Strategy for Exotic, Emerging Diseases and Animal Health Emergencies. This document will serve as the agreed framework to prevent, protect against, control and provide an animal health and zoonosis response to the international spread of disease in the regions which can cause catastrophic impact. This document aims to give guidance ASEAN Member States to implement and strengthen the core capacities for Exotic, Emerging Diseases and Animal Health Emergencies. The member states guide to focus on building the minimum components of the animal health system for early detection, early response and outbreak investigation.

The main stakeholders that will involve in this mainly is the ASEAN Secretariat and the Member states authorities which dealing with animal health and zoonotic diseases. Since the disease also impacted the trade and other sectors which involve private sector, the private sectors as well as other organization has also importance role thus, they will involve for the prevention and control purposes.

This document will mainly focus into nine areas which are (1) Animal health emergency preparedness; (2) Surveillance, risk assessment and response; (3) Laboratories; (4) Zoonosis; (5) Prevention through livestock and animal health treatment; (6) Risk analysis and risk communication; (7) Regional preparedness, alert and response; (8) Recovery; (9) Monitoring and evaluation.

Threats of Animal and Zoonotic Diseases in ASEAN

Land encroachment and climate change contribute to outbreaks of such animal diseases – some transmissible to humans – as brucellosis, bovine tuberculosis, parasitic illnesses, anthrax, bovine spongiform encephalopathy (BSE) and certain strains of influenza viruses. High-impact animal diseases such as foot-and-mouth disease, peste des petit ruminants, classical or African swine fevers, while not directly affecting human health, do affect food and nutrition security and livestock production and trade.

An enormous range of diseases impacting upon the health and productivity of livestock occurs around the ASEAN regions. Several major animal diseases frequently reported by ASEAN member countries are the foot-and-mouth disease of cattle and buffalo, classical swine fever of pigs, Newcastle disease, and highly pathogenic Avian Influenza (HPAI) of poultry. Other diseases of particular concern include anthrax, rabies, hemorrhagic septicemia, Aujesky's disease and recently the important disease for pig population is African swine fever.

Emerging Disease in Southeast Asia

In the past decade, livestock sectors in Southeast Asia growth rapidly particularly in poultry sectors. The expansion was led by Thailand, Malaysia followed by Indonesia, Vietnam and Cambodia. However, the traditional livestock rearing still remains for the smallholders. The livestock are reared in an extensive or backyard system[3], [4]. This type of animal husbandry has been linked to several emerging diseases and has been identified as a risk factor for future emerging infections[5], [6].

The close contact in unsanitary condition inter species including human is one of the important risk factors of the emerging infectious diseases in this region. SEA was highlighted as among the areas with high concentration of poor livestock keepers where intervention at the human–livestock interface could give positive impacts on zoonosis control.

Moreover, the bushmeat, the hunting practice, and increasing trend of wildlife pets in Southeast Asia countries in general also increase the risk of this threat. These practices allow continuous interaction between various species or animals and humans and has been frequently reported as one of the most important emerging disease determinants in this region.

There were several outbreaks in the region which had major impact to the livestock sector and seen as public health threats

Nipah Virus Infection

In late 1997, novel Nipah virus discovered at Northern state of Peninsular Malaysia and rapidly spread to the central states of Malaysia rapidly[7]. The disease was found as a mysterious 'pig diseases'

[3] Ahuja, V., 2013. Asian Livestock: Challenges, Opportunities and the Response, third ed. Rome, Italy: FAO
[4] Del Rosario, B., Aquino, A., Tidon, A., Gerpacio, R., 2007. Livestock sector training needs assessment report for South Asia.
[5] Biswas, P.K., Christensen, J.P., Ahmed, S.S.U., et al., 2009. Risk for infection with highly pathogenic avian influenza virus (H5N1) in backyard chickens,Bangladesh. Emerging Infectious Disease 15, 1931–1936.
[6] Grace, D., Mutua, F., Ochungo, P., et al., 2012. Mapping of Poverty and Likely Zoonoses Hotspots. Kenya: ILRI
[7] Mohd Nor MN, Gan CH, Ong BL. avia virus infection of pigs in peninsular Malaysia. Rev Sci Tech. 2000;19(1):160-165. doi:10.20506/rst.19.1.1202

appeared in a pig farm which closely linked to clustered cases of febrile encephalitis among individuals occupationally exposed to pigs[8].

The Nipah virus, named after the location where the disease was first discovered at Sungai Nipah, Negeri Sembilan is antigenically and genomically similar to the Hendra virus isolated from bats in Australia and was later classified into a distinct taxonomic unit as the new genus Henipavirus of the family Paramyxoviridae[8] .

Pigs were identified as the amplifier host for Nipah virus, resulting in the culling of approximately 1.1 million pigs as part of the outbreak response[7]. Pteropus bats (flying foxes or fruit bats), which were found at the index farm, have since been proven in many studies to be the symptomless reservoir host of the virus[9]. The species that have been well studied for Nipah virus infection are *Pteropus vampyrus* (large flying fox) and *Pteropus hypomelanus* (island flying fox)[10] [11].

Apart from bats in Malaysia, serological evidence of Nipah virus has been found in pteropids trapped throughout SEA such as Cambodia, Indonesia, and Thailand[10,12] a finding that is not surprising given the distance travelled and migratory nature of these bats[13].

Highly Pathogenic Avian Influenza A H5N1

The HPAI H5N1 causes severe morbidity and mortality among poultry and was the first type of avian flu to cause severe respiratory disease and high mortality among human. In SEA, the reported case-fatality rate of H5N1 infection in humans vary between 50% and 80%, however the rate is acknowledged to be inflated due to an undetermined number of individuals who may have been silently or sub clinically infected during the outbreaks[14] . The incubation period of H5N1 in chickens is tricky to measure but has been estimated to be between 2 and 3 days[15] .

Avian influenza was formally reported in SEA in Vietnam at the end of 2003. The infection rapidly spread in the country's poultry population where severe respiratory infection and lethality occurred among poultry and humans. Within a few ensuing months the disease had spread to Thailand, Cambodia, Indonesia, Laos, and Malaysia[16], [17]. Most outbreaks occurred among backyard poultry with instances of virus transmission to local commercial poultry farms usually via fomites (such as trucks, crates, and cages) and personnel. Even though the poultry industry is the major livestock industry

[8] Chua, K. B., W. J. Bellini, P. A. Rota, B. H. Harcourt, A. Tamin, S. K. Lam, T. G. Ksiazek et al. "Nipah virus: a recently emergent deadly paramyxovirus." Science 288, no. 5470 (2000): 1432-1435.

[9] Johara, M. & Field, H. & Rashdi, A. & Morrissy, Chris & Heide, B. & Rota, Paul. (2001). Serological evidence of infection with Nipah virus in bats (order Chiroptera) in Peninsular Malaysia. Emerg Infect Dis. 7. 439-441.

[10] Sendow, Indrawati & Ratnawati, Atik & Taylor, Trevor & Adjid, Rm & Saepulloh, Muharam & Barr, Jennifer & Wong, Frank & Daniels, Peter & Field, Hume. (2013). Nipah Virus in the Fruit Bat Pteropus vampyrus in Sumatera, Indonesia. PloS one. 8. e69544. 10.1371/journal.pone.0069544.

[11] Chua, Kaw Bing. "Nipah virus outbreak in Malaysia." Journal of Clinical Virology 26, no. 3 (2003): 265-275.

[12] Reynes, Jean-Marc, Dorian Counor, Sivuth Ong, Caroline Faure, Vansay Seng, Sophie Molia, Joe Walston, Marie Claude Georges-Courbot, Vincent Deubel, and Jean-Louis Sarthou. "Nipah virus in Lyle's flying foxes, Cambodia." Emerging infectious diseases 11, no. 7 (2005): 1042.

[13] Breed, Andrew C., Hume E. Field, Craig S. Smith, Joanne Edmonston, and Joanne Meers. "Bats without borders: long-distance movements and implications for disease risk management." EcoHealth 7, no. 2 (2010): 204-212.

[14] Wang, Taia T., Michael K. Parides, and Peter Palese. "Seroevidence for H5N1 influenza infections in humans: meta-analysis." Science 335, no. 6075 (2012): 1463-1463.

[15] Bouma, Annemarie, Ivo Claassen, Ketut Natih, Don Klinkenberg, Christl A. Donnelly, Guus Koch, and Michiel Van Boven. "Estimation of transmission parameters of H5N1 avian influenza virus in chickens." PLoS Pathog 5, no. 1 (2009): e1000281

[16] Sims, L.D., Domenech, J., Benigno, C., et al., 2005. Origin and evolution of highly pathogenic H5N1 avian influenza in Asia. Veterinary Record 157 (6),159–164.

[17] WHO, 2012. H5N1 avian influenza: Timeline of major events (WWW Document). Available at: http://gvaonline.in/sites/default/files/H5N1_avian_influenza_update150612N_1.pdf

undergoing rapid intensification in this region, 50–70% of poultry are raised in backyard farms where little biosecurity exist[18], [19].

Since its emergence in 2003 to January 2014, the World Health Organization has tallied 650 human confirmed cases of avian influenza and 386 deaths worldwide[20] . SEA contributed to more than 50% of the cases and fatalities related to human H5N1 infection. Based on the formal notification to OIE between 2003 and 2013, Vietnam surpassed other nations in the world with 2682 outbreaks followed by Thailand with 1141 outbreaks. Indonesia, Myanmar, Cambodia, Laos, and Malaysia each reported 269, 114, 37, 19, and 16 outbreaks, respectively. Malaysia and Thailand have not reported any outbreaks since 2006 and 2009 respectively.

HPAI H5N1 outbreaks were better controlled in a few SEA regions compared to others. The success in eradicating H5N1 virus depends primarily on early detection of virus introduction and prompt institution of control measures such as aggressive culling or stamping-out policy in the country[21], [22].

Indonesia and Vietnam were the countries affected by H5N1 worst in terms of human incidence and fatalities, which by the end of 2004 and 2005, respectively instigated the decision to perform mass vaccination of poultry[22].

The vaccination was performed along with other control measures such as systematic annual testing and pre-movement testing of local poultry. Both countries have since been considered endemic for avian influenza H5N1. By 2006 Indonesia reported H5N1 outbreaks in 31 of its 33 provinces and 286 of 444 its districts[23]. Up until now Vietnam, Indonesia, Cambodia, Laos, Myanmar, and Indonesia continue to face intermittent outbreaks despite significant control efforts by the governing authorities.

However, the incidence and the number of outbreaks in poultry along with those in humans have continuously declined over the past few years consistent with the declining global trend of avian influenza H5N1 worldwide

Pandemic Influenza A (H1N1) 2009 Virus

Between March and early April 2009, a novel influenza A (H1N1) virus emerged in the United States among individuals with travel history to Mexico[24]. Initial cases of influenza were later discovered to have occurred in Mexico before it was reported in the United States[25]. The virus rapidly spread to the whole northern hemisphere and within the first few months had spread throughout the globe via human-to-human transmission leading to the first global influenza pandemic of the century.

[18] Bethe, M.R., 2006. Global Spread of the Avian Flu: Issues and Actions. Nova Publishers.
[19] Boni, M.F., Galvani, A.P., Wickelgren, A.L., Malani, A., 2013. Economic epidemiology of avian influenza on smallholder poultry farms. Theoretical Population Biology 90, 135–144
[20] WHO, 2014. Influenza at the human animal interface (WWW Document). Available at: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_24January14.pdfua=1
[21] Coker, R.J., Hunter, B.M., Rudge, J.W., Liverani, M., Hanvoravongchai, P., 2011. Emerging infectious diseases in southeast Asia: Regional challenges to control. Lancet 377, 599–609.
[22] OIE, FAO, 2007. The Global Strategy for Prevention and Control of H5N1 Highly Pathogenic Avian Influenza. Rome: Food and Agriculture Organization of the United Nations
[23] Sumiarto, B., Arifin, B., 2008. Overview on poultry sector and HPAI situation for Indonesia with special emphasis on the Island of Java (Pro-poor HPAI Risk Reduction No. 3). Addis Ababa: International Food Policy Research Institute (IFPRI) with the International Livestock Research Institute (ILRI) and Royal Veterinary College (RVC).
[24] Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team, Dawood, F.S.,Jain, S., et al., 2009. Emergence of a novel swine-origin influenza A (H1N1) virus in humans. New England Journal of Medicine 360, 2605–2615. doi:10.1056/NEJMoa0903810.
[25] Neumann, G., Noda, T., Kawaoka, Y., 2009. Emergence and pandemic potential of swine-origin H1N1 Influenza virus. Nature 459, 931–939. doi:10.1038/nature08157.

The pandemic H1N1 struck almost every SEA countries, and post-pandemic surveillance among pigs in Thailand, Cambodia, and Vietnam suggest that reverse transmission of pandemic H1N1 2009 virus infection had occurred at rates of more than 20% among sampled pigs[26] [27]

Low Pathogenic Avian Influenza

Low pathogenic avian influenza virus (LPAIV) usually causes mild disease or asymptomatic infection in poultry. LPAIV has, however, become a great threat to poultry industry and also to human health. Currently, LPAI cases were predominantly caused by H7 and H9.

At the beginning of 2013, another avian influenza virus strain of low pathogenicity, H7N9 resulted in severe respiratory infection among humans. The infection first appeared in the southern part of China and later spread to a wider region within the country[28]. The infection in humans are severe and resulted in high case–fatality, however there was little clinical implications to poultry even though epidemiological evidence among human cases highly suggest some level of contact (direct or indirect) with this species[29]. Fortunately, the low pathogenic avian influenza (LPAI) H7N9 have to date not been reported among the poultry populations of the SEA countries or any other countries.

The H9 subtype are enzootic in Asia, the Middle East, and parts of North and Central Africa, where they cause significant economic losses to the poultry industry. Some strain of H9N2 have been associated with to zoonotic cases of mild respiratory diseases. The virus is threat to poultry and human health and considered of pandemic concern by the World Health Organization (WHO).

African swine fever

African swine fever (ASF) is a devastating haemorrhagic fever of pigs with mortality rates approaching 100 percent. It causes major economic losses, threatens food security, and limits pig production in affected countries. ASF is caused by a large DNA virus, African swine fever virus (ASFV). There is no vaccine against ASFV and this limits the options for disease control. ASF has been confined mainly to sub-Saharan Africa, where it is maintained in a sylvatic cycle and/or among domestic pigs. Wildlife hosts include wild suids and arthropod vectors. The relatively small numbers of incursions to other continents have proven to be very difficult to eradicate. Many countries in Southeast Asia have affected severely impact by this disease since 2018 and continue until now.

Animal health security threats, particularly outbreaks of emerging of animal diseases, can rapidly expand to affect multiple countries. This common vulnerability highlights the need for collective preparedness and response, and a common strategic direction nationally, regionally and globally. Capacities and systems need to be strengthened in order to anticipate risks and act early in response to identified threats. Strengthening the components of the health system, such as rapid response teams (RRTs), EBS systems and the Field Epidemiology Training for Veterinary (FETPV) programme is also important to support emergency preparedness system.

However, from the recent outbreaks, it is concluded that all Member States in the region remain vulnerable to emergence of animal diseases and public health emergencies, and that national and regional readiness to respond to large-scale and complex events in an effective and coordinated way is still lacking.

[26] Hiromoto, Y., Parchariyanon, S., Ketusing, N., et al., 2012. Isolation of the pandemic (H1N1) 2009 virus and its reassortant with an H3N2 swine influenza virus from healthy weaning pigs in Thailand in 2011. Virus Research 169, 175–181

[27] Rith, S., Netrabukkana, P., Sorn, S., et al., 2013. Serologic evidence of human influenza virus infections in swine populations, Cambodia. Influenza and Other Respiratory Viruses 7, 271–279. doi:10.1111/j.1750-2659.2012.00382.X.

[28] CDC, 2013. Emergence of Avian Influenza A (H7N9) Virus Causing Severe Human Illness-China, February–April 2013

[29] Chen, Y., Liang, W., Yang, S., et al., 2013. Human infections with the emerging avian influenza A H7N9 virus from wet market poultry: Clinical analysis and characterisation of viral genome. Lancet 381, 1916–1925.

African horse sickness

African horse sickness (AHS) is a deadly disease caused by a virus transmitted by arthropods belonging to the family Reoviridae, genus Orbivirus. It is considered a major health threat to horses in areas endemic to sub-Saharan Africa. The African horse sickness virus (AHSV) repeatedly causes major epizootics in the Mediterranean region (North Africa and southern Europe in particular) as a result of the trade in infected goods. The unexpected emergence of a closely related virus, the bluetongue virus, in northern Europe in 2006 has raised concerns about the entry of AHSV into Europe, and more specifically to AHSV-free areas where an AHSV vector has been reported, eg. Midwife Culicoides. Nine different serotypes have been described.

AHS laboratory diagnosis is very important. Although clinical signs and lesions are characteristic, they can be confused with other equine diseases such as anthrax, equine infectious anemia, equine viral arteritis, trypanosomosis and equine encephalosis, et al.

AHS specifically caused by the AHS serotype 1 virus was first reported in Thailand in March 2020, which was the first to be introduced in Asia. This has the potential to be a significant challenge for the equine and veterinary services industry on both a national and regional scale.

Lumpy skin disease

Lumpy skin disease (LSD) is a poxviral disease with significant morbidity in cattle. Although the mortality rate is generally low, economic losses result from loss of condition, decreased milk production, abortion, infertility and skin damage. The causative virus appears to be spread primarily by blood-eating insects, such as certain species of flies and mosquitoes or ticks, and outbreaks can be widespread and difficult to control.

The lumpy skin disease virus (LSDV) is a member of the genus Capripoxvirus and the Poxviridae family. It is closely related antigenically to the sheep pox virus and the goat pox virus. Although these three viruses are considered distinct virus species, they cannot be distinguished by routine serological testing. There is no evidence that LSDV can infect humans.

LSD was first reported in the Asia and Pacific region in 2019 in northwest China, Bangladesh and India. During the northern summer of 2020, LSD continues to spread across the Asian continent with many members in South and Southeast Asia confirming an outbreak. As of October 2020, LSD has spread to Bhutan and Vietnam.

Coronavirus

The emergence of severe acute respiratory syndrome (SARS) illustrates that the coronavirus (CoV) can covertly emerge from a possible animal reservoir and can cause potentially fatal disease in humans, as previously known in animals. Animal corona virologists have previously recognized the potential for the coronavirus to cause fatal gastrointestinal or respiratory infections in animals and new strains of CoV emerge from unknown reservoirs, often causing fatal disease in naïve populations. The risk of susceptible animals, such as mink, becoming a reservoir for SARS-CoV-2 is a cause for concern around the world, as it could pose a continuing public health risk and lead to future spill events in humans. Recent surveillance findings in Denmark suggest that the SARS-CoV-2 virus, which gets into mink through contact with humans, developed via viral mutations and has been reintroduced into humans.

Vision, Goal and Objectives

Vision:

An ASEAN region able to prepare for, prevent, detect, respond to and recover from animal health and zoonosis emergencies through collective responsibility for managing animal health security.

Goal:

To strengthen response capacity by improving core animal health systems, increasing regional connectivity and coordination, and investing in ongoing performance improvement.

Objectives:

1. Strengthen effective preparedness for emerging animal disease and zoonosis emergencies
2. Reduce the risk of emerging animal disease and zoonosis emergencies
3. Strengthen early detection and assessment of outbreaks, and animal health and zoonosis emergencies
4. Strengthen rapid and appropriate response to and recovery from emerging animal diseases and zoonosis emergencies
5. Build strategic partnerships and sustainable financing for animal health preparedness and response
6. Strengthen prevention through livestock and animal health treatment

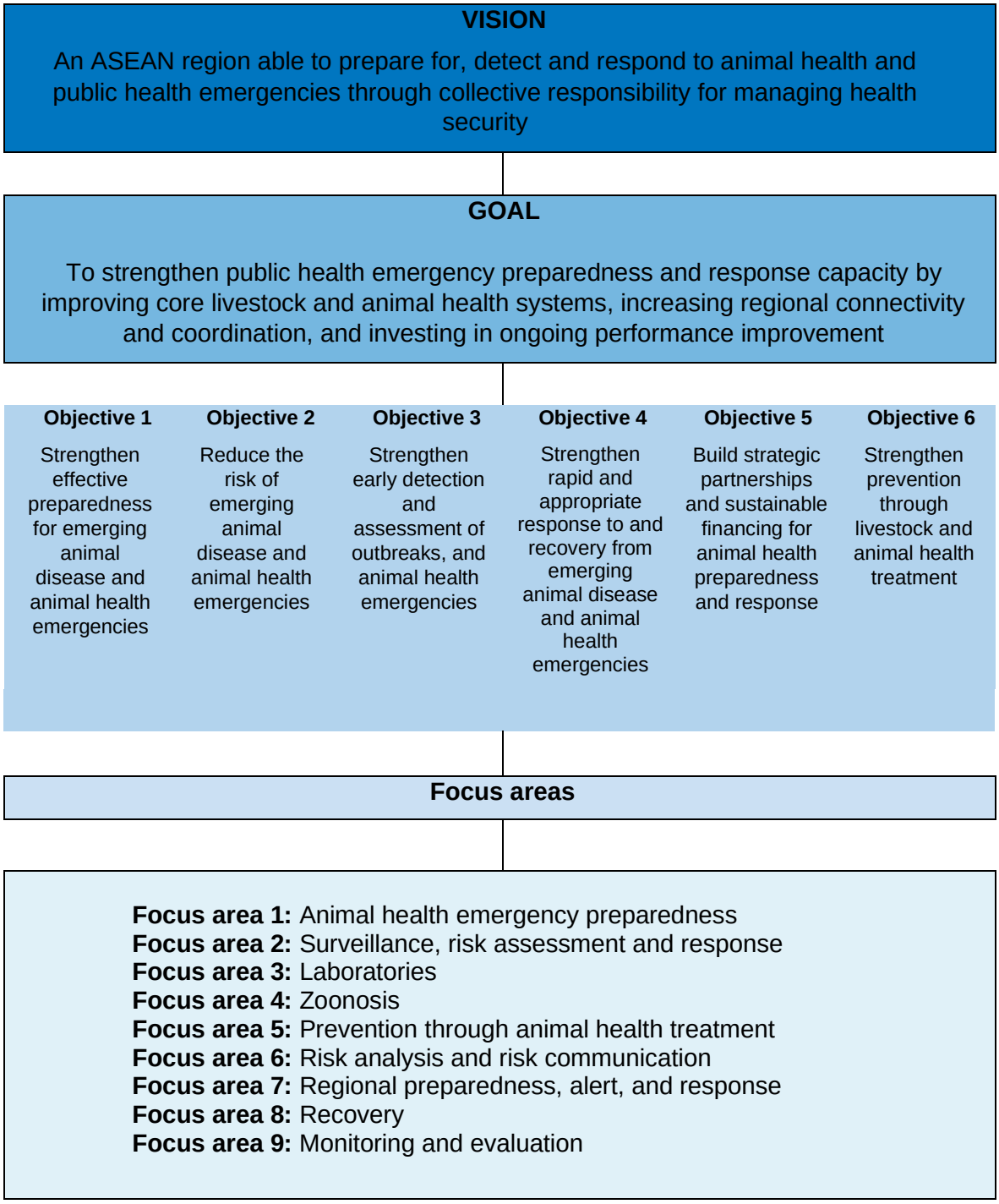

Figure 1. Vision, Goal, Objectives and Focus Areas of ASEAN Strategy for Exotic, Emerging Diseases and Animal Health Emergencies

Scope and Limitation

Scope

The ASEAN Strategy for Exotic, Emerging Diseases, and Animal Health Emergencies is a regional framework for animal health and zoonosis which could cause a huge impact on economic and trades as well as the public health in the regions. The framework mainly to strengthen and further improve the animal health system for early detection and response by member states and regions.

The ASEAN Strategy for Exotic, Emerging Diseases, and Animal Health Emergencies is develop based on the similar initiative for the public health security system for the regions namely Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSED) that developed by WHO in 2017 and Good Emergency Management Practice: The Essentials developed by FAO in 2011.

Recognizing the emergency preparedness capacity in many countries is insufficient and international coordination is too limited to fully understand the risks and reduce the consequences of animal health emergencies, The ASEAN Strategy for Exotic, Emerging Diseases, and Animal Health Emergencies main aim is to reduce the impact of animal health emergencies by strengthening the core of the animal health system function such as the surveillance system, the response of the animal health event, the financial system.

Limitation

This document was developed as a how the regional implementation mechanisms for animal health emergencies in the region was not agreed yet. This document is also the initial document for ASEAN which will need further discussion within ASEAN member states and can be revisit as required.

In the wider landscape of the document development, there are a number of issues – such as the recognition of other health emergencies within the One Health framework such as APSED to be harmonize with this document. The document need respond and contributing to ongoing other regional initiative and other international initiative such as SDGs and the Global Health Security Agenda (GHSA) which work direct and indirectly with the animal health and zoonosis.

Emergency Management Plan Guiding Principles

- Country focused: places countries, communities and people at the centre.
- The biological hazards approach: provides a generic platform to strengthen animal health system core capacities and core systems required for managing all emerging animal disease and animal health emergencies.
- Staged approach: adopts a step-by-step approach to develop or enhance emergency management plan
- Continuous learning for improvement: reviews experiences and lessons from past events and revises plans
- Regional and global public goods: increases the importance of connecting national surveillance, risk assessment, risk communication and response systems to the regional and international levels;
- Partnership for collective action: increases the emphasis on partnerships for collective preparedness and response, and provides a common platform for stakeholder engagement;

- Forward-looking: increases the importance of looking to the future, including predicting risks, being proactive rather than reactive; and
- Financial sustainability: invests in preparedness.

Purposes of the Guidelines

A disease emergency is one of the most challenging situations that a veterinary service can confront. Recent experience on the ASF outbreak and other major disease outbreaks in various countries in SEA as well as other regions has shown that veterinary services must be well-prepared to deal with such an emergency to achieve rapid, cost-effective control. To perform this, the government authorities and veterinary services should have a well-developed plan, the capacity to implement it, and it must practice implementing its plan.

The main purpose of this guideline is to provide strategic framework for action and allow Member States flexibility in its implementation. It takes into account the needs and priorities of Member States; lessons learnt; the economic landscape, the livestock sector industries, environmental, demographic and other social factors; and the development and implementation of initiatives and frameworks developed in ASEAN. Some of these frameworks may also focus more on the control of transboundary animal diseases (TADs) but could also be used for food safety and zoonosis.

The guideline is a systematic way the elements required to achieve the level of preparedness for any emergency disease in animals in the region as one single entity to protect their member states. This guideline will act as one of reference for ASEAN member countries to develop their plan for disease emergency with their context. Eventually the guideline is to protect the animal's health in the region and improvement and protect the health of the people from zoonoses in the ASEAN region.

Intended Implementer

Considering the member states shared vulnerability and responsibility to manage animal health security, protect the economic sectors and public health relate with zoonosis are the key implementers of ASEAN Member States and other partners. Implementation should be overseen by veterinary departments which responsible for the management of animal health, zoonosis and other emerging diseases and response, in coordination with the unit or office designated as the National Veterinary authority and or national disaster management offices.

Other important implementers are agencies working on animal health system; zoonotic and emerging diseases in the public health, and wildlife sectors; food safety authorities; and environmental health and other departments concerned with the animal health management emergencies such as chemical or radiological events.

In addition, academia, the private sector, non-government organizations, civil society, and security and judicial authorities can play an important role in implementing the guideline particular relate with animal health emergency response.

Use of the Strategy

It is highly recommended that the strategy be used in the following ways:

- As a common framework for action to further enhance the progress made in building national and local capacities to manage animal health emergencies for exotic diseases, EIDs, food safety and public health emergencies;

- As a common approach to facilitate coordination of various initiatives and external support and maximize multi-sectoral collaboration at the national and regional levels;
- As a regional mechanism to collectively monitor progress, facilitate learning for continuous improvement, and improve regional preparedness and response; and
- As a strategic document for advocacy and to mobilize domestic and external financial and technical resources.

Focus Areas of Animal Health Emergencies

Focus area 1: Animal Health Emergency Preparedness

Animal Health Emergency Preparedness is the core of ASEAN Strategy for Exotic, Emerging Disease and Animal Health Emergencies. It is a key aspect of sustainability and resilience as an action framework of the animal health resilience efforts for SEA regions. While much of this focus area concentrates on the development of emergency plans for the region and each country, it also highlights the importance of system readiness, that is, having in place the key functions, people, resources, tools and facilities across the health system (and in other sectors) to operationalize those plans effectively and efficiently.

The animal health sector will need to work together with other sector actors as a One Health approach (for example public health, wildlife, education, environment, foreign affairs, security, trade and industry, and civil society) to plan for and respond to animal health emergencies public health threat emergencies, and to ensure effective plans and adequate resources are in place.

Experience has shown that putting all the right components in place during the peace time provides the foundation for delivering prompt and effective management of an emergency. Furthermore, having incident management system (IMS) capacity with trained personnel who can be rapidly activated for an effective response can prevent a small emergency from becoming a big one.

The two concepts mentioned above – planning and readiness as a "two-tier approach", which is shown in Fig. 2.

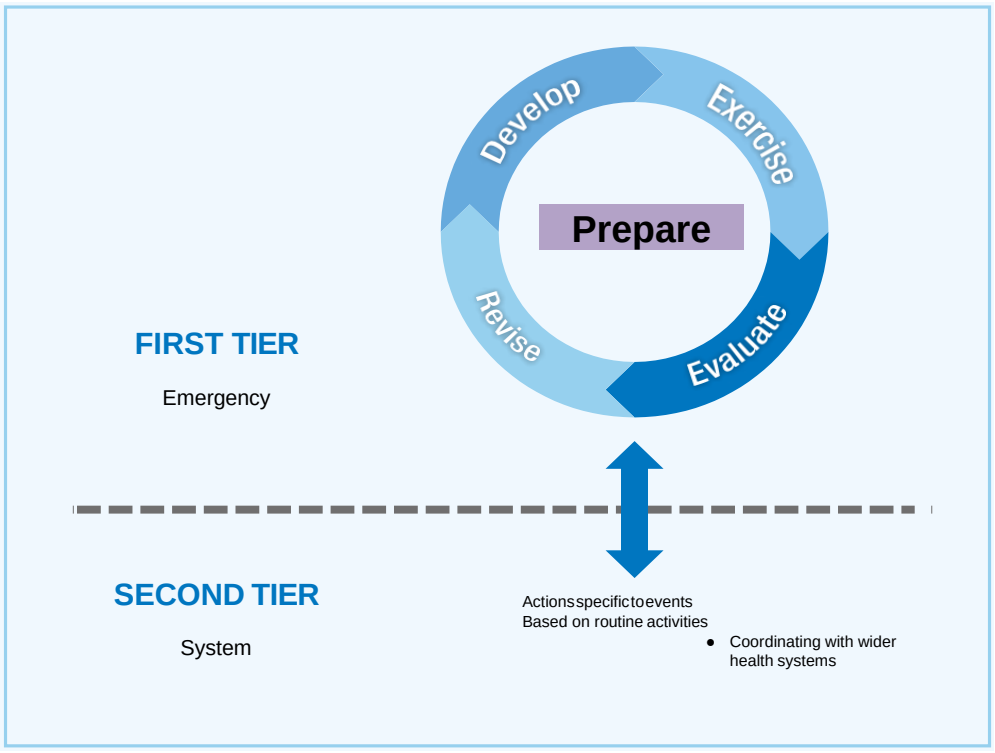

Figure. 2. Framework for animal health emergency planning and preparedness (adapted from APSED WHO)

Emergency planning (the top tier in Figure 2) is described later in this focus area, and has been split into two parts: (1) the response plan itself; and (2) the ongoing planning and coordination process.

System readiness is about ensuring the availability of all structures and resources in the animal health sector and other sectors, including multi-sectoral coordination mechanisms that facilitate a whole-of-society approach and allow response plans to be implemented immediately and effectively.

The two fundamental components of animal disease emergency preparedness planning are the development of capabilities for:

1. Early warning, and
2. Early reaction to disease epidemics and other animal health emergencies.

These require advance preparation of both generic and disease-specific written contingency plans and operating procedures, the testing of such plans and training of staff; the development of capabilities at national, provincial and local veterinary headquarters, including field and laboratory services; development of mechanisms to involve other necessary government and private sector services and farming communities in the emergency response; development of the capacity to apply all the necessary resources to counter the disease or other animal health emergency in the most efficient way (including equipment, personnel and finances); and, finally, advance establishment of the appropriate legal and administrative structures to deal with an emergency.

1. Early warning of diseases

Early warning enables rapid detection of the introduction of, or sudden increase in the incidence of any disease in livestock which has the potential of developing to epidemic proportions and/or causing serious socio-economic consequences or public health concerns. It embraces all initiatives, mainly based on disease surveillance, reporting and epidemiological analysis that would lead to improved awareness and knowledge of the distribution and behaviour of disease outbreaks (and of infection) and which allow forecasting of the source and evolution of the disease outbreaks and the monitoring of the effectiveness of disease control campaigns.

The success of a country's capability for rapid detection of the introduction or increased incidence of transboundary and potentially epidemic animal diseases depends on:

a. Good farmer and public awareness programmes for high-threat epidemic livestock diseases that involve improving the veterinary/farmer interface;

b. Training of field veterinary officers and veterinary auxiliary staff in the clinical and gross pathological recognition of serious epidemic livestock diseases; collection and transportation of diagnostic specimens; and the need for prompt action;

c. Sustained active disease surveillance to supplement passive monitoring, based on close coordination between field and laboratory/epidemiology veterinary services, and use of techniques such as participatory questionnaires, serological surveys and abattoir monitoring to supplement field searching for clinical disease;

d. Establishment of reliable livestock identification systems for enhancement of disease-tracing capabilities;

e. Dependable emergency disease-reporting mechanisms to regional and/or national/ federal veterinary headquarters;

f. Implementation of an emergency disease information system;

g. Enhancement of laboratory diagnostic capabilities for priority diseases within provincial and national veterinary laboratories;

h. Development of strong linkages between national laboratories and regional and world reference laboratories, including the routine submission of specimens for specialized antigenic and genetic characterization of disease-causing agents;

i. Strengthening of national epidemiological capabilities to support emergency preparedness and disease management strategies;

j. Prompt and comprehensive international disease reporting to OIE and neighbouring countries, etc.;

k. Inclusion of early warning in contingency planning for livestock disease epidemics.

2. Early reaction to disease outbreaks

Early reaction means carrying out without delay the disease control activities needed to contain the outbreak and then to eliminate the disease and infection in the shortest possible time and in the most cost-effective way, or at least to return to the status quo and to provide objective, scientific evidence that one of these objectives has been attained.

For this to be achieved, the following elements need to be in place:

a. Development of national emergency disease contingency plans, both generic and for specific identified high-risk diseases, which should be established, tested and refined through simulation exercises;

b. Establishment of a national animal disease emergency planning committee;

c. Establishment of a consultative committee on emergency animal diseases (or a national animal disease emergency task force) charged with the responsibility of implementing the national animal disease emergency plans;

d. Installation of diagnostic capabilities for all high-threat diseases. These should be fully developed and tested in national and, where appropriate, provincial diagnostic laboratories and linkages established with world and regional reference laboratories;

e. Ensured arrangements for involvement of the private sector (e.g. Livestock farmers' organizations, veterinary practitioners, livestock traders, commercial farming companies, animal product processors and exporters);

f. Arrangement for epidemic livestock diseases to be included in national disaster plans so that the police, army and other services can be involved as and when necessary;

g. Preparation of legislative and administrative frameworks to permit all necessary disease control actions to be implemented without delay;

h. Arrangements whereby funding for disease control campaigns can be quickly provided;

i. Ensuring that veterinary services are structured in such a way as to facilitate disease reporting and implementation of a nationally coordinated disease control/eradication campaign without delay during an emergency;

j. Provision of trained personnel and other necessary resources;

k. Compensation arrangements whereby farmers or others can be paid fair and quick compensation for any animals or other property destroyed as part of a disease control campaign;

l. Ensured access to quality-assured vaccines (containing the appropriate antigenic strain(s) for likely disease outbreaks) through a vaccine bank or from other sources;

m. Harmonization of disease control programmes and cooperation with neighbouring countries to ensure a regional approach;

n. Determination of the available international agencies involved in epidemic disease control/containment, including FAO/EMPRES, which could provide early reaction assistance if needed and establishment of regular communication channels with such organizations.

Expected outcome

National plans, structures and resources for managing outbreaks and animal health emergencies are in place and function well.

The key elements of this focus area are:

- Management of emergency events is improved through the use of IMS principles.
- A national response plan for animal health emergencies, food safety and public health is developed and tested.
- An ongoing and coordinated process for emergency preparedness planning, management and response is in place, with appropriate authority and building on existing mechanisms set up under ASEAN.
- Animal health emergency response systems, are prepared and tested, and management capacity is strengthened.
- The animal health response system is further strengthened and 24/7 communications capability is ensured.
- The risk areas as point of entry have animal health emergency contingency plans that are part of the national animal health emergency response plan, are regularly tested and use border measures that are appropriate and effective.

Strategic actions

Improve management of emergency events through the use of IMS principles

- Establish and/or maintain animal health emergency response protocols based on IMS principles, including clear roles, lines of communication and reporting, common terminology, and scalability and flexibility so that size and functions can adapt to changing needs.
- Ensure response structures have sufficient and appropriate physical resources. This includes equipment to set up physical or virtual EOCs, information and communications tools preferably with the ability to work with existing systems, for example surveillance, and other essential response equipment.
- Ensure that multi-sectoral coordination, communication and information-sharing mechanisms are functional at the national and subnational levels and can relocate and mobilize resources as required.

- Develop training programmes and exercises for management of emergency events, including incident management, EOC operations and response logistics.
- Engage in multi-stakeholder training and simulation exercises to ensure functionality of emergency management systems. Where appropriate, these activities should include other non-health ministries and departments, United Nations agencies, security authorities, public and private sector organizations, and civil society.

Develop and test a national response plan for animal health emergencies

- Develop and maintain national operational response plan for animal health emergencies (see Fig. 3). When and where practicable, this plan should include national resource and risk mapping, be adapted to match country risks and consider the management of new and multiple concurrent threats.
- Supplement the generic response plan with hazard-specific plans when needed or operating procedures, which, at a minimum, include health-care facility plans and business continuity plans.
- Test and revise emergency response plans to improve multi-sectoral coordination, communication and information-sharing. Plans should include sending, receiving or distributing staff, supplies and equipment.
- Support plans with legislation when required, including any special measures needed for emergency response.
- Ensure sustainable financing and emergency contingency funding necessary to procure and maintain national stockpiles, for example personal protective equipment (PPE), antivirals, vaccines, and other emergency supplies and equipment.

Ensure there is an ongoing and coordinated process for emergency preparedness planning, management and response

- Establish and/or maintain an effective coordination mechanism for emergency preparedness and response with relevant stakeholders, including other health ministries and other relevant Government Institutions, United Nations agencies, security authorities, public and private sector organizations, and civil society.
- Ensure there is authority and clarity of sector and agency roles and responsibilities, through legislation, memorandums of understanding (MOUs), interagency agreements, and operating procedures to mandate and guide preparedness and response for all hazards.
- Ensure emergency planning processes are informed by and contribute to other national action plans and the emergency plans and priorities are updated through M&E process.
- Build and strengthen efficient and equitable systems for management and rapid deployment of supplies for outbreaks and other animal health emergencies.

Ensure animal health emergency response systems are prepared and tested

- Ensure response structures can rapidly access expert technical advice and logistical expertise, have mechanisms for rapid deployment of surge personnel and supplies, have staff trained in emergency response including the use of IMS and it can ensure the safety and security of response staff including psychosocial support, if needed.

- Strengthen animal health emergency management capacities (human resources, financial and information management, logistics, and resource mobilization).

Focus area 2: Surveillance, Risk assessment and Response

Surveillance, risk assessment and response are fundamental for decision-making in order to minimize the consequences of animal health and food safety emergencies such as economic, social and public health consequences.

Risk assessment can be defined as the ongoing systematic process of organizing multiple sources of information within a risk management framework to determine a level of risk to guide decision-making. Risk assessment is crucial to ensure a proportionate response to an animal health, food safety and public health risk and to prioritize and mobilize resources. Risk assessment has two facets: (1) identification and characterization of threats; and (2) analysis and evaluation of vulnerabilities associated with susceptibility, exposure to those threats and coping capacities. Risk assessment, when combined with other information such as event impact assessments, availability of response measures implemented and the effectiveness of those measures, provides intelligence to guide further response decisions and may also inform changes in information requirements as an input to further risk assessments. Risk assessment, while an essential link between event detection and response, is not performed systematically in all Member States and remain a priority area for improvement.

ASEAN strategy for exotic diseases prioritized the improvement of timely event-based surveillance, risk assessments, rapid response and other aspects of outbreak investigation, including training national field officers.

Lessons learnt from the outbreak of trans-boundaries animal diseases (African swine fever-ASF) and the other emerging diseases (Nipah, H5N1, COVID 19) have emphasized the importance of animal health-in detecting unusual event of disease. These lessons have highlighted the potential benefits that an event-based surveillance (EBS) system for animal health-workers and community could offer to the rapid and timely detection of emerging diseases and others animal health emergencies.

Moving forward, there is a need to combine surveillance data from the other sectors mainly public health and wildlife health. The main objective of is to carry out a timely risk assessment to guide decision-making and response. No single surveillance system or information source is suitable for all purposes, as each one varies in terms of objectives, timeliness, sensitivity, representativeness and completeness.

Consistent information about a possible animal health event including food safety issues and public health threat from multiple sources is needed to increases the analyst's confidence that the signal is credible and requires further investigation. Other sources and types of information are needed to assess exposure and contextual vulnerabilities as part of the risk assessment and for decision-makers to formulate the objectives, nature, scale, timing and types of response needed.

Surveillance

Implementing active surveillance systems ensures rapid detection of an outbreak, which is key to controlling an infectious disease, and helps to demonstrate freedom from disease. The overall size and cost of any infectious disease outbreak is most strongly related to the delay in its detection. Trading partners may require surveillance to demonstrate freedom from disease. Also, any positive surveillance result that is obtained later can be regarded as indicating an incursion. A risk Based surveillance method referring to the Article 1.4.4 Terrestrial Animal Health Code might be used to increase the probability of detection.

It is equally important to publish negative results from investigations of suspect cases. Every year, there should be a number of suspect cases of most TADs which are investigated. Maintaining and publishing records of these cases is important in establishing international confidence that there is a

functioning scanning surveillance system. An absence of suspect cases will certainly be taken internationally as evidence of a non-functional surveillance system and should also prompt action to improve surveillance nationally. The reports can be published in summary form, either in an annual report or in “real time” as an updated table on a Web site, or both.

An animal preparedness program for emergencies is the key to determining effective actions as early as possible in the face of an emergency. In fact, the program is really essential for national animal health services. Strong linkages between the animal and human health sectors are very important in supporting the survey and response. Early detection will be able to determine the severity of an outbreak. Routine surveillance activities and targeted surveillance are very useful in this regard.

Surveillance is the collection and analysis of information relating to the disease in a systematic and ongoing manner, as well as timely distribution of information so that the right decisions can be taken.

The surveillance system is used to provide basic information in taking action. Thus, the surveillance system must be designed to meet the types of information needed by personnel / agencies that have authority in controlling and preventing disease.

The surveillance approach chosen can be divided into two types: (1) Passive surveillance; (2) Active surveillance. Passive surveillance passively monitors disease, using reportable diseases through animal health services or through other reporting systems available in their respective countries. Active surveillance is surveillance that has been designed with a specific purpose and involves special surveillance officers who visit the field / target area of surveillance. Data obtained from surveillance will be used to determine the appropriate response as shown in Figure 3.

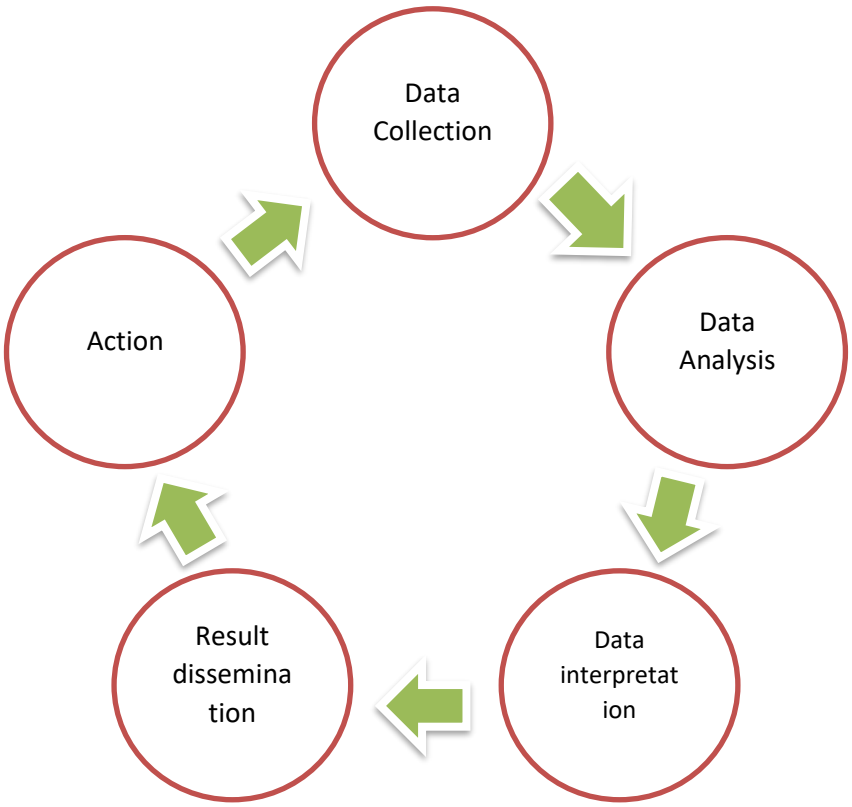

Figure 3. The Surveillance Cycle

During emergencies effective and ongoing surveillance capacity is needed, correct identification of diseases, and estimates of disease magnitude quickly to ensure a continuous response.

During an emergency, it is necessary to activate an outbreak investigation.

Outbreak Investigation is an investigation conducted at the time of an outbreak, outbreak investigation is needed to prevent the spread of cases; Preventing future outbreaks, by improving animal health programs/systems and surveillance systems; Implement a surveillance system; Learning new diseases; Learn new aspects of old diseases; giving public confidence to overcome the outbreak so that no panic situation occurs; Minimization of economic and social disruption due to outbreaks; Teach what and how to perform epidemiology (because actually outbreak investigations are "prototypes" of epidemiology, including descriptive epidemiology, analytic epidemiology, and the application of study results to control and prevent disease).

Outbreak investigation steps include:

1. Preparation of Field Work
2. Ensuring that a true outbreak is taking place
3. Verifying the diagnosis
4. Arranging / making an outbreak Case Definition
5. Systematically finding cases and recording all information
6. Composing descriptive epidemiology
7. Building a hypothesis
8. Analytical Studies to test hypotheses *)
9. Special studies (e.g. environment / ecology) *)
10. Implementation of Control Measures (Response)
11. Communication and creating an outbreak report

*) This should be done in parallel while controlling the outbreak

In addition to conducting an outbreak investigation, several types of surveillance can support the rapid detection of disease during an emergency. Syndromic surveillance is one of the "alerts" because it can monitor clinical syndromes before a diagnosis can be confirmed / determined. For example, increased syndromes associated with respiratory systems in poultry could be an indication of avian influenza outbreaks.

Internet-based real time reports have been widely used in various countries. This system will be useful for vigilance and rapid reports that are closer to the real time of the occurrence of a case / outbreak. The use of participatory reporting systems combined with online reporting will capture new cases of animal diseases in the field. Risk based surveillance can also be carried out during an emergency by utilizing the results of a risk analysis conducted.

Cross-sectoral collaboration can be carried out to increase the speed of collecting surveillance data for certain diseases such as zoonosis or wildlife-related diseases. This collaboration, among others, is between the health and wildlife sectors so that they can improve responses to findings on the ground and actions will be carried out together with the aim of immediately stopping / controlling outbreaks.

Updating Disease Plan

Determination of the disease plan in the context of detection must be preceded by the determination of the types of diseases that have priority in the ASEAN region for detection. Determination of priority animal diseases is preceded by making certain criteria, for example: animal diseases that will have a broad economic impact, zoonotic animal diseases that have a serious impact on human health, or other agreed criteria. It could happen that priorities between ASEAN countries are actually different, but prioritizing needs to be done at the ASEAN regional level so that the allocation of resources becomes targeted. For exotic diseases, a detection plan can be carried out by looking at the potential of animals / livestock in ASEAN countries. Any exotic diseases that threaten animals or livestock, or even have a serious impact on human health (such as the corona virus) requires a detection plan to be carried out by ASEAN member countries. Detection planning can be carried out periodically by looking back at the criteria for diseases that have priority from ASEAN member countries.

Preparedness plans, contingency plans, recovery plans and operations manuals should not be treated as static documents. They should be regarded as living documents that need to be regularly reviewed and updated as warranted by changing circumstances and technical knowledge. To assist in this approach, documents might be prepared in forms that are readily updated and a document identification process used to track the “current versions”. In reviewing and updating plans, the following factors should be taken into account:

- Changing epidemiological situations, both within the country and externally;
- New disease threats;
- Any in simulation exercises findings;
- The results of new risk analyses;
- New scientific findings or technological advances (e.g. Better diagnostic methods or vaccines, new techniques related to culling of animals in outbreaks);
- Experiences in previous equivalent outbreaks in the country and other countries;
- Changes in the structure of livestock industries or methods of livestock husbandry, and internal or export trade requirements;
- New standards, guidelines and recommendations by international organizations such as the food and agriculture organization of the United Nations (FAO) or OIE;
- Changes in national legislation or in the structure or capabilities of government veterinary services (or other government instrumentalities); and
- Feedback from major stakeholders, including farmers.

Risk analyses may also show that new emergency diseases have come to the fore, and highlight the need to prepare a new set of contingency plans for these new high-threat diseases. It may be useful to consider the capabilities of the veterinary and other relevant services as preparations are made. The OIE Performance of Veterinary Services Pathway, which corresponds to a global programme for the sustainable development of a country’s veterinary service’s compliance with OIE standards on the quality of veterinary services, provides one good tool for achieving such a review.

Determine the Emergency Situation

Determination of the emergency situation is done by first agreeing to the limits/threshold with specific situation as follow:

1) The emergency situation begins,

2) The emergency situation is set,

3) The emergency situation begins to decline, until

4) The end of the emergency situation.

This limit must be based on evidence of data and information. Disclosure of animal disease data and information between ASEAN countries must be prioritized so that signals/alerts between ASEAN member countries can run

Risk Assessment

Risk monitoring and regular review of the effectiveness of response feed back into the risk assessment so that corrective actions can be taken in a timely fashion, if needed. Risk communication is an integral part of this process, contributing and generating information throughout the cycle. Fig. 4 illustrates the cyclical nature of "information for action", incorporating the use of multiple sources of information to generate risk assessments and inform decision-making for responses.

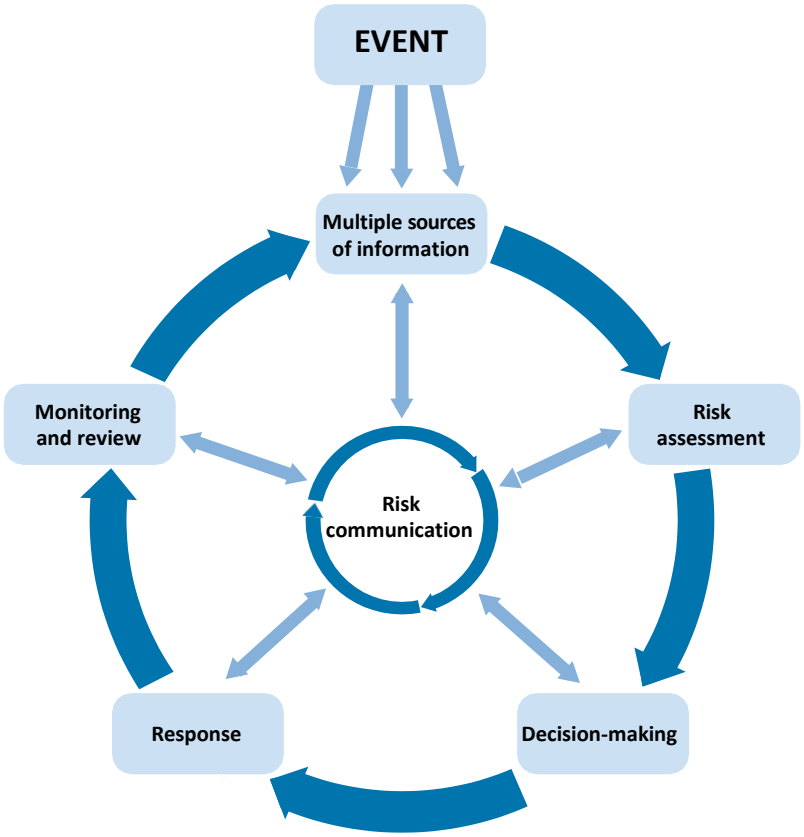

Figure 4. Cycle of surveillance, risk assessment and response

In order to adapt to various animal health and food safety emergency and response needs at different times during the course of the emergency, various information sources and surveillance methods may

be needed over time. It is vital that surveillance systems and information sources are prepared before emergencies occur.

Figure 5. Provides a schematic overview of how the relative importance of different information sources may change throughout the course of an acute animal health event. The addition of new sources of information and/or scaling up of some activities to enhance surveillance can change the mix of sources used to inform decision-making during the course of an event.

In Figure 5, an alert signal is detected through existing (routine) surveillance activities. Once an event is detected, other sources of information may be needed to confirm and characterize the event. The exact mix of surveillance sources and methods used will depend on the type and complexity of the event, for example when the aetiology is known compared to events of underdetermined cause. The information sources that are important in the post- event phase may be different from those that were used in the previous phases.

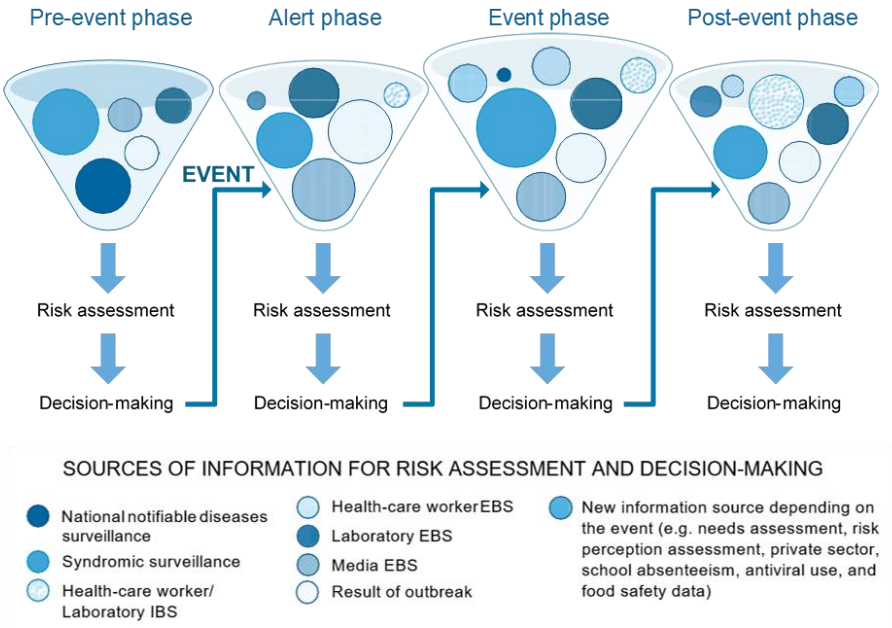

Figure 5. The relative importance of different information sources used for risk assessment and decision-making during different phases of an event

Expected outcome

Member States are able to conduct systematic and ongoing risk assessments using multiple sources of information for timely, informed decision-making to guide preparedness and response.

The key elements of this focus area are:

- Surveillance is appropriate to Member States' needs and is flexible, rapidly adapting to changing information and contextual needs before, during and after events.
- The surveillance and risk assessment function uses multiple sources of information from animal and health related sector.
- Risk assessments lead to timely and informed decision-making to guide preparedness and response.

- An adaptable, skilled workforce, incorporating FETPV-SEA trainees and alumni and other technical experts, carry out surveillance, risk assessment and response.

Strategic actions

Ensure surveillance systems are effective, efficient and flexible, and can rapidly adapt to changing information and contextual needs before, during and after events

- Review existing surveillance systems and identify data and information that can be used during different phases of an event.
- Streamline existing surveillance systems for effective and efficient use of resources.
- Improve surveillance systems by involving animal health and health workers, laboratories, civil society organizations, as well as individual citizens (using social media or other innovative technology) in identifying and reporting unusual or unexpected events.
- Establish reporting and communication channels between animal health facilities and laboratories and animal health systems to facilitate rapid reporting of events as part of EBS.
- Ensure clinical and laboratory staff are alerted to cross-border animal health threats.
- Develop and implement data management systems to facilitate timely analysis of data and production and sharing of reports

Use multiple sources of information from within the animal health sector and other sectors for risk assessment

- Review and identify sources of information for risk assessment including sources from non animal health sectors.
- Formalize and implement the risk assessment function using multiple sources of information.
- Develop operational arrangements for access to multiple sources of information for risk assessment.

Strengthen the risk assessment function to bring about timely and informed decision-making that can guide animal and public health preparedness and response

- Initiate multi-sectoral policy dialogue to strengthen coordination and communication with stakeholders.
- Produce and communicate timely risk assessment products to stakeholders.
- Conduct forward-looking risk assessment to anticipate threats and contribute to better preparedness.
- Continuously review the risk assessment function to improve the scientific basis for decision-making.

Develop a skilled and adaptable workforce, incorporating FETPV, other field officer trained on epidemiology and other technical experts, to carry out surveillance, risk assessment and response

- Build capacity in surveillance and risk assessment at the national and subnational levels.
- Strengthen capacity for multidisciplinary RRTs at the national and subnational levels.
- Promote operational and applied research to improve evidence-based risk assessment.
- Develop and maintain a sustainable and effective FETPV

Response

Controlling an infectious disease, such as HPAI or FMD, does not require anything technically innovative or particularly difficult in principle. But it is difficult to achieve because it requires the effective application of logistics and no one action alone will do the job. There must be a series of measures that are operating at the same time, each to a high level of efficiency and fully integrated with each other. This requires keeping clear objectives in mind and the efficient application of resources. For the whole process not to become overwhelming, there needs to be a relatively straightforward way of thinking about, and assessing the progress of, disease control. This can be done by keeping simple, easily understood principle objectives, or pillars, in mind. All three are important. They are:

• find infection fast;

• eliminate infection quickly; and

• stop infection spreading.

They are like the legs of a tripod. If one leg is not functioning, the whole effort will collapse. Those charged with managing disease control should bear these three objectives in mind. Everything they do or direct should be aimed towards one of these. Their management information systems, however basic, should be aimed at defining how well each objective is being met. They should constantly be asking for information that answers the questions:

• How fast are we finding it?

• How quickly are we eliminating it?

• How effectively are we stopping the spread?

It is strongly recommended that the NDCC and LDCCs have sections charged with responsibility for each of these three main areas. There should be sections responsible for: (1) surveillance, (2) culling and disposal, and (3) biosecurity. The head of each section will report to the local head of the unit formally on a daily basis. In turn, each of the three pillars is made up of, or supported by, different activities, some of which contribute to more than one.

Focus area 3: Laboratories

In every emergency event, logistics is a very important necessity during the phases of prevention, detection and response. The logistics consists of the need for medicines, vaccines, equipment and laboratory readiness in detecting diseases. Central and local governments can facilitate and support these logistical needs.

Each contingency plan must contain detailed plans to improve laboratory testing, especially laboratory capacity requirements during the animal outbreak.

In the use of diagnostic laboratories for confirmation of EIDs it should be owned by each particular area, so that test results can be obtained quickly and accurately. For countries that do not yet have diagnostic laboratories, they can carry out work contracts / services both with domestic laboratories as well as overseas laboratories.

Diagnostic laboratories as a means of confirming the diagnosis of animal diseases must be equipped with facilities and infrastructure (support). In supporting the success of the test, it takes at least 4 things, namely: personnel; equipment, inventory / stock and emergency funds.

Diagnostic laboratories must be equipped with adequate and ready-to-use equipment in order to anticipate when outbreaks of animal diseases (Emerging Infectious Diseases / EID) appear suddenly. During a quiet period (when there is no disease), there is a guarantee of preparation according to plan, considering that when the outbreak comes, the need for testing will increase dramatically.

All tests must use standard methods and have been internally validated by the laboratory and carried out under appropriate occupational safety and biological safety requirements. In order to ensure the quality of our laboratory testing, it is recommended that the laboratory collaborate with an international referral laboratory during this calm period (no disease).

There needs to be a good cooperative relationship with international reference laboratories in terms of sending test samples to confirm laboratory tests.

Diagnostic laboratories are expected to be able to diagnose diseases quickly and accurately, these results can only be obtained from laboratories that are equipped with adequate equipment and quality assurance. Even better if the laboratory has been accredited by the National Accreditation Institute. The laboratory also has the competence to carry out diagnostic standard tests with sufficient resources, experienced in competence and trained in a variety of related training which is always updated so that the laboratory's proficiency can be maintained.

Related to the training, at least 3 types of training that must be attended are trainings related to ongoing public education in management; trainings on various laboratory designs as well as specific trainings related to the expected function.

Regarding the diagnosis of animal diseases there are several types of laboratory, but what is meant here is preferred for laboratories in testing the presence of animal disease antigens rather than testing related to animal immunity.

Care should be taken in handling disease agents and taking into account occupational safety and biological safety, so high security is needed so that testers and the environment are not exposed to diseases, especially in the handling of zoonotic diseases, biocontainment and biosafety practices is needed.

The test method applied must be validated internationally and if there is a reference the OIE method is better to use that method.

In handling / sending samples, containers are required that contain certain transport media and are equipped with ice packs / ice boxes and if possible, ice boxes equipped with electrical equipment that ensures the disease agent can remain alive during the shipping period. Bottles/vials containing disease agents should be made of a polystyrene or polyurethane container with a screw cap.

As for laboratory facilities, they must at the minimum be equipped with water, electricity, PAL, generators, crematoria, air conditioners, experimental animal facilities, special decontamination, washing facilities used test items, complete PPE, means of making media and sterilization.

The division of laboratory space must at the minimum have a clean area, locker, bathroom, sample reception room, test room for bacterial pathogens of bacteria origin, handling room for virus origin agent, pathology room and histopathology room.

Expected outcome

Animal health laboratory system is able to rapidly, accurately and safely identify infectious and non-infectious hazards in order to contribute to health security.

The key elements of this focus area are:

- Laboratories have the capacity to diagnose and report priority diseases in both laboratory and field settings (i.e., location of outbreak), as well as perform antimicrobial susceptibility testing.
- Data from laboratories are used routinely in surveillance and risk assessment.
- New diagnostic technologies are reviewed for their applicability in the local context.
- Ongoing internal and external assessments and exercises assess functionality, identify gaps and inform corrective actions.
- Laboratories are connected nationally, internationally and across sectors in a referral network.

Strategic actions

Ensure fundamental laboratory functions

- Strengthen and maintain the fundamental laboratory functions.
- Ensure systems and guidelines for specimen collection, shipping and referral are in place.
- Strengthen laboratory governance, ensure sustainable financing of its animal health and zoonosis functions and support to field operations, and develop a trained and skilled laboratory workforce.
- Ensure laboratory biosafety and biosecurity systems are in place to carry out laboratory procedures in safe and secure environments.
- Support generic laboratory techniques that contribute to quality-assured resistance testing with protocols and procedures in place for referral testing of new or unusual resistance patterns.
- Laboratory Proficiency testing program (Interlaboratory)
- Regional reference laboratory networking

Link animal health laboratories with surveillance and risk assessment

- Develop and/or strengthen laboratory data management.
- Support linkages of laboratories to surveillance and risk assessment function

Review new diagnostic technologies

• Establish a process for periodic review and evaluation of new diagnostic and pathogen characterization technologies for use in laboratory and field settings, taking into consideration the country context.

Assess functionality of animal health laboratory system

• Assess laboratory systems using standardized tools, work towards accreditation and conduct simulation exercises to test surge capacity during public health emergencies (refer to the M&E focus area).

• Participate in regional and global EQA program such as PVS from OIE and establish a national EQA scheme.

Enhance laboratory connections and coordination

- Improve coordination and laboratory networking nationally and internationally among sectors with a public health and wildlife sectors including and water safety.

Focus area 4: Zoonosis

Zoonosis is a disease that can be transmitted from animals and vice versa. In the last 2 decades and in the current era of globalization, emerging infectious diseases (EID) and re-emergence of infectious diseases are accelerating. As many as 60% of diseases that infect humans are zoonotic diseases. Every year five new diseases emerge, 75% of new diseases in humans come from animals and 80% are zoonotic pathogens. Zoonosis have social, economic and health impacts so they need to be dealt with quickly and appropriately. Managing and responding to risks related to zoonoses requires requires multi-sectoral and multi-disciplinary cooperation at the human-animal-ecosystem interface to tackle the risks and reduce their impact, using a One Health approach.

In the event of an emerging infectious disease (EID) in animals that are zoonotic which has the potential to cause a public health emergency, there needs to be an effort to prevent and control EID. It is necessary to take action steps in the form of comprehensive and coordinated analysis of animal health and public health risk factors, optimally mobilizing all resources, involving the participation of various community components, and cooperation between ASEAN and International member countries.

In order to prevent the emergence of a public health disorder that is troubling the world, it is necessary to have regulations that govern both animals and communities affected nationally, regionally and internationally. The implementation of these efforts must follow international regulations in the field of animal health and public health with full respect for human dignity, human rights, the basics of freedom, and its universal application.

For the creation of laws and regulations related to pandemic disease outbreaks, new regulations are required which involve all relevant institutions that are integrated in an effective manner that can automatically apply automatically in national / regional / international outbreaks / disasters.

Regulations and legislation can be in the form of Laws, Government Regulations, Ministerial Regulations, and Regulations of the Director General in charge of Animal Health, Distribution Agency or Director General in charge of handling non-natural disasters (epidemics), Regional Regulations.

In handling zoonosis, there are several elements that must be considered:

- Surveillance information are shared with all relevant stakeholders for detection, risk assessment and response.
- Coordinated response to zoonotic diseases and events is ensured.
- Risk reduction strategies are developed and effectiveness is evaluated.
- Guidelines are established and policy documents are informed by research.

Expected outcome

Member States adopt a multi-sectoral, multi-stakeholder coordinated approach to manage zoonotic diseases and events.

The key elements of this focus area are:

- Surveillance information are shared with all relevant stakeholders for detection, risk assessment and response.
- Coordinated response to zoonotic diseases and events is ensured.
- Risk reduction strategies are developed and effectiveness is evaluated.
- Guidelines are established and policy documents are informed by research.

Strategic actions

Share surveillance information with all relevant stakeholders for detection, risk assessment and response

- Share multi-sectoral and multi-stakeholder surveillance data for early warning of and response to emerging zoonoses (refer to the surveillance, risk assessment and response focus area).
- Improve risk assessment capacity.
- Ensure coordinated response to zoonotic diseases and events
- Establish a systematic coordination mechanism using the One Health approach.
- Invest in workforce development in animal health sectors, public health and wildlife health.
- Evaluate the effectiveness of multi-sectoral communication, coordination and information-sharing (refer to the M&E focus area).
- Ensure multi-sectoral information exchange and joint participation in RRTs to investigate zoonotic disease outbreaks (refer to the surveillance, risk assessment and response focus area).

Develop risk reduction strategies and evaluate effectiveness

- Develop and establish risk reduction strategies across sectors.
- Enhance and evaluate communication.

Establish guidelines and policy documents informed by research

- Develop or update evidence-based guidelines and policy documents.
- Enhance understanding of zoonotic diseases through support of priority research areas.

Focus area 5: Prevention through animal health service system

A well-functioning animal health system is a prerequisite for preventing and responding to outbreaks and animal health emergencies.

Establishing effective of animal health frontline services is essential for early detection of the diseases and to response the disease in timely manner. The knowledge on how the field officers to do the early detection, reporting, response and collaborate with other sectors are paramount in order to reduce the impact of animal health emergencies and for more potential impact such as economy and public health.

It's essential to deliver of high-quality services for the communities to minimize morbidity and mortality. With regard with this, the animal health workers capacities play an important role in recognizing the early stage infectious and to confine the disease to other areas.

Zoonosis and food safety issues is also related with others sectors particularly public health and wildlife health sectors. Within One Health framework, it is also important to establish strong links between the animal health and public health as well as the wildlife sector for the early detection, report and response of the event.

Recognizing the risk of the transmission to the field officer which dealing with the animal health and zoonosis. The field officer's capacities on the biosafety and biosecurity is also essential. Thus the safety and preparedness of animal health services facilities for all types of hazards must be strengthened through multi-sectoral coordination mechanisms for policy development and service delivery, and application of risk-informed approaches that can assist in identifying and prioritizing options likely to be most effective in reducing identified risks.

Expected outcome

Animal health services facilities are able to provide services for prevention, treatment, containment and response in order to reduce the risk and mitigate the impact of animal health event including zoonosis and food safety event.

The key elements of this focus area are:

- Relevant infrastructure is in place to reduce the risk of transmission of emerging diseases
- The ability to rapidly identify, report and manage animal health, zoonosis and EIDs in a way that minimizes mortality and morbidity of the animals and minimize the risk to public.
- Comprehensive animal health facility plans for preparing for and responding to outbreaks and animal health emergencies are developed and implemented.

Strategic actions

Ensure relevant infrastructure is in place

- Develop standard SOP for the animal health services
- Strengthen animal health services practices as part of health system strengthening prior to outbreaks and animal health emergencies through clinical audits, critical incident reporting and training.

- Establish mechanisms to ensure the timely supply and availability of PPE, vaccines, drugs and other materials to ensure the safety and well-being of animal health workers, and the broader community at all levels.
- Develop and enhance mechanisms for mobilizing experts for animal health emergency response including zoonosis, food safety and EIDs nationally or internationally.
- Conduct rapid investigations of disease clusters, infections associated outbreak.
- Develop and strengthen surveillance and reporting on infections

Rapidly identify, report and manage EIDs to minimize mortality and morbidity

- Establish strong links with public health sectors and wild life sectors to facilitate rapid reporting of events.
- Ensure that animal health authorities are able to disseminate important information regarding outbreaks and animal health emergencies.
- Ensure mechanisms are in place to facilitate communication and sharing of information among animal health practices and veterinarian
- Develop and enhance mechanisms to rapidly mobilize experts to support response to outbreaks and animal health emergencies.
- Coordinate with animal health systems to ensure that there are sufficient and appropriately trained and certified veterinarian, para veterinarian and other professionals.

Develop and implement comprehensive health facility plans for preparing for and responding to outbreaks and animal health emergencies

- Develop national guidance and training materials on for animal health services facilities particularly of early detection and early response
- Ensure animal health-care worker safety appropriately equipped facilities and adequate supply of PPE, waste management, access to post-exposure prophylaxis and appropriate training.
- Ensure facilities have appropriate emergency preparedness plans in place
- Strengthen national coordination and management of animal health services facilities during outbreaks and animal health emergencies to address surge capacity requirements.
- Implement continuous quality improvement in animal health-care facilities as part of national animal health systems strengthening.
- Test, evaluate and revise on the response plans, at all administrative levels on a regular basis.
- As part of health systems strengthening, ensure all animal health services facilities have in place infrastructure, policies and procedures that are consistent

Focus area 6: Risk Analysis and Risk communication

Risk Analysis

In animal health, risk analysis has been most widely used for helping to decide the most appropriate health conditions for imported animals and animal products and for strategies for quarantine operations. In addition, risk analysis is a tool that also can be used to very good advantage for animal disease emergency preparedness planning in term of animal health emergencies. It provides an exceptional foundation for decision-making and should be undertaken in an early stage of the development of emergency plans. Managing and responding to risks related to zoonoses requires multi-sectoral and multi-disciplinary cooperation at the human-animal-ecosystem interface to tackle the risks and reduce their impact, using a One Health approach.

Some process of risk analysis is needed to determine which disease(s) require preparedness planning and to what extent. Regular updates of the risk analysis process are required to detect changes in threats of incursion (e.g., new pathogens, changes in distribution and virulence of known risks and changes in possible routes of introduction). A risk analysis process identifies the threats that represent the greatest risk and for which preparedness is most important and therefore helps to prioritize the range of disease threats.

Risk analysis can be applied at each stage of the emergency animal disease preparedness process which includes:

- Priority ranking of infectious disease threats for the country and region, indicating what level of resources should be needed for preparing for each of the high-priority diseases;
- Determining import quarantine policy and how quarantine and other disease prevention procedures need to be strengthened;
- Planning well-focused training courses for veterinary staff and farmer awareness and publicity campaigns;
- Determining how and where disease surveillance and other epidemiological systems need to be strengthened;
- Planning disease response strategies, including comparative evaluation of different disease-control options.
- Implementing join risk assessment involving multisector institution responsible of animal health system interface such as wildlife conservation, transportation, education, private sector.

Principles of Risk Analysis

Risk analysis contains four components, which are hazard identification, risk assessment, risk management, and risk communication. The main threats are identified and described in the hazard identification process. In risk assessment process, the risk of an event occurring and developing in particular ways are first identified and described. The likelihood of those risks occurring is then estimated. The potential consequences of the risks if they occur are also evaluated and are used to complete the assessment of the risk. Risk management involves identifying, documenting and

implementing measures to reduce identified risks and their consequences as the risks never can be completely eliminated. The aim of this stage is to adopt procedures that will reduce the level of risk to what is deemed to be an acceptable level. Risk communication is the process of exchanging information and opinions on risk between risk analysts and stakeholders.

The risk analysis component would best be carried out by the epidemiological unit in the national veterinary headquarters as part of the national early warning system for transboundary animal diseases and other emergency diseases. Risk management and risk communication are tasks for everyone, but the Chief of Veterinary Officer should coordinate these. As risks are not static and will change with such factors as evolution and spread of epidemic animal diseases internationally, emergence of new diseases, changing international trading pattern for the countries, new scientific knowledge and technology, risk analysis should be done repeatedly and updated regularly.

Hazard identification

Hazard identification is a necessary first step, a hazard being something that is potentially harmful to animals, humans, and the environment. The hazard identification involves identification of the pathogenic agents, and genotype and phenotype changes as potential hazards that could be introduced with commodity or activity and for which pathways exist for exposure of susceptible animals and humans to these hazards. This process occurs through the collection of evidence found in the literature and includes consultation with experts regionally and internationally. This should be done by constantly monitoring the international status and evolution of outbreaks of transboundary and emerging animal diseases. The latest scientific literature should be monitored also. This should be a routine function of the epidemiological unit of the national veterinary services.

Risk Assessment

Risk assessment is the systemic evaluation process of assessing or evaluating the magnitude of the risk of an unwanted outcome resulting from a hazard. The assessment of risks can be done in a quantified, semi-quantified or qualitative way. The first step of assessing the risks is to assess how serious the threat of entry of each disease is and the routes and mechanisms by which it may enter. The following risk factors might contribute to the likelihood/impact of animal disease outbreaks such as agricultural practices, slaughtering practices, farm biosecurity measures, social-cultural considerations, and environmental factors. The points which should be answered during this step such as:

- The current geographical distribution and incidence around the world.
- The distribution of the risks to new countries, regions or continents.
- The information of any new antigenic subtypes which may threaten countries that routinely vaccinate against the disease.
- The status of neighbouring countries, not only in respect to known presence of the disease, but also the level of confidence in their veterinary services to be able to detect and control outbreaks of the disease.
- The information of any feral or wild animal populations in the country which are susceptible to the disease and which may introduce the disease (e.g. through natural migrations) and/or act as a reservoir for the disease.

- The information of how the disease spreads in the country and what the relative roles of live animals and their movements, fomites, meat or other animal products, insect vectors, wind-borne spread, etc. in transmitting the etiological agent.

The next step is to evaluate how serious the socio-economic consequences might be if there is an incursion of the disease. The factors that may be taken into consideration include:

- The possibility of the disease establishment in the country, including the information of susceptible livestock host and feral animal or wildlife populations.
- The size of the populations of susceptible livestock populations in the country.
- The information of the livestock management and trading systems and how important those livestock industries are to the national economy.
- The information on how serious the production losses will be from the disease.
- The information on how difficult and costly the disease can be controlled and eliminated.

On the basis of this risk assessment and profiling, it should be possible to prioritize the risk associated with each of the diseases and determine what level of resources should be devoted to preparedness planning for each disease. It will also be possible to get some idea of the most likely sources and methods of entry of the disease agent and how the disease may spread in the country. The geographical pressure points for entry, establishment and spread of the disease also may be assessed. On the basis of this, it will become clear how and where preventive and disease surveillance strategies and programmes need to be strengthened. Finally, it should indicate how veterinary services and contingency planning might need to be strengthened for the highest priority threat diseases.

Risk Management

Risk management is the identification and implementation of risk reduction measures, involving risk appraisal, option appraisal (including impact assessment), implementation of chosen risk reduction measures, and monitoring and evaluation. Risk management utilizes the results of risk assessment to evaluate potential benefits against assessed risks, to reach decisions on acceptable risk and to formulate risk management policy on that foundation. Identification of critical control points through the risk assessment process will prioritize the steps included in this manual which are needed to manage the risks. Cost-benefits and/or risk-benefit analyses should be included in the decision-making process.

The three fundamental principles of contagious diseases control

1. Reduce/restrict production of disease agent:
    i. Cull the infected animals quickly (stamping out); this requires good surveillance and reporting
    ii. Vaccination: for some disease vaccination does not fully protect from infection but will reduce production of disease agent in infected animals
2. Reduce contact rate within the population (this requires understanding of the contact networks within value chains and application of biosecurity), for examples:
    i. Barriers – routine and temporary
    ii. Streamline value chains
    iii. Remove disease agent from environment

3. Reduce the number of susceptible animals:
    i. Vaccination
    ii. Area culling

Risk Communication

Risk communication and joint community engagement are important in managing animal health emergencies, especially in the early stages when decisive action needs to be taken to mitigate risks in the midst of uncertainty. Risk communication covers a wide range of communication capacities necessary to enable individuals and communities to make informed decisions, undertake positive behaviour change and maintain trust in animal health authorities. This is the process of exchanging information and opinions on risk between risk analysts and stakeholders. Stakeholders in this context would include all those who could be affected by the consequences of the risks (i.e. everyone from farmers to politicians). It is important that risk analysis strategies, including risk assessment and risk management are fully discussed with stakeholders so that they are certain that no unnecessary risks are being taken and that the risk management costs are a worthwhile 'insurance policy'.

ASEAN focuses on enhancing capacities on three interlinked functional areas: (1) animal health emergency communication; (2) operational communication; and (3) behaviour change communication. The availability of trained personnel for risk communication within the South-East Asia region also needs to be further enhanced.

Expected Outcome

The risk communication system is strengthened with the capacity to manage the process of risk communication for all phases of animal health emergencies.

The key elements of this focus area are:

- Risk communication is a core element of prevention, animal health preparedness, response and recovery from animal health emergencies.
- Operational links between risk communication, surveillance and risk assessment across all sectors are strengthened, and risk communication is incorporated in all phases of the risk management cycle.
- A mechanism to listen to and engage with all groups within communities is established, and risk perception assessment is integrated into risk assessment procedures.
- The use of new information and communication media, including social media and networks where access is widely available, is an integral component of capacity enhancement for risk communication.
- There is a system that routinely evaluates the effectiveness of risk communication and community engagement approaches as soon as possible following the intervention.

Strategic actions

Make risk communication a core element of prevention, preparedness, response and recovery

- Embed risk communication in the preparedness plans and response systems of animal health authorities.
- Maintain and strengthen basic elements of the risk communication system as mandated by ASEAN.
- Ensure continuous skills development and enhancement for risk communication.

Strengthen operational links between risk communication, surveillance and risk assessment

- Strengthen operational mechanisms between risk communication and surveillance teams for risk assessment (refer to the surveillance, risk assessment and response focus area).
- Test the operational mechanisms between risk communication and risk assessment through joint exercises and/or application to real-life events.

Establish a mechanism for dynamic listening and community engagement and integrate risk perception assessment into risk assessment procedures

- Establish a culture of routine reciprocal engagement with the public, civil society and media to build trust in advance of animal health emergency communications.
- Develop or adapt guidance for community engagement and the assessment of risk perception to inform risk assessment and guide interventions.
- Implement a system that routinely assesses the effectiveness of risk communication and community engagement approaches for behaviour change (refer to the M&E focus area).

Enhance use of new media, including social media and social networks, for risk communication

- Enhance capacity to use new technologies, including new media, in risk communication.
- Routinely assess and improve the use of new media for public communication, proactive listening and rumour management.

Formalize a mechanism that routinely assesses the effectiveness of risk communication

- Develop a framework for routine evaluation of risk communication interventions.
- Develop a mechanism to share lessons and experience in risk communication (refer to the M&E focus area).
- Regularly test national arrangements and systems for risk communication.

Focus area 7: Regional preparedness, alert and response

Regional Preparedness, alert and response

ASEAN is authorized to strengthen regional animal health systems and capacities in detecting, assessing and responding to all animal health events and emergencies, particularly with regards to the possibility for transnational disease spread. Exotic diseases, EIDs and animal health emergencies can quickly move beyond country borders, highlighting the status of regional preparedness, alertness and response.

The focus of regional preparedness, alertness and response was on strengthening current systems for surveillance, risk assessment, information sharing, preparedness and response at the regional level. Regional preparedness and response provide or facilitates support to member countries at any time during emerging animal disease outbreaks or emergencies. A regional rapid response mechanism is a resource to enhance regional emergency response capacity and strengthen its ability to respond to animal health security threats regionally and internationally. This may involve working with partners for event management and coordinated action, mobilization of emergency teams and response logistics, such as accessing stockpiles and mobilizing resources.

ASEAN supports member countries to prepare for and respond to animal health emergencies by sharing risk and operational communications and facilitating access to properly trained and experienced personnel for rapid deployment. A skilled workforce is critical to ensuring that ASEAN continues to play a leadership role in the provision of high-quality operational support and technical advice.

Key elements

The regional preparedness, alert and response system serves as an operational hub to effectively manage and mitigate the risks and impacts associated with animal disease outbreaks and animal health emergencies. The key elements of this focus area are:

- A regional risk assessment system that can use multiple sources of information for decision-making for response is strengthened.
- A regional operational for preparedness planning and coordinated response to animal health events and emergencies is functional.
- A regional rapid response mechanism that can be used to deploy experts and teams at short notice is in place.
- An information-sharing platform that utilizes available and innovative technology to enhance knowledge development, exchange and transfer is enhanced.
- Regional learning is used to develop a skilled workforce through on-the-job training and learning by doing.

Strategic actions

Develop or strengthen regional risk assessment system

- Develop and disseminate generic standard operating procedures and protocols for risk assessment.
- Use multiple information sources at the regional level to conduct and share rapid risk assessments for timely decision-making and action for all hazards.
- Conduct regional surveillance, risk assessment and response as part of the global system for animal health events.

Ensure that a regional operational for coordinated planning and response is functional

- Use the regional emergency centre to facilitate collective preparedness planning and simulation exercises.
- Coordinate logistics preparedness planning including stockpile of drugs, vaccines, PPE and other response equipment and supplies.
- Promote the use of joint missions between ASEAN and member countries during responses to outbreaks and animal health emergencies to support development of national capacity and capabilities.
- Support national governments to collaborate actively with each other, including providing surge capacity in animal health emergencies and technical cooperation with resource-poor countries.

Ensure that a regional rapid response mechanism is in place

- Maintain country capacity in outbreaks and animal health emergencies.
- Develop and maintain a register of experts, including FETPV fellows and alumni, available for rapid regional and global deployment in response to disease outbreaks and animal health emergencies.
- Establish a regional rapid response mechanism to support the deployment of experts and teams at short notice regionally and globally to assist rapid investigation and response to animal health threats.
- Evaluate rapid response mechanisms for animal health emergency management.

Establish an information-sharing platform that utilizes available and innovative technology

- Improve access to evidence-based guidelines, surveillance data, results of risk assessments, M&E reports and other information products for member countries through an approach that utilizes available and innovative technology.
- Contribute to the animal health evidence base through applied and operational research that can play a critical role in influencing policy and practice at all levels.
- Promote sharing of information on surveillance of and response to animal health emergencies in the Southeast Asia region through timely publication, for example on the regional office websites.

Develop a skilled workforce with the Regional Office as a study

- Develop workforce through opportunities for regional FETPV program, alumni and others, for example through placement within the ASEAN country and regional offices or through deployment for animal health emergencies (refer to the surveillance, risk assessment and response focus area).
- Develop training programmes and exercises for animal health emergency management, including incident management, risk assessment, response logistics, risk communication and partner coordination.

Focus area 8: Recovery

Recovery

When it is believed that infection has been eliminated, a series of verification programmes should be carried out. However, in some cases, a certain disease could not be eliminated and become endemic in the country. An important aim of these will be to provide objective proof to other countries and to the international community that the country is now free from the disease or controlled. This may provide the foundation for export trade in livestock and animal products to be restored and/or developed.

This may involve:

- Demonstration that the country has a capable livestock and animal health service and comprehensive disease-surveillance programmes.
- Statistically based serological surveys; and
- Active clinical surveillance.

Reference should be made to the OIE Terrestrial Animal Health Code for more specific guidelines on acceptable international disease freedom verification procedures for each disease.

The first, and most important, aim is to ensure that the causal agent of the disease (and not just the clinical disease) has been eliminated. There have been many occasions in which eradication efforts have been stopped when the disease seems to have disappeared.

It is therefore vital that as disease-control measures diminish towards the end of the campaign, there should be a shift of emphasis towards active disease surveillance to detect any residual infection and retention of sufficient capacity to respond quickly to these. The surveillance involves continuing visits to detect clinical disease within the infected area and taking samples from a statistically valid sample (i.e. of holdings and individual animals) to show that those surviving the outbreak have not been exposed to the infectious agent.

The exact design of such a sero-survey will vary from situation to situation and whether it is to demonstrate freedom from disease locally or to resume export trade. The latter tends to require a larger sample size to give a high level of reassurance to the trading partners that there will be no risk to imports from the previously affected country. The overall design used is usually a two-stage design. First, a number of locations are selected at random that would be expected to detect an infected holding with a given degree of confidence. The second stage is that within each selected location, a sample size of animals is taken that would detect infection given that if the infection is present within the location, a given proportion of animals would be expected to be infected and at a given level of confidence.

It is recommended that the exact design and sample size estimation be undertaken by an experienced epidemiologist with training in this type of sample design and that local conditions be well-understood by this person during the design phase. Sample size tables are easily available, as are software's that can generate sample sizes for very large or smaller population sizes; however, their use without taking local condition into account will often lead to a sample size which is either too large for the available resources or too small for the degree of confidence required. The major factors influencing the size of the sample are the expected prevalence within a herd if it were to be infected and the degree of certainty of detecting an infection if it is present. The expected proportion of herds that would be infected is also important.

Also important are the characteristics of the assay used and, particularly, the sensitivity and specificity of the assay. Ideally, the assay would be both highly sensitive and highly specific in order to avoid false positive and false negative results, but this is not always available, technically possible or within the budget available. In all designs, the sensitivity of the test must be taken into account when selecting

the sample size, resulting in an increased size to prevent a herd being identified as negative when it is, in fact, infected.

A more difficult problem is that of false positive results. Virtually no test is 100 percent specific and given the often-large numbers of negative samples that are tested, some false positive results are to be expected. How these animals and herds are dealt with can be politically difficult. They should certainly be revisited and carefully examined for signs of disease. Known susceptible sentinel animals could be introduced. It may be possible to rule out infection through careful analysis of the results or through the use of complementary assays (i.e. enzyme linked immunosorbent assay (ELISA) and virus neutralization). For all of the above reasons, it is strongly recommended that an experienced epidemiologist be closely involved in the design of the survey and the analysis of the results.

Proof-of-freedom phase requires monitoring, surveillance and/or research that are conducted to collect data to provide evidence that regions or zones are free from disease. This is a key step in removing restrictions and progressing towards disease control (i.e. eradication or containment). The proof-of-freedom phase begins when authorities are confident that the emerging of animal disease has been controlled, and all indications are that the emerging of animal disease has been eradicated in one or more regions. Depending on the scale of activities, the proof-of-freedom phase may require significant physical, laboratory and staff resources. Maintaining restrictions on regions for long periods has important implications for resource management, animal welfare, business continuity, and socio -economic impacts on producers and regional communities. It is not necessary to wait until disease has been eradicated in all infected areas before commencing proof-of-freedom activities.

All levels of government have responsibilities to provide for emergency and disaster recovery, which encompasses four nationally recognized ‘pillars’:

• Psychosocial (people/community aspect)

• Economic

• Environment

• Infrastructure.

A wide range of supporting agencies may be involved in emergency and disaster recovery, and may seek information from central and local government on matters such as:

- The number of livestock and farmer directly affected (required field monitoring)
- The number of properties, areas and families directly affected (and requiring crisis counselling, personal support and/or individual financial assistance)
- Supply-chain impacts of the disease and response (e.g., on other businesses; sectors, such as tourism; geographic areas)
- Consequences relevant to the four pillars that are likely to flow from the disease control measures
- Anticipated needs of affected communities while the response is under way and after it is concluded.

In each country, the relevant agencies are often active following natural hazard events. They are coordinated through the central and local government animal disease committee structures. Lead agencies for emerging of animal disease responses should engage with them as soon as possible to optimize recovery for the entire community, including affected industries.

Stopping vaccination

The use of vaccination during an outbreak can complicate the move from control to recovery phases. The issue of an exit strategy from vaccination should be considered before it is commenced, as mentioned in the planning stage. Vaccination may make the demonstration of absence of infection

difficult to achieve. Many vaccines are known to prevent disease, and while they decrease shedding and spread of the pathogen, they may not eliminate all infection. In these circumstances, the vaccine may mask infection, so that the demonstration of antibodies will not necessarily be equivalent to a demonstration of freedom from infection.

Strategic vaccination has been used as part of the control programme, it may prove desirable to maintain strategic vaccination if there is still a high risk of a new incursion of the disease, for example from a neighbouring country. If neighbouring countries are free of infection, stopping vaccination programmes altogether can be considered, diverting the resources that have been devoted to the vaccinations to enhanced early warning activities and intensified surveillance. In this way, preparedness for the disease recurrence will be maintained at a high level and any disease breakdowns can be detected and eliminated quickly, either by a short, sharp targeted vaccination campaign or by eradication procedures. If the latter strategy is followed, it should be possible to declare provisional freedom from the disease after a suitable period following the cessation of vaccination. After further periods, declarations of freedom from the disease and finally from infection may be made to OIE. This is subject to demonstrated evidence of a high level of clinical surveillance, the carrying out of well-planned serological surveys giving negative results and follow-up on false positive results.

Recovery and rehabilitation of affected farming communities

Epidemic animal diseases may reach magnitudes of major catastrophes with long-term economic implications at the individual and national levels. During the outbreak, the losses are caused by the disease itself, but also by man-made activities such as culling. Heavy economic losses result from the quarantine measures imposed, such as banning the transportation of meat, eggs and milk products and restricting animal movement, which will affect producers (the farmers), first users (e.g. laying farms, the broiler industry, feedlots and fattening units, dairies and slaughterhouses), second users (e.g. food processors, the retail market) and prices to the consumers (or their perceived or real food-safety threats). Other stakeholders in the production and marketing chain (e.g. transporters, animal markets and traders and feed mills) also will be seriously affected during the outbreak.

In some countries, non-agricultural industries, such as tourism, may be affected, sometimes severely, but the recovery of these is usually not the responsibility of the veterinary authorities or agricultural ministry.

The day on which an outbreak is declared over is the first day on a long and sometimes difficult road to recovery and rehabilitation of severely damaged livelihoods and, in many cases, spirit. Public assistance is needed to help the affected populations towards recovery, rehabilitation, development and a capacity to satisfy future needs. Not all those affected will wish to return to their previous engagement. Following a massive animal disease outbreak accompanied by mass mortality or mass destruction of livestock, a certain percentage of the owners do not wish to restock or to continue animal breeding. But the majority will wish to return to their traditional way of life, i.e. tending animals as livelihood. They will have to restock.

Restocking

Restocking is a complex activity. Targeting, implementation and sustainability are key questions that arise again and again wherever restocking takes place. Too often, the push to replace livestock has resulted in hasty decisions being taken without due consideration to the types of animals that are required and the existing resources and knowledge of the people to whom they are to be given. FAO, in combination with other organizations, has published Livestock Emergency Guidelines and Standards (LEGS).9 this tool, designed originally for natural disasters such as floods or droughts, provides helpful decision-support tools for the provision of livestock as part of the recovery process.

In general, and where possible, it is better to provide compensation for culled animals (and other items which may have been destroyed) rather than animals. This allows the livestock-keepers to

choose the type and numbers of livestock they wish to buy, and, just as importantly, control the timing. However, the disbursement of cash is open to mismanagement (i.e. Corruption and theft). It is sometimes the case that the money is not paid to the primary caregiver and beneficiary of the livestock. For instance, poultry are usually the responsibility of women who may not control much of the family income. If compensation is paid to their husbands (which may be required by local custom), the women (and thus also the children) may not have access to the compensation for restocking. Cash compensation is best paid when it can be given directly, with few or preferably no intervening levels of officials or others, from the source of the funds to the actual keeper/beneficiary of the livestock that have been culled. Where direct payments, either in cash or, increasingly, bank transfers, are not possible, it may be preferred to give replacement livestock to the producers. However, the difficulties in this should not be underestimated. The keepers must be closely involved in selecting the type of animals and the source(s). They will want to be consulted about the timing of replacement. Some will want immediate replacements; others will want to delay. Incorporating these wishes in a government-run livestock purchasing programme can be difficult. Also, when governments buy livestock, they usually prefer to buy as many as possible at the same time from as few locations as possible. The sellers are aware of this and will use their control of supply to drive up prices and to use the opportunity to sell lower-quality animals. Whether to supply stock or money to farmers who have had their livestock culled depends on the local situation, but where possible it is almost always better to give the keepers money rather than livestock so that they have choice and flexibility. Before any restocking, the premises must be free of the pathogen. This can be achieved through thorough cleansing and disinfection, often carried out twice. It may be required to keep susceptible sentinels for a given period (two or three incubation periods are recommended for the given pathogen) before restocking, to make sure there is no residual infection. Another approach is that the replacement animals should be vaccinated and immune prior to their introduction. This should be a definite, unconditional requirement when the farm has not been completely depopulated, which is often the case in developing countries where stamping out is applied.

Livestock for restocking should, if possible, be bought locally or in neighbouring areas. These animals are adapted to local conditions, the risk of transmitting disease is minimized, and they are usually those that farmers know best. However, some may feel that restocking may provide a chance for upgrading and improvements. One common example is replacing the local, low-production stock with imported breeds with a greater genetic potential in order to “improve” the national herd. Long experience has shown that this must be accompanied by a sustainable improvement in nutrition and husbandry facilities as well as an adequate regime of disease prevention if it is to be successful at both the national level and for individual producers. In many cases, it has ended in a failure to achieve a desired objective.

Great care should be exercised in using restocking after an outbreak as a “development” tool, as well as to improve the genetic composition of the restocked population. The purchase of large numbers of livestock to replace whole herds may bring diseases that are unfamiliar or even unknown in an area. This is particularly true for diseases with few prominent clinical signs and/or long incubation periods such as bovine tuberculosis, small ruminant and bovine brucellosis, infectious bovine rhinotracheitis (IBR), porcine respiratory and reproductive syndrome (PRRS), all of which cannot be readily recognized without specific tests which may not always be readily available. It is difficult to be sure that livestock are disease-free, but the risks and consequences of introducing disease can be minimized with careful planning. It is important that livestock-keepers be advised of the issue of disease introduction and, where necessary, controls imposed to limit the risk posed by this large-scale movement of animals. Buying livestock from several sources will inevitably mean that animals will be of different health and immune statuses and mixing them under stress can lead to cross-infection.

Restocking, therefore, presents many issues and challenges that need to be discussed with stakeholders, particularly livestock holders and potential traders (sources). Nonetheless, in the absence of restocking, other alternatives would have to be found to sustain the livelihoods of people

who have to find some means of surviving in the aftermath of the disease epidemics – similar to other natural disasters.

Expected outcome

Animal health services facilities are able to conduct verification to confirm that the country is free of certain diseases and to ensure that restocking is implemented and sustained by preparing all instruments such as compensation.

The key elements of this focus area are:

- Relevant infrastructure is in place to conduct surveillance and diagnostic test
- The ability to rapidly identify, report and manage outbreak to ensure the rapid recovery
- Accessible fund for restocking and compensation

Strategic actions

Ensure relevant infrastructure is in place

- Develop SOP for verification of disease free status of a country
- Strengthen animal health services practices as part of health system strengthening prior to outbreaks and animal health emergencies through clinical audits, critical incident reporting and training.
- Establish mechanisms to ensure the accessible fund for example for restocking and compensation

Focus area 9: Monitoring and evaluation

M&E is a management tool that assesses what has taken place to facilitate continuous learning and improve future work. Robust, integrated M&E systems support the overall objectives of an emergency management and the achievement of specific improvements.

This applies not only to the animal health system but also to the overall health system. In the context of Emergency Management, M&E functions as an ongoing process of planning and review that helps to coordinate key stakeholders, promote transparent reflection on progress, and enhance ongoing priority setting, which is important in an environment of scarce resources.

In the past decade, many Member States have made solid progress in the adoption of national planning and M&E systems. Assessments of real-world functionality, including outbreak reviews and Emergence have provided a simple and practical mechanism for collective process monitoring Management and learning for continuous improvement.

Moving forward, M&E will place greater emphasis on measuring how well national animal health capacities and animal health are functioning while taking into consideration relevant aspects of gender, equity and human rights. The guiding principles and mechanisms of M&E developed for Emergency Management

After-action reviews include programmatic outbreak reviews to measure the functionality of Member State capacities and may also include review of regional responses to outbreaks animal health and zoonosis emergencies. In the absence of outbreaks or public health /animal health emergencies for review, Member States and International Agency conduct exercises to test response processes under simulated conditions, thereby identifying areas for improvement.

Evaluations of Emergency Management capacities will be jointly conducted by teams of internal and external experts to promote transparency and accountability. The evaluation process provides a mechanism to overcome the challenges associated with multi-sectoral coordination.

An Emergency Management evaluation is targeted at national and regional systems for collective learning for continuous improvement. Member States should continue to lead M&E and engage sectors beyond health in planning, implementation and monitoring.

Expected outcome

M&E systems are incorporated in national work plans to measure health system functionality, promote system improvement and ensure mutual accountability for health security. The key elements of this focus area are:

- Integrated national and regional planning and review processes are strengthened and lead to learning for continuous system improvements at all levels.
- M&E processes measure whether systems are working, not just whether capacities are in place.
- Partnership is promoted through M&E processes that include stakeholders from multiple sectors.
- Transparency and accountability in reporting on Member State capacities is fostered through annual reporting, after-action reviews, simulation exercises and joint evaluation with external partners.

Strategic actions

Apply M&E systematically at all stages of the planning and implementation cycle

- Establish and/or maintain an Emergency Management and M&E activities are aligned and followed up
- Develop multi-year work plans that take into consideration recommendations from joint evaluation with external partner's reports and include funding for M&E activities that are in line with regulation.
- Establish or strengthen an annual review and planning process that incorporates findings from after-action reviews, simulation exercises and joint evaluation with external partners.

Measure system functionality

- Use both quantitative and qualitative M&E methods to measure system functionality, including joint evaluation exercises, after-action reviews and simulation exercises.
- Incorporate the lessons learnt from M&E processes for corrective actions and provide feedback to stakeholders.

Promote partnership through M&E processes

- Engage implementing partners and stakeholders from sectors beyond human health, and animal health in national planning and review processes, and ensure that M&E addresses relevant aspects of gender, equity and human rights.

- Maintain and enhance the M&E function of the Emergency Management meeting to become a more robust annual monitoring mechanism.

Improve transparency and accountability in reporting

- Complement annual self-assessment and reporting with after-action reviews, simulation exercises and joint evaluation with external partners by national and international independent experts.
- Contribute to peer-review processes in other Member States.
- Share results of exercises, outbreak reviews, assessments and evaluations with stakeholders.

The Component on Monitoring and Evaluation

Prepare

1. Bodies/organizations – Have I established?
   - NADEPC
   - NDCC
   - Advisory groups
   - Enabling legislation
2. Documents/system/logistics – Do I have?
   - List of priority diseases
   - List of notifiable diseases
   - Specific legal framework
   - Compensation policy and finance plans
   - Emergency preparedness plan
   - Contingency plans
   - Strategy of vaccines supplies
   - Operational manuals
3. Activities – Have I or will I:
   - determine a command structure within the veterinary services, including veterinary laboratories
   - Perform risk analysis and recurring updates
   - Establish criteria for case confirmation
   - Undertake recurring meetings between stakeholders
   - Carry out desktop and field simulation exercises
   - Design and implement a scanning surveillance to ensure early detection
   - Equip LDCCs with IT, meeting rooms, cold storage facilities, etc.
   - Determine the type and quantities of vaccine needed

- Publish results of investigations
- Conduct public awareness campaigns

Prevent

1. Bodies/organizations – Have I established?
   - NDCC
   - Early warning system
   - International border security
2. Documents/system/logistics – Do I have?
   - import quarantine policy
   - Biosecurity policy including wildlife component
3. Activities – Have I or will I:
   - Implement border inspection points
   - Provide capacities to carry out disinfections at border inspection points
   - Perform intelligence-gathering of distribution, virulence or epidemiology in affected countries for priority diseases
   - Establish and strengthen cross-border contacts with neighbouring countries
   - Ensure the availability of import quarantine policy at all veterinary services, etc.
   - Perform training of livestock farmers and other stakeholders on proper containment methods
   - Conduct public awareness campaigns

Detect

1. Bodies/organizations – Have I established?
   - NADEPC, NDCC, LDCCs
   - Advisory groups, specialist diagnostic team including laboratory expertise
2. Documents/system/logistics – Do I have:
   - Biosecurity policy, including wildlife component
   - Field diagnostic manuals
   - Template for disease reporting, suspected and confirmed cases (electronic and hard version)
   - SOPs for investigating suspect cases and shipment of samples (in-country and foreign shipments)
   - Computer-based animal information system
3. Activities – Have I or will I:
   - perform passive and active surveillance
   - report all notifiable diseases on a regular basis
   - organize training sessions for animal-health officers including para-veterinarians, including the use of the animal health system
   - keep regular contacts between veterinarians, para-veterinarians and livestock farmers and traders

- ensure the availability of templates for disease reporting at all veterinary services, SOPs, etc.
- develop capabilities for some key diagnostic tests (e.g. antigen and antibody detection tests)

Respond

1. Bodies/organizations – Have I established?
   - NEC
   - NDCC
   - LDCCs
   - Security forces
   - Advisory groups
   - NGOs
2. Documents/system/logistics – Do I have?
   - Contingency plan for each animal disease identified
   - Resource plans, including resource inventory
   - Operational manuals
   - Series of SOPs
   - Compensation policy, including funding details
3. Activities – Have I or will I:
   - Ensure the availability of a known stock of resources (e.g. people, materials and finance)
   - Ensure that the series of SOPs are covering the whole field needs for emergency disease control
   - Establish a working group composed of NDCC, LDCC and livestock farmers
   - Hold recurring meetings (at least on a weekly basis)

Recover

1. Bodies/organizations – Have I established?
   - NEC
   - NDCC
   - LDCCs
   - NGOs
   - Farmers groups and/or beneficiaries representatives
2. Documents/system/logistics – Do I have?
   - Restocking policy, including alternatives
   - DIVA strategy
3. Activities – Have I or will I:
   - Carry out active surveillance

- Prepare a declaration of freedom of disease as per OIE standards
- Coordinate with beneficiaries to agree on timing and nature of compensation
- Undertake psychological support for affected communities/ fragile people
- Carry out an after-action review

Emergency Management Plan for ASEAN

ASEAN priority actions

Animal health emergencies in ASEAN countries are evolving due to the increase of infectious diseases spreads within the countries and cross-border threats from other countries. These emergencies can create significant impacts in animal health, public health as well as socio-economic consequences.

Thus, priorities for the ASEAN include:

- Maintain the work on human resources development across all animal health functions and facilitate the improvement of ASEAN regional resource in risk assessment, data management, logistic supply, risk communication and monitoring and evaluation.
- Strengthen relationships between animal health professional, field staff and laboratories particularly in responding to event-based surveillance.
- Further enhance coordination and collaboration of AMS in implementing regional dan national approaches in animal health and zoonoses measures including disease surveillance, diagnosis and control, and rapid response for the ASEAN region
- Harmonize mechanism and framework of regional coordination among AMS in response to specific challenges in animal health and zoonoses
- Establish an ASEAN surveillance network utilizing current regional coordination and ad hoc working groups within ASEAN.
- Ensure multisectoral coordination, communication, and information-sharing among AMS are established and are tested before the real emergencies occur
- Optimize existing information and communication system and diagnostics tools and explore innovative options to support disease surveillance, field investigation, laboratory diagnosis, and field response especially in remote areas.

The approach

The ASEAN Sectoral Working Group on Livestock (ASWGL) was established to provide a mechanism to develop and implement relevant activities in the livestock sector such as management of exotic and emerging disease including emergency preparedness and response. The meeting that is held annually can be used to discuss relevant issues related with threats of exotic and emerging diseases and the emergency preparedness and response.

Implementing this document must consider the fact that each country is responsible for preparedness, prevention, response, and recovery planning and for the management of outbreaks and the animal and public health consequences of the disease introduction and spread. Principally, the ASEAN Surveillance Network is needed as a regional structure for the partnerships to implement this document in the ASEAN countries.

Specific approaches for the ASEAN include:

Make sure that the focus areas are lined up with national animal disease priorities

- Prioritize on the list of strategic animal diseases or potential emerging animal diseases and highly vulnerable, low resource ASEAN countries with a target on improving animal health functions for early warning, incident management and risk communication
- Implement the focus area based on local context and national priorities and following a stepwise approach.

Focus on human resources development

- Employ distance learning and mentoring to build human resource capacity
- Establish, develop, and maintain in-country expertise in the critical emergency preparedness and response functions of risk assessment, incident management, risk communication and response logistics.

Explore ASEAN regional approaches to share resources

- Facilitate and promote partner coordination within the ASEAN to fill the gap in limited technical and material resources and ensure these are available to all ASEAN countries and areas, as well as improve efficiencies of joint planning and budget setting between development partners and countries. For example, coordination between FAO, OIE, WHO as key implementation partners in the region and AMS.
- Explore opportunities to further strengthen ASEAN regional networks and collective learning through joint exercises, thematic planning processes to address common threats.

Establish a testing procedure to ensure the systems are ready

- Conduct simulation exercises that test the readiness of the national surveillance and response system comprehensively in respond to outbreaks
- Conduct specific exercises to test logistics in the ASEAN context.

Strengthen multisectoral and multilateral coordination and collaboration within ASEAN

- Foster and enhance collaboration between AMS and relevant national and international partners, public health sector and related stakeholders on the prevention control and eradication of TADs and zoonoses including a common understanding in information management, supply chain management and response logistics, resource mobilization and administration.
- Improve multisectoral and multilateral coordination in technical assistance, including arrangements with international laboratories, specimen referral logistics and support for diagnostic capacity.

Ensure that M&E component relates to the existing monitoring frameworks

- Align the M&E framework in this document with PVS OIE tools and other related national, regional and international indicators.

Connection with other ASEAN and Global strategies and initiatives

This document has been developed with a focus on the fundamental components for emerging and re-emerging diseases emergencies, which are covered in the nine focus areas. As described in focus area 1, there are several other strategies and initiatives that provide a broader context for emergency response and contribute to overall “system readiness”.

This section provides a brief description of some initiatives, programs, and forum that can be related to the emergency response.

This document works towards a resilient animal health system through a focus on animal health preparedness, emphasizing the importance of other health system fundamentals including field, laboratory and field epidemiology.

Link to the ASEAN *strategies and initiatives*

ASWGL (ASEAN Sectoral Working Group on Livestock)

ASWGL was established to provide a mechanism to develop and implement relevant activities in livestock sector such as ASEAN Standards in Livestock for Vaccines and Good Animal Husbandry Practices. Intensive and larger scale production and processing is increasing; however, smallholder livestock is still dominating in the AMS countries. Hence, role of smallholder sector plays important role and need to be considered when developing policies and strategies. Under ASWGL there are number of initiatives in the form of group, forum, coordinating centre including ACCAHZ, AVEG, AIGA, ALDF, ANFPPV, and GAHP that are described below and linked to the emergency preparedness and response against exotic and emerging diseases.

ACCAHZ (ASEAN Coordinating Centre for Animal Health and Zoonoses)

The formation of ACCAHZ have been initiated since the year 2012 that aims to facilitate and provide a framework for cooperation and coordination among ASEAN member countries in response to an increasing risk of the introduction and spread of emerging and re-emerging zoonotic disease. As these diseases introduction and spread are difficult to be predicted, a preparedness and rapid response capacity need to be in place.

AVEG (ASEAN Ad-Hoc Veterinary Epidemiology Group)

The AVEG has been recommended to integrate with the ACCAHZ. Currently, this group is developing a draft Regional Strategic Framework for Veterinary Epidemiology Capacity Development and Networking in Southeast Asia (Epi Framework) and other associated plan of action including One Health strategies at country level in collaboration with FAO.

AIGA (Avian Influanza Group in ASEAN)

The AIGA is an expansion of one of the oldest animal health groups of ASEAN, the HPAI Taskforce that was established in 2004. The continuing threats of avian influenza virus due to greater viral diversity and their pathogenicity, more complex value chain, and the presence of AI in countries neighbouring ASEAN has initiated the endorsement of the group rebranding to AIGA. A concept note has been endorsed on the Review of the implementation of the Roadmap to an HPAI-Free ASEAN Community by 2020 and ways Forward Towards Prevention and Control of Avian Influenza in ASEAN.

ALDF (ASEAN Laboratory Directors' Forum)

Strengthening national laboratory capacities, collaboration as well as information sharing among the laboratories within the region through the "Regional Laboratory Network (RLN)"is essential for the effective surveillance and control program against transboundary animal diseases (TADs) and emerging infectious diseases (EIDs)in Southeast Asia (SEA). The ALDF focuses on Laboratory Capacity Building and Networking in Southeast Asia. In coordination with different international organizations, reference laboratories, and donors, ALDF has role to review and adapt the current diagnostic tests and algorithms for AI, ASF, FMD, and other emerging diseases. Furthermore, this forum also reviews the outcomes of Regional Expert Group activities on FMD and establishment of Regional Expert Group on AI and swine diseases

Other related initiatives

ASEAN NFP on Veterinary Product for Regularization and Utilization of Veterinary Products, ASEAN Ad hoc Communication Group for Livestock for ASEAN Livestock Information and Communication Technology and EWG-GAHP as an Expert working group on good animal husbandry practice are also identified to have potential role in implementing emergency preparedness and response in exotic and emerging diseases.

Links to global initiatives and frameworks

GFTADS (Global Framework for the progressive control of Transboundary Animal Diseases)

The GF-TADs is a coordinating mechanism, based on a joint initiative from the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) that aims, in association with other relevant partners to initiate and support regional cooperation for the control of transboundary animal diseases (TADs). As a general principle, the GF-TADs governance bodies at the global level will not interfere in the existing activities of each organization and will not duplicate work already done by each organization in the framework of its mandate. The governance bodies will respect the roles and existing activities and mandates of the OIE and FAO, in particular concerning the management of Animal Health Information.

It addresses the animal health matters of the region ensuring good governance of Animal Health Systems (a model has been described in 'Ensuring good governance to address emerging and re-emerging animal disease threats: supporting the veterinary services of developing countries to meet OIE international standards. It defines and implements appropriate policies and strategies regarding prevention and control of animal diseases, including compliance to OIE standards for Veterinary Services, central command for TADs matters and enforcement of rules and regulations.

GHSA (Global Health Security Agenda)

Threats of infectious diseases continues to pose countries. Current infectious disease outbreaks that have pandemic potential such as Ebola, Lassa, Zika, MERS-CoV, plague, cholera, and influenza1 are reminders of the significance of these threats and the range of gaps in capabilities to prevent, detect, assess, and respond in countries worldwide. The Global Health Security Agenda (GHSA) serves as a catalyst for progress toward the vision of attaining a world safe and secure from global health threats posed by infectious diseases. It is a collaborative, multisectoral initiative, bringing together countries, regions, international organizations, and the non-governmental sector (including the private sector) to accelerate and optimize global health security. This includes sharing best practices, elevating global health security as a national leaders'-level priority, and facilitating national capacity to comply with and adhere to the World Health Organization (WHO) International Health Regulations (IHR), the World Organization for Animal Health (OIE) international standards and guidelines, the United Nations Security Council Resolution 1540 and Biological Weapons Convention, and other relevant frameworks that contribute to global health security. GHSA emphasizes the need for strong multisectoral

engagement, including human and animal health, agriculture, security, defence, law enforcement, development assistance, foreign affairs, research, and finance sectors, among others. As of September 2018, 65 participating countries representing nearly 6 billion people, along with 9 international and regional multilateral organizations and institutions, and non-governmental sector partners – including over 100 private companies, non-governmental organizations, and academic institutions – are part of GHSA.

APHCA (the Animal Production and Health Commission for Asia and the Pacific)

The establishment of APHCA within the framework of the FAO was initiated by Asian nations at the 5th FAO Regional Conference on Animal Production in 1974. It supports sustainable improvement in rural livestock agriculture and resource use through information sharing, disease control, enhanced organizational efficiency, the diversification of farm production, value-chain development and other initiatives. APHCA works on the principle of collective self-reliance and mutual assistance among developing countries. Brucellosis is one of the main endemic zoonoses affecting livestock and people in the Asia-Pacific region. APHCA is building capacity in brucellosis diagnosis and control by testing the proficiency of 16 laboratories under the Joint FAO-APHCA/OIE Brucellosis Diagnosis and Control Programme in the region. In addition, APHCA recently presented and reviewed the extent of antimicrobial use (AMU) in livestock production and antimicrobial resistance (AMR) in microorganisms isolated from livestock and livestock products by commissioned a systematic review of the literature on the subject. APHCA further contributes to regional information exchange on animal diseases through participation in the regional meetings of the Global Framework for Transboundary Animal Diseases (GF-TADs) while information on AMR is shared with respective working groups of OIE and WHO.

Socioeconomic determinants

Gender and equity and human rights

Gender and equity are crucial subjects in maintainable development. The terminology of sex refers to the biological factors distinguishing males and females, while gender refers to the socially built customs, roles and relations between men and women. With regards to animal health emergencies, sex and gender inequities can affect exposure and vulnerability to pathogens or hazards, access to resources, and risk communication. Other discriminations include those formed by social marginalization and geography, isolating communities and individuals from being effectively engaged in the animal health system and affecting social and economic determinants of animal health. Member countries are encouraged to consider factors relating to gender and equity in ASEAN planning, implementation and M&E.

Implementing the strategy

National-level mechanisms

Management and coordination mechanisms are needed in planning, implementation and monitoring and evaluation at the national level. An impact assessment and situation awareness are the first step that must be taken after activating an emergency plan. The impact of the disaster on the Veterinary Services themselves and their capacity to implement the plan must be assessed. Veterinary Services need to prioritize joint activities with key stakeholders. They must remain flexible and take appropriate action after assessing impacts on animal health and welfare, human safety and the environment. If there is no specific contingency plan for the type of disaster occurring, the Veterinary Service must take a step-by-step approach to decision making and refer to the content described in the mitigation and prevention phases and preparedness of the contingency plan that has been developed for general guidance.

Each contingency plan (developed in the mitigation / prevention phase) will determine governance and the chain of command. Collaboration and coordination with stakeholders under a clear line of responsibility will be important to expand the capacity of Veterinary Services. Adaptability, efficiency, and continuity of support are essential for an effective response.

Member States may consider using the following mechanism, or similar, for planning and implementation:

- Establish and / or maintain key health functions, M&E guidelines and activities are followed up. If possible, a national chain of command structure is formed.
- Establish a permanent committee with primary responsibility for implementation strategies. Representation of all stakeholders involved must be present in this commission.

Regional-level mechanisms

Executive functions

Executive functions refer to the ASEAN Secretariat or other high-level meetings of senior decision-makers from national animal health authorities in Member States, will be used, when appropriate, to ensure political commitment.

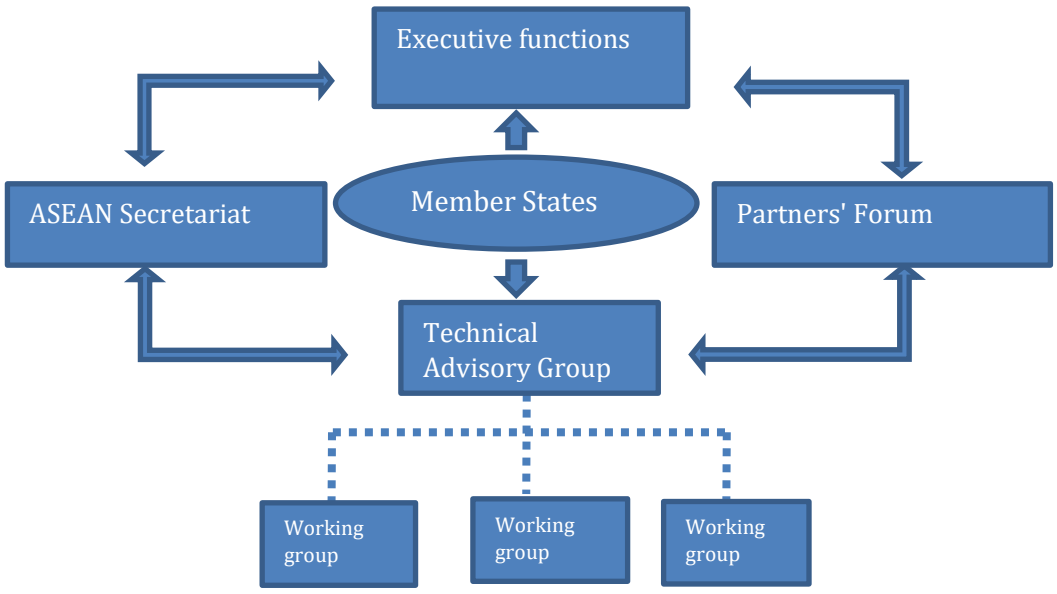

Figure 6. Model for regional coordination and management (adopted from APSED III)

Technical Advisory Group

Members of Technical advisory group (TAG) are selected from member states, partners and experts. The TAG mechanism contributes to the M&E processes for emergency response strategy through reviewing progress and making recommendations for implementation. Time-limited working groups may be established to bring together expertise to work on specific issues as need arises. The TAG meeting, with attendance from TAG members and representatives from Member States and partners, is anticipated to occur annually. This meeting serves as a regional platform to foster and coordinate partnership on animal health security.

Partners' Forum

There are numerous partner organizations that have worked collectively with Member to strengthen preparedness and response capacity for emerging diseases and animal health emergencies in the past decade. Continued technical and financial support from partners is essential to the success of this strategy. The annual meetings are a forum for enhancing harmonized partner coordination and collaboration. It is proposed that these partner's forums will continue to facilitate aligning and harmonizing partner support thus contributing to efficient use of resources.

Financing and sustainability

Ensuring regional emergency preparedness and response requires sustainable financial investment from national governments and from national and international partners. Implementation of this document represents a joint commitment and collective effort to ensure that all Member States are safer and more secure in the face of emerging diseases and animal health emergencies. Effective implementation of the strategy to achieve this common goal requires sustainable financial and technical support.

Member States and partners will be required to establish and support a strategic approach for mobilizing adequate and sustainable financial resources to implement the strategy at the country, regional and global levels. High- and upper- middle-income countries are strongly encouraged to provide financial and technical support to resource-limited countries.

There are a number of initiatives related to health security that provide opportunities to implement this document. These include initiatives funded under the GHSA.

Recommended mechanisms and options for Member States, various stakeholders and potential partners include:

- Strengthening preparedness-driven resource mobilization by creating an annual budget, using national action plans to mobilize long-term resource commitments from countries and partners, refocusing from a response-driven to a generic preparedness-driven resource mobilization approach, and establishing emergency contingency funds at the national level to ensure that adequate funds are available immediately for responding to emergency situations.
- Strengthening financial mechanisms through bolstering existing national financial mechanisms and seeking alternative financial mechanisms, for example expanding financial mechanisms to include partnerships with the private sector.
- Working with FAO and partners to utilize funding opportunities from various health security initiatives.
- Strengthening advocacy through formulating and disseminating a set of information and advocacy packages that are closely linked to emergency preparedness and response success stories.

Bibliography

1. ASEAN Economic Community at glance 2016. ASEAN Secretariat
2. 9 things you need to know about ASEAN-Deutsche Bank. Access on 17th May 2020. https://www.db.com/newsroom_news/2019/9-things-you-need-to-know-about-asean-en-11469.htm
3. Ahuja, V., 2013. Asian Livestock: Challenges, Opportunities and the Response, third ed. Rome, Italy: FAO
4. Del Rosario, B., Aquino, A., Tidon, A., Gerpacio, R., 2007. Livestock sector training needs assessment report for South Asia.
5. Biswas, P.K., Christensen, J.P., Ahmed, S.S.U., et al., 2009. Risk for infection with highly pathogenic avian influenza virus (H5N1) in backyard chickens,Bangladesh. Emerging Infectious Disease 15, 1931–1936.
6. Grace, D., Mutua, F., Ochungo, P., et al., 2012. Mapping of Poverty and Likely Zoonoses Hotspots. Kenya: ILRI
7. Mohd Nor MN, Gan CH, Ong BL. Nipah virus infection of pigs in peninsular Malaysia. Rev Sci Tech. 2000;19(1):160-165. doi:10.20506/rst.19.1.1202
8. Chua, K. B., W. J. Bellini, P. A. Rota, B. H. Harcourt, A. Tamin, S. K. Lam, T. G. Ksiazek et al. "Nipah virus: a recently emergent deadly paramyxovirus." Science 288, no. 5470 (2000): 1432-1435.
9. Johara, M. & Field, H. & Rashdi, A. & Morrissy, Chris & Heide, B. & Rota, Paul. (2001). Serological evidence of infection with Nipah virus in bats (order Chiroptera) in Peninsular Malaysia. Emerg Infect Dis. 7. 439-441.
10. Sendow, Indrawati & Ratnawati, Atik & Taylor, Trevor & Adjid, Rm & Saepulloh, Muharam & Barr, Jennifer & Wong, Frank & Daniels, Peter & Field, Hume. (2013). Nipah Virus in the Fruit Bat Pteropus vampyrus in Sumatera, Indonesia. PloS one. 8. e69544. 10.1371/journal.pone.0069544.
11. Chua, Kaw Bing. "Nipah virus outbreak in Malaysia." Journal of Clinical Virology 26, no. 3 (2003): 265-275.
12. Reynes, Jean-Marc, Dorian Counor, Sivuth Ong, Caroline Faure, Vansay Seng, Sophie Molia, Joe Walston, Marie Claude Georges-Courbot, Vincent Deubel, and Jean-Louis Sarthou. "Nipah virus in Lyle's flying foxes, Cambodia." Emerging infectious diseases 11, no. 7 (2005): 1042.
13. Breed, Andrew C., Hume E. Field, Craig S. Smith, Joanne Edmonston, and Joanne Meers. "Bats without borders: long-distance movements and implications for disease risk management." EcoHealth 7, no. 2 (2010): 204-212.
14. Wang, Taia T., Michael K. Parides, and Peter Palese. "Seroevidence for H5N1 influenza infections in humans: meta-analysis." Science 335, no. 6075 (2012): 1463-1463.
15. Bouma, Annemarie, Ivo Claassen, Ketut Natih, Don Klinkenberg, Christl A. Donnelly, Guus Koch, and Michiel Van Boven. "Estimation of transmission parameters of H5N1 avian influenza virus in chickens." PLoS Pathog 5, no. 1 (2009): e1000281
16. Sims, L.D., Domenech, J., Benigno, C., et al., 2005. Origin and evolution of highly pathogenic H5N1 avian influenza in Asia. Veterinary Record 157 (6),159–164.
17. WHO, 2012. H5N1 avian influenza: Timeline of major events (WWW Document). Available at: http://gvaonline.in/sites/default/files/H5N1_avian_influenza_update150612N_1.pdf.
18. Bethe, M.R., 2006. Global Spread of the Avian Flu: Issues and Actions. Nova Publishers.

19. Boni, M.F., Galvani, A.P., Wickelgren, A.L., Malani, A., 2013. Economic epidemiology of avian influenza on smallholder poultry farms. Theoretical Population Biology 90, 135–144
20. WHO, 2014. Influenza at the human animal interface (WWW Document). Available at: http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_24January14.pdfua=1
21. Coker, R.J., Hunter, B.M., Rudge, J.W., Liverani, M., Hanvoravongchai, P., 2011. Emerging infectious diseases in southeast Asia: Regional challenges to control. Lancet 377, 599–609.
22. OIE, FAO, 2007. The Global Strategy for Prevention and Control of H5N1 Highly Pathogenic Avian Influenza. Rome: Food and Agriculture Organization of the United Nations
23. Sumiarto, B., Arifin, B., 2008. Overview on poultry sector and HPAI situation for Indonesia with special emphasis on the Island of Java (Pro-poor HPAI Risk Reduction No. 3). Addis Ababa: International Food Policy Research Institute (IFPRI) with the International Livestock Research Institute (ILRI) and Royal Veterinary College (RVC).
24. Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team, Dawood, F.S.,Jain, S., et al., 2009. Emergence of a novel swine-origin influenza A (H1N1) virus in humans. New England Journal of Medicine 360, 2605–2615. doi:10.1056/NEJMoa0903810.
25. Neumann, G., Noda, T., Kawaoka, Y., 2009. Emergence and pandemic potential of swine-origin H1N1 Influenza virus. Nature 459, 931–939. doi:10.1038/nature08157
26. Hiromoto, Y., Parchariyanon, S., Ketusing, N., et al., 2012. Isolation of the pandemic (H1N1) 2009 virus and its reassortant with an H3N2 swine influenza virus from healthy weaning pigs in Thailand in 2011. Virus Research 169, 175–181
27. Rith, S., Netrabukkana, P., Sorn, S., et al., 2013. Serologic evidence of human influenza virus infections in swine populations, Cambodia. Influenza and Other Respiratory Viruses 7, 271–279. doi:10.1111/j.1750-2659.2012.00382.X.
28. CDC, 2013. Emergence of Avian Influenza A (H7N9) Virus Causing Severe Human Illness-China, February−April 2013
29. Chen, Y., Liang, W., Yang, S., et al., 2013. Human infections with the emerging avian influenza A H7N9 virus from wet market poultry: Clinical analysis and characterisation of viral genome. Lancet 381, 1916–1925.