World Organisation for Animal Health
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SEACFMD

Report of the 26th SEACFMD National Coordinators Meeting

22 to 24 August 2023, Kuala Lumpur, Malaysia

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TABLE OF CONTENTS

Table of Contents

ACKNOWLEDGEMENTS

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The organization of this meeting and preparation of this report was coordinated by Karma Rinzin, Ashish Sutar, Bolortuya Purevsuren and Onsiri Benjavejbhaisan under close supervision of Ronello Abila.

This meeting was made possible through the generous fund support of the Government of the People's Republic of China, Government of Australia and Government of Japan.

EXECUTIVE SUMMARY

The 26th SEACFMD National Coordinators was held in Kuala Lumpur, Malaysia from 22 – 24 August 2023. The meeting was attended by 55 participants from 12 SEACFMD Member Countries (Brunei, Cambodia, China, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand and Vietnam), non SEACFMD Countries in the Asia Pacific region (Chinese Taipei, Japan, Korea, Timor Leste and Papua New Guinea), WOAH Reference Laboratories, donors (Australia, China) and Private Sectors (Biogenesis Bago and Boehringer Ingelheim).

Dr Ronello Abila, WOAH Sub-Regional Representative for South-East Asia welcomed Dr Akma Binti Ngah Hamid, President of SEACFMD Sub-Commission and all the participants to the meeting on behalf the SEACFMD Campaign Secretariat. The 26th SEACFMD National Coordinators was officially opened by the Dr Akma Binti Ngah Hamid, SEACFMD Sub-Commission President and WOAH Delegate of Malaysia and Director General of the Department of Veterinary Services (DVS).

The Day 1 of the 26th SEACFMD National Coordinators Meeting reviewed the SEACFMD Campaign progress at the regional and country level and provided platform for the Members to share experiences and challenges faced by both infected and FMD free countries and countries with free zones. The meeting also reviewed the FMD situation at the country level in the infected countries and FMD related activities implemented by both SEACFMD and non SEACFMD Members through a poster session. The meeting updated the global and regional FMD situation, with a specific focus on examining the evolutionary patterns of the FMDV observed across seven distinct pools. The Day 1 of the meeting ended with series of presentations from the FMD Laboratories (Australian Centre for for Disease Preparedness, Pak Chong FMD Laboratory, Lanzhou Veterinary Research Institute) in the region who presented their respective activities and ongoing research activities on FMD.

The Day 2 of the meeting reviewed the progress of SEACFMD campaign including the presentation on the evaluation of SEACFMD Campaign from 1997 to 2020 and critical review of the progress of the SEACFMD Roadmap 2021 -2025. The World Café session was organized to brainstorm on the critical gaps identified during the evaluation of the SEACFMD campaign and address these gaps. The participants were divided into four groups while each group were assigned with one booth with different topics – Fit for purpose surveillance system, Incentives and pathways for livestock movement (weak biosecurity), Access to quality vaccines and effective vaccination, and Multi-disciplinary and multisectoral efforts including Public-Private-Partnerships. The group rotated to provide additional inputs on different topics.

The panel discussion focused on improving the country ownership and enabling environment at national level; national legislation related to FMD and TADs control; and enhancing regional coordination and collaboration was moderated by Dr Abila. The four Panellists were from the SEACFMD Members with varying FMD situation (Philippines, Indonesia, Malaysia and Myanmar). The day 2 session ended with discussion of priority actions to be implemented in next 5 to 6 months.

The Day 3 of the meeting concentrated on enhancing cost efficient synergies in the control of FMD and other TADs. The session started with an Update on Regional GF-TADs Strategy and an update on regional ASF, LSD and PPR situation and highlights of the key activities implemented by WOAH. This was followed by presentation from the Members focusing on Synergy in prevention and control of FMD and other TADs (FMD and LSD – Thailand, FMD and PPR – Mongolia). Although Vietnam was invited to make presentation on Synergy in prevention and control of FMD and ASF, a brief update on ASF vaccine in Vietnam was made.

This was followed by brain storming session moderated by Dr Karma Rinzin where some Members provided verbal updates to share any success stories, lessons learnt on the recent incursion of emerging TADS in the region (ASF and LSD) and its impact on FMD control; and lessons learnt from the COVID pandemic and its impact on FMD and TADs control; and measures to enhance cost efficient synergies in prevention of control of FMD and other TADs. Members shared several stories on cost efficient synergies and lessons learnt during the COVID pandemic. The FMD Reference Laboratories reported drastic reduction in receiving FMD samples from the Members during the COVID pandemic and still low numbers of samples being received which has an impact on FMD surveillance. Considering the tremendous improvement in molecular diagnostic capacity in the human laboratories during the COVID pandemic, national veterinary authorities should collaborate with human health authorities to seek their support; also recommended members to enhance cost efficiency by sharing PCR equipment and other consumables for diagnosing different diseases in animals. Australia and Japan also shared their experience in adoption of different cost efficient synergies to enhance their pre-border, border and post-border biosecurity measures.

During the closing session of the meeting, the participants went through the draft recommendations of the meeting and provided feedback. These recommendations were also circulated to the Members and participants over email after the meeting. The meeting concluded with the closing remarks by Dr Karma Rinzin on behalf of WOAH Sub-Regional Representative and Dr Akma Binti, SEACFMD President Sub-Commission and on behalf of host country.

The 26th SEACFMD National Coordinators Meeting ended with a Field trip to Farm Fresh Dairy Farm at the University of Putra Malaysia. The primary objectives of this farm are to support student learning and research in the dairy sector while also serving as an agritourism destination. Following the farm visit, the participants proceeded to the World Veterinary and Animal Welfare Day 2023 exhibition site with several stalls to show case different animals types and breeds such as cattle, buffalo, sheep, goat, poultry birds, dogs and a stall for adoption of cats. There were other stalls with veterinary equipment, products, pharmaceuticals, animal feeds and to show case DVS activities.

MEETING RECOMMENDATIONS

Considering

- the accomplishments made in the region since the creation of the Sub-Commission for FMD control in South-East Asia in 1994, the launching of SEAFMD Campaign in 1997, its expansion to become a SEACFMD campaign following inclusion of China PR and Mongolia;
- the endorsement of the SEACFMD Roadmap 2021-2025 by 25th SEACFMD Sub-Commission Meeting in December 2020; and endorsement of the Monitoring and Evaluation (M&E) framework for SEACFMD Roadmap 2021-2025 by the 26th SEACFMD Sub-Commission in March 2022;
- the findings of SEACFMD Campaign Evaluation from 1997 to 2020;
- the progress of the implementation of the SEACFMD Roadmap 2021 - 2025;
- the existing FMD status of the SEACFMD member countries including FMD PCP stages and FMD situation at the global and regional level;
- the dynamic spread of different FMD virus serotypes within the region and the potential for the introduction of new viral lineages (such as O/ME-SA/SA-2018);
- the recent incursion of emerging transboundary animal diseases (ASF, LSP and PPR) in the region;
- the endorsement of the Regional GF-TADs Strategy 2021 -2027 for Asia and the Pacific;
- the importance of regional coordination for the effective control of FMD;
- the challenges faced in the region to control FMD and other TADs.

The 26th SEACFMD National Coordinator Meeting held in Kuala Lumpur, Malaysia from 22 to 24 August 2023 made the following recommendations for better implementation of the SEACFMD Roadmap activities; and to to guide future SEACFMD Campaigns:

- **Surveillance**

1. Develop improved ways to quantify the burden of FMD infection across the whole region including structured sero-surveillance between Members to give a crude estimation of prevalence (including existing sero-surveillance reports);
2. Conduct sequence analysis of the reported outbreaks to better understand the patterns of FMDV circulation in the region;
3. Map FMD risk pathways with FMDV lineages present in the region along the value chains;
4. Conduct spatial risk analysis using Multi criteria decision analysis (MCDA) techniques;

5. Conduct a study of ruminant transportation routes in Southeast Asia and China, incorporating various strategies to enhance safe livestock trade;
6. Assess historical presence of FMD at the smallest administrative levels such as village/ commune etc (for the last 1 year, 2 to 3 years and 5 years) using the template provided by the SEACFMD office that will be circulated to all countries;

- **Vaccination**

7. Advocate testing of vaccine quality across the region;
8. Collate regional information regarding FMD vaccine use in SEACFMD Members including submission of Annual vaccination reports by the Members with information on doses of vaccines produced/ procured, vaccination conducted; and vaccination maps describing (i) blanket (prophylactic) vaccination and (ii) targeted (suppressive) vaccination at different administrative levels;
9. Continue to improve our understanding of vaccination responses in vaccinated livestock (including coordinated work to calibrate ELISA tests used in the region and comparisons to VNT test results);

- **Biosecurity and animal movement**

10. Members to conduct Risk Assessment studies which will guide them to develop disease free zones to facilitate livestock trade;
11. Explore and bench mark what is being traded online that could potentially introduce new viruses into the region;

- **Advocacy and communication**

12. Develop policy brief on the importance of using quality vaccines;
13. Develop Advocacy materials for policy makers on the importance of prevention and control of FMD and other TADs;
14. Develop risk communication materials for FMD targeting traders and members to disseminate FMD communication materials (including newly developed and translated digital materials) to the targeted stakeholders to enhance awareness on FMD prevention and control;

- **Horizontal issues**

15. Identify capacity building and training needs on FMD and other TADs to adapt to changing circumstances, emerging and reemerging diseases, and advancements in technology and knowledge;
16. Identify and develop synergies between FMD control and other TADs or other livestock production/health activities;

17. Develop and maintain active collaboration between the partners and relevant stakeholders for prevention and control of FMD and other related TADs;

18. Conduct workshop on safe trade to exchange knowledge and understanding of the role of WOAH international standards, the role of importing and exporting countries and SPS market access requirements.

19. Organize bilateral discussion between WOAH SRRSEA (SEACFMD Secretariat) and SEACFMD Members to review the progress of the implementation of SEACFMD Roadmap 2021 – 2025 and M&E targets at the country level;

- **Specific issues**

20. Support development of FMD Risk-based strategic plan for Cambodia;

21. Encourage both importing and exporting countries within the region to include in shipment protocol the requirement to vaccinate animals against FMD using high quality vaccines (for example use 6 PD50);

- **Request**

22. REQUEST Thailand to host 27th SEACFMD Sub-Commission Meeting in March 2024;

23. REQUEST Cambodia to host 27th SEACFMD National Coordinators Meeting in August 2024;

- **Acknowledgement:**

24. THANK the Government of Malaysia for its successful hosting of the 26th Meeting of the SEACFMD National Coordinators;

25. THANK the Governments of Australia and China for their continuous financial support to the SEACFMD campaign;

26. THANK all participants from SEACFMD Members, non SEACFMD Members and Partners for their active participation in the meeti

INTRODUCTION

Background

The World Organisation for Animal Health (WOAH, founded as OIE) continues to work towards controlling foot and mouth disease (FMD) and its negative effects on economies and livelihoods in South-East Asia, China and Mongolia, through the South-East Asia and China Foot-and-Mouth Disease (SEACFMD) Campaign. The SEACFMD Campaign initiated in 1997 is implementing its 6th phase under the 2021-2025 SEACFMD Roadmap. The SEACFMD Campaign coordinates FMD control activities between its member countries, provides technical advice, ensures coherent regional strategies and enlists political and resource support to FMD activities. SEACFMD has been globally recognised as a model in the regional control of a priority transboundary animal disease.

The SEACFMD National Coordinator's annual meeting remains an important platform to member countries to discuss current FMD risk situation, exchange ideas, review progress of SEACFMD Campaign and assist in the formulation of action plan keeping in view both country context and regional cooperation.

The 26th SEACFMD National Coordinators Meeting was held in Kuala Lumpur, Malaysia from 22 – 24 August 2023. The meeting was attended by 55 participants from 12 SEACFMD Member Countries, five non SEACFMD Countries in the Asia and the Pacific region (Chinese Taipei, Japan, Korea, Timor Leste and Papua New Guinea), WOAH Reference Laboratories, donors (Australia, China) and Private Sectors (Biogenesis Bago and Boehringer Ingelheim) – Refer Annex 1 – List of participants. The meeting provided an update on the latest global and regional FMD situation and serve as a platform for countries to share experiences and challenges faced by both infected and FMD free countries and countries with free zones. Besides, this meeting discussed and aligned the ongoing SEACFMD activities based on the findings and recommendations of the SEACFMD campaign evaluation from 1997 to 2020; and explored options to enhance cost efficient synergies for the control of FMD and other related Transboundary animal diseases (TADs) such as

Objective

The objectives of the 26th SEACFMD National Coordinators are to:

- Review the SEACFMD campaign progress, regional FMD risk situation and current FMD epidemiological situation amongst member countries.
- Review and follow up on the key actions to implement the recommendations of 26th Sub-Commission meeting and 25th National Coordinators meetings held in March 2022 and October 2022 respectively.
- Discuss and align the ongoing SEACFMD activities based on the findings and recommendations of the SEACFMD campaign evaluation from 1997 to 2020.
- Discuss the various options to enhance cost-efficient synergies in the control of FMD and other related TADs (ASF, LSD and PPR).
- Provide platform to share experiences and challenges faced by both infected and FMD free countries and countries with free zones and come up with solution to address some the challenges.

DAY 1: 22 AUGUST 2023

Session I: Opening Session

The 26th SEACFMD National Coordinators Meeting started with welcome remarks from Dr Ronello Abila, WOAH Sub-Regional Representative for South-East Asia. In his welcome remarks Dr Abila provided historic overview of the SEACFMD campaign and its progress since 1997 to prevent and control FMD in South East Asia. He also highlighted the challenges faced by the sub-region in the control of FMD with the incursion and spread of other emerging Transboundary Animal Diseases (TADs).

The 26th SEACFMD National Coordinators was officially opened by the Dr Akma Binti Ngah Hamid, the President of the SEACFMD Sub-Commission and WOAH Delegate of Malaysia and Director General of the Department of Veterinary Services (DVS).

Session II: SEACFMD Campaign Progress

Objective and expected outcome of the 26th SEACFMD National Coordinators Meeting

Dr Karma Rinzin, Regional Animal Health Coordinator made a brief presentation on the Objective and Programme for the 26th SEACFMD National Coordinators meeting. He also provided brief highlights of the background of SEACFMD campaign including the SEACFMD Governance structure (Presentation available here).

SEACFMD Campaign progress and status of the SEACFMD Governance meeting recommendations

Dr Karma also presented the Progress of the SEACFMD Campaign (2022 – 2023) for each of the Outcomes under Objective 1 and progress under Objective 2 (Presentation available here). The highlights of the achievement are summarized below:

- The achievement under Outcome 1 includes the recently completed studies such as Regional animal price monitoring study; Assessment of emergency preparedness and response capacity of the Members; and FMD value chain study in Malaysia. Some of the ongoing studies are In-depth FMD risk assessment in Johor and Langkawi in Malaysia; Status of FMD virus Asia 1 serotype in South-East Asia and assess detection probability of FMDV Asia1 in SEACFMD region; and Country level animal price monitoring study.
- The achievement under Outcome 2 are alignment of National FMD control plan with the SEACFMD roadmap 2021-2025 and formalizing M&E framework for the SEACFMD Roadmap 2021 – 2023 at the regional as well as at the national level; review of revision of national legislation by some Members. The digitalization of FMD communication materials and development of SEACFMD portal and dashboard were done to facilitate easy sharing of resources to the Members.
- The highlights of achievement under Outcome 3 are organizing SEACFMD Governance meetings (26th Sub-Com meeting in March 2022; Special Meeting of the SEACFMD National Coordinators focused on FMD Preparedness and Response in June 2022; 25th SEACFMD National Coordinators Meeting in October 2022; Joint Virtual EpiNet and LabNet Meeting in December 2022 ; and Virtual SEACFMD Private Sector Consultative Committee Meeting in March 2023). The SEACFMD Secretariat (WOAH SRRSEA) and SEACFMD Members attended the various meetings

under the GF-TADs framework at the global and regional level, maintained partnership with Partners and Research Institutions and closely engaged with some Non-SEACFMD Members.

- The Objective 2 of the Roadmap which is Comprehensive evaluation of SEACFMD Campaign from 1997 – 2020 to address critical gaps was successfully completed and its detail findings presented in Day 2 of the Meeting.
- Dr Karma also reported the status of the implementation of the recommendations of various SEACFMD Governance meetings.
- He concluded his presentation by reporting the progress of the implementation of five priority actions identified during the 25th SEACFMD National Coordinators Meeting including Exploring possibility to set-up Regional FMD Vaccine Bank/ Antigen Bank (Annex IV).

Session III: FMD updates

Global FMD situation – An overview of recent FMD events

Dr Donald King from the World Reference Laboratory for FMD in Pirbright made presentation on Overview of global FMD events and core activities of WOAH/FAO Laboratory network on the collation and exchange of FMD data, a review of FMD risk relating to FMDV trans-pool movement, test improvement and harmonization, vaccine performance and support to GF-TADs regional roadmaps. He reported recent evolutionary patterns of the FMDV observed across seven distinct pools. The recent detection of SAT 2 for the first time in North Africa and Middle East raises concern. The dominance of Serotype 0, particularly O/ME-SA/Ind-2001e from Pool 2 to North Africa, Middle East and South-East Asia as well as the recent FMD epidemic in Indonesia, South Korea and Mongolia indicates that it is most widely spread FMD lineage across the regions. The recent detection of new emerging serotype O lineage (O/ME-SA/SA-2018) detected in Pool 2 (India, Bangladesh and Sri Lanka) with scope to spread more widely following pathways for O/ME-SA/Ind-2001 (d and e) pose a new threat to South-East Asia.

Dr King also presented the vaccine matching data for field isolates from regions where O/ME-SA/Ind-2001e lineage is present. The recent vaccine matching data from WRLFMD for Indonesia and South Korea field isolates supports selection of O-Manisa, O-3039 and combination. He also reported that vaccine matching for new serotype O lineage detected in Pool 2 appears to be similar to O/MESA/Ind-2001e. Dr King concluded his talk by highlighting the importance of sampling during the field outbreaks to monitor FMD epidemiology and to assess impacts of the disease, emergence of new strains and to inform vaccine selection and deployment of vaccines (Presentation available here).

Regional FMD situation

Dr Bolortuya Purevsuren, Project Officer, WOAH SRRSEA, made presentation using Online SEACFMD dashboard on the regional FMD based on data from ARAHIS, WAHIS, WOAH FMD Reference Laboratory report and Country reports situation. The presentation focused on the yearly trend, spatial patterns and circulating FMDV types. Based on the available information she reported declining trend in FMD outbreak reports from the SEACFMD Members. She reported FMDV types circulating in the SEACFMD region: Serotype O/ME-SA/Ind-2001e remain predominant in SEACFMD region including involvement of this lineage in the recent FMD epidemic in Indonesia; Serotype A was consistently reported in Thailand with observed clusters from 2014 to 2023; Serotype O/ME-SA/Ind-2001d reported from five countries between 2015 – 2017; Serotype O/ME-SA/Pan-Asia in seven countries from 2015 to 2020; and Serotype Asia 1 was

not detected in the region since 2017, with the last recorded case in Myanmar. Dr Bolortuya concluded her presentation by emphasizing on the importance of timely reporting and need to conduct detail epidemiological investigation including sample collection from the outbreak areas to fully understand the FMD situation and circulating FMDV types which will have impact on the successful FMD control (Presentation available here).

Updates on Global strategy and WOAH standards

Dr Bolortuya Purevsuren presented the Global FMD Control Strategy which has three Components: Global FMD control, Strengthening of veterinary services, and Prevention and control of other major diseases of livestock. She highlighted the state of play of the Global FMD Control Strategy implementation and its milestones in three phases of five years each from 2012. She also explained about the various tools that are available for enhancing FMD prevention and control which includes SEACFMD Roadmap, FMD Progressive Control Pathway, PCP-FMD Self Assessment Tool; The WOAH standards including endorsement of official control programmes and recognition of disease status; The WOAH PVS Pathway; WOAH/ FAO FMD Reference Laboratories and other tools (Presentation available here).

Session IV: Country Reports – FMD prevention and control activities

SEACFMD Members – FMD infected countries

Cambodia:

Dr Lim Socheat, Alternate SEACFMD National Coordinator, Department of Animal Health, General Directorate of Animal Health and Production (GDAHP) updated the FMD situation in Cambodia. A total of 18 outbreaks were reported in 2022 compared with 38 outbreaks in 2021. FMD prevention and control activities in Cambodia include revision of Law on Animal Health and Production, disease outbreak investigation, mobile animal movement control, border control, biosecurity, awareness etc (Country Poster available here).

China:

On behalf of Dr Youming Wang, National Coordinator, China Animal Health and Epidemiology Center (CAHEC), Dr Zixiang Zhu of Lanzhou Veterinary Research Institute reported FMD situation in China. A total of seven sporadic outbreaks were reported from 2021 till date (3 outbreaks in 2021, 1 outbreak in 2022 and 3 outbreaks in 2023). All outbreaks during the period are due to FMDV O serotype. FMD vaccination is main control measures implemented in China with vaccination of all cattle, sheep, goat, camels and deer with bivalent vaccine (Serotype of O and V) and vaccination of all pigs with monovalent vaccine with O serotype (Country poster available here).

Indonesia:

Dr Siti Yulianti, Veterinary Officer, Directorate of Animal Health presented FMD situation in Indonesia. FMD was reported for the first in Indoenesia in Aceh and East Java Province in May 2022 and as of August 2023, 27 out of 38 provinces are affected. The virus types involved in FMD outbreak in Indonesia is O/ME-SA/Ind-2001e. vaccination of susceptible animals is the main strategy implemented in Indonesia to control FMD. Other prevention and control measures include establishment of FMD Task Force at national and local level, revision of legislations, movement control, biosecurity measures, Public-private-partnership, communication and awareness etc (Country Poster available here).

Lao PDR:

Dr Laphinh Phithacthep, Department of Livestock and Fishery (DLF) updated the FMD situation in Lao PDR**.** No FMD outbreaks were reported in year 2021 and 2022. The poster and flash talk highlighted FMD control zone for cattle from Lao PDR to China including the type of activities implemented in Collection Zone, Buffer zone and FMD free zone (Country poster available here).

Malaysia:

Dr Jamaliah Senawi, SEACFMD National Coordinator, Department of Veterinary Services (DVS) briefly presented FMD situation in Malaysia including the key interventions to prevent and control FMD. In 2022 a total of nine FMD outbreaks were reported and all cases were due to FMDV Serotype O/ME-SA/Ind-2001e. The detail outbreak investigation indicated animal movement as main source of introduction and spread of FMD in Malaysia. In Peninsular Malaysia, vaccination of susceptible animals and awareness campaign are key strategies adopted for prevention and control of FMD. She reported the ongoing Study on FMD in-depth risk assessment in Johor and Langkawi with the ultimate aim to create FMD free zone to facilitate safer trade from this areas. Dr Jamaliah also reported ongoing surveillance and FMD prevention activities in Sabah and Sarawak which maintain FMD free status without vaccination. She also reported the recent WOAH FMD Expert mission to Sabah and Sarawak to assess maintenance of its FMD free status (Country poster available here).

Mongolia:

Dr Narantuya, Director General of General Authority of Veterinary Services (GAVS) briefly presented FMD situation in Mongolia. A total of 109 796 livestock were infected by FMDV in 2021 – 2022 which spread to 100 soums in 19 provinces. FMD virus Serotype involved in this FMD epidemic is O/ME-SA/Ind-2001. Since April 2022, the GAVS implemented well planned FMD vaccination campaign along with post vaccination monitoring to control FMD in Mongolia (Country poster is available here).

Myanmar:

Dr Ye Tun Win, Director General of Livestock Breeding and Veterinary Department made brief ipresentation on the FMD prevention and control measures in Myanmar. No FMD outbreaks were reported in 2022 in Myanmar. The FMD Sero-surveillance was conducted in 2022 and 2023 to assess NSP antibody for O serotypes where 40.49% and 5.87% were reported positive in year 2022 and 2023 respectively. Dr Ye Tun Win reported that the key strategies implemented for prevention and control of FMD are rapid detection and containment of FMD at source, establishing and expanding zones with reduced FMD incidence, and protecting and maintaining FMD free zone (Country poster available here).

Thailand:

Dr Sith Premasthira, SEACFMD National Coordinator, Department of Livestock Development presented the current FMD situation in Thailand. In 2022 a total of 110 FMD outbreaks were reported and from January to August 2023 a total of 8 FMD outbreaks were reported. While FMDV serotype Ind2001e predominates, some outbreaks in 2022 were caused by FMDV A Serotype. Thailand implements FMD control measures under the Law on Animal Epidemics Act and establishment of a temporary epidemic zone announced by local veterinary authorities. The control measures include animal movement controls, establishment of disinfection checkpoints, surveillance, public awareness, isolation of sick animals and the

ring vaccination. FMD preventive measures mainly focused on enhancing farm biosecurity and prophylactic vaccination (Country poster available here).

Vietnam:

Dr Ta Hoang Long of Department of Animal Health updated the participants on FMD situation in Vietnam. There were 17 FMD outbreaks reported in 2022 with nine provinces affected. In 2023, a total of 19 FMD outbreaks were reported from eight provinces. In the last two years only cattle were affected and cause of the outbreaks were due to FMDV Serotype O/ME-SA/Ind-2001e. Vietnam is currently implementing National program for FMD Prevention and Control 2021 -2025 which focus on risk-based FMD vaccination with good quality FMD vaccines (vaccine with high antigen payload >6PD50) with six monthly vaccination and ensuring 80% vaccination coverage of all the eligible population and supported by post-vaccination monitoring. Other measures include clinical surveillance and virological surveillance, timely reporting via the online Vietnam Animal Health Information System, establishment of FMD free zones (Country poster available here).

SEACFMD Members – with FMD free status

Brunei:

Dr Raihan Zulkifli Hamsiah Md Saat of Department of Agriculture and Agrifood reported on the level of preparedness for FMD incursion in Brunei Darussalam. Their preparedness strategy focuses on enhancing ruminant disease surveillance including FMD, strengthening of laboratory capacity (serology for NSP and RT-PCR for confirmatory); import regulations (allowing import from only FMD free countries or zone); border control including quarantine; and focused awareness campaign for different groups such as livestock owners, general public and Government officials including the decision makers. Other preparedness and contingency planning include legal provisions for FMD reporting and response for rapid containment of FMD; simulation exercise plan and stock piling of FMD vaccine for emergency use (Country poster available here).

Philippines:

Dr Arlene Asteria V. Vytiaco, SEACFMD National Coordinator, Bureau of Animal Industry (BAI), updated on the FMD preparedness plan of Philippines. Their preparedness strategy encompasses providing FMD refresher course for frontliners; strengthening of border control measures at all the entry points including sea ports, airports and other land check points); creation of technical working group for revision of FMD preparedness plan; conduct FMD table top and field simulation exercise; stock piling of FMD vaccine for emergency use; securing emergency fund from Department of Budget Management etc. The BAI also conduct serological and clinical surveillance which is necessary for the annual reconfirmation their FMD-free status without vaccination (Country poster available here).

Singapore:

Dr Sean Sum from Quarantine and Biosecurity Services, Animal & Veterinary Service, National Parks Board, presented the country poster on the level of FMD preparedness to maintain FMD-free status. Singapore safeguards and maintains its FMD free status without vaccination through four main pillars, namely surveillance for early detection, strict biosecurity measures and risk assessment, legislative and regulatory powers and coordinated disease response and control. Singapore has also established emergency

preparedness capabilities to respond to disease outbreaks e.g., contingency planning and simulation exercises on related TADs. Country poster available here.

Non SEACFMD Members

South Korea:

Dr Subeom Lee of Ministry of Agriculture, Food and Rural Affairs provided updates on the recent FMD outbreak situation in South Korea. The FMD outbreak was reported in Korea after four years of freedom in May 2023 affecting 35 heads of cattle and 1 goat. The FMDV Serotype O/ME-SA/Ind-2001e was the cause of the recent outbreak in South Korea. The measures implemented to prevent the spread of FMD are: stamping out of susceptible animals in the affected farms; movement control and declaration of FMD affected city as protection zone; nationwide blanket vaccination of susceptible animals (cattle, pigs and goats); and biosecurity measures including disinfection of farms and livestock related facilities until eradication (Country poster available here).

Australia:

Dr Jennifer Davis of Department of Agriculture, Fisheries and Forestry presented the country poster focused on strategies to maintain Australia FMD free status. The highlights of the activities are: strengthened biosecurity measures for imported goods, incoming passengers and mail by deployment of additional Biosecurity Officers at the airports and mail Centres; provision of training to Biosecurity Oficers, deployment of detector dogs at the international airports; granting extra powers to Biosecurity Officers under Biosecurity Act 2015 to reduce risk items on travellers; and impose additional biosecurity measures to mitigate the threat of introduction of hazards such as FMDV. Australia also supported control of FMD in the region including collaboration on biosecurity capacity building and donation of 4 million doses of FMD vaccines to Indonesia. Australia has detailed, well-rehearsed FMD response plans and arrangements in place including the Australian Veterinary Emergency Plan (AUSVETPLAN) and the AUSVETPLAN Disease Response Strategy for FMD. Governments and industry's preparedness is continuously reviewed and tested through simulation exercises (Country poster available here).

Chinese Taipei:

Dr Guan-Jhin Liu of Animal Health Inspection Division presented the poster focused on key strategies implemented to regain FMD free status. He presented on the critical requirement before cessation of FMD vaccination, in the zone covering Taiwan, Penghu and Matsu such as: FMD vaccination rate in cloven-hoofed animals exceeded 90% in the zone; FMD immunization coverage rate at farms exceeded 80% in the zone; Test results of Co-habitation test, the environmental samples collected from pig auction markets and pig slaughter houses as well as sentinel pig experiments all indicated that FMD virus was eliminated from this zone. Upon fulfilment of this requirement and stopping of FMD vaccination, serological surveillance with VNT or NSP reactors followed by clinical investigations should be conducted. He also highlighted the key prevention and preparedness strategies to maintain FMD free status focused on active surveillance in the farm (clinical inspection and serological testing) and auction market (clinical inspections and serological testing for NSP) and passive surveillance which recommends tracing back of suspected cases to the original farm to conduct movement restriction and follow-up serological and virological testing. Other recommended prevention measures are application of biosecurity measures at the farm level and auction markets for the personnels and transporting vehicles (Country poster available here).

Japan:

Dr Rei Jinnai of Animal Quarantine Service brief presentation on the key strategies implemented to regain FMD free status; and prevention and preparedness strategies to maintain FMD free status. Following the detection of FMD outbreaks in April 2010, immediate measures applied are culling and burial of carcass followed by disinfection and imposing of movement restriction from infected premises. Emergency vaccination was started on 22 May 2010 in the farm surrounding the infected premises and later all the vaccinated animals were culled and achieved recovery of free status without vaccination on 5 February 2011. In order to maintain FMD free status, the prevention activities mainly focused on border inspection and quarantine operation. This includes requirement of Health Certificate issued by competent authority of exporting country for the live animal/animal product; prohibition of commodities from FMD infected country/zone; stringent border control measures including inspection of the passengers and their belongings, disinfection of shoes and baggage's. The preparedness strategies mainly focused on early detection and notification (early warning system, onsite farm inspection and confirmatory diagnosis) and rapid response such as establishment of movement restriction zone, stamping out, disposal of carcass and disinfection, detail epidemiological investigation and surveillance including in wild animals (Country poster available here).

Papua New Guinea:

Dr Thompson Walambo of National Agriculture Quarantine & Inspection Authority presented the Country poster focused on National Disease Preparedness Strategy which covers: FMD risk analysis, Border Biosecurity services; Consultations with relevant stakeholders; Strategizing and planning (draft and formalize preparedness strategies and plans); capacity building of veterinary services; building veterinary laboratory diagnostic capacity and support services. This strategy aims to have sustained capacity to prevent, prepare, and respond to FMD threat and maintain disease free status (Country Poster available here).

Timor-Leste:

Dr Joanita Jong, National Director presented country poster focused on Preparedness Strategies to maintain FMD free status. The highlights of activities includes: training of veterinary staff on emergency management in August & Sept 2023; Upgradation of laboratory diagnostic capacity – now with LAMP-qPCR; development of cloud-based Epicollect5 passive surveillance system and cloud-based emergency management database; public awareness activities; active surveillance in April 2022 (94 goats, 19 pigs) in Ermera and Dili municipalities where all the animals were PCR negative for FMD; and survey to proof FMD freedom in all Villages at the border Municipalities (April-July 2023). She also reported that the Contingency plan for FMD is in draft form and there is plan to conduct full functional FMD simulation exercise in 2024. She also reported their plan to present the results from the recent survey to proof freedom from FMD at the International seminar and re-submit the application for FMD free status to WOAH (Country Poster available here).

Session V: Updates from Reference Centres and partners

Australian Centre for Disease Preparedness

Dr Wilna Vosloo presented the Activities at the Australian Centre for Disease Preparedness to assist with FMD preparedness and response. The highlights of her presentation are laboratory predictions of vaccine efficacy with in-vitro screening and vaccine matching using VNT and ELISA and novel way of phylogenetic

analysis. She also reported that various support provided to the region through the ACDP International Program to enhance laboratory capacities in Asia-Pacific region and in particular those countries in South East Asia (Indonesia, Philippines, Singapore, Laos, Cambodia and Vietnam) and Pacific region (Timor-Leste, PNG and some Pacific island countries) – Presentation available here.

Lanzhou Veterinary Research Institute

Dr Zixiang Zhu of Lanzhou Veterinary Research Institute, China made brief presentation on Investigation of innate immune evasion by FMD virus and its application. The innate immune response is critical for initiation of adaptive immune response. Dr Zhu highlighted use of key research findings such as deletion or modification of the immunosuppressive sites or domains in viral proteins as a strategy to develop FMDV vaccine strain (Presentation available here).

Pak Chong FMD Laboratory

Dr Nalinee Hongchumpon updated the activities of Pak Chong FMD Laboratory which covers FMD diagnosis (antigen detection, antibody detection and virus characterization), reagent production for ELISA, and quality assurance. Other activities are improving the capacity of the Pak Chong Laboratory including human resources (short term and long term training) and capacity building such as refurbishing the Training Building Centres and BSL3 facilities. She also briefly shared the research and collaboration works that is ongoing with other Institutes in Japan, Australia and UK (Presentation available here).

Dr Nalinee also made a poster presentation on "Comparison of sensitivity and specificity of commercial ELISA kits available in Thailand for detecting antibodies to non-structural proteins of foot and mouth disease virus" – Poster available here.

DAY 2: 23 AUGUST 2023

Session VI: Strengthening FMD Prevention and control

Evaluation of the SEACFMD campaign from 1997 to 2020

The Objective 2 of the SEACFMD Roadmap 2021 – 2025 is "Comprehensive evaluation of SEACFMD Campaign from 1997 to 2020 to address critical gaps". In order to fulfil this objective, WOAH SRRSEA hired an Expert to conduct evaluation of the SEACFMD campaign. Dr Ronello Abila presented the key findings of the Evaluation of SEACFMD Campaign from 1997 to 2020 covering brief background of the SEACFMD campaign including its objectives, objective of the evaluation, adopted methodology and key findings of the evaluation (Presentation available here).

The lessons learned from the implementation of different phases of SEACFMD campaign were discussed during the presentation particularly highlighting the recognition of SEACFMD as a model for regional coordination mechanism which could be adapted for other TADs control; benefits of the SEACFMD campaign capacity building programme for other TADs control; variable implementation of SEACFMD campaign activities among the SEACFMD Members; and impact of recent incursion of emerging TADs (ASF, LSD and PPR) in the region on SEACFMD campaign.

The summary of the evaluation of the SEACFMD Campaign from 1997 to 2020 can be referred in Annex V.

Review progress of the implementation of the SEACFMD Roadmap (2021 –2025)

The M&E Framework for the SEACFMD Roadmap 2021 – 2025 was endorsed by the 26th SEACFMD Sub-Commission Meeting held virtually in March 2022. The M&E indicators were identified and agreed for the Goal, Objective and each of the Outcome and Outputs. The baseline for each indicators was set based on the available data and based on the survey when existing data is not available. Dr Karma Rinzin presented the progress of the implementation of SEACFMD Roadmap 2021 – 2025 based on the agreed M&E indicators. The progress for implementation of SEACFMD Roadmap 2021 – 2025 for each of the SEACFMD Members were aggregated at the regional level for the Goal, Objective 1 and for the Outcome 1 and 2 including Outputs under this two outcomes. The indicators for Outcome 3 and its Outputs are more focused on the regional platforms. The meeting critically reviewed the progress of the implementation of SEACFMD Roadmap 2021 – 2025 and discussed relevancy of some of the indicators including the method to obtain data/ information for these indicators. The meeting agreed to have bilateral discussion between WOAH SRRSEA (SEACFMD Secretariat) and SEACFMD Members to review the progress of the implementation of SEACFMD Roadmap 2021 – 2025 and M&E targets at the country level (Presentation available here).

World Café Session (AS)

The World Café session was organized to brainstorm on the critical gaps identified during the evaluation of the SEACFMD campaign and address these gaps. The participants were divided into four groups while each group were assigned with one booth with different topics – Fit for purpose surveillance system, Incentives and pathways for livestock movement (weak biosecurity), Access to quality vaccines and effective vaccination, and Multi-disciplinary and multisectoral efforts including Public-Private-Partnerships. The group rotated to provide additional inputs on different topics.

The World Café session brainstormed on:

- The issue of lack of surveillance capacity for early detection and response and need to enhance capacity of Members in the region to detect and diagnose (including development of laboratory capacity, sampling and FMDV serotyping) and respond to FMD outbreaks in timely and effective manner;
- The Weak regional biosecurity systems and their failure to keep pace with the increasing TADs risks following rapid regional socio-economic development and need to strengthen national and regional biosecurity;
- The challenges in access to quality vaccines by most of the Members and need to ensure access to quality vaccines and addressing the challenges in implementing effective vaccination strategies;
- Insufficient Private sector participation and engagement in FMD prevention and control and need to enhance Public and Private sector dialogue, initiatives and partnerships to build resilience and sustainable control of FMD and other important TADs.

The outputs of the World Café session can be referred in Annex VI.

Panel discussion

The panel discussion focused on improving the country ownership and enabling environment at national level; national legislation related to FMD and TADs control; and enhancing regional coordination and collaboration was moderated by Dr Abila.

The Panellists were Dr Arlene Asteria Vytiaco from Philippines who has the FMD free status, Dr Siti Yulianti from Indonesia who had recent introduction of FMD, Dr Jamaliah Senawi from Malaysia who has FMD free zone (Sabah and Sarawak) and Peninsular Malaysia which FMD endemic with FMD-PCP Stage 3 and Dr Ye Tun Win from Myanmar which is FMD endemic with FMD-PCP Stage 2.

All the Members reported that their FMD national plan is endorsed by the Government and there is political commitment from their respective Government to support FMD prevention and control. However, most of the Members reported some constraints in obtaining the required fund and resources due to recent emergence of African swine fever and Lumpy skin disease in their respective countries. Myanmar reported that there is strong interest and incentives from the Government to facilitate trade with neighbouring countries such as China. Philippines reported that the recent incursion of FMD in Indonesia arouse interest of the private sectors who started lobbying with the Government to commit more fund and resources for FMD prevention and preparedness, including FMD vaccine bank. The Panellists also discussed on number of challenges including the fund commitment from the Government, collaboration between the Central and Local Government and support from the private sectors for FMD prevention and control. The Panellists and meeting participants agreed on the need to develop policy brief on the importance of controlling FMD and other TADs with cost-benefit analysis.

When asked about the Level of legislative support for FMD control and how the country legislation linked with international standards support FMD control, all the Panellists reported having a country legislation that support FMD prevention and control. Malaysia reported that they are currently reviewing and revising their legislation to fulfil emerging needs. Other Panellists reported that the Ministry's decree is issued to complement existing legislation to enhance FMD prevention and control.

The Panellists acknowledge the existing SEACFMD Governance mechanism such as Sub-Commission, National Coordinators, EpiNet and LabNet Forums which platform excellent platform for the Members to discuss and share information on FMD prevention and control. The Panellists insisted on the persistence of the Members to implement the recommendations of these Governance meetings. The

Panellists also noted the existing ASEAN mechanism such as ASEAN Sectorial Working Group (ASWGL) and ASEAN Coordinating Centre for Animal health and Zoonoses (ACCAHZ) that could be leveraged for enhancing prevention and control of FMD and other TADs.

The panel discussion concluded by acknowledging the importance of unity in the region, transparency in sharing information , networking and being persistent and aggressive in implementation of FMD and other TADs activities to have successful control of FMD and other TADs at the regional and at the country level.

Session VII: Priority actions to enhance FMD prevention and control

The 26th SEACFMD National Coordinator deliberated and came up with number of actions to enhance FMD prevention and control under the SEACFMD Roadmap 2021 – 2025. The following priority actions were proposed to be implement in next 5 to 6 months:

➢ Surveillance

- Map FMD risk pathways with FMDV lineages present in the region along the value chains;
- Assess historical presence of FMD at the smallest administrative levels such as village/commune etc (for the last 1 year, 2 to 3 years and 5 years) using the template provided by the SEACFMD Secretariat (WOAH SRRSEA) to the Members.

➢ Vaccination

- Collate regional information regarding FMD vaccine use in SEACFMD Members including submission of Annual vaccination reports by the Members with information on doses of vaccines produced/ procured, vaccination conducted; and vaccination maps describing (i) blanket (prophylactic) vaccination and (ii) targeted (suppressive) vaccination at different administrative levels;

➢ Biosecurity and animal movement

- Explore and benchmark what is being traded online that could potentially introduce new viruses into the region;

➢ Advocacy and communication

- Develop policy brief on the importance of using quality vaccines;
- Develop Advocacy materials for policy makers on the importance of prevention and control of FMD and other TADs;

➢ Horizontal issues

- Identify capacity building and training needs on FMD and other TADs to adapt to changing circumstances, emerging and reemerging diseases, and advancements in technology and knowledge;
- Conduct workshop on safe trade to exchange knowledge and understanding of the role of WOAH international standards, the role of importing and exporting countries and SPS market access requirements.

- Organize bilateral discussion between WOAH SRRSEA (SEACFMD Secretariat) and SEACFMD Members to review the progress of the implementation of SEACFMD Roadmap 2021 – 2025 and M&E targets at the country level;

    - **Specific issues**

- Support development of FMD Risk-based strategic plan for Cambodia

The identified priority actions are included in the Meeting Recommendations and outcome of some of the actions will be reported at the 27th SEACFMD Sub-Commission Meeting

DAY 3: 24 AUGUST 2023

Session VIII – Enhance cost-efficient synergies in the control of FMD and other TADs

Update on Regional GF-TADs Strategy

The Day 3 of the meeting focused on enhancing cost efficient synergies in the control of FMD and other TADs. The session started with an Update on Regional GF-TADs Strategy by Dr Li Peng of WOAH Regional Representation for Asia and the Pacific (RRAP). The Regional GF-TADs strategy for Asia and the Pacific (2023-2027) has three objectives along with eleven expected outcomes. The objectives of regional strategies are to establish strategies for priority TADs at the regional and sub-regional level; develop and maintain capacities to prevent and control TADs; and improve sustainability of strategies to control priority TADs through multi-disciplinary partnerships. Dr Peng Li also presented the highlights of some the GF-TADs meeting organized in Asia and the Pacific such as 12th Regional GF-TADs Steering Committee Meeting held in Tokyo, Japan; First TADs Coordination Meeting for SAARC in Paro, Bhutan; East Asia CVO/ Contact Persons Meeting on PPR and LSD in Qingdao, China; The Eighth Standing Group of Experts on ASF for Asia and the Pacific in Qingdao, China; and some activities organized under International Horese Movement Project (Presentation available here).

Update on the regional ASF, LSD and PPR situation and key activities

Dr Ashish Sutar and Dr Karma Rinzin made a joint presentation on the Update on regional ASF, LSD and PPR situation and highlights of the key activities implemented by WOAH. After the introduction of ASF in China in August 2018, this disease has spread to 18 WOAH Members. In response to ASF outbreaks in the Asia-Pacific region, WOAH has organized series of webinars, meetings, established Standing Group Experts for ASF and provided support to enhance knowledge and response capabilities of the Members. The ASEAN ASF Prevention and Control Strategy has also been developed to coordinate actions in Southeast Asia and mitigate the spread and impacts of ASF. The ASEAN region has been historically free from PPR except for serological evidence of the disease in Laos and Vietnam and an outbreak in imported goats in Thailand. In order to enhance the capacity of the ASEAN and ASEAN Member States A(AMS), the online training on PPR was organized followed by PPR Risk Assessment study to assess the likelihood of introduction of PPRV into AMS. Based on the findings of the PPR risk assessment and in line with Global PPR Control and Eradication Strategy, the ASEAN PPR Preparedness Strategy was developed to enhance early warning and early reaction to the PPR incursion. After introduction of LSD in India, China and Bangladesh in 2019, WOAH organized series of webinars, coordination meetings, developed communication materials and provided support to enhance knowledge and response capability of the Members. The WOAH SRRSEA is currently support AMS and ASEAN Secretariat to develop ASEAN LSD Prevention and Control Strategy (Presentation available here).

Synergy in prevention and control of FMD and LSD

Dr Sith Premashthira from Department of Livestock, Thailand made a short presentation on the Synergy in prevention and control of FMD and other TADs including LSD in Thailand. He emphasized on the expansion of their surveillance system through e-smart surveillance system to gather information about animal disease outbreak; implementation of animal disease surveillance with cooperation from local leader and livestock volunteer; animal importation protocol including sampling to screen for diseases; animal quarantine following prescribed procedures; combined vaccination of FMD and LSD to optimize

resources and reduce workload; and simultaneous communication campaign and provision of other veterinary services through integrated approach (Presentation available here).

Synergy in prevention and control of FMD and PPR

Dr Narantuya, Director General of General Authority for Veterinary Services gave presentation on the Synergy in prevention and control of FMD and other TADs including PPR. Mongolia placed strong emphasis on comprehensive planning for the control of various TADs under the guidance of the TADs Advisory Committee. This group is represented by diverse sectors including the international Experts, all of whom played crucial roles in efficiently targeting disease control efforts within the country. This group came up with an integrated action plan for FMD and TADs control which is disseminated to the local veterinarians after the plan is approved by CVO. The local veterinarians are trained on prevention and control of FMD and other TADs and implement various activities in line with the action plan. The online early warning alert system, an outbreak investigation form, surveillance, collection of samples from the field and laboratory diagnosis are generic and applicable for FMD and other TADs. Mongolia also practice simultaneous vaccination of FMD and LSD to optimize the resources (Presentation available here).

ASF vaccine in Vietnam

Although Vietnam was invited to make presentation on Synergy in prevention and control of FMD and ASF, Dr Ta Hoang Long from National Centre for Veterinary Drug and Vaccina Quality Control made a brief presentation on the use of ASF vaccine in Vietnam. His presentation covered brief highlight ASF situation in Vietnam; actions taken by Vietnam veterinary Services in response to ASF outbreak and status of ASF vaccine production in Vietnam including vaccine quality control . He reported that ASF vaccine is currently produced by three companies in Vietnam – AVAC, NAVETCO and DABACO Group (Presentation available here).

Brainstorming session on enhancing synergies in prevention and control of FMD and other TADs

The brain storming session was moderated by Dr Karma Rinzin where some Members provided verbal updates to share their success stories and lessons learnt on the recent incursion of emerging TADS in the region (ASF and LSD) and its impact on FMD control; and lessons learnt from the COVID pandemic and its impact on FMD and TADs control; and measures to enhance cost efficient synergies in prevention of control of FMD and other TADs.

Timor-Leste, drawing from their experience with an ASF outbreak, discussed supporting farmers through basic biosecurity measures, like simple fencing and single-door entrances, changing of shoes and following hand hygiene practices. They unveiled biosecurity SOPs, ongoing public awareness and community engagement initiatives for ASF and other TADs, and a strong commitment to train veterinary technicians on ASF diagnosis, and use of EpiCollect5 for ASF and other TADs surveillance. Dr Peng Li shared China's experience in establishment of compartments for pigs and using PPP for enhancing biosecurity measures and surveillance of ASF and other TADs in China.

Sabah and Sarawak, two Malaysian states, faced challenges during the COVID-19 pandemic due to incursion of ASF and rabies. They addressed these issues with zoning strategies, controlled movement between zones, incentives for those farms with good biosecurity by allowing the movement of pigs and pig products, integrated communication and utilized video calls and phone consultations when physical farm visits weren't feasible. Veterinarians at the central and provincial level have made interventions including virtual examination of the suspected cases through the video calls with the local veterinary staff

and farmers. Delays in rabies detection was linked to a lack of awareness about rabies in the region, which was previously rabies-free, underscoring the need for improved preparedness. Information sharing and collaboration among the neighbouring countries at the national and local levels would enhance preparedness capacity, thus better management of animal and human diseases in a previously free country and zone.

Despite several challenges to confront with the FMD and TADs outbreaks, some Members also reported that COVID pandemic helped in reducing the spread of TADs which is as a result of movement control. Thailand reported that they managed to successfully control African horse sickness (ASF) due to strict movement restrictions during the COVID pandemic, and reclaiming their AHS free status within two years.

The WRLFMD. Pirbright emphasizes the need for regular studies on Foot-and-Mouth Disease (FMD) vaccines in Mongolia. He suggests increasing vaccination efforts, particularly in resource-constrained situations, by administering double doses in a single vaccination, which has shown promising results in protecting against FMD. The WRLFMD reported drastic reduction in receiving FMD samples from the Members during the COVID pandemic and still low numbers of samples being received which has an impact on FMD surveillance. The WRLFMD proposed to provide testing and analysis services for FMD samples from member countries to address this issue. This collaborative approach between the Members and Reference Laboratories would enhance regional understanding of the FMD situation. There was also tremendous improvement in molecular diagnostic capacity (PCR) in the human laboratories in several countries during the COVID pandemic which can be repurposed for animal disease diagnosis and recommend national veterinary authorities to collaborate with human health and seek their support.

The ACDP highlighted the use of Polymerase Chain Reaction (PCR) technology for diagnosis of Avian Influenza (AI), ASF and other diseases, which is usually done using separate sets of equipment. She suggested that sharing of reagents and equipment for diagnosing various diseases can be a cost-efficient and encourage Members to come of with procedures to share these resources of efficient diagnosis of different diseases in animals. Additionally, she points out that countries in disease-free zones should enhance their surge capabilities to increase flow of sample and be better prepared for future outbreaks. When an outbreak occurs, the burden of sample collection and regular testing can be overwhelming. Therefore, it is essential to focus on preparedness and build capacity to address emerging situations effectively.

In order to build surge capability, Australia has an agreement with several countries to share veterinary personnels and other resources during the disease emergency and also to provide opportunity for their staff to get real field experience to respond to disease outbreaks. Australia also shared their experience in biosecurity including pre-border (intelligence gathering, risk analysis, early warning) and border biosecurity (border control, inspection and quarantine) and Post border Biosecurity which is focused on Farm biosecurity. All the farms in Australia should be registered and have very comprehensive biosecurity plan. The biosecurity measures are strictly implemented following the public-private-partnerships model with focus on prevention of disease, rapid detection and to stop spread of disease should it occur.

Japan shared their experience in implementing their biosecurity measures and border control which has evolved a lot after the introduction of FMD in 2010. Japan recognized the rapid increase in e-commerce of animal and livestock products following the COVID pandemic which pose a new challenge to incursion and spread of TADs. Japan Veterinary Service is already collaborating with International Postal Office to

conduct risk assessment and to come up with appropriate risk mitigation measures for the e-commerce of animal and livestock products.

Session IX – Way Forward and Closing

Conclusions and Recommendations

Dr Karma Rinzin presented the draft recommendations of the 26th SEACFMD National Coordinators Meeting for the participants considerations. Twenty six recommendations were eventually proposed and endorsed in plenary: 6 recommendations focused on surveillance, 3 on vaccination, 2 on biosecurity and movement control and 3 on advocacy and communication including 5 horizontal, 2 specific and 5 general recommendations.

Closing of the meeting

Dr Karma Rinzin on behalf of Dr Ronello Abila, Sub-Regional Representative for South-East Asia, thanked the Government of Malaysia for hosting the 26th SEACFMD National Coordinators Meeting. He also thanked all the participants from SEACFMD Members, Partners and non-SEACFMD members for their active participation in the meeting and for their support to the SEACFMD campaign. He added that the next few months will be challenging to implement the key priority actions and recommendations that were agreed upon and that we look forward to working together as always, until the 27th SEACFMD Sub-commission meeting planned in March 2024 in Thailand.

Dr Akma Ngah Hamid, SEACFMD Sub-Commission President and Director General of Department of Veterinary Services expressed her gratitude to WOAH for holding this important event in Malaysia and to participants for their active participation and contribution during the meeting to enhance FMD prevention and control in the region. She thanked SEACFMD Members, Partners and donors for all the support received so far to make good progress in the SEACFMD campaign and she wished for the similar hard work and commitment in the coming years.

Field Visits

In the afternoon, DVS Malaysia organized field visits for the participants to the Dairy farm - Industry Centre of Excellence farm at the University of Putra Malaysia. This farm was established through a collaboration between the Farm Fresh Milk Company, the largest milk producer and supplier, and the university. Its primary objectives are to support student learning and research in the dairy sector while also serving as an agritourism destination. Following the farm visit, the participants proceeded to the World Veterinary and Animal Welfare Day 2023 exhibition site organized by DVS Malaysia. The exhibition showcased various aspects of animal breeding, animal production, pet exhibitions, and featured displays of animal feed and other farming-related equipment.

ANNEXURES

Annex I – Meeting Programme

Day 1: 22 August 2023

Time	Topics	Speakers/ Responsibility
8.30 – 9.00	Registration of Participants	
Session I	**Opening Session**	
9.00 – 9.20	Opening session - Remarks by WOAH Representative - Official opening by the Delegate of Malaysia	 Dr Ronello Abila Dr Akma Ngah Hamid
9.20 – 9.30	Introduction of Participants	MC
Session II	**SEACFMD Campaign Progress** **Chair: Malaysia**	
9.30 – 10.00	Objective of the meeting SEACFMD campaign progress and status of the SEACFMD Governance meeting recommendations	WOAH SRR SEA WOAH SRR SEA
10.00 – 10.30	**Photo session and Coffee break**	
Session III	**FMD updates** **Chair: Malaysia**	
10.30 – 11.30	Global epidemiological overview of recent FMD events Regional FMD situation Updates on Global strategy and WOAH standards Q&A session	Pirbright WOAH SRR SEA WOAH SRR SEA
Session IV	**Country Reports - FMD Prevention and control activities (Posters)** **Chair: Dr Ronello Abila**	
11.30 – 11.40	Highlights of FMD Prevention and Control in Malaysia	DVS
11.40 – 12.30	***Flash talk – Introduction to Country Poster*** - SEACFMD Members - Non SEACFMD Members	 Members
12.30 – 13.30	**Lunch**	

Session IV	**Country Reports - FMD Prevention and control activities (Continuation of Poster Session)**	
13.30 – 15.00	Poster session – Gallery Walk Plenary – Q&A Session Wrap up of the poster session with key take home message	All participants

15.00 – 15.30	**Coffee break**	
Session V	**Updates from Reference Centres and Partners** **Chair: Mongolia**	
15.30 – 17.00	Australian Centre for Disease Preparedness Lanzhou Veterinary Research Institute Pak Chong FMD Laboratory	Partners Collaborators Participants
18.30	**Reception dinner hosted by WOAH**	

Day 2: 23 August 2023

Time	Topics	Speakers/ Responsibility
9.00 – 9.05	Recap of Day 1	WOAH SRR SEA/ Chair
Session VI	**Strengthening FMD Prevention and control** **Chair: Thailand**	
9.05 – 9.30	Evaluation of the SEACFMD campaign from 1997 to 2020	WOAH SRR SEA
9.30 – 10.00	Review progress of the implementation of the SEACFMD Roadmap 2021 – 2025	WOAH SRR SEA
10.00 – 10.30	Introduction to World café session and Panel discussion	WOAH SRR SEA
10.30 – 11.00	**Coffee break**	
Session VI	**Strengthening FMD Prevention and control**	
11.00 – 12.30	World café session - Fit for purpose surveillance system - Incentives and pathways for livestock movement (weak biosecurity) - Access to quality vaccines and effective vaccination - Multi disciplinary and multisectoral efforts including Public-Private-Partnerships	Moderators and Participants
12.30 – 13.30	**Lunch**	
Session VI	**Strengthening FMD Prevention and control**	
13.30 – 15.00	Panel discussion - Improved country ownership and enabling environment at national level - National legislation related to FMD and TADs control - Enhancing regional coordination and collaboration	Moderator – Dr Abila Panellists All Participants
15.00 - 15.30	**Coffee break**	
Session VII	**Priority actions to enhance FMD prevention and control**	

15.30 – 17.00	Discussion on - Priority Actions in next 6 – 8 months - 27th SEACFMD Sub-Commission and WOAH Centenary celebration	WOAH SRRSEA, National Coordinators and Participants
18.30	**Reception dinner hosted by DVS Malaysia**	

Day 3: 24 August 2023

Time	Topics	Speakers/ Responsibility
9.00 – 9.05	Recap of Day 2	WOAH SRRSEA/ Chair
Session VIII	**Enhance cost-efficient synergies in the control of FMD and other TADs** **Chair: Myanmar**	
9.05 – 10.30	Update on Regional GF-TADs Strategy Update on regional ASF, LSD and PPR situation and key activities Synergy in prevention and control of FMD and other TADs - FMD and ASF (Vietnam) - FMD and LSD (Thailand) - FMD and PPR (Mongolia) Q&A Session	WOAH RRAP WOAH SRRSEA All participants
10.30 – 11.00	**Coffee Break**	
Session VIII	**Enhance cost-efficient synergies in the control of FMD and other TADS** **Chair: Philippines**	
11.00 – 11.40	Invite verbal updates from other Members to share any success stories Brainstorming session on enhancing synergies in prevention and control of FMD and other TADs - Lessons learnt - Challenges in enhancing synergy - Opportunities and scope to enhance synergy	WOAH SRRSEA All participants
Session IX	**Way Forward and Closing**	
11.40 – 12.10	Conclusions and Recommendations	WOAH SRR SEA
12.10 – 12.30	Closing of the Meeting - Remarks from WOAH - Closing remarks from host country	
12.30 – 13.30	**Lunch**	
13.30 – 17.00	**Field Trip**	

Annex II – List of Participants

Country/ Organisation	First name	Family name	Position	Organisation
Australia	Jennifer	Davis	Principal Veterinary Officer	Department of Agriculture, Fisheries and Forestry
Brunei	Raihan Zuhairah	Haji Zulkifli	Veterinary Officer	Department of Agriculture and Agrifood
Brunei - Observer	Hamsiah	Mohd Saat	Head Section of Veterinary Laboratory / Senior Livestock Husbandry Officer	Department of Agriculture and Agrifood
Cambodia	Socheat	Lim	Vice Chief of Office of Slaughterhouse and Processing	General Directorate of Animal Health and Production
China	Youming	Wang	Senior researcher	China Animal health and epidemiology center
China - Lanzhou	Zixiang	Zhu	Lanzhou, Gansu, China	Lanzhou University, Lanzhou Veterinary Research Institute, Chinese Academy of Agricultural Sciences
Chinese Taipei	Kuan-Chih	Liu	Specialist	Animal Health Inspection Division
Indonesia	Siti	Yulianti	Veterinary Officer	Directorate General of Livestock and Animal Health Services, Ministry of Agriculture
Japan	Rei	Jinnai	Animal Quarantine Officer	Animal Quarantine Service
Korea	Subeom	Lee	Deputy director	MAFRA (Ministry of Agriculture, Food and Rural Affairs)
Lao PDR	Laphinh	Phithacthep	Deputy Head	Division of Veterinary Services, Department of Livestock and Fishieries
Malaysia	Akma	Ngah Hamid	Director General	Department of Veterinary Services, Malaysia
Malaysia	Jamaliah	Senawi	FMD National Coordinator for Malaysia	Department of Veterinary Services, Malaysia

Country/ Organisation	First name	Family name	Position	Organisation
Mongolia	Narantuya	Ayushjav	Director General	General Authority for Veterinary Department, implementing agency of the Government of Mongolia
Myanmar	Ye Tun	Win	Director General	Livestock Breeding and Veterinary Department
Papua New Guinea	Thompson	Walambo	Animal Health Technical Officer	National Agriculture Quarantine & Inspection Authority
Philippines	Arlene Asteria	Vytiaco	Assistant Director	Bureau of Animal Industry
Singapore	Jia Jun, Sean	Sum	Veterinarian & Manager	National Parks Board (NParks)
Thailand	Sith	Premashthira	Senior Veterinary Professional	Department of Livestock Development
Thailand - Pakchong	Nalinee	Hongchumpon	Veterinarian	Pakchong FMD Laboratory, Department of Livestock Development, THAILAND
Timor-Leste	Joanita Bendita	Da Costa Jong	WOAH Permanent Delegate	The Ministry of Agriculture, Livestock, Fisheries and Forestry
Vietnam	Ta	Hoang Long	Director	National Center for Veterinary Drug and Vaccine Control, Department of Animal Health (DAH)
CSIRO	Wilna	Vosloo	Group Leader	CSIRO - Health and Biosecurity Australian Centre for Disease Preparedness
Pirbright	Donald	King	Head: WRLFMD	The Pirbright Institute
WOAH	Peng	Li	Regional Project Officer	World Organisation for Animal Health
WOAH	Ashish	Sutar	Capacity Building Coordinator	WOAH
WOAH	Bolortuya	Purevsuren	Project officer	WOAH SRR SEA
WOAH	Onsiri	Benjavejbhaisan	Finance Officer	WOAH SRR SEA
WOAH	Ronello	Abila	Sub-Regional Representative	WOAH SE Asia

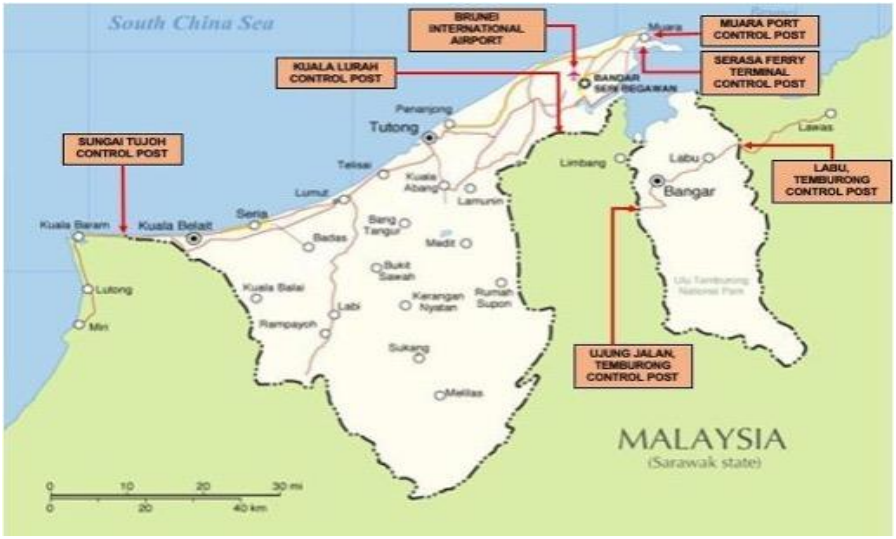
Country/ Organisation	First name	Family name	Position	Organisation
WOAH	Karma	Rinzin	Regional Animal Health Coordinator	WOAH SRRSEA
Biogenesis Bago	Juver	Membrebe	Asia Technical Service Manager	Biogenesis Bago
Boehringer Ingelheim	Carlo	Maala	Technical Manager	Boehringer Ingelheim
Malaysia - Observer	Aida	Muhid	Senior Director of Disease Control and Veterinary Biosecurity	Department of Veterinary Services of Malaysia
Malaysia - Observer	Nik Hamidah	Nik Husin	Seksyen Kawalan Penyakit Haiwan dan Zoonosis, BKPBV	Department of Veterinary Services of Malaysia
Malaysia - Observer	Salina	Amad Bugis	Seksyen Kawalan Penyakit Haiwan dan Zoonosis, BKPBV	Department of Veterinary Services of Malaysia
Malaysia - Observer	Muhammad Nazri	Khairuddin	Seksyen Epidemiologi dan Survelan, BKPBV	Department of Veterinary Services of Malaysia
Malaysia - Observer	Leonora	Tuah Merawin	Seksyen Kawalan Penyakit Haiwan dan Zoonosis, BKPBV	Department of Veterinary Services of Malaysia
Malaysia - Observer	Khairina Akmar	Khalid	Seksyen Epidemiologi dan Survelan, BKPBV	Department of Veterinary Services of Malaysia
Malaysia - Observer	Mariani binti Hashim	Hashim	veterinary officer	Department of Veterinary Services Malaysia
Malaysia - Observer	Siti Norsyakirah	Binti Hashim	veterinary officer	Department of Veterinary Services Malaysia
Malaysia - Observer	Yahasmida	Yaacob	Head of Epidemilogy and Surveillance Section	Department of Veterinary Services (DVS) Malaysia
Malaysia - Observer	Norzufikal	Zulkifly	Veterinary officer	Department of Veterinary Service (DVS) Malaysia
Malaysia - Observer	Mohd Khairuzaki	Paiman	TSUB Cawangan Ternakan, Bahagian Biosekuriti Makanan, KPKM	Department of Veterinary Services of Malaysia

Country/ Organisation	First name	Family name	Position	Organisation
Malaysia - Observer	Shaharul Akmar	Talib	Pengarah DVS Kedah	Department of Veterinary Services of Malaysia
Malaysia - Observer	Liew Lee	Su		PSUK Cawangan Ternakan, Bahagian Biosekuriti Makanan, KPKM
Malaysia - Observer	Noor Asyikin	Abu	DVS Selangor	Department of Veterinary Services of Malaysia
Malaysia - Observer	Sheau Wui	Lo	Veterinary officer	Department of Veterinary Services
Malaysia - Observer	Nicholas	Jenek	DVS Negeri Sarawak	Department of Veterinary Services of Malaysia
Malaysia - Observer	Andrea	Lim Li Li	Head of Animal Health Division	Department of Veterinary Services Sarawak, Malaysia
Malaysia - Observer	Mary Josephine	S. Golingai	Deputy director	Department of Veterinary Services, Sabah
Malaysia - Observer	Connie Joyce	Tann	Veterinary Officer	Department of Veterinary Services Sabah, Malaysia
Malaysia - Observer	Nor Azhaini	Kamaruddin	DVS Pulau Pinang	Department of Veterinary Services of Malaysia
Malaysia - Observer	Marni	Mohamad	DVS Melaka	Department of Veterinary Services of Malaysia
Malaysia - Observer	Ainin Syakirah	Rosli	Veterinary officer	Department of Veterinary Service Kelantan
Malaysia - Observer	Jin Seng	Ong	DVS Negeri Sembilan	Department of Veterinary Services of Malaysia

Annex III – Country Reports

Brunei Darussalam

Background



Brunei Darussalam is one of the ASEAN member countries located in the northwest of the Island of Borneo. The land area of Brunei Darussalam covers 5,765 square kilometres and administratively is divided into four districts i.e. Brunei-Muara, Tutong, Belait and Temburong. Geographically, the country is bordering with a coastline of South China Sea in the north and two Malaysian states in the region, Sarawak, in the south-west, and Sabah, in the north-east.

Brunei has been recognized as a FMD-free country by WOAH since 2007 **without vaccination.** Historically, there has never been any clinical case of FMD recorded in Brunei.

Prevention activities to maintain FMD free status

Surveillance

To ensure Brunei Darussalam's FMD free status, a national taskforce for FMD has been appointed, which included official veterinarians and trained officers, and maintained as key personnel to undertake clinical-based FMD surveillance. There are two (2) types of surveillance systems implemented:

a) Negative Reporting

During surveillance of disease in ruminant farms, all data collection based on clinical signs would be analysed as well as sample collected if required. For FMD, any report on observations of clinical signs consistent with FMD would be collected since Brunei Darussalam's situation of disease freedom, collection of negative cases for FMD clinical signs is crucial for negative reporting. This is possible for border control posts as well as field cases.

The clinical signs that the task force will especially be vigilant of during the sampling program are vesicular conditions of the feet, buccal mucosa and mammary glands which may raise suspicions for FMD. Training

for the officers in the Veterinary Services as well as at the border are conducted routinely (at least 2 times a year) so that they will remain vigilant of the symptoms and risk of the disease.

b) Laboratory Diagnostics Sero-surveillance

For FMD free disease situations, sero-surveillance is centred on detection of non-structural proteins (NSPs) in non-vaccinated animals' indicative of prior to FMD exposure. Based on the current domestic livestock owners registered with the Department of Agriculture and Agrifood, serological sampling is carried out for the total ruminant population in the country. The targeted population of the susceptible herd is at least 80% of the total population susceptible to FMDv.

Animal Movement

For movement of animals between other countries and Brunei Darussalam, Biosecurity and Market Access Division under the Department of Agriculture and Agrifood is specifically tasks with this responsibility and closely regulate the movement of animal and animal products. They work closely with the Royal Customs and Excise Department of Brunei Darussalam to monitor and regulate the movement of animals and animal products in and out of the country. Permits are required to import in or export out animals and the animals need to pass a veterinary examination to obtain health certificates. Imported animals are also required to be quarantined for a specified length of time before released to the importer, subject to the animal being free of diseases at the time of quarantine.

There are seven (7) official entry points into Brunei Darussalam:

- ✓ 4 via land (Labu, Ujung Jalan, Kuala Lurah and Sungai Tujoh)
- ✓ 1 via airport (Brunei International Airport)
- ✓ 2 via seaport (Muara Port and Serasa Ferry Terminal)

Zoning Policies

In case of declared infection status of FMD in an area, zoning policies will be implemented which includes compartmentalization of affected areas based on sero-surveillance. The following measures can be taken upon declaration of positive areas:

- ✓ Restriction of animal movement also ensuring traceability;
- ✓ Culling of clinically diagnosed animals following proper SOP for disposal and decontamination; and
- ✓ FMD Vaccination where deemed necessary.

Screening at the border

- ✓ Allowing importation of ruminant only from FMD-free countries or zones;
- ✓ On-site quarantine for newly-arrived live ruminants into Brunei Darussalam, minimum of 3 days before slaughter.

Preparedness and contingency planning

Legislation

Animal (Diseases and Quarantine) Act, 2021

- ✓ Includes notification of the list of notifiable diseases in animals which are mandatory to be reported (includes FMD).
- ✓ Includes movement control, declaration of infected areas as well as disposal of diseased animal.

Laboratory diagnostic capacity

- ✓ In process of developing molecular testing for FMD confirmatory diagnosis.
- ✓ Upgraded lab facility with BSL3 in preparation of any incursion.
- ✓ As of now, laboratory capacity is limited to diagnosis on the presence and absence of the virus without serotyping. However, the lab is equipped with MinION for further testing development.

Contingency plan (Emergency Response Planning and Preparedness)

Brunei has been historically free from FMD **without vaccination** and will consider vaccination as part of our control strategies. In case of outbreaks, according to our FMD Preparedness and Response Plan (FMD PREP), the following steps will be taken:

a) Choice of disease control measures for Brunei Darussalam in FMD

Stamping-out / Destruction / slaughter / culling of all infected animals to eliminate the point and source of infection. To enable emergency slaughter, a legal framework or national policy is required for implementation and compliance by livestock owners. Destruction / slaughter / culling of the animals would be guided by specific protocol.

Vaccination will also be considered where necessary according to zoning policies.

b) Decontamination and disinfection Protocol for the infected zones

Zoning will be implemented to ensure controlled animal movement and ease of elimination of infected livestock as well as carcass disposal.

c) Farm Biosecurity Standard Operating Procedures for post disease outbreak management

All protocols and SOPs will be periodically reviewed systematically by planning, implementation, technical review and then updated.

d) Vaccine procurement and stocking mechanism

As part of disease preparedness in case of incursion, to identify source of suitable vaccines and stock-piling where necessary.

Testing of Contingency Plan

Plan to develop and conduct table-top exercises with relevant agencies for priority TADs:

- ✓ Phase 1 – for internal country disease preparedness.
- ✓ Phase 2 – for transboundary with neighbouring regions.

Others

Communication and awareness

- ✓ Awareness talk held 3 times a year by the Livestock Industry and Veterinary Services Division intended for farmers, relevant stakeholders and the public.
- ✓ FMD infographics available in official agricultural social media to reach a wider audience to raise awareness for FMD.

Meetings and workshop

A. Regional and International Trainings:

- ✓ Online training on PPR, 14-18 October 2022;
- ✓ Virtual Learning Course on Foot-and-Mouth Disease Laboratory Investigation by FMD World Reference Laboratory, Pirbright Institute, UK; and EuFMD, 15th November - 13th December 2022;
- ✓ SEACFMD Joint EpiNet and LabNet Virtual Meeting, 8th December 2022
- ✓ Virtual Consultation Workshop on the Revision of the ASEAN Rabies Elimination Strategy (ARES), 17th - 18th January 2023;
- ✓ ASEAN Rabies Consultation Meeting, Bali, Indonesia 2nd-4th May 2023;
- ✓ Regional Training Course on Detection and Characterization of Capripox Viruses (LSD, Sheeppox & Goatpox), 21st - 25th May 2023;
- ✓ Borneo Meeting: Updates on Animal Disease Status, 14th August 2023.

B. In-house Trainings:

- ✓ Livestock Industry and Veterinary Services Course:
  - 19th - 21st September 2022; 8 participants
  - 8th - 10th November 2022; 18 participants
  - 24th - 26th March 2023; 7 participants
  - 24th - 26th July 2023; 12 participants

Main challenges and recommended solution

Identification of Problems	Solution
i. Manpower Although Brunei is a small country and the amount of manpower is just enough to carry out the essential monitoring and surveillance program, it is still not sufficient hence limiting the scope of work that could have been covered for example for researching, advocacy,	▪ Recruitment of iReady (attachment) staff ▪ Undergo self-assessment and evaluation of veterinary services ▪ Training for frontliners including officers and staff at border control

	increasing awareness to stakeholders or farmers etc.	
ii.	**Smuggling** There is a limitation to what the government could control, especially when smuggling is involved although our aim is to keep this to a bare minimum.	▪ Strengthening biosecurity services
iii.	Lack of FMD Awareness	▪ Ongoing awareness campaigns are being carried out, including web-based programme to reach more people

Way forward – Future activities

Activities that will be implemented from August 2023 till December 2024:

- ✓ To undergo self-assessment and evaluation of veterinary services and subsequently WOAH PVS Gap Analysis;
- ✓ Validation of Molecular Diagnostic Testing RT-PCR for FMD Confirmatory Test;
- ✓ To undergo self-assessment on Surge Capacity for laboratory;
- ✓ To conduct Table-Top Exercises for FMD for internal agencies and separately for transborder (Borneo Initiative);
- ✓ To improve surveillance of diseases nationally as well as at the border;
- ✓ Ongoing internal training with the officers and staff of Veterinary Services and Border Control;
- ✓ Ongoing awareness activities to farmers, stakeholders and the public on notifiable diseases including FMD.

Support from WOAH and other partners:

- ✓ To further improve our overall control and prevention program, Brunei Darussalam recognised the needs to improve the following:
    - i) Improve of disease monitoring and sero-surveillance for FMD;
        - Ensuring robust sampling protocol to provide confidence in the maintaining FMD-free status in the country.
    - ii) Improve in laboratory diagnostic capacity;
        - Ensuring robust sampling protocol to provide confidence in the maintaining of FMD-free status in the country.
    - iii) Advocacy and Awareness Program (Risk Communication);
        - Communication that involves top management on the situation for advocacy, administrative decision making as well as funding;

- Risk communication tools available from WOAH and other partners that can be of use in the country.

Country's contribution to strengthen SEACFMD campaign at the regional level:

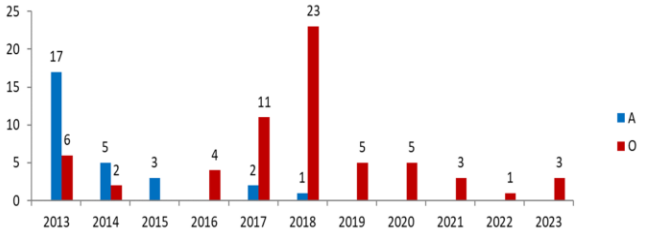
- ✓ Brunei Darussalam will work closely with SEACFMD Members/ ASEAN Member States to continue collaborative effort in controlling the FMD Disease spread in the region.

China

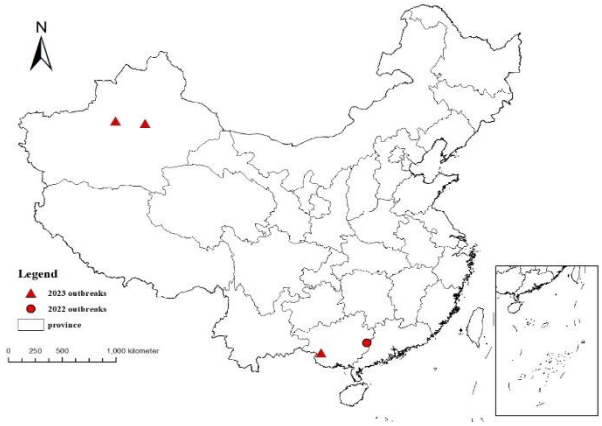
FMD situation in 2022 – 2023

FMD epidemiology

From 2022 to July 2023, four FMD outbreaks occurred in China, three occurred in 2023 and only one in 2022. The four outbreaks happened in Xinjiang, and Guangxi province.



Temporal distribution



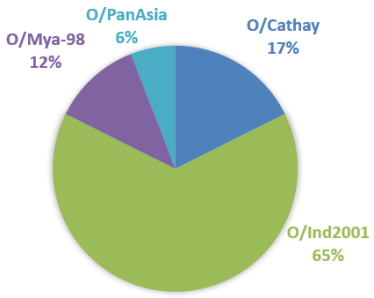
Spatial distribution

Details of FMD outbreaks in China in 2022 – 2023

Report Date	Location	Type	Strain	Species	Susceptible	Cases	Deaths	Destroy
5/27/2022	Wuzhou,Guangxi	O	Cathay	Pig	454	21	0	454
3/27/2023	Chongzuo,Guangxi	O	Ind-2001	Cattle	79	1	0	79
4/13/2023	Kuche,Xinjiang	O	Ind-2001	Cattle	12	6	0	12
5/12/2023	Heshuo,Xinjiang	O	Ind-2001	Cattle	35	8	0	35

Epidemiological characteristics:

In the past five years, the epidemiological characteristics of FMD in China have not changed significantly. The epidemic strains are complex, especially type O, such as India-2001, Myanmar-98,and Cathay. Among them, the Indian-2001 strain is the most common strain circulating in China. Despite the complexity of epidemic strains, the number of outbreaks has been decreasing in recent years. In addition, there has been no clinical outbreak of type A since 2019.



Proportion of each FMDV strain since 2019

FMD prevention and control activities

Vaccination:

All susceptible animals have to be compulsorily vaccinated against vaccines in accordance with the National Animal Disease Compulsory Vaccination Program. All cattle, sheep, goats, camels and deer are vaccinated with bivalent vaccine (A and O serotypes). All pigs are vaccinated with monovalent vaccine against Serotype O. The decision to vaccinate pigs with Serotype A vaccine shall be implemented based on the assessment by the Provincial Animal Husbandry and Veterinary Department. According to the surveillance data from November 2021 to October 2022, the overall antibody protection rate was close to 90%, of which the antibody protection rate in cattle reached 92%.

Post vaccination monitoring (November 2021 – October 2022)

Animal	Serum	With protective titre	Protection rate
Pig	1,220,530	1,099,804	90.11%
Cattle	676,783	625,379	92.40%
Sheep/goat	879,955	786,239	89.35%
Total	2,777,268	2,511,422	90.43%

Surveillance

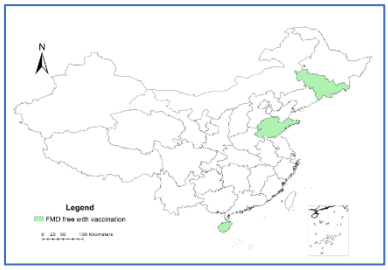
In 2021,the MARA issued the FMD surveillance program from 2021 to 2025, which was mainly undertaken by the National Reference Laboratory, and the Animal Disease Prevention and Control Center at all levels. The Animal Disease Prevention and Control Center mainly carried out:

- Clinical surveillance
- Serological surveillance
- Pathological surveillance.

FMD Reference Laboratory mainly participated in the confirmatory testing of samples, tracking the variation of FMD virus strains. The surveillance results are published on monthly basis in the Veterinary Bulletin.

FMD free zones with vaccination

This year, new progress has been made in the construction of FMD free zone in China. In August 2022, FMD-free zone with vaccination of Shandong province has passed the national assessment and certification. The area has expanded from Jiaodong Peninsula to the whole of Shandong Province. With this, three provinces have established FMD free zone with vaccination, including Jilin Province, Hainan province and Shandong Province.



Animal movement control

In order to promote beef cattle trade, China and Myanmar have jointly established a FMD free zone in Kuikai. In July 2023, Chinese customs lifted FMD ban from Kukai.

Key activities planned in 2024

Following activities are planned for year 2024:

- Compulsory vaccination and post vaccination monitoring
- Surveillance and early warning
- Diagnosis and analysis of FMD virus
- Prevention and control of FMD by regions
- Control of FMD in synergy with other priority animal diseases.

Main challenges and recommended solution

Although the outbreak of FMD in China has remained stable in recent years, the prevention and control work is still facing many challenges.

Main challenges	**Recommended solution**
Biosecurity of backyard farms is poor	Encourage the farmers to improve biosecurity, and boost vaccination
Long-distance movement of live animals is still an important risk of FMD outbreaks.	Reduce long-distance animal transport Inter-provincial joint prevention and control
Risk of introduction of foreign FMDV strains	Strengthen international cooperation to deal with new outbreaks in time
Lack of personnel and capacity of local veterinary teams	Provide training and support them in terms of policy and funding

Indonesia

Foot and Mouth Disease (FMD) Situation

Indonesia was declared Foot and mouth disease (FMD) free since 1986 and it has been recognized by World Organisation of Animal Health (WOAH) as a FMD-free country in 1990. After 36 years of FMD freedom, the FMD was first reported in Indonesia on 4 and 5 May 2022 at Aceh and East Java Province and confirmed by National Reference Laboratory on 6 and 7 May 2022 and reported to WOAH on 9 May 2022. It made this the first detection of FMD since this status was acquired. FMD in Indonesia was officially declared through Decree of Minister of Agriculture for declaration of FMD outbreak in Indonesia, number 500.1/2022, date 25 June 2022. The virus strain circulating is O/ME-SA/Ind-2001e. Genotyping has been conducted by the Pirbright Institute on isolates from Aceh, East Java, and other provinces.

The outbreaks currently have spread to several other districts in Aceh and East Java Province, as well as other provinces. Until August 2023, 27 out of 38 Provinces were affected by FMD in Indonesia. These Provinces were Aceh, Bali, Bangka Belitung, Banten, Bengkulu, DI Yogyakarta, DKI Jakarta, Jambi, West Java, Central Java, East Java, West Kalimantan, South Kalimantan, Central Kalimantan, East Kalimantan, North Kalimantan, Riau Island, Lampung, West Nusa Tenggara, Riau, West Sulawesi, South Sulawesi, Central Sulawesi, Southeast Sulawesi, West Sumatera, South Sumatera, and North Sumatera. Spatial distribution of FMD in Indonesia is presented in Figure 1.

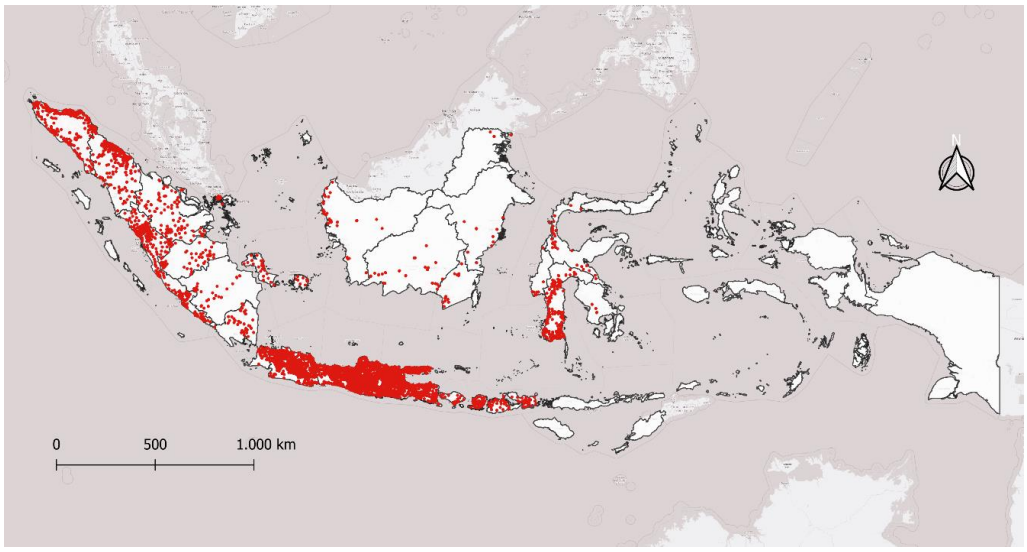


Figure 1. Spatial distribution of FMD in Indonesia

Based on Indonesia's integrated real-time information system for animal health called iSIKHNAS, the numbers of FMD outbreaks in Indonesia for each month during 2022 – 2023 is presented in Figure 2.

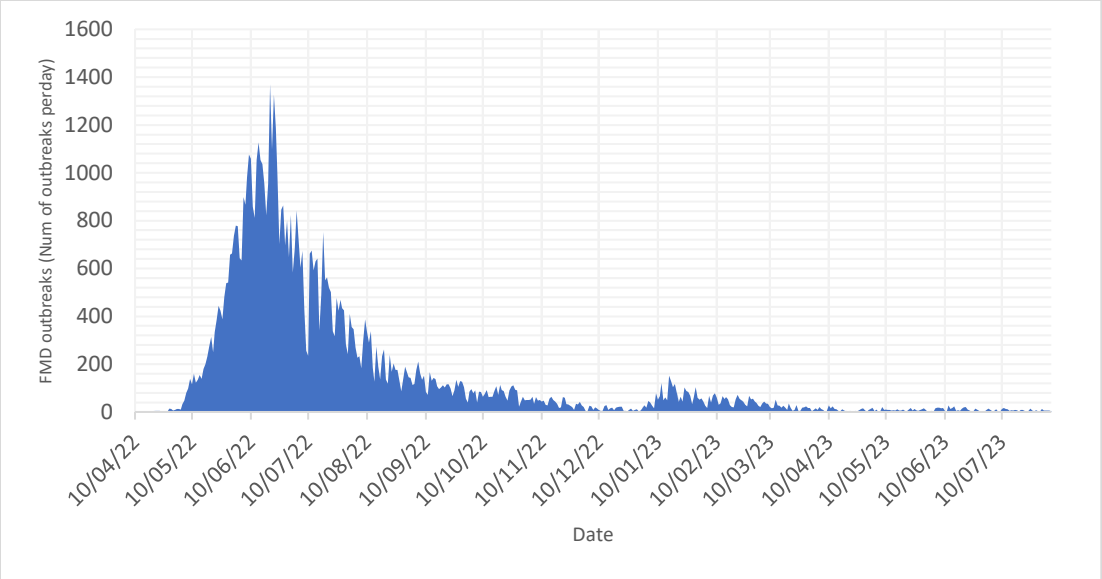


Figure 2. FMD outbreaks in Indonesia during 2022 – 2023.

The first occurrence of in FMD in Indonesia was suspected in April 2022 and confirmed in May 2022 at Aceh and East Java Province. The peak FMD outbreaks during 2022 until 2023 was in June 2022. It showed 27.624 outbreaks with 255.667 cases, related with the peak of FMD outbreaks and cases on East Java, Aceh and other provinces due to rapid spread of disease. The outbreaks as well as the cases start to decrease from July 2022 onwards.

Figure 3 showed reported outbreaks of FMD in 27 affected Provinces in Indonesia. The highest number of outbreaks and cases were in East Java (199.846) and Nusa Tenggara Barat Province (124.414). These provinces have the largest cattle population in Indonesia.

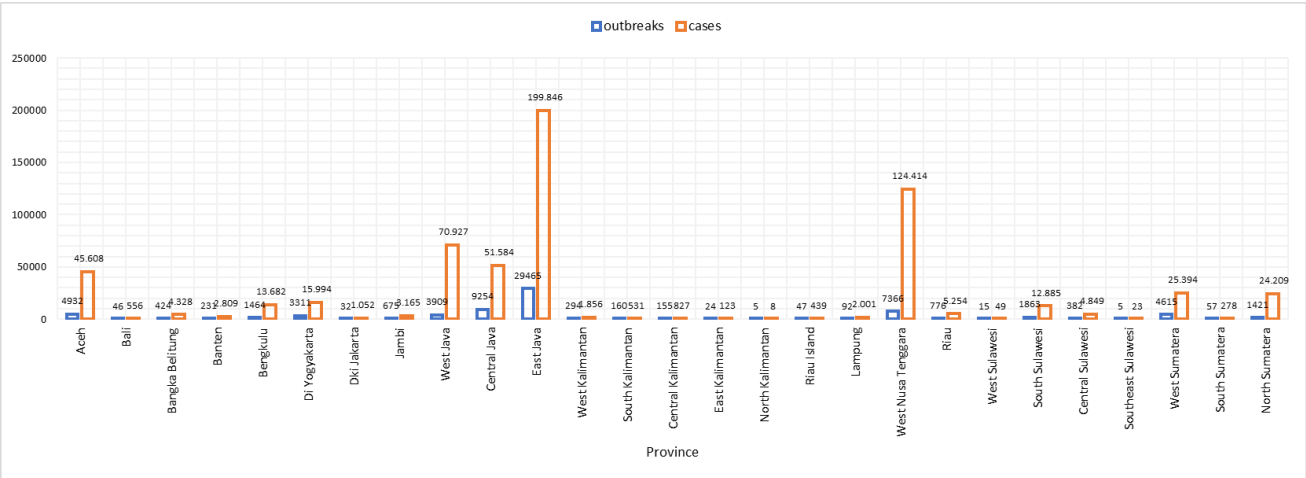


Figure 3. Reported cases of Foot and mouth disease in Indonesia.

The data was based on number reported cases through national animal health system (iSIKHNAS) that confirmed and validated by Province level. Therefore, there was possibility of unreported cases.

FMD Prevention and Control Activities

Surveillance, early detection and response

The success of FMD prevention is very dependent on early detection activities, especially before the disease spreads widely. Public awareness programs on FMD and the threat of other livestock diseases, including increased communication between veterinary officers and farmers, are one of the factors that influence the success of early detection of FMD outbreaks.

Other determining factors are the expertise and knowledge of field staff about FMD, the expertise of staff in sampling and sending samples, the capacity of the diagnostic laboratory to test FMD, and the capacity of the national surveillance system. Reporting by field officers through iSIKHNAS, (Indonesia's integrated real-time information system for collecting, managing, reporting and using data to support animal health and production) is a key factor in achieving early detection. Reporting via iSIKHNAS and followed up by field and lab investigation. This syndromic surveillance report is for early detection in new areas and to detect new case in infected areas.

Laboratory capacity for surveillance and testing were by assigning PMK National Referral Laboratory (LRN) at Pusvetma (Surabaya) and 8 (eight) Disease Investigation Centre's (DIC) for FMD diagnostic using PCR diagnostic test. Training of veterinarians for clinical diagnosis and epidemiology was also being implemented. The Minister of Agriculture can designate additional testing labs based on the recommendations of the FMD Task Force with the approval of the Advisory Agency.

The first occurrence of FMD was suspected in April 2022 and confirmed on 4 - 5 May 2022 at Aceh and East Java Province. Following the laboratory confirmation of FMD in Aceh and East Java Province on 6 - 7 May 2022, notified WOAH through WAHIS on 9 May 2022. Then Taskforce for FMD within the Ministry of Agriculture were established.

Movement control and quarantine procedure of cattle and their products were also implemented. It is important to increase capacity in controlling animal movement across the border. This include improving the capacities and facilities of Quarantine Station (adding scanners) at the entrance and exit point. Besides that, supportive medicines (vitamins, feed supplements) and disinfectants in the treatment of FMD were provided to the affected Provinces. Provision of Curative and supportive medicines (antibiotic, antipyretic, analgesic, antihistamine, anti-inflammatory, vitamins, feed supplements) and disinfectants in the treatment of FMD.

Penta helix approach for FMD control are implemented in Indonesia. National Task Force for FMD were established. Furthermore, establishment and involvement of multi-institution/organizations and societies, national prioritization and resource mobilization. Structured organization of National Task Force for FMD from the national to the local level and supported by the international organizations and partners. This task force not yet fully implemented for other diseases (i.e. LSD and other priority national animal diseases).

Biosecurity measures – Movement Control

Various actions were to taken to raise awareness on biosecurity measures by publishing alert letters, campaigns, etc. Movement control (transportation restrictions, movement certificate request, etc.) have also been implemented by each province.

Before a suspected case can be confirmed, traffic/ movement control can be carried out at both the farm and regional scale. The main principle of traffic control is to reduce the risk of spreading disease by preventing the movement of infected animals, their products and vectors that can spread disease and only allowing the movement of animals and products that have minimal risk.

Movement control is carried out by activating check points for animal movement. It is also in collaboration with other sectors, such as army and police sectors, Animal Quarantine and the Department of Transportation. Indonesia has also regulation for animal movement through Minister of Agriculture Regulation.

Biosecurity are the key to Stop FMD virus replication and circulation in the environment. Training for vet and para vets on good biosecurity practice for large, medium and small-scale farms and producing simple biosecurity video for field officers were done.

Government also provided technical guidance for farmers on simple farm biosecurity practices for small holder farmers; and introducing the usage of effective disinfectant that are easy to access. Government provided effective disinfectant and equipment for disinfection and sent the disinfectants and equipment to affected areas.

Vaccination

An appropriate control strategy is needed to be able to free Indonesia from PMK again. One of the main strategies currently implemented is vaccination of FMD susceptible animals. In addition, other control activities are also carried out, including treatments, biosecurity measures and increase public awareness.

The objective of vaccination to protect the animals with high economic value and have a long lifetime (breeding cattle and dairy cows) and reducing the FMDV transmission of the frequently trafficked animals.

Vaccination program for FMD in Indonesia are prioritized for cattle and buffalo. Total population of cattle and buffalo in Indonesia based on national statistical agency are 17.956.849. Currently, vaccination coverage in cattle and buffalo in Indonesia is 43.1%. Furthermore, based on risk mitigation, goats, sheep and pigs for breeding or trafficked, and hoofed wild animals could be also vaccinated when necessary. Vaccination is implemented in infected area and area which is in same island with infected area.

Post-vaccination monitoring and surveys have also been carried out in Indonesia by Laboratory Center for Quality Testing and Certification of Veterinary Drugs, Pusvetma, and DICs. The test used ELISA SP and showed a national seropositivity of 80% (162,843 of 203,308 samples). At the district/city level, the minimum seropositivity is 0%; maximum 100%. Seropositive results only show the proportion of vaccinated animals that have an immune response (ELISA SP serology) and do not show herd immunity.

Communication and awareness

Communication and awareness activities were targeted to various stakeholders, such as government authorities; veterinary service; general public; commercial and backyard farmers. The activities through

sharing of infographics, presentations; training / capacity building – Educational material, posters, radio, and social media.

Socialization and education about FMD were delivered to breeders, traders, butchers and associations, especially on knowledge about FMD in general, vaccination program and biosecurity to prevent FMD spreading. Socialization is also done in order to raise awareness of farmers to report to the local animal health officers if there are any suspected cases of FMD for early detection.

Information, Education and Communication (IEC) Materials about FMD through social media (Facebook, Twitter, Instagram, TikTok, WhatsApp) about Disease Recognition & Reporting; Prevention and Control; Farm Biosecurity; Movement Restriction; Animal Health Issues (Not Zoonosis); and Impact of FMD. Indonesia have National Hotline in the Crisis Centre to provide data and information on FMD that could be access by community in general, including establishment of a website for FMD data and information. Moreover, government has also organized series of Online Training and Webinar on FMD.

Governance and legislations

National level:

- ✓ Minister of Agriculture decree on first confirmed outbreak of FMD in Aceh and East Java Province, Indonesia on May 2022;
- ✓ Developed Veterinary Emergency Preparedness Guidelines for FMD in Indonesia (Contingency plan), Biosecurity Guidelines, Vaccination Guidelines;
- ✓ Minister of Agriculture decree on FMD as one of infectious animal diseases priority in Indonesia;
- ✓ Minister of Agriculture decree concerning Roadmap for FMD eradication in Indonesia;
- ✓ Official letter to infected Provinces concerning FMD prevention and control activities;
- ✓ Minister of Agriculture regulation concerning animal movement control;
- ✓ Minister of Agriculture regulation concerning Standard Operational Procedures for Vaccination of FMD;
- ✓ Minister of Agriculture regulation concerning FMD Control and Mitigation Activities in Indonesia;
- ✓ Circular Letters from National FMD Task Force;
- ✓ Other Decree, Circular Letters, Instruction from Different Ministries, Army/Police;

Provinces / districts level:

- ✓ Traffic restriction for cattle and their products in infected Provinces;
- ✓ Official letter concerning preparedness for FMD in Provinces free of FMD.

Public Private Partnerships

- ✓ Collaboration between government and commercial scale farmers and also association is increasing. This partnership is to increase awareness to control FMD in Indonesia.

Collaboration with partners

The Technical assistance support were received from International Organizations and Neighboring Countries. International Organizations such as WOAH and FAO support for: Training program; raising

Awareness; Laboratory diagnostics and supplies; Expert mission and lab confirmation (Pirbright); and Material and equipment for control (Small amount of FMD vaccine (emergency procurement) and PPE.

Support from neighbouring countries such as Australia and New Zealand. Australia through existing partnership (Australia-Indonesia Health Security Partnership/AIHSP) provided support on provision of Vaccine for FMD; Training for FMD; Laboratory support; Awareness raising and development of National FMD Roadmap. New Zealand also support for Biosecurity support for the breeding center and through donation of PPE and Medicine.

Challenges in FMD control

There are many challenges for FMD control in Indonesia. One of them is about border control. The resources to control the border (illegal entry) are limited. It is needed for risk analysis team on an ad hoc basis. Risk assessments are conducted irregularly and only for import risk analysis. Furthermore, law enforcement is also limited.

Movement control can only be enforced at the official entry points due to limited resources: need to map the risk of animal disease introduction so the resources can be allocated efficiently. Lack of movement control between administrative areas on the same land: checkpoints between areas have not been efficient to control movement.

Beside border control, there are many challenges in early detection and response for FMD control in Indonesia. Limited laboratories that were capable of performing a diagnostic test for FMD: currently 8 DICs, Pusvetma and NVDAL are able to conduct PCR and serological tests for FMD (additional lab in progress). Simulation exercises for FMD preparedness and response are irregularly conducted: lack of preparedness for example access to FMD vaccines, lack of awareness on disease introduction. Limited access to emergency funding: delay in deploying a rapid response team to affected areas.

Challenges in vaccination of FMD in Indonesia such as: Limited vets and para vets to implement vaccination; Extensive farming management: difficulties to access and handle animals; Farmer rejection: death and abortion after vaccination; Natural Disaster (flood/rainy season); and Vaccination in sheep, goats and pigs for FMD.

Furthermore, outbreaks of other emerging infectious diseases (EIDs) in Indonesia occurred, such as Lumpy skin disease (LSD) and African Swine Fever (ASF) made control of these diseases difficult. There is competition for resources and fund for the control of FMD, ASF and LSD. There is need to optimize the use of budget and available resources and promote cost efficient synergies for better control of FMD and other EIDs.

Way Forward – Future Activities

- ✓ Training/ capacity building;
- ✓ Refresher training course for veterinarians about clinical diagnosis, laboratory and epidemiology of FMD;
- ✓ Socialization /public awareness
- ✓ Increase socialization and education about FMD to breeders, traders, butchers and associations;

- ✓ Coordinating with other stakeholders;
- ✓ Increase coordination with other stakeholders, including of Involvement of multi-institution/organizations and societies;
- ✓ Strengthen biosecurity measures
- ✓ Improve biosecurity at the farm level, as well as the market chain, traders, collectors. Set-up community-based approach to re-educating farmers on biosecurity measures;
- ✓ Indonesia ROAD MAP of FMD eradication;
- ✓ Implementing Minister of Agriculture decree concerning roadmap for FMD eradication in Indonesia by 2035 and propose the Official Control Program Recognition from WOAH.

Lao People Democratic Republic (Lao PDR)

Abstract

Laotian household depend on the Livestock for their livelihood and regarded as the key priority actions to generate income and food security. FMD is recognized as one of the serious disease given socio-economic and trade impact. However, a number of endemic diseases continue to obstruct the true potential of production, animal health and some even cause human health issues (zoonotic diseases). Of the livestock diseases, Foot-and-mouth disease (FMD) is recognized to be one of the most serious disease. FMD Outbreaks often lead to a high number of affected animals, with deaths and reduced production thus resulting in severe financial losses to farmers and hamper the trade. In endemic regions of Lao PDR, FMD exerts a progressive socio-economic burden and continue to pose a threat to the livelihood and security of smallholder farmers and their community depend on the livestock.

National Strategy Framework for progressive FMD control has been designed with the support from New Zealand funded FMD control Project and WOAH. The Risk Based Strategic Plan (RBSP) plan [2019-2023] and FMD control strategy [2018-2025] was developed by DLF and endorsed by the Ministry of Agriculture, Lao PDR. This framework intends to change disease control management such that it not only addresses the trading conditions with neighboring countries in the region but aims to also safeguards a country-wide efficient use of resources with sustained impact on disease control. In addition, the strategy also advocates for the promotion of animal health and production in all regions of Lao PDR. This National Strategy Framework on FMD control 2018-2025 is consistent and in line with the Agriculture Development Strategy to the year 2025 (ADS 2025) and vision to the year 2030 of Lao PDR. It complements the successful and effective implementation of ADS2025 with the Livestock sector-specific measures in policy, governance, promoting coordination mechanism, capacity development, promoting entrepreneurship, cooperation and investment. The efforts are continuing to implement the law on Livestock and Veterinary Matters which was revised and were endorsed by National Parliament on 11 November 2016. The challenges remain with the implementation of the RBSP plan at its entirety however Veterinary Services has taken steps with the support of both public and private sector to support the implementation of FMD control activities including disease monitoring, surveillance, vaccination, biosecurity, animal movement control and biosecurity at FMD control zone at Laung Namtha province in Lao PDR

Lao PDR and China have been contracted for cattle trade export from Lao PDR to China. The first lot of cattle happened in 2021 with 2013 cattle and buffaloes were sent to China. Unfortunately, the first case of LSD which occurred in Vientiane and spread to Savannakhet province resulted into impact on cattle trade. As the animal health situation in Lao PDR has improved, an approval for cross border trade is pursued by relevant authorities. To be prepared for cattle trade or cattle re-exportation, the relevant Office in Lao especially Department of Livestock and Fisheries, Loungnamtha Province Agriculture and Forestry Office (LNT PAFO) and District Agriculture and Forestry Offices, Farmers, Traders and International organisations are working hard together. The Quarantine and Vaccination training, FMD and LSD Vaccination campaign were organized. In early August 2023, LDF, Lao PDR and AGCC, China delegate signed the contract to export 3000 cattle and buffaloes from Lao to China and expect to exported by the end of September 2023. DLF is demonstrating successful FMD control in Laung Namtha zone. The trade opportunities are supporting the livelihood and income of famers, traders and local communities and expected to give boost to FMD control activities in the province and rest of the country.

FMD STATUS

In the last few years, FMD outbreak occurred in some animal herds, which affected the farmers economy and income. In 2018, the FMD outbreak due to FMDV Serotype A occurred in Attapeu province. In 2019 and 2020, FMD outbreaks due to FMDV Serotype O was reported in some provinces: Xayabouly, Houaphan, Oudomxay and Luangprabang. Thereafter, no clinical FMD outbreak are reported in Lao PDR.

FMD prevention and Control Activities

Disease Reporting System

Currently the main official disease reporting structure is done through paper report. The information is shared through phone call and WhatsApp from the local offices to centre. The technical staff uses WhatsApp for disease reporting, however there ares still some limitations. The Enhancement of Zoonotic Disease Outbreak Detection in Lao PDR and Cambodia(LACATH4) developped and introduced and piloted in the project target areas. However, the system was just introduced to the PAFO and DAFO level, they report after they received the reports from farmers or Village Veterinary Workers (VVW). Curretntly, DLF and Chiang Mai University is preparing the MOU on disease reporting using Participatory One Health Disease Detection(PODD) Application.

Quarantine and Vaccination Training

Training on quarantine management and vaccination on FMD and LSD organised on 6–10 December 2022, 50 participants attended the training, of which 18 participants were female. There are 7 participants from Division of Veterinary Services (DVS), Department of Livestock and Fisheries (DLF), 11 participants are from livestock and fisheries section of Louangnamtha province, 12 participants are from Sing district agriculture and forestry office and quarantine station, and 20 participants are from Louangnamtha, Viengphoukha, Long and Nalae district agriculture and forestry offices (5 participants for each district) . DLF, PAFO and FAO consultant provided training and invited all participants for both modules.

Training on quarantine management and vaccination on FMD and LSD was organized on 13–15 December 2023, The total number of participants are 64 people, of which 5 livestock officers from each district, 28 participants are farmers and traders, and 31 participants are Village Veterinary Workers (VVW).

Vaccination campaign advocacy

Before the start of FMD vaccination, DLF with PAFO worked closely to organize the vaccination advocacy workshops in the villages. This activity took place in some villages of each district aiming to disseminate relevant information on FMD and LSD prevention and control in order to increase the understanding and involvement of farmers during the vaccination campaign. The number of villages covered during the vaccination advocacy during March 20 to May 31, 2023 is summarised as follows:

Districts' name	No. of Villages
Louangnamtha	22 Villages
Sing	48 Villages
Long	25 Villages
Viengphoukha	25 Villages
Nalae	21 Village
Total	**141**

Through awareness campaigns in each village, participants are made aware of information about animal diseases and prevention methods, they see the importance of vaccination against animal diseases, reporting when there is an outbreak of disease or an outbreak of animal diseases in their village, including the destruction and disposal of animal carcasses that die due to disease, including cleaning and disinfection, etc.

Vaccination campaign

DLF worked closely with FAORAP and FAOLA to ensure that vaccines are purchased and delivered to PAFO and DAFOs on time as per their request. In order to ensure the good participation of animal keepers in every village, PAFO organized a planning workshop, then gave the notification to DAFOs to nominate the technical staffs to be in charge of vaccination in each village. PAFO appointed 17 technical staffs from Livestock and Fisheries Section (LFS) to assist DAFOs for conducting vaccination campaign. PAFO and DAFOs formed up vaccination teams together; each team consists of one technical staff from LFS and three staffs from DAFO. Each DAFO were divided in to three teams, except Sing DAFO which has four teams.

Vaccination against animal diseases is one of the most important tasks that we have always paid attention. According to the target stated in the LoA between DLF and the FAO, bovine must be vaccinated against FMD and LSD (at least 85% of animal herds throughout the province). This is to ensure that animals are immune to the disease, are healthy and be able to trade safely.

In order to complete this work, 17 appointed technical staffs from PAFO coordinated closely with the DAFOs to carry out vaccinations against FMD & LSD as well as animals' registration (ear tagging). Vaccination campaign started from the villages located in the plains (low land) and had a good access first, then spread out in a wide circle to the remote mountainous areas. Animal vaccination and animal registration activities started from March 20 to June 8, 2023 (In fact, the project ends on June 3, 2023) and implemented as follows:

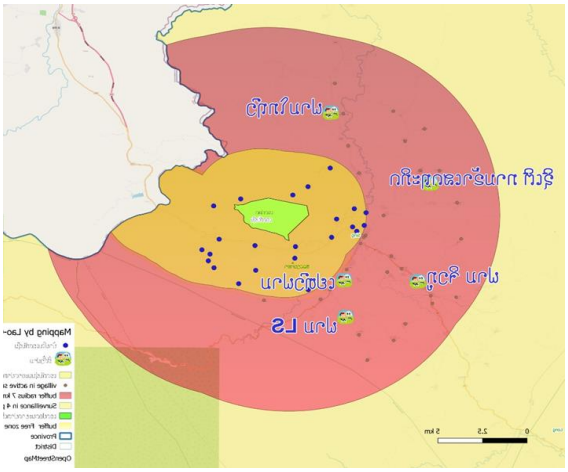
Districts name	Animal statistics			Animals vaccinated			% of Vaccination
	Cattle	Buffalo	Sub-total	Cattle	Buffalo	Sub-total	
Louangnamtha	7,094	874	7,968	6,458	750	7,208	90.46
Sing	9,777	2,739	12,516	9,489	2,795	12,284	98.15
Long	7,019	1,417	8,436	6,397	1,184	7,581	89.86
Viengphoukha	11,153	2,220	13,373	9,345	1,899	11,244	84.08
Nalae	5,357	4,364	9,721	5,180	4,036	9,216	94.81
Total/Average	40,400	11,614	52,014	36,869	10,664	47,533	**91.47**

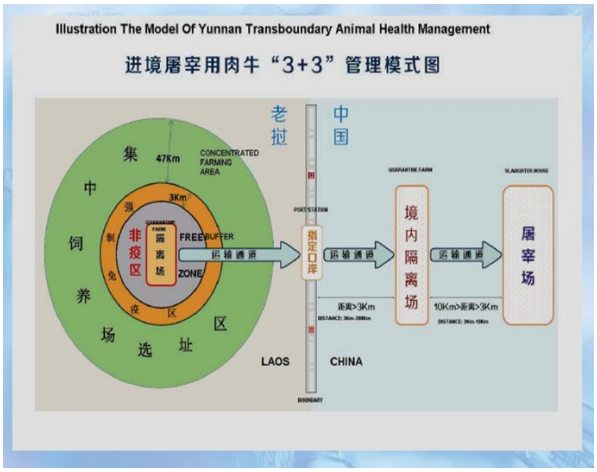
Note: The animals that have been vaccinated against FMD include cattle, buffaloes and goats, while the animals that have been vaccinated against LSD include cattle and buffaloes.



Specific FMD control Zone to promote Cattle Trade between Lao and China

The FMD control zone divided into 3 parts as follow: FMD free zone with Animal quarantine inside, Buffer zone and collecting zone





1) FMD Free Zone:
    - Quarantine station inside the free zone
    - 30 days quarantine before export
    - Routine clinical examination of animals
    - 10% blood sample collection for LPB ELISA test
    - 30 sentinel animals
    - NSP and Probang testing
2) Buffer Zone:
    - Covers 22 villages with over 1800 cattle and buffaloes
    - FMD Vaccination and post vaccination monitoring practiced

- 10% blood samples every 3 months for NSP test

3) Collection Zone:
   - There are collection farms inside this zone
   - 45 days quarantine before moving to quarantine zone
   - Ear tagging with HS, FMD and LSD vaccination 2 times (day 0 to 4 and after 30 – 35 days
   - Routine clinical examination

Cattle and Buffaloes exportation

After preparing for years, in Early 2021, Lao exported 2013 heads of cattle and buffaloes to China by following the regulations of FMD Control Zone

Unfortunately, the first case of Lumpy Skin Disease (LDS) occurred in June 2021 resulted in stopping of cattle export from Laos to China. After the Outbreak stopped Lao team worked closely with China side to work out or be prepared to re-export cattle. Finally, DLF and AGCC signed agreement to export 3000 heads of cattle and buffaloes by the end of September 2023.

Coordination, training and communication for control activities

- ✓ Organized the Veterinary Workforce Meeting by supported Fund and expertism from WOAH;
- ✓ Joined the World Organization for Animal Health (WOAH) on disease notification training, including the use of World Animal Health Information System (WAHIS), for national WOAH focal points for animal disease notification, 21 – 23 June 2023, Chiba Japan.

Constraints and solutions

- ✓ Free range husbandry system;
- ✓ Improve vaccination coverage by continued public awareness, implement biosecurity practices;
- ✓ High price of FMD vaccine: less interest of farmers to vaccinate their animals given cost and low level of mortality;
- ✓ Lack of funding and equipment for field operational works;
- ✓ Delay or under-reporting;
- ✓ Animal and animal products movement control-both in country and cross border.

Future activities

- ✓ Continue to conduct vaccination campaign in the FMD control Area (LNT), other provinces and some hot spot areas;
- ✓ Review risk based strategic plan and secure support to implement some of the priority activities highlighted under the plan;
- ✓ Scheduled Post vaccination monitoring In FMD control Area (LNT);
- ✓ Strengthen targeted surveillance at FMD control Area (LNT), border check point, airports, farms;
- ✓ Explore public–private partnership, national and international coordination and collaboration opportunities in FMD control;
- ✓ Increase capacity in laboratory to support trade;
- ✓ Improve public awareness, implement biosecurity practices, animal movement control.

Malaysia

Foot-and-Mouth Disease in Malaysia in 2022

Malaysia is comprised of two main islands with different Foot and mouth disease (FMD) statuses. Peninsular Malaysia is endemic in the west, whereas in the east, Malaysia is represented by the state of Sabah, and Sarawak which has FMD-free status without vaccination.

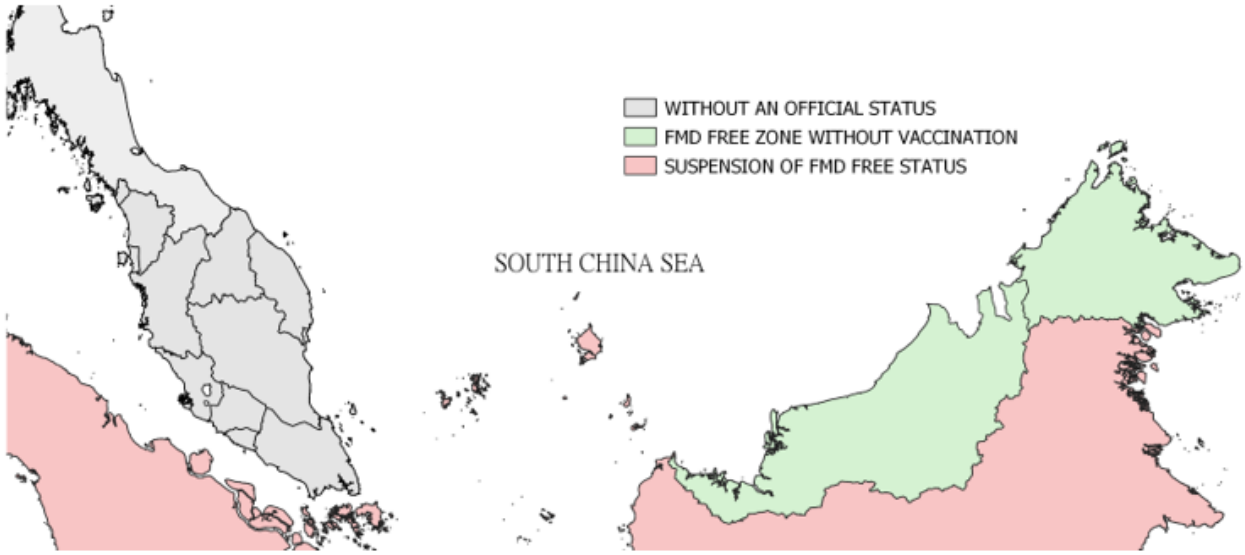


Figure 1: Map of Malaysia with FMD status; indicated by grey in the west is Peninsular Malaysia, which is endemic, and in the east are the state of Sabah and Sarawak, that the FMD-free zone without vaccination status.

Foot-and-Mouth Disease in Peninsular Malaysia (FMD endemic area) in 2022

FMD is endemic in Peninsular Malaysia. Its location shares a land border with the neighbouring counties in the north, making the FMD control and eradication program challenging. In addition to the country's shortage of ruminants, the culture and lifestyle of the people and their preference towards fresh warm meat add more to the challenge. In 2022, 31 FMD cases were recorded in Peninsular Malaysia. Cumulatively, 155 animals have shown FMD clinical signs out of the total population of 5,896 in 31 infected premises. The number of susceptible premises in a 1 km radius was 152, with a total susceptible animal of 82.087. The FMD cases described do not include one FMD case during the quarantine period in a group of 40 beef cattle imported from Thailand despite the strict import protocol requirement.

There are 28 bovine cases, two swine and one caprine. The number of cases is based on premise. The majority (97%) of the cases involve livestock producing meat (87% beef, 3% mutton and 6% pork). All cases are localised, involving unvaccinated livestock or missed the six months vaccination schedule. The majority of cases (68%) are related to movement. The FMD control measures followed the Malaysian Veterinary Protocol (PVM) for FMD. Briefly, the

control measures implemented include sampling, treatment for secondary infection of the animal with the clinical lesion, isolation of the diseased animal, vaccination of healthy animals and disinfection of the infected premises. Besides, clinical surveillance, movement control and vaccination of the premises with susceptible animals within a five to 10 km radius surrounding the index is carried out.

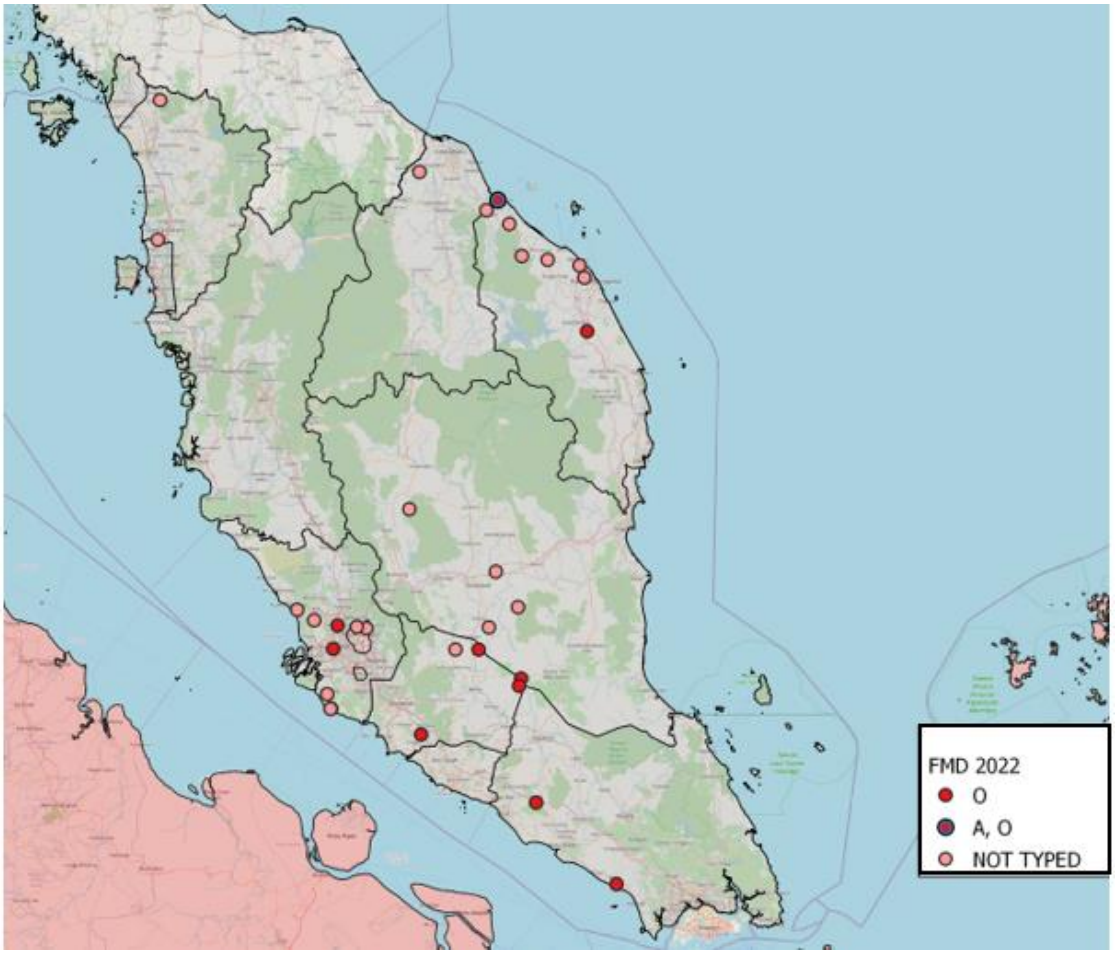


Figure 2: Map of Peninsular Malaysia with the spatial distribution of FMD cases for 2022; the dots illustrate the FMD case locations. Red indicates FMDV O/ ME-SA/ Ind 2001, blue indicates FMDV A/Asia/Sea-97 and pink indicate untyped FMD cases.

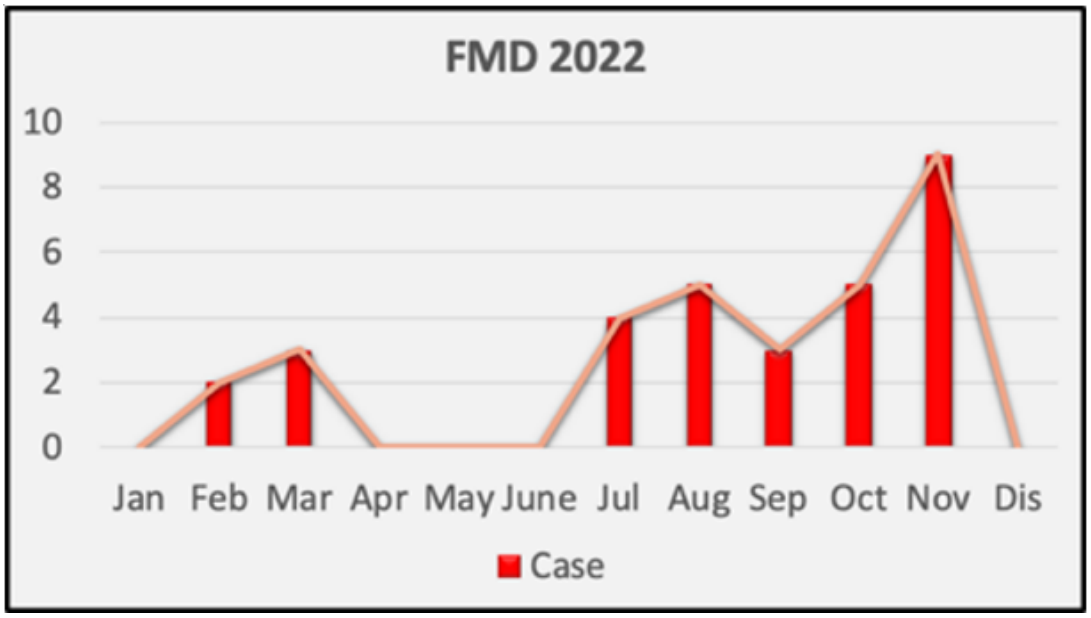


Figure 3: Temporal distribution of FMD cases in 2022; higher number of FMD cases recorded in the year's second half.

Foot-and-Mouth Disease Virus characteristic

Following the PVM of FMD all FMD cases need to be sampled. Currently, Malaysia is using molecular methods for serotyping. All samples with differential diagnosis of FMD are subjected to confirmatory tests using PCR for clinical samples and NSP ELISA for serum. In the year 2022, only 32% of samples were characterised. The main factors associated with the failure to characterise 68% of the samples were related to inappropriate and low sample quality despite availability of detail guidelines for sample submission and provision of practical training for sample collection. Therefore, more training for field personnel should be conducted throughout the country.

Similar to previous years, the FMDV serotype O is predominant with 90%, whereas a small percentage (10%) are Serotype A. The phylogenetic trees for both serotype O and A sequence analysis using the neighbour-joining method are illustrated in Figures 4 and 5.

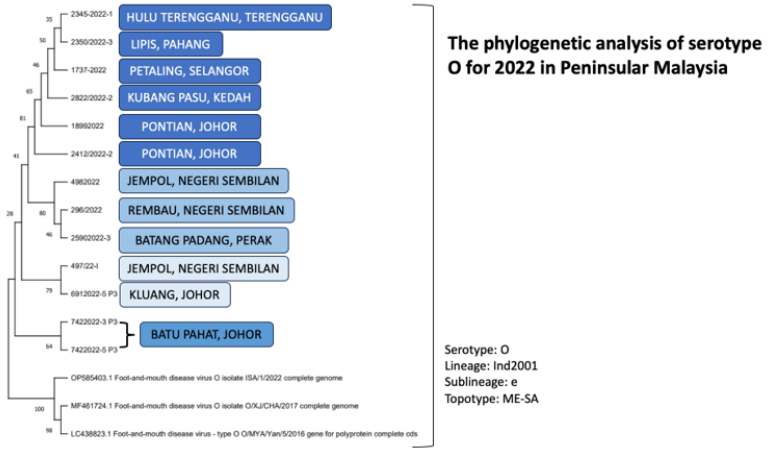


Figure 4: A Phylogenetic tree of FMDV serotype O collected in 2022; the location (district and state) where FMDV were collected are highlighted in shades of blues, and the three (unmarked) at the bottom are the reference.

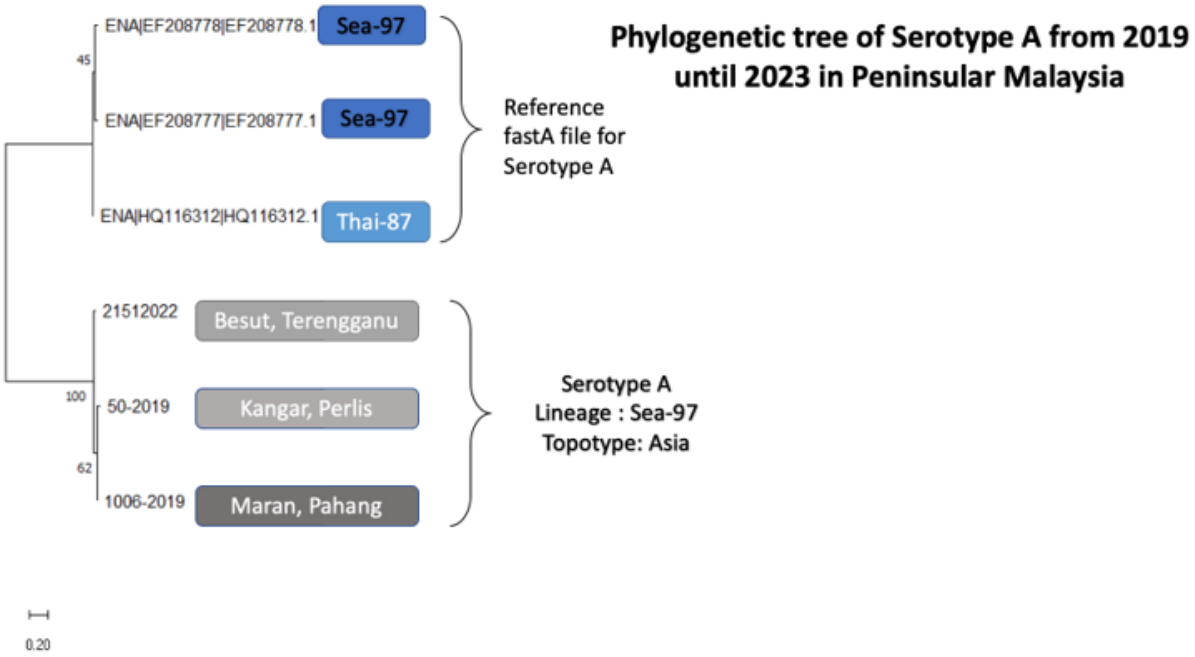


Figure 5: A Phylogenetic tree of FMDV serotype A collected in 2019 - 2023; the location (district and state) where FMDV were collected are highlighted in shades of greys.

Vaccination and Post-vaccination monitoring for FMD

Vaccination for FMD in Peninsular Malaysia

Malaysia emphasized on the importance of using good quality FMD vaccine. Only registered FMD vaccines are permitted to be used in the country. The current FMD vaccine is a trivalent containing serotype O (O-3039 and O1 Manisa), A (A/May-97) and Asia 1 (Shamir). Besides other challenges, Malaysia faces budget constraints to procure enough vaccines and a limited workforce to administer the FMD vaccine. Malaysia has yet to overcome both main limitations

to control and eradicate the disease effectively. In 2022 only, a total of 1,093,028 doses (ruminant: 469,200 and pigs: 623,828) of FMD vaccine were purchased and administered to the susceptible population. Due to the limitations, Malaysia has no choice but to practice strategic vaccination and, consequently, stay at PCP level 3. Only pig farmers and a tiny number of ruminant farmers are purchasing their own vaccinesou soon

The other animal sectors susceptible to FMD still depend on the government.

Post-vaccination monitoring for FMD in Peninsular Malaysia

Post-vaccination monitoring is conducted to determine whether the vaccine used in the country is eliciting antibody titre above the required cut-off (log10 1.6, log10 1.4) against the field virus and a coefficient of variant (CV) of less than 30% using the Virus Neutralisation Method (VNT). Before the VNT method, all sera collected are screened with NSP ELISA. Only serum with negative NSP ELISA results are subjected to the VNT method using the heterologous viruses. However, vaccine-matching tests cannot be conducted in Malaysia because the vaccine virus is unavailable in the country. The post-vaccination monitoring result for the year 2022 are shown in Table 1.

Table 1: Post-vaccination monitoring result for serotype O and A

SPECIES	NO. OF SAMPLES	Serotype O mean titre	Serotype O CV (%)	Serotype A mean titre	Serotype O CV (%)
CATTLE & BUFFALO	120	1.975	25.65	2.202	22.18
GOATS & SHEEP	80	1.762	29.16	1.674	24.5
PIG	280	2.27	19.2	2.2	20.73

Malaysia's FMD-free zone without vaccination (Sabah and Sarawak)

The program conducted within the FMD free zone is mainly surveillance, awareness and emergency preparedness and response, including capacity building, training and simulation exercises. DVS Malaysia submits the annual reconfirmation report to maintain zone with FMD freedom status every year in accordance with WOAH requirement.

Active surveillance program

The FMD surveillance programme is designed explicitly by DVS headquarters for DVS Sabah and Sarawak to undertake the program. Clinical and serological surveillance is performed as per Articles 8.8.40 to 8.8.42 of the WOAH Terrestrial Animal Health Code. The field personnel conducts the clinical surveillance via a standardised FMD questionnaire. Following the FMD incursion into Kalimantan, Indonesia, in mid-year 2022, a risk assessment identified the need to intensify surveillance at Miri, Serian and Samarahan divisions for Sarawak and Tawau regions for Sabah. The location of the surveillance is illustrated in Figure 6.

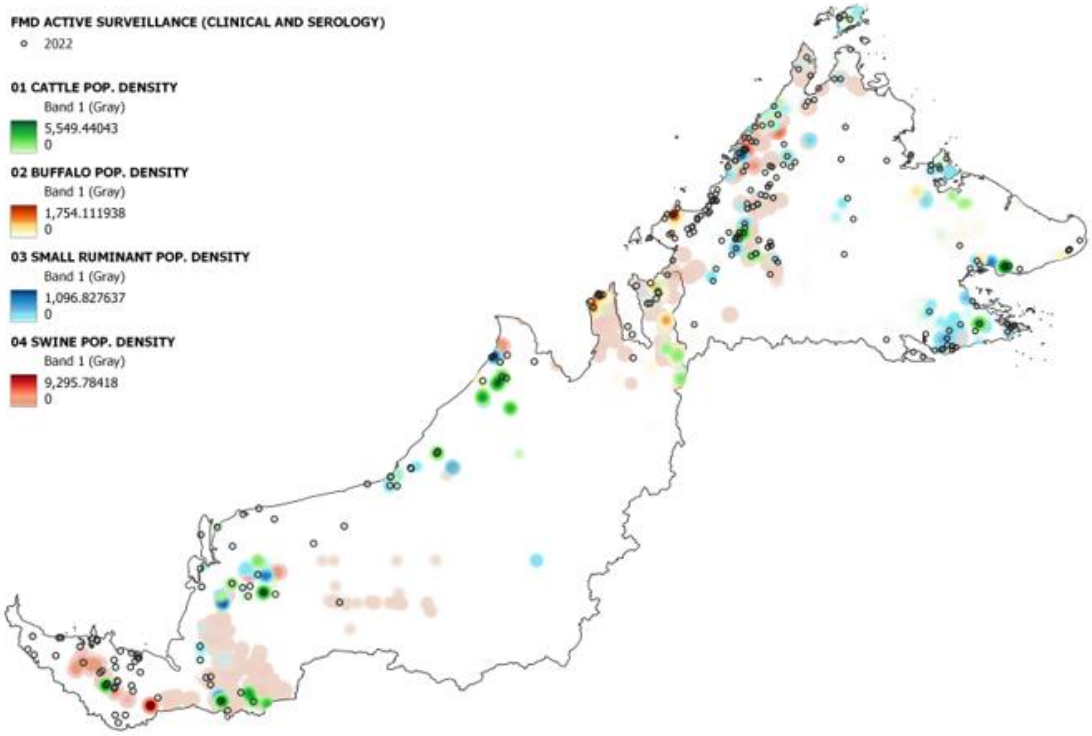


Figure 6: Map of clinical and serological surveillance overlaying all FMD susceptible species of livestock population density for Sabah and Sarawak for the year 2022

Animal disease emergency preparedness and response

The Emergency Preparedness and Response (EPR) for animal disease in Malaysia comprise three main pillars: policies and governance, planning and resources, and operation. In the event of an animal health emergency, all technical personnel are guided by the contingency plan in the form of the Malaysian Veterinary Protocol (Protokol Veterinar Malaysia - PVM) and specifically for FMD-free zone in Sabah and Sarawak following the SOP in the form of Malaysian Veterinary Standard Operating Procedure (Arahan Prosedur Tetap Veterinar Malaysia - APTVM). These documents are accessible online through the DVS website.
(For PVM - URL: https://www.dvs.gov.my/index.php/pages/view/1397, For APTVM –
URL: https://www.dvs.gov.my/index.php/pages/view/1408) .

Budget Allocation

Emergency financial resources for responses to animal health emergencies are mainly established through Operational Budget, and in emergencies, DVS could adequately source funds through fund transfers or make an emergency request to the National Security Council if necessary. There is also a provision in the Animals Act 1953 for compensation of animals that are culled without testing for emergency disease control purposes. However, there is no compensation for sick animals or the loss of equipment, materials or business income.

Technical Competencies

The DVS actively conducts continuous technical training for its field personnel in Veterinary Services through theoretical and hands-on courses relating to animal health, disease investigation, control and prevention guided by the available PVM and APTVM. Field and table top simulation exercises are also conducted to ensure that all personnel know their roles and functions in the event of an outbreak. In addition, DVS also continuously engages with international organisations (e.g. WOAH, FAO) for training related to EPR, TADs, disease control measures, epidemiology, laboratory and the development of trainers through Training of Trainers (TOT) courses. The National FMD laboratory, as part of regional veterinary diagnostic laboratories, participates in training (including hands-on) with other national and reference laboratories to improve competencies and enhance diagnostic methods.

Awareness campaign

Awareness campaign on FMD is conducted regularly through various channels, namely television shows with daily schedules and social media (YouTube, Facebook, Instagram, Twitter). In addition to regular engagement with the Malaysian Livestock Association and farmers, all state DVS conduct seminars and dialogue locally. For the FMD-free zone, the DVS Sabah and Sarawak have intensified awareness campaigns throughout the states, particularly at the identified high-risk divisions and regions following the FMD incursion into Southern Borneo Island.

Other initiative

As part of the initiative to increase FMD vaccination coverage for P. Malaysia, DVS, through the Ministry of Agriculture and Food Security, has acquired additional funding in Malaysia Plan 2021-2025. In addition, DVS, through a re-organisation program, is strengthening the field of veterinary services. Furthermore, DVS participate actively in various activities organised by international and national bodies.

Challenges

The main challenges identified are low vaccination coverage due to not having enough funding to procure good quality vaccines that is expensive. Other than exorbitant cost of FMD vaccines, DVS also faces with shortage of workforce to conduct FMD prevention and control activities.

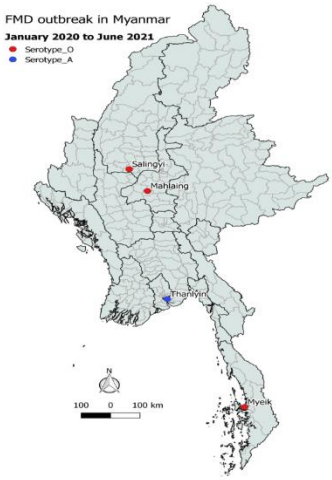
Way forward

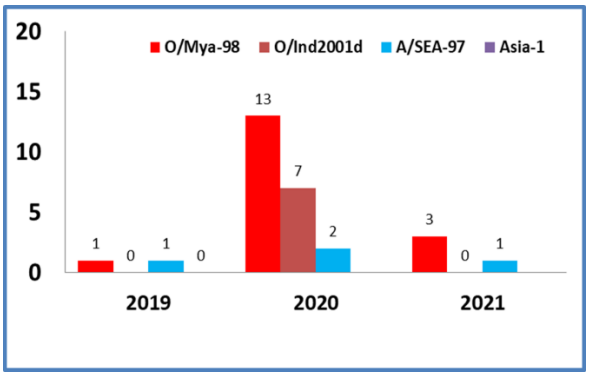
Malaysia is persevering the FMD control and eradication effort through strengthening of Vaccination, surveillance and awareness campaign in the FMD endemic area and particularly in identified FMD control zone in Johor and Langkawi, Kedah. In addition, Malaysia encourage participation of the private sectors through Public, Private Partnership program. Malaysia will also continue to actively participate in SEACFMD campaign under the guidance of successive SEAFMD roadmaps.

Myanmar

FMD situation in 2023

- Four FMD outbreaks reported from January 2021 to December 2021, of which three outbreaks were due to O Serotype and one outbreak was due to A Serotype.
- No report of FMD during 2022 to July 2023.
- Currently Myanmar is in FMD-PCP Stage- 2; and aims to reach PCP Stage 3 in December 2025.

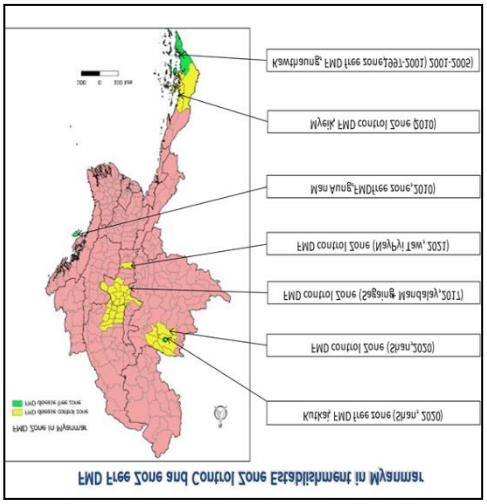




Key FMD Prevention and control strategies

Key Strategies

- ✓ Addressing FMD at source,
- ✓ Establishing and expanding zones with reduced FMD incidence, and
- ✓ Protecting and maintaining areas which are FMD free.



Strategic Activities

- ✓ Vaccination
- ✓ Surveillance
- ✓ Reporting and Rapid Response
- ✓ Awareness and Education
- ✓ Biosecurity
- ✓ Movement Control
- ✓ Traceability by animal identification
- ✓ Zoning

Technical activities

- ✓ Identification of and immediate response to foci of FMD infection,
- ✓ Elimination of the source of FMD,
- ✓ Prevention of spread of FMD, and
- ✓ Protection of susceptible hosts

Communication and advocacy activities

- ✓ Increased cooperation in FMD prevention and control,
- ✓ Improved capacity of the veterinary services in behavior change communication and advocacy,
- ✓ Creating awareness and securing the support of veterinary services, donors, NGOs and other development partners

Coordination mechanism

- ✓ National and Sub-National levels
- ✓ Regional and international levels
- ✓ Monitoring and evaluation

FMD vaccination campaign

Sl. No.	Type of vaccine	Doses	Animal	Region
1	Trivalent (O, A Asia-I)	5,298	Cattle, Buffalo, Sheep, Goat, Pig	Kutkai FMD protection Zone
2	Trivalent (O, A, Asia-I)	28199	Cattle, Buffalo, Sheep, Goat, Pig	Biosafety Channel
3	Monovalent (O)	132,090	Cattle, Buffalo, Sheep, Goat, Pig	FMD Control Zone (kutkai)
4	Monovalent (O)	103021	Cattle, Buffalo, Sheep, Goat, Pig	FMD control Zone (NPT)
5	Monovalent (0)	62274	Cattle, Buffalo, Sheep, Goat, Pig	FMD cntrol Zone (Meikhtilar)
6	Monovalent (O)	3,283	Cattle, Buffalo, Sheep, Goat, Pig	FMD control zone (Bago)
	Total	334,165	Cattle, Buffalo, Sheep, Goat, Pig	

FMD Sero-surveillance

Year	State/ Region	Township	Species	Sample type	No. surveillance	No. of sample	NSP antibody for O
2021	7	53	cattle, buffalo	Serum	10	5000	30-40%
2022	6	67	cattle, buffalo	Serum	67	7329	40.37%
2023	5	14	cattle, buffalo	Serum	16	1413	5.87%

Main responses implemented to rapidly control FMD outbreak

- ✓ Quarantine of the suspect premises,
- ✓ Sample submission to the laboratory
- ✓ Outbreak area officially defined to strictly control animal movement (Zoning)
- ✓ Animal check point set up
- ✓ Ring vaccination
- ✓ Outbreak investigation
- ✓ Cleaning and disinfection
- ✓ Communication Awareness and education
- ✓ Surveillance

Animal movement Control and Traceability

- ➢ Bilateral agreement between Myanmar and China for "Protocol for quarantine health requirement s for slaughter bovine to be exported from the Union of Myanmar to PR China" on 18-1-2020.
- ➢ Animal movement was controlled by animal Identification
- ✓ Microchip ear tag

Governance and legislations

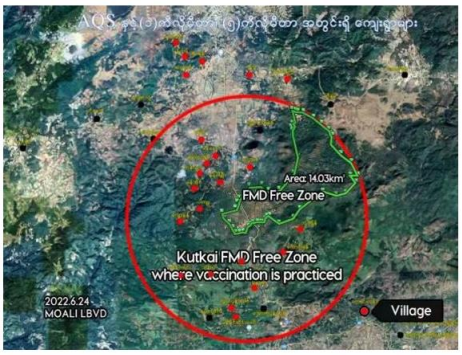
- ✓ Animal Health and Livestock Development Law as issued as 13/2020.

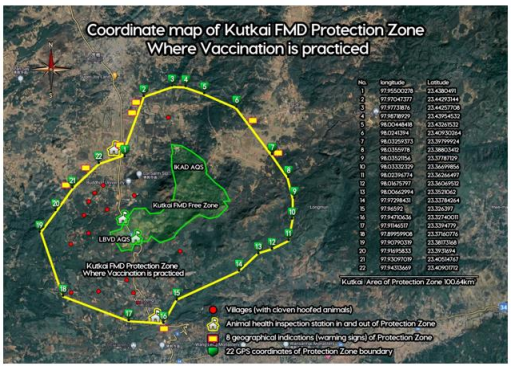
National FMD Prevention and control Plan

- ✓ Myanmar is going to implementing Zooning approach in FMD control particularly in trade-based areas as Phase I.
- ✓ National FMD control plan (including RBSP), was aligned with SEACFMD 2021 road map and in line with Global FMD Control Strategy.
- ✓ FMD Plan endorsed by minister for Ministry of Agriculture, Livestock and Irrigation with a budget allocation is under submission.

FMD control using zoning approach

- ✓ On Dated(14-7-2023) The General Administration of Custom China and Ministry of Agriculture and Rural Affair (MARA) officially announced acceptance of FMD free Zone on Myanmar (cross border trade)





Official acceptance of FMD Free Zone (Kulkai)

Main challenges and recommended solution

Challenges	Solution
Sustainable funding	PPP (private participation), Advocate to union minister
shortage in human resources	Participation of private vet and all sectors
Routine vaccination	Participating Community Animal Health Worker CAHW, PPP
Lack of international partner for FMD control	Seeking international partners JICA Project
Availably of vaccine to achieve targeted coverage	Limited in-country production (300,000) dose/year JICA Project
Reluctance of Farmer to use animal Identification	Insurance system linked with animal Identification system will be conducted. Official Trade and market access (Official recognition of FMD free zone)
Maintained of FMD Free Zone , Control Zone (progressive Zoning)	Mutual recognition, Mekong-Lancang Cooperation project

Way Forward – Future activities

- ✓ Progressive Zoning and Safer Trade
  - ➢ Establishing Disease Free Zooning, Control Zone with vaccination practice in trade-based areas.
  - ➢ Mutual recognition of DFZ, AQS with GACC (PR China)
- ✓ Communication
  - ➢ Using IT application (e.g Viber application, facebook,),
  - ➢ RRT was set up including central, state/region, district, township, reporting
- ✓ Vaccine
  - ➢ 1 million doses vaccine plant will be encouraged to be completed (JICA Project)
  - ➢ Vaccine procurement, FMD virus typing, molecular technology support from WOAH
- ✓ Surveillance
  - ➢ Active and passive surveillance, Post Vaccination Monitoring, outbreak investigation
- ✓ Traceability
  - ➢ movement control upgrading microchip ear tagging for official trade and border trade
- ✓ Laboratory
  - ➢ Capacity building, technical support from WOAH or any donor collaboration

Philippines

Preparedness activities to maintain FMD-free status

The country needs to be continuously on guard to keep its status of being FMD free without vaccination. The core components of our prevention program include surveillance, animal movement management, and biosecurity.

Surveillance

Our current risk-based surveillance system ensures greater sensitivity in detecting suspect cases and at the same time maximizes resources. With the new system, provinces identified as low risk are exempted from sample collection; those with medium risk are required to submit samples once a year; while those with high risk shall continue with the bi-annual submission. As of 16 August 2023, a total of 1,298 samples (448 swine, 525 large ruminants, 325 small ruminants) have been submitted to the National FMD Laboratory at the Bureau of Animal Industry and all have tested negative to NSP ELISA.

With the FMD incursion in Indonesia, we shall be beefing up our surveillance activities in Mindanao because of its proximity to our neighboring countries with FMD. Balut island in Sarangani has been specially identified to be with high level of risk because of the ease of access and frequency of trips to the island from Indonesia. FMD Refresher Course for frontliners, Quarantine Seminar, and surveillance activities will be conducted in Balut Island by September.

Animal movement management

The Animal Movement Management entails regulation of both domestic and international livestock transport and trade. Importation of live animals from FMD infected countries remains to be banned. The Bureau of Animal Industry (BAI) has created a Risk Analysis (RA) Unit to support, among others, trade issues of live animals and their products and by-products as well as animal health interventions for disease control and prevention. It is chaired by the Chief of the BAI National Veterinary Quarantine Division. Among its functions include the preparation and conduct of risk assessments related to importation or movement of animals, its products and by-products; assessment of the level of risks on proposed animal health interventions; and identification and assessment of the options that would reduce livestock diseases and associated health risks.

Strengthening of border control measures is deemed to be very crucial and include inspection at airports and seaports, inspection of hand-carried meat products, confiscation of goods without SPS Import Clearance and establishment of checkpoints in strategic regional boundaries (133 in all).

Biosecurity measures

Among the biosecurity measures carried out are the installation of foot mats in airports and disinfection of vehicles at checkpoints. Some of them already have semi-automatic wall mounted disinfection system. In one of our major ports in Manila, enzyme treatment processing of seized meat is being done. Compliance with biosecurity measures is one of the requirements of BAI farm registrations. There is a biosecurity checklist with corresponding scores with a set passing level. A farm will not be registered unless they meet the minimum biosecurity standards.

Preparedness and Contingency Planning

FMD Preparedness

The country has an emergency preparedness plan handbook. It contains protocols and modules. The **protocols** provide guidelines to FMD Program implementers and Frontliners in the event of FMD incursion while the **modules** are aimed to sustain the awareness and review the technical knowhow of the local and regional field on the prevention, control and management of FMD.

Due to the FMD outbreak in Indonesia, Mindanao has been placed under red alert. We have been in collaboration with the Food and Agriculture Organization's ECTAD program in the conduct of a table top simulation exercise, retooling of FMD frontliners, and meeting with the FMD regional and provincial coordinators in Mindanao by the last quarter of this year. We are currently updating our FMD coordinators directory for the preparation and distribution of the FMD Information cards to all the FMD frontliners.

Contingency Planning

As part of the country's contingency planning, the BAI Veterinary Technical Advisory Committee has been in coordination with a vaccine manufacturer which offers the services of a vaccine bank and antigen bank. Since we cannot precisely predict which strains will become the main cause of the outbreak in the future, it was suggested that we can choose specific strains which can provide the broad cross protection to many regional circulating strains.

WOAH PVS Mission and other tools

There is an ongoing WOAH Evaluation of the Performance of Veterinary Services in the Philippines. The entry meeting was on 14 August 2023 and the closing meeting will be on the 25th. The last PVS Evaluation Follow-Up Mission was on November to December 2016, then in June 2019, there was a Pilot Mission on Legislation related to Antimicrobial Usage and AMR.

Challenges in FMD Control and Recommended Solutions

- ✓ Overdue review and revision of the FMD EPP in order to equip, strengthen capacities and level of preparedness of the veterinary workforce in order to adequately respond to inadvertent FMD incursion → A BAI technical working group has been created to organize consultation meetings with relevant stakeholders and conduct focus group review and discussions on the components of the FMD EPP.
- ✓ FMD surveillance activities are sidelined by efforts towards ASF and AI control → Implementation of synergies between FMD and other Animal Health Programs to maximize resources
- ✓ Logistical problem in the submission of samples to the National FMD laboratory → Coordination with the BAI Regional and NAIA Veterinary Quarantine Officers
- ✓ Most of the new and young field personnel are no longer familiar with FMD → Orientation and re-tooling on disease recognition and diagnosis
- ✓ Unhampered smuggling of meat and meat products → Strengthened border control measures and establishment of Cold Examination Facility in Agriculture (CEFA) which will house state-of-the-art laboratories for the examination of all imported agricultural commodities.

Way Forward from August 2023 till December 2024

- ✓ Preparation and submission of letter-request for funding to the Department of Budget for FMD emergency vaccination
- ✓ Review and Revision of the FMD Emergency Preparedness Plan
- ✓ Updating of the List of Regional and Provincial FMD Coordinators for distribution of the FMD Information cards
- ✓ Orientation and re-tooling of field personnel nationwide on disease recognition and diagnosis
- ✓ Strengthening of surveillance activities in Mindanao
- ✓ Conduct of Table Top Simulation Exercises
- ✓ Conduct of risk assessment for future incursions of exotic FMDVs
- ✓ Construction of the first Cold Examination Facility in Agriculture (CEFA)

Singapore

Background:

Singapore is recognised by the WOAH as a FMD free country where vaccination is not practiced. There has been no outbreak and evidence of FMD in Singapore since 1935. No vaccination against FMD has been carried out and no vaccinated animal has been imported into Singapore in the last 12 months.

Singapore has a very small ruminant population. There are 105 heads of cattle (all age groups) and 1070 heads of goats (all age groups) across 3 farms in Singapore, as of June 2023. These ruminant farms are all dairy farms licensed by the Singapore Food Agency (SFA). Ruminants are also present in a zoological centre in Singapore. The zoological centre is officially designated as quarantine premises and is under the supervision of licensed veterinarians.

Prevention activities to maintain FMD free status:

Compulsory reporting of FMD cases

All ruminant farms in Singapore are under direct monitoring and surveillance by SFA. FMD is gazetted as a notifiable disease under the Animals and Birds Act (CAP 7). Under the Act, any person in custody of animals who suspects FMD is obliged to report the case to the National Parks Board (NParks). Any person who fails to report FMD can be subject to prosecution and liable to a fine and imprisonment upon conviction.

FMD surveillance

The main target population for FMD surveillance is the animals at the ruminant farms in Singapore. All the ruminant farms are inspected monthly by SFA officers for clinical signs of ill-health, and farms will be advised to seek further veterinary attention if needed. Serological samples are also collected annually for laboratory testing, alongside clinical surveillance by trained veterinarians to assess for characteristic clinical signs of FMD.

Sera from the blood samples collected are tested for antibodies to FMD NSP b cELISA at the Centre of Animal and Veterinary Sciences (CAVS) under NParks. All samples collected so far have tested with negative results.

NParks also has a surveillance programme in place to detect FMD in local wild boars. Wild boars (found dead or euthanized as part of population control) are tested for exposure to the FMD virus. To date, exposure to FMD virus has not been detected in wild boars in Singapore. Unusual mortality or disease observed in any wild animals would be investigated.

19 blood samples of wild boar were collected for laboratory testing in 2022. Sera were tested for antibodies to FMD NSP by cELISA. All samples were tested with negative results.

Import controls

The importation of animals and animal products is governed by the Animals and Birds Act (CAP 7). Under this Act, importers are required to obtain a licence prior to commencement of import. An import licence is also required for each consignment of animals or animal products (including animal feeding stuffs) being imported. Penalties including fines and imprisonment can be imposed in cases of importation without a licence.

NParks and SFA regulate the import of animals and animal products for non-food and food-producing animals respectively. NParks and SFA will only issue an import licence if the animals or animal products meet import requirements, and have the required health and disease freedom certifications. NParks and SFA do not allow the import and transhipment of meat and animals from sources that are not FMD-free or if they do not meet the risk mitigation measures, such as heat treatment. Singapore has regionalisation & compartmentalisation arrangements with countries that import/export animals and animal products to Singapore. This approach minimises disruption to trade in the event of animal disease outbreaks. In addition, animal products must be certified to not contain any infectious or contagious agent, including FMD virus.

The import of zoological animals is regulated by AVS through an assessment of foreign establishments housing zoological collections, before allowing the import of such animals from these establishments into Singapore. With regards to FMD, NParks requires the exporting zoological establishment to be accredited by NParks, and free from FMD before the import of animals into Singapore is allowed. In addition, animals are subject to conditions such as pre-export isolation and no contact with other animals during travel to mitigate any risk of exposure to FMD.

Control measures at entry points

Singapore is an island State. It is geographically segregated from Malaysia by the Straits of Johor. Routes of entry into Singapore are restricted to the seaport, airport and two road links to Malaysia. Live animals and animal product consignments entering Singapore are subject to control by the Immigration and Checkpoints Authority (ICA) and NParks at the point of entry into Singapore. ICA operates these entry ports round the clock. NParks and ICA officers will check and verify that the accompanying import documents such as import licences and veterinary health certificates are in order before releasing the consignment into Singapore's territory.

In addition, NParks inspects all live animal imports at the border checkpoints. NParks further undertakes random checks over and above ICA's control at the entry points. NParks has in place standard operating procedures with ICA to deal with illegal import of commodities under the purview of NParks. The procedures involve detention of suspect consignments and notification of NParks and SFA officers to investigate cases in detention.

Sources of meat and meat products

SFA has an accreditation system for meat and meat products imports, whereby only countries and establishments, which have been pre-accredited by SFA, may export meat and meat products to Singapore. The accreditation process includes approving the country first, based on assessment of animal health and veterinary public health systems, followed by accreditation of the establishment based on documentary evaluation and on-site inspections. One of the elements considered for accreditation is the country's FMD status. For pork, imports are allowed only from establishments in FMD-free countries or zones (with and without vaccination). For beef, only establishments in FMD-free countries or zones (with and without vaccination) are able to export bone-in meat and offal products to Singapore. Import of boneless beef is allowed from establishments in FMD-infected countries/zones with official control programme. Import of beef and pork products from non-FMD-free countries or zones is possible only if these products have been subjected to procedures to inactivate the FMD virus according to WOAH guidelines.

Preparedness and Contingency Planning

Legislation for FMD control

Under the Animals and Birds Act (CAP 7), NParks is given legislative mandate to put in place regulatory measures for the early detection, prevention and control of FMD in Singapore. The Act provides powers to carry out investigation, surveillance, vaccination and destruction of animals where necessary in the event of an animal disease outbreak. FMD is gazetted as a notifiable disease under the Animals and Birds Act (CAP 7). Under the Act, any person in custody of animals who suspects FMD is obliged to report the case to NParks. Details of the Animals and Birds Act (CAP 7) are available at NParks' website at www.nparks.gov.sg/avs/resources/legislation.

Laboratory capabilities for FMD

The FMD test capabilities at CAVS are as follows:

- ✓ Real-time RT-PCR (pan-FMDV) (for detection & identification)
- ✓ Real-time RT-PCR (FMDV 'O') (for detection & identification)
- ✓ NSP cELISA (for serological screening)
- ✓ Solid-Phase Competitive ELISA, Serotype O (for typing)
- ✓ Solid-Phase Competitive ELISA, Serotype A (for typing)
- ✓ Solid-Phase Competitive ELISA, Serotype Asia 1 (for typing)
- ✓ Antigen Detection ELISA and Serotyping for O, A, C, Asia1, SAT1 and SAT2

Measures to control FMD outbreaks

NParks has a structured emergency response system in place to deal with animal disease incidents such as FMD outbreaks. This emergency system will employ strategies encompassing the following: upon confirmation/suspicion of FMD infection, there will be issuance of an immediate isolation order on the suspected premises; initiation of an immediate standstill of movement of vehicles, livestock/ungulates, in-contact material, personnel and dairy and meat products in related farms and premises; field and laboratory investigation and assessment of the situation to determine extent of the outbreak. The system also involves a command structure that includes the relevant government agencies and industry stakeholders. If FMD is confirmed, stamping out will be carried out for affected livestock (i.e. food animals), with a mix of culling and vaccination activities for zoological animals. Animal species with high conservation value (e.g. elephants) will likely be vaccinated, provided that a suitable vaccine in relation to the prevailing serotype is available. Species of less conservation value may be culled to reduce the risk of disease spread within the zoo premises. Aside from culling and vaccination, ground operations for the FMD contingency plan will largely involve disposal of carcasses and related in-contact material by incineration; and thorough cleaning and decontaminating of the premises and all related equipment and vehicles.

A Table-Top Exercise for a disease related to FMD (through similar risk pathways), African Swine Fever (ASF) ("Ex Sus"), was conducted in July 2021 (see *Figure 1*). The main recommendations arising from the After-Action Review include refining operational plans and SOPs, conducting follow-up simulation exercises with industry stakeholders and improving inter-agency collaboration.

Figure 1: ASF TTX Ex Sus, 5 July 2021

Challenges in FMD control and recommended solution to address these challenges

Outbreaks of emerging diseases (including ASF) and disruption to global supply chains (arising from pandemics, etc.), are a potential risk to Singapore's food security and animal health. NParks, together with SFA, will continue to explore establishing more bilateral zoning and compartmentalization arrangements for beef and meat products which continually meet WOAH standards for safe trade an enhance food security.

As Singapore is free from FMD, there is a constant need to ensure that contingency plans and its concept of operations are fit-for-purpose. Operational teams (e.g. wildlife, park officers) and outbreak investigation teams should undergo regular training to recognize suspect clinical signs, epidemiology and outbreak investigation protocols associated with FMD. NParks will conduct follow-up simulation exercises with industry stakeholders and improve inter-agency collaboration to enhance disease preparedness. Regular capability-building activities (e.g. training workshops and programmes) will be conducted for staff.

Way Forward – Future activities

In light of the recent ASF outbreak in Singapore, NParks has carried out the following activities in 2022/2023 and will continue to refine them:

- ✓ Review & update contingency plans for animal diseases (including TADs related to FMD)
- ✓ Conduct follow-up simulation exercises with other government agencies and industry stakeholders

- ✓ Review of national legislation related to the control of FMD and other animal diseases

Singapore seeks the WOAH's support on reviewing our animal health and veterinary legislation to combat animal diseases and zoonoses, as well as emergency preparedness and peacetime vaccination policies (e.g. in the event FMD outbreaks occur in zoological collections).

Singapore is committed to participating actively and supporting the WOAH SRRSEA's initiatives and activities that are implemented as per the M&E framework for the SEACFMD Roadmap 2021-2025.

Thailand

FMD Situation in 2022

Temporal distribution:

In 2022, the situation of foot and mouth disease in Thailand exhibited a specific temporal pattern. Analysis of the timeline revealed that the outbreak initially emerged in August and reached its highest point in October. Notably, July had the lowest incidence of reported cases, with no reports of the disease during that month.

Spatial distribution:

Regarding the spatial distribution analysis in 2022, FMD was identified that the outbreak was most prevalent in Nakhon Ratchasima and Prachuap Khiri Khan, which are recognized as dairy cattle regions. Numerous provinces across the country reported instances of foot and mouth disease. No reports of FMD were found in the eastern region. Additionally, provinces on the eastern side of the country exhibited a comparatively lower number of reported FMD cases.

Serotype distribution:

In the context of the foot and mouth disease situation in Thailand during 2022, an analysis of the serotypes revealed the following distribution among 110 outbreaks: 74 were identified as serotype O, 13 as serotype A, 19 were untyped, and 4 lacked samples for analysis. The prevalence of serotype O was more pronounced in the lower southern regions, while it was present across various locations nationwide. Serotype A was predominantly detected in the western region, but occurrences were also observed in the northern, northeastern, and upper southern parts of the country.

Number/ species of animals affected:

There were three species affected which are dairy cattle, beef cattle and buffalo. There were no reports concerning sheep, goats, and pigs. The cumulative cases observed were as follows: 3358 cases in dairy cattle, 640 cases in beef cattle, and 68 cases in buffalo. Among these, the cumulative fatalities were recorded at 90 for dairy cattle, 20 for beef cattle, and 0 for buffalo. The median values for morbidity and mortality within affected herds were 30.8 and 0.0, respectively.

FMD situation in 2023:

The foot and mouth disease situation in Thailand for the year 2023 (up to July 2023) has seen the emergence of 6 outbreaks in beef cattle, mainly concentrated in the southern region, with one isolated incident in the northern part of the country. Additionally, 4 outbreaks have been reported among dairy cattle, occurring in areas not far from the locations identified in 2022. Notably, all diagnosed serotypes in these outbreaks have been identified as serotype O.

FMD Prevention and control activities

Efforts to prevent and control foot and mouth disease (FMD) in Thailand encompass a range of strategic activities.

Improvement of Farm Biosecurity:

One key measure involves enhancing farm biosecurity practices, ensuring better disease prevention at the farm level. This is facilitated by the Animal Epidemics Act, B.E. 2558 (2015), particularly under Section 7 which establishes a comprehensive general biosecurity framework. To further fortify biosecurity, the implementation of both Good Farming Management (GFM) and Good Agricultural Practices (GAP) is paramount. These certifications, administered by DLD, address farm biosecurity standards and protocols. Additionally, commercial farms can opt to integrate the FMD-Free farms approach into their GFM/GAP practices. Such an integration necessitates adherence to stringent biosecurity protocols, and farms are granted a 1-year accreditation if their herds remain negative for NSP (Non-Structural Protein) for the specified period.

Immunization/ Vaccination:

Efforts to prevent and control foot and mouth disease (FMD) in Thailand involve a strategic approach that includes immunization. A comprehensive vaccination campaign has been established, consisting of 3 rounds for dairy cattle and 2 rounds for beef cattle including sheep and goat. Notably, the first round of vaccinations commences in October, which marks the onset of the fiscal year. This adjustment is a proactive measure aimed at enhancing the overall herd immunity levels, building upon lessons learned from previous practices. The pig vaccine is currently presented as a discretionary option for individual farms. However, there is a concerted effort to encourage vaccination through the criteria outlined in the GAP farm certification process. Farmers have the choice to either purchase commercial vaccines or opt for the DLD vaccine, which is offered at a more affordable rate due to government subsidies.

Outbreak Response:

In Thailand, the approach to foot and mouth disease (FMD) prevention and control extends to outbreak response strategies. Legal measures are enforced through the Animal Epidemics Act, B.E. 2558 (2015), which designates FMD as a notifiable disease. In the event of an outbreak, a temporary epidemic zone is declared, limited to a 5 km radius within the province, and this announcement is made by the local veterinary authority. The response at the outbreak point involves sample collection, quarantine, and treatment of affected animals. Comprehensive trace-back and trace-forward activities are undertaken to establish the origin and potential spread of the disease. Rigorous biosecurity measures are put in place, including clinical surveillance within a 10 km radius, both passively and actively, with a focus on raising awareness. Additional actions entail disinfection of high-risk areas, enhancing farm biosecurity, issuing warnings, and fostering collaboration among livestock networks and cooperatives. Within the 5 km radius zone, a ring vaccination strategy is employed, coupled with animal movement restrictions. Furthermore, animal movement is closely controlled through checkpoints that include disinfection measures.

Constraints and Solution

Challenges in the FMD prevention and control efforts in Thailand encompass:

- ✓ Limited adherence to robust biosecurity measures among small-scale holders.
- ✓ Illegal animal movements that undermine containment measures.
- ✓ Inadequate manpower resources to effectively manage and implement control strategies.

Proposed resolutions for enhancing FMD prevention and control efforts in Thailand include:

- ✓ Offering heightened incentives to motivate farmers to elevate their farm biosecurity practices, transitioning from foundational GFM to more advanced GAP standards.
- ✓ Reinforcing border control by fostering robust cooperation with pertinent agencies, bolstering vigilance.
- ✓ Cultivating a robust partnership with the private sector, engaging their firm dedication in vaccination campaigns and disease surveillance initiatives.

Vietnam

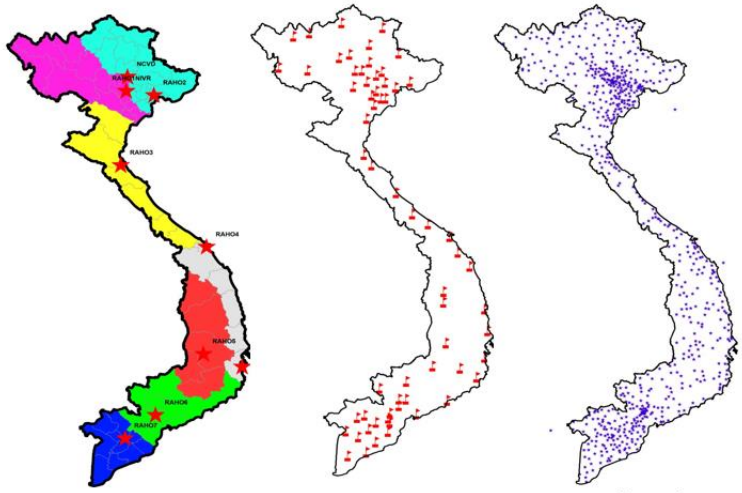
Vietnam Animal Health System

Department of Animal Health (DAH)

Divisions of DAH

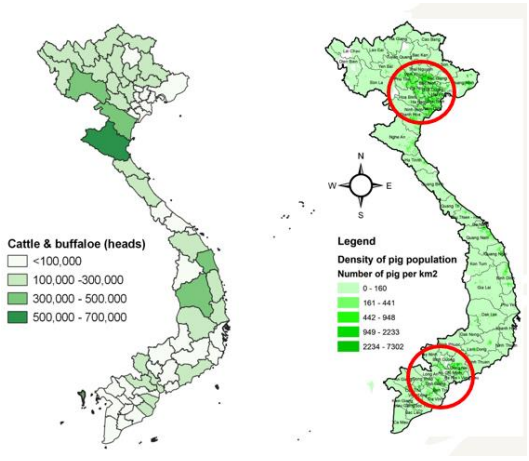
Institutions of DAH

- ✓ Regional Animal Health Office No. 1 to 7
- ✓ Regional Sub-departments of Animal Quarantine and Inspection: Quang Ninh, Lang Son, Lao Cai
- ✓ National Center for Veterinary Diagnosis
- ✓ National Center for Vet. Drug and vaccine Quality Control No. I, II
- ✓ National Center for Vet. Hygiene Inspection No. I, II



Livestock population

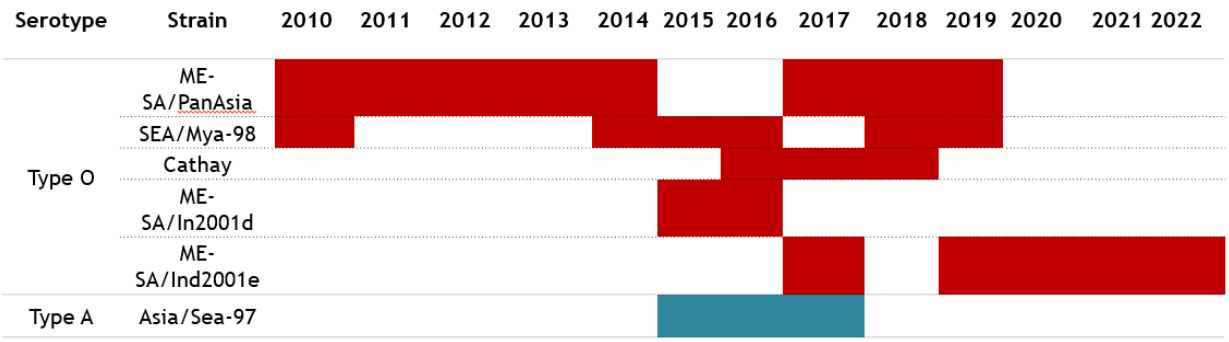
- ✓ Pig population (Jan 2023): ~ 24.6 million (before ASF introduction Feb 2019: > 30 million)
- ✓ Ruminant animals population (Jan 2023):
  - Cattle: ~6.3 million
  - Dairy cattle: ~325 thousand,
  - Buffalo: ~2.2 million
  - Goats and sheep: ~2.9 million



FMD situation in Vietnam

- FMD is an endemic diseases in cattle, buffalo and pigs in Viet Nam
- FMD caused much damage to livestock every year, especially before covid pandemic
- Recently, FMD outbreaks were reduced due to good vaccination strategies and movement control

Temporal distribution of FMDV in Vietnam between 2010 - 2022



Serotype O:

2018-2019, FMD situation in Vietnam was complicated by cocirculation of multiple FMDV strains: Ind2001e, Mya-98, PanAsia and Cathay

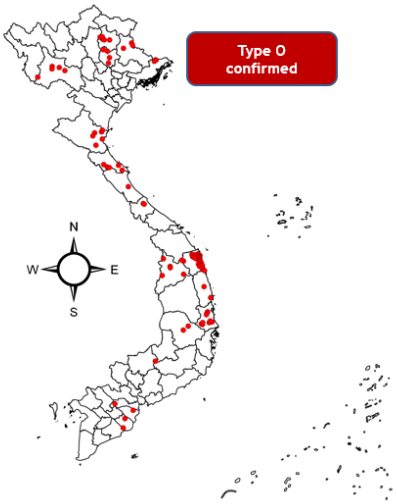
Since 2020 until now, only Ind2001e found in FMD outbreaks.

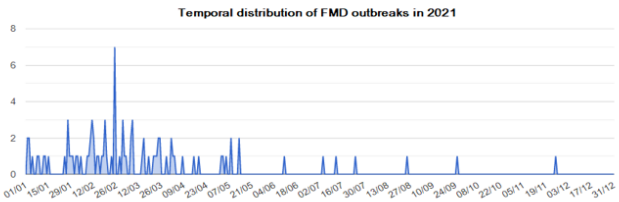
Serotype A:

first detected in 1997, only strain A/ASIA/Sea-97 had circulated sporadically and mainly in the north of Vietnam and the last outbreaks occurred in 2017.

No FMD type A outbreak has been detected and reported throughout Vietnam since 2018

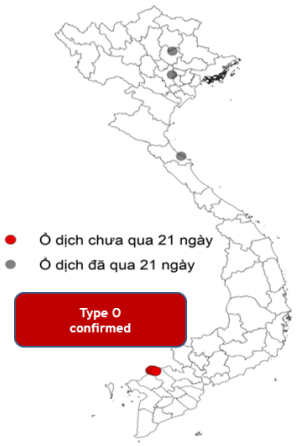
FMDV serotype O in 2021





No. Outbreaks	89 *(type O detect only)*
No. Province	17
Species affected (total animal :3407)	- Cattle: 2804 - Buffalo: 376 - Pig: 182 - Goat: 45

FMDV serotype O in 2022



No. Outbreaks:	17 *(type O detect only)*
No. Province:	9
Species affected	Cattle only: 1.288

ELISA typing testing & Sequencing confirmed
FMDV type O (collected in 2022): ME-SA/Ind-2001e

Viet Nam enhances use high potency FMD vaccine (>6PD$_{50}$) on cattle, pigs for livestock farms

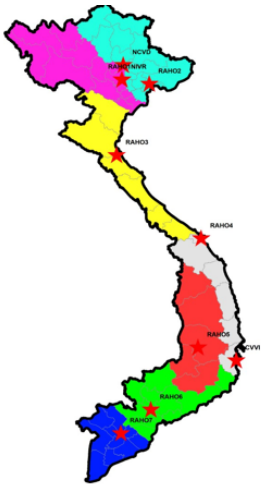
Laboratory capacity

FMD testing Methods

Testing	Method	Reference/manual
Virus antigen detection	ELISA detecting and typing FMDV	WRL-Pirbright
	Realtime RT-PCR	Manual of Diagnostic Tests and Vaccines for Terrestrial Animals OIE
	Isolation virus on BHK-21, ZZR, LFBK cell line	Manual of Diagnostic Tests and Vaccines for Terrestrial Animals OIE
Antibodies detection	Liquid phase blocking type O, A and Asia1	WRL-Pirbright
	Non-Structure protein (3ABC)	PrioCHECK FMDV NS-ELISA (Prionics commercial kit)
	Virus neutralization test (VNT)	Manual of Diagnostic Tests and Vaccines for Terrestrial Animals OIE

FMD diagnostic in DAH's key Laboratories

FMD Testing	DAH's key laboratories							
	NCVD	RAHO 1	RAHO 2	RAHO 3	RAHO 4	RAHO 5	RAHO 6	RAHO 7
ELISA typing	yes		yes	yes			yes	
ELISA serology	yes	yes	yes	yes	yes	yes	yes	yes
Isolation virus	yes						yes	
Realtime RT PCR (gene detection)	yes		yes	yes		yes	yes	yes
VP1 sequencing	yes		yes				yes	



7 Regional Animal Health Office (RAHO)

FMD Prevention and Control Strategies

Key changes/highlights of the implementation of FMD Prevention and Control activities

- ✓ Implemented the "National program for FMD prevention and control for the period 2021-2025“ approved by the Prime Minister (Decision No. 1632/QD-TTg dated October 22, 2020)
- ✓ Post vaccination monitoring from sera samples of cattle & buffaloes with protective antibody titers accounting for 87%.
- ✓ Distributed 95,000 leaflets & 8,000 handbooks on FMD prevention and control to all 63 provinces.
- ✓ Using online reporting platform (VAHIS)

FMDV & vaccine matching 2020-2021

Virus identification: Analysis of representative samples sent to WOAH Reference Labs for sequencing and vaccine matching

- FMD viruses in Viet Nam belong to 3 topotype (strains) of type O: O/ME-SA/Pan Asia; O/SEA/Mya-98 and O/ME-SA/Ind2001e. In which, strain O/Ind2001e accounted for the majority (no strains O/Ind2001d and O/Cathay have appeared since 2018).
- The vaccine antigens currently in use are homologous to the field strains of FMDV type O in recent years.

Vaccine matching:

- Strong antigenic relationship between field isolates and vaccine strains (O3039, O1manisa, O/Tur/5/09; O1campos, O135).
- Post-vaccination: High antibody response tested by VNT, ELISA in laboratory.
- The vaccine matching results (R1 value >0.3) showed that vaccine O3039, O Manisa, O TUR/5/09, O1 Campos still matching with virus strains Ind2001e in Viet Nam

Isolate	Serotype O		O 3039 Boehringer Ingelheim		**O Manisa** Boehringer Ingelheim		**O/TUR/5/09** MSD		**O_1 Campos** Biogénesis Bagó	
	Topotype	*Lineage*	*r1*	*Titre*	*r1*	*Titre*	*r1*	*Titre*	*r1*	*Titre*
VIT/47/2018	SEA	Mya-98	0.34	1.48	0.14	1.67	0.3	1.78	0.49	2.37
VIT/21/2020	ME-SA	Ind-2001	0.59	1.79	0.30	2.06	0.54	2.12	0.38	2.42
VIT/24/2020	ME-SA	Ind-2001	0.39	1.61	0.20	1.89	0.42	2.01	0.37	2.41
VIT/1/2021	ME-SA	Ind-2001	0.38	1.53	0.29	0.98	0.72	2.16	0.45	2.33

Ind2001e is the most common FMDV strain in Viet Nam

Available FMD vaccines in Vietnam

- 19 FMD vaccines licensed in Vietnam including domestic products as well as imported from other countries (Argentina, England, France, Russia and China).
- Some common vaccines are listed below:

TT	Vaccine	Company	Strain	Serotype
1	Avac-V6 FMD Emulsion	AVAC (Vietnam)	RAHO6/FMD/O-135 (PanAsia)	O
2	Aftovax mono O	BOEHRINGER INGELHEIM	O Manisa và O 3039	O
3	Aftovax Bivalent	BOEHRINGER INGELHEIM	O (O Manisa và O 3039), A (A22 Iraq, A May 97)	O, A
4	Aftovax	BOEHRINGER INGELHEIM	O (O Manisa và O 3039), A (A22 Iraq, A May 97), Asia 1 (Asia 1 Shamir)	O, A, Asia
5	Aftogen OLEO	BIOGENESIS BAGO	O1 Campos	O
6	Bioaftogen	BIOGENESIS BAGO	O1 Campos; A24 Cruzeiro; A2001 Argentina	O, A

Vaccine(s) and FMD field viruses are homogenous and the vaccine(s) with 6PD50 can provide good protection

Key activities planned in 2022 – 2030 period:

- ✓ Implement the "National program for FMD prevention and control for the period 2021-2025"
- ✓ Establish FMD free-zone & farms
- ✓ Prevention of new FMDV introduction
- ✓ Early detection and rapid outbreak response
- ✓ Animal movement control
- ✓ Stamping out policy, especially for pigs
- ✓ Compensation
- ✓ Cleaning and disinfection
- ✓ Vaccination
- ✓ Communication

Main challenges

- ✓ High percentage of small-scale farms
- ✓ Free grazing practice
- ✓ Control animal movement between provinces and across border
- ✓ Deal with infected animals
- ✓ Vaccination programme: Vaccines supply and cost of vaccines
- ✓ Post vaccination monitoring
- ✓ Surveillance system
- ✓ Awareness of livestock owners and local authorities

Conclusion

- ✓ Ind2001e is the main FMDV strain circulating in Viet Nam
- ✓ Current registered vaccines are effective to protect livestock from FMD
- ✓ Vaccine monitoring and genetic analysis need to continue to make sure the vaccine effectiveness and detect the occurrence of new virus strains
- ✓ Free diseases zone, compartmentalization need to be expanded and combined with good movement control to eliminate the disease step by step.

Annex IV: Note related to the access to quality FMD vaccines and FMD vaccine/antigen banks

Background

The 25th SEACFMD National Coordinators Meeting held in Bali, Indonesia from 3 to 5 October, made the following recommendations related to the access to FMD quality Vaccines.

- *"to explore possibility of setting up of vaccine / antigen bank for the region[1], to address difficulties in obtaining quality vaccines in the face of emergencies due to supply, regulatory and distributor contractual issues"*
- *"to promote access to quality FMD vaccines through awareness of the policy makers, streamlining the registration and procurement process and encourage the use of a vaccine compliant with the Chapter 3.1.8. of the WOAH Terrestrial Manual of Diagnostic Tests and Vaccines for Terrestrial Animals"*

As Secretariat of the SEACFMD Campaign, WOAH Sub-Regional Representation for South-East Asia obtained information from various sources to provide relevant knowledge and guidance to SEACFMD Members on these questions.

Relevant information related to the access to quality FMD vaccines and FMD vaccine/antigen bank

1. WOAH used to manage a FMD Antigen Bank to support several Members in Asia from 2013 to 2020. This FMD Antigen Bank has been discontinued in 2020.
    - It has allowed Myanmar, Laos, and in lesser quantity Mongolia and Cambodia to receive good quality FMD vaccines.
    - While it has served the implementation of specific projects funded by donors in the region, the WOAH FMD Vaccine Bank was reliant to donor funding and not sustainable in the long term. Only limited number of beneficiary countries and limited deliveries were possible through this mechanism.
    - As of today, WOAH would not be in capacity to establish a new FMD Antigen Bank
2. WOAH SRRSEA met different stakeholders (manufacturers, Centro Panamericano de Fiebre Aftosa Salud Pública Veterinaria-PANAFTOSA/SPV) to better understand the opportunities and challenges related to the access to quality FMD vaccines.
    - Several countries, including in Asia, have signed **bilateral supply agreements (Antigen or Vaccine Bank)** with manufacturers to secure their access to quality FMD vaccines. Manufacturers have capacity to formulate and deliver FMD vaccines in sufficient quantities and without much delays.
    - In the Americas, a regional/multi country mechanism has been established to provide access to FMD vaccines to the countries interested. The mechanism, called **BANVACO**[2], will be operational once three countries has signed the Agreement. This FMD Antigens Bank in the Americas can serve as an example for similar future initiatives in Asia but the process is long and requires strong political will from the countries involved.

3. WOAH has recently drafted Practical Guidelines for National Procurement of Veterinary Vaccines. The guidelines have been developed to support WOAH Members in their procurement of quality-assured veterinary vaccines. WOAH will share the guidelines with SEACFMD Members as soon as they are published.
4. The European Commission for the control of Foot and Mouth Disease (EuFMD) is currently developing a prequalification scheme for FMD vaccines (PQv)[3]
    - Prequalification (PQv) of vaccines is a system/ procedure for assurance that vaccines comply with the standards and norms of the international standards. The aim of PQv is to give confidence to organisations/Members procuring such vaccines by ensuring that vaccines are of good pharmaceutical quality, safe and effective.
    - PQv is not a regulatory procedure. It is a scientific peer review process aiming to provide assurance that a vaccine complies with minimum international standards.
    - Once established, this PQ system will provide an independent and internationally recognised source of information for risk managers and potential purchasers on vaccines against FMD that comply with the requirements for PQ. It will reduce the timescale required for procurement and reduce the risks of procuring vaccines of inadequate quality.
5. For ASEAN Member States (AMS), the **Mechanism for ASEAN Registration of Animal Vaccine**[4] is in place. This mechanism covers several procedures for preliminary review among AMS such as registration procedure, sample supply and testing in the accredited laboratory, determination of registration code and renewal and revocation of the registration of animal vaccines. All animal vaccines to be distributed in ASEAN countries should be registered following this mechanism. The producer manufacturer or importer shall submit an application form of ASEAN registration of animal vaccines

Recommendations

1. Quality should remain number one criteria in your purchase of FMD vaccines
2. Compare the vaccines produced nationally with vaccines produced internationally and only select the vaccines which comply with minimum international standards
3. Read the WOAH Practical Guidelines for National Procurement of Veterinary Vaccines when you start a process to procure FMD vaccines
4. Follow the latest information on the EuFMD prequalification scheme for FMD vaccines which can help you list only high-quality vaccines in your future purchase of FMD vaccines
5. For ASEAN Member States, refer to the ASEAN Vaccine Registration mechanism of animal vaccine when purchasing FMD vaccines
6. Liaise with relevant manufacturers providing quality FMD vaccines to assess the opportunity to develop a bilateral supply agreement (including for FMD Vaccine/ Antigen Bank)
7. Contact WOAH in case you would like more information and guidance on FMD supply agreements and FMD vaccine/antigen banks. A specific call on this topic can be organised.

8. Respond carefully to the questionnaires and requests submitted by the SEACFMD secretariat (FMD Vaccination Reports in particular) which will help better understand the issue of access to FMD quality vaccines in the region and feed discussions in future SEACFMD meetings.

Countries in Asia face different situations (free, endemic, variable implementation of vaccination campaigns). While the information and recommendations provided in this note are general, individual situation, needs and expectations of each country to secure its access to FMD quality vaccines differ and may require different solutions. WOAH remain available to discuss this important question bilaterally with any SEACFMD Members.

Annex V: Summary of the SEACFMD campaign evaluation from 1997 to 2020

The South-East Asia and China Foot and Mouth Disease (SEACFMD) Campaign is a regionally coordinated programme to combat foot and mouth disease (FMD) in South-East Asia, China and Mongolia. There has been substantial progress through the implementation of the SEACFMD campaign and completion of 5 phases of implementation from 1997 to 2020: Phase 1 (1997–2001), establishing the Campaign; Phase 2 (2001–2005), refining strategic direction and components of the Campaign; Phase 3 (2006–2010), improving coordination and partnership efforts; Phase 4 (2011–2015), refining of FMD control strategies with targeted vaccination and enhanced technical coordination; Phase 5 (2016–2020), continuing a sustainable approach to FMD control with expansion of the Progressive Control Pathway for FMD (PCP-FMD). The SEACFMD Campaign now enters its 6th phase of implementation under the guidance of the SEACFMD Roadmap 2021–2025 which mainly focus to reinvigorate FMD prevention and control in SEACFMD member countries. Apart from continuing with the key elements in FMD prevention and control during the 6th phase, an in-depth evaluation of the SEACFMD Campaign since its establishment in 1997 and up until 2020 has to be conducted, hence the conduct of this evaluation.

This evaluation process started with desktop reviews of the published documents from the SEACFMD Campaign, scientific literature and other documents. This was followed by series of virtual consultations with the SEACFMD Members, key stakeholders and experts involved in SEACFMD campaign; an online survey and face-to face focus group discussion. Several strengths and gaps were identified and some key recommendations to addressed the identified gaps were offered. Importantly, there was general agreement that the structural expansion of SEAFMD through SEACFMD to involve more countries beyond the Greater Mekong Subregion (GMS) was appropriate considering the increasing interconnectedness of FMD virus pools. There was also an agreement that the evolution of the Phases of the SEAFMD, now SEACFMD campaign, was a robust mechanism that facilitated progress, particularly since the introduction of the PVS and PCP tools. Further, respondents from diverse roles and affiliations categories unequivocally agreed that the SEACFMD campaign has been extremely successful in orchestrating solid relationships between technical staff, facilitating fruitful coordination, collaboration and communication amongst member countries. However, successes in nurturing political and financial commitments for sustainability of the interventions were considered insufficient.

Among the several gaps and recommendations, the following are the critical gaps and key recommendations providing guidance for the future SEACFMD Campaign.

1. **Inadequate political commitment and resourcing:**

   Despite the importance of the SEACFMD campaign, a number of countries still lack the political will to prioritize the campaign, which hinder progress and limit its effectiveness. Some governments in the region don't allocate sufficient funding to support its implementation which lead to a shortage of resources for vaccination, surveillance and other measures that are critical to controlling the spread of the disease. Similarly, FMD free countries required resources to continue with its prevention and preparedness measures in place hence advocacy and other appropriate intervention are required to secure policy makers support for successful implementation of SEACFMD campaign.

2. **Lack of surveillance capacity:**

   An effective surveillance system is critical to identify and control FMD outbreaks. However, many of the SEACFMD members still lack capacity for early detection and response, effective laboratory diagnosis, and understanding of the dynamic epidemiological changes of FMD. This can result in

delays in detecting outbreaks and responding to them, which can lead to the spread of the disease. To address this gap, there is a need for investment to enhance the capacity of countries in the region to detect, diagnose and respond to FMD outbreaks in a timely and effective manner. Additionally, it is important to have a better understanding of the epidemiological patterns of the disease, including the various strains of the virus, to support effective prevention and control measures.

3. Access to quality vaccines and effective vaccination:

While vaccines are an important tool in preventing and controlling FMD, there are still some challenges related to their availability. Many countries still suffer from shortage of quality vaccines. Additionally, there are many challenging factors in implementing effective vaccination programs such as limited resources, poor infrastructure and logistical challenges. Ensuring access to quality vaccines and addressing the challenges in implementing effective vaccination strategies with attention to vaccine serotypes and matching, vaccine efficacy, plus addressing vaccine delivery logistics and capacities in member countries are critical to controlling the spread of the disease and achieving the goals of the SEACFMD campaign.

4. **Weak regional biosecurity**

Uncontrolled animal movement is a significant risk factor for the spread of FMD in the region, including the introduction of new virus strains. While the SEACFMD campaign includes measures to control animal movement, there are challenges in enforcing these measures effectively. Biosecurity practices are crucial in limiting the spread of FMDv across animal populations. The SEACFMD campaign has encouraged improved biosecurity practices between and within member countries to suppress FMDv transmission and restrict the impacts of emerging disease outbreaks. However, recent incursion of FMD into a previously free country (FMD incursion in Indonesia) and rapid spread of emerging TADs such as ASF and LSD in South-East Asia, exemplifies the weakness of regional biosecurity systems and their failure to keep pace with the increasing TAD risks following rapid regional socio-economic development.

To address this gap, there is a need for risk assessment studies, appropriate legislation and stronger enforcement of regulations, effective awareness campaigns, among livestock farmers and traders about the risks associated with uncontrolled animal movement, and better collaboration between countries in the region to address the risks of cross-border movement of animals. There is also need to strengthen the regional biosecurity strategies to stop spread of FMD and emerging TADs through elimination of 'informal cross border movement of livestock and their products and more effective border controls and quarantine facilities.

5. **Inadequate emergency preparedness and response capacity**

Emergency preparedness and response is a mechanism to ensure that a particular country is prepared to respond to animal disease emergencies through development of capabilities for early warning and for early reaction to disease epidemics. However, recent experience in responding to FMD incursion in Indonesia, and ASF and LSD in Southeast Asia showed that the Members are not adequately prepared to respond to such emergencies.

Effective coordination and a clear chain of command are critical for the prevention and control of FMD and emerging infectious diseases. There is lack of dedicated organizational structure with a

clear chain of command in many countries. This is crucial to ensure that activities are implemented in a coordinated manner and that there is a clear line of authority for decision-making and implementation during the emergencies.

In order to address these gaps, adequate preparation prior to an emergency occurring is essential to ensure that there is sufficient capacity, legislative support, resources and clear incident command system including whole of system approach to conduct the activities included in the emergency disease response plans. The focus should be made on activities related to preparedness and contingency planning systems to prevent the introduction of the disease into territories, early detection of disease event and rapid response to a disease emergencies to stop further spread and to minimize the impact of the disease event.

Members and development partners should also consider capacity building programmes on emergency preparedness planning and on conducting simulation exercises to response to disease emergencies.

6. **Insufficient Private sector participation**

SEACFMD campaign has recognised the important role played by the private sector in FMD prevention and control. There are some successful Public-Private-Partnerships (PPP) examples demonstrated by the Members with shared responsibilities and resources in FMD control particularly to improve and expand the implementation of vaccination programmes. The evaluation indicated that private sector participation is still insufficient hence to address this issue fostering dialogue with public and private sector including livestock traders, livestock associations, federations, vaccine manufacturers etc is critical going forward. Members are encouraged to refer to WOAH tools including PVS targeted support on PPP based on the Guidelines for Public_-Private-Partnerships in veterinary domain (PPP handbook), and PPP e-learning courses, and best practices referring to WOAH PPP database. Members are encouraged to promote Public and Private sector dialogue, initiatives and partnerships to build resilience and sustainable control of FMD and other important TADs.

Annex VI – Outputs of the World Café session

Group 1: Fit for purpose surveillance system

The current challenges in surveillance in the region were highlighted i.e. delay in Information sharing, low percentage of the full outbreak investigation and follow-up investigation. The reported cases have not been sampled, quality of samples and typed are continuing to be challenged as per the country report.

Following challenges and solutions were identified:

Challenges	Soluations
Lack of awareness of farmers and animal handlers in terms of monitoring of disease and sampling	Enhance awareness, compensation and
Lack of communication between different administrative levels	Increased funding from the government, facilitate community engagement in disease prevention and control
Access to the certain areas due to topography /geography is an issue	Enhance awareness and relationship between farmers, and local CHAWs, VPPS
Fear of consequences after reporting and lack of incentives	Use social science to understand reporting barriers, consider incentive schemes for reporting
Under staffing	trained paraprofessionals in disease monitoring and surveillance
Lack of disease monitoring /sampling	Strategic sampling, develop rapid test for the field, use vaccination campaigns for the surveillance

Group 2: Incentives and pathways for livestock movement (weak biosecurity)

Current challenges in livestock movement in the region/ biosecurity were referred prior to the group work i.e informal cross border movement of livestock and their products, weak regional biosecurity system and failure to keep pace with the increasing TADs risks and poor infrastructure for quarantine and border control measures.

Following challenges and solutions were identified:

Challenges	Soluations
Lack of regulation support	Review legislation support, develop legislation online trade, establish CDC like organisation in country or region
In effective enforcement	Increase integrity of the enforcement, penalty for the violation
Poor traceability system	Digital solution, tracking online trade
Common culture practices across the border	Enhance better communication and coordination across the border, regional collaboration, include intelligence agencies

bilateral and regional collaboration	Promote transparency amongst neibouring countries, facilitate bilateral agreement and safer trade.
Biosecurity infrastructure	Harmonise biosecurity approaches, scanning facility and increase quarantine facilities

Group 3: Access to quality vaccines and effective vaccination

The current challenges in accessing to quality FMD vaccines and effective vaccination that were identified before the session are poor awareness of decision makers on the importance of using quality vaccines; selection of quality vaccines (monopoly of some vaccine manufacturers, availability of different types of vaccines with varying quality); low vaccination coverage/ poor planning of vaccination campaign by some countries; and some logistics challenges such as cold chain, manpower, fund etc. The World café session tried to address the following key questions to enhance access to quality FMD vaccine and effective vaccination:

What is the purpose of FMD vaccination?

- Outbreak control;
- Reduce losses
- Promote food security;
- Protect high value animals
- Prevent from disease outbreaks
- Antigen reserve for FMD free countries

How do you selection Vaccines?

- Vaccine easy to use
- Low price, good quality
- Efficacy, safety
- High potency
- Rapid onset of immunity
- Reputation of Manufacturers
- Meets import requirement
- Multivalent – combined serotypes
- Rely on empirical data (homologous or heterologous) - VNT – PD50
- Antigenic match – Field vs vaccine strain
- Reports of the field performance from other countries
- Animal with high antibody protection level
- Would be nice to have
    - Thermostability, single dose vaccine

How do you know vaccine is working?

- PVM – screen for NSP
- Outbreak investigation – comparison of vaccinated and non vaccinated herd
- Measure antibody titre in vaccinated herd
- Less outbreak following vaccination
- Small scale immunogenicity studies
- Sentinel animal

What are the priority action in next 1 – 2 years?

- Combine FMD and LSD vaccination or other vaccines (HS, anthrax, Brucellosis etc) and validate efficacy
- Routine vaccination –
    - IM/ SC – validate efficacy
- Duration of immunity
- Cold chain
- Awareness on importance of vaccination
- Management of vaccines – staff
- Availing antigen bank – free country
- Identify reliable source of NSP free animals
- Regional vaccine bank with subsidies
- Difficulty in determining response in wild animals

Food for thoughts

- Single dose vaccine
- Conduct trials of oral vaccines
- New technology

Group 4: Multi-disciplinary and multisectoral efforts including Public-Private-Partnerships

The current challenges with multi-disciplinary and multisectoral efforts including Public-Private-Partnerships were illustrated to trigger the discussions. i.e lack of national policies to support PPP in Veterinary domain and lack of networking platform between public and private sector including sharing of success stories and failures of past PPP's.

Following challenges and solutions were identified:

Challenges	**Solutions**
In relation to the multi-agency coordination, all agencies have their own priorities	Stakeholder mapping, Communication and coordination, sharing information and success stories
Private sector involvement is lacking in SEACFMD	engagement with the private sector, encourage corporate social responsibility, collaboration with importer and exporter
Limited multidisciplinary engagement	Mass media, communication specialist, socio anthropology expert, agriculture cooperatives, partnership with academia, farmers
Advocacy	Conduct modelling study to demonstrate the cost benefit analysis for FMD -free countries and in endemic countries use actual data, advocate local champions to disease control
PPP in Veterinary domain	Review policy and legal basis for PPP, recongnise incentives for the PPP, private sector as a strategic partner