

Report: One Health Policy, Research and Education Symposium, December 10-11, 2025



Mekong One Health Innovation Program (MOHIP)
MICHIGAN STATE UNIVERSITY

Report:

One Health Policy, Research and Education

Symposium

December 10-11, 2025

Hanoi, Vietnam



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ACRONYMS

AMR	Antimicrobial Resistance
ASEAN	The Association of Southeast Asian Nations
CDC	Center for Disease Control and Prevention
FAO	Food and Agricultural Organization of the United Nations
GHI	Global Health Institute
GHPN	Global Health Pathology Network
HWU	Heriot Watt University
LAOHUN	Laos One Health University Network
LMSr	Lower Mekong Subregion
MOH	Ministry of Health
MOHIP	Mekong One Health Innovation Program
MSU	Michigan State University
MUSP	Mekong US Partnership Program
NBS	Nature-Based Solutions
OHS	Occupation Health and Safety
OHUN	One Health University Network
PPP	Public Private Partnership
PU	Phenikaa University
RCCE	Risk Communication and Community Engagement
SEAOHUN	Southeast Asia One Health University Network
THOHUN	Thailand One Health University Network
UK	United Kingdom
VOHUN	Vietnam One Health University Network
WATER	Water Applied Testing and Environmental Research
WQQI	Water Quality and Quantity Index (WQQI)

Acknowledgment

We extend our deepest gratitude to everyone whose dedication made the Mekong One Health Final Symposium in Hanoi (December 10–11, 2025) a resounding success. This event was made possible through our fruitful collaboration with Phenikaa University alongside the vital contributions of the One Health University Networks (LAOHUN, SEAOHUN, THOHUN, and VOHUN), the International Advisory Board, senior officials at the Southeast Asia Regional Office, US Centers for Disease Control and Prevention, CDC Vietnam Office, U.S. Embassy Hanoi Vietnam, and distinguished delegates from Lao PDR, Thailand, Vietnam, Cambodia, the UK, and India.

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Executive Summary

Background: Lower Mekong Subregion (LMSr) holds a strategically important position in U.S. foreign policy and global health security. Supported by the U.S. Department of State, and as a part of the Mekong US Partnership Program (MUSP), Michigan State University (MSU) has been implementing the Mekong One Health Innovation Program (MOHIP) in Lao PDR, Vietnam, and Thailand since October 2022, collaborating with respective country One Health University Networks. The overarching goal of MOHIP is to create a transnational network and empower health researchers and practitioners to make informed decisions about their health security programs and policies, thereby improving health security. To achieve this goal, MOHIP connects Mekong One Health researchers and practitioners with researchers and practitioners in the U.S. and beyond, facilitating the sharing of research, education, and outreach tools. Within these contexts, the MOHIP organized the MOHIP One Health research, education, and policy symposium commemorating its successful implementation and appreciating the collaboration it has bestowed among One Health stakeholders in the lower Mekong region and beyond.

Purpose and Objectives: The symposium organized with the theme "Building Resilient Health Systems through One Health Integration and Innovation" has a goal to share lessons learned from MOHIP and charter a path forward to ensure sustainable health security in the LMSr through continued collaboration, innovation, and capacity building. Symposium objectives were (i) Review the progress made by MOHIP highlighting key accomplishments in research, education, and outreach. This includes presentations of research findings, success stories, and testimonials from stakeholders in Lao PDR, Vietnam, and Thailand. (ii) Engage stakeholders in discussions about the challenges encountered during the program's implementation, including those related to capacity building, policy integration, and cross-border collaboration and identify opportunities for further strengthening the One Health approach in the region. (iii) Foster stronger connections between One Health practitioners, researchers, and policymakers across the LMSr and beyond. Encourage the formation of new partnerships and collaborative projects that can sustain and expand the impact of MOHIP. (iv) Develop actionable strategies to ensure the sustainability of health security initiatives in the LMSr. This included planning for the continuation of MOHIP activities, exploring new funding opportunities, and integrating One Health principles into national and regional health policies.

Date, Venue and Modality: The symposium was held on December 10 - 11, 2025 – the first half of December 10, 2025 in Phenikaa University, Hanoi, Vietnam, and the rest of the first day and entire second day in Wyndham Garden Hotel, HH01 To Huu Street, Van Phuc Ward, Hanoi, Vietnam. The symposium was an excellent example of multi-agency collaboration

and participatory exercises with due regard and acknowledgement to the country representatives and delegates, ideas they shared and their active participation.

Representation: There was a strong geographic representation showing regional ownership with global partnership. Representations in the symposium spanned Lower Mekong countries (Vietnam, Thailand, Lao PDR, Cambodia); India, United Kingdom; and regional and global partners: United States (Center for Disease Control and Prevention, Michigan State University), FAO (Asia-Pacific), UK and Indian academic institutions, and One Health University Networks including Southeast Asia One Health University Network (SEAOHUN). See Appendix 1 and 2 for the program agenda and participant list, respectively. Institutional representation shows multi-sectoral One Health participation (education, policy, research, practice). They included universities and academic networks, government ministries (health, agriculture, environment) and national research institutes, international organizations (FAO, CDC), and student groups. There was vertical integration from policy to grassroots capacity building representing stakeholders, senior policymakers and diplomats, researchers and technical experts, educators, and importantly, students and early-career professionals.

Symposium sessions ranged from formal knowledge exchange (opening ceremony and keynote addresses, country status presentations, and technical research sessions) to capacity-building and dialogue (breakout discussions and panel discussions) to experiential and networking components (student presentations, reception dinner, group reflections). The sessions were balanced regarding combining science, policy dialogue, and relationship building.

Presentations and Core Themes Discussed: The delegates engaged in scientific presentations, panel discussions, and breakout group exercises in different One Health related topics. Various One Health related agenda and issues spanning micro-level biology to macro-level governance were covered (Figure 1).

Technical science	Environmental contamination, AMR ecology, Zoonotic disease epidemiology, Wildlife and occupational health
Systems & governance	National One Health implementation, Legal and policy frameworks, Cross-border collaboration
Education & workforce	University network initiatives, Curriculum development, Student leadership pathways
Strategy & future planning	ASEAN-level expansion, Sustainable health system design, Partnership development

Figure 1. Key themes evolved and discussed at the symposium

Below are core themes ranging from surveillance and science to education and policy to regional systems transformation discussed in the symposium.

- **One Health systems strengthening:** Health security implementation across countries; wildlife, environment, and zoonotic disease integration; and occupational health, surveillance, vaccination, outbreak prediction
- **Environmental and antimicrobial resistance risks:** Antibiotic contamination in river basins; microplastic-mediated AMR; and environmental exposure in border and vulnerable populations.
- **Zoonoses and infectious disease control:** Brucellosis, schistosomiasis, anthrax, dengue, and streptococcus suis and wildlife-linked risks.
- **Education, workforce, and student leadership:** One Health curricula in multiple countries, student-led research and advocacy, and capacity building for future professionals.
- **Regional collaboration and governance:** Policy/legal integration, transnational networks, and strategic planning for ASEAN-scale expansion.

Student presentations were key highlights of the symposium. Four students representing three MOHIP countries presented their One Health works. Those projects ranged from AMR, microplastic, wildlife diseases and One Health network development.

Take-Away Messages: i) One Health is operational: Countries are actively implementing surveillance, education, and control programs. ii) Environmental health and AMR are central emerging risks: Microplastics, water contamination, and ecological drivers are critical next-generation challenges. iii) Regional collaboration is essential: Health threats are transboundary, requiring ASEAN-scale coordination and even beyond. iv) Universities and students are pivotal: Future workforce development is core to sustainability of One Health systems. v) Policy integration is the next frontier: Scientific evidence must translate into legal frameworks, governance, and financing.

Resolutions: The delegates suggested continuing MOHIP activities as resources allowed such as information and knowledge sharing through webinars and other activities (virtual or online training) that can be managed virtually and also suggested forming a wider transnational network, bringing other ASEAN countries and countries from South onboard and form a multicounty core team to materialize these plans.

Symposium Report

The following sections are about the technical presentations and breakout and panel discussions at the symposium. Such discussions range from experience of each of three countries (Lao PDR, Thailand, and Vietnam) on Mekong One Health Innovation Program (MOHIP) implementations, education on One Health in four countries (Lao PDR, Thailand, Vietnam, and Cambodia), MOHIP research presentations, research on other key health issues Anthrax, Dengue, among others. Individual sections are devoted to the agenda discussed at and summary and take way messages of the breakout sessions and student presentations.

Summaries of individual presentations and themes discussed at the breakouts were generated using Michigan State University subscribed Google Gemini. The outputs were read through by the Michigan State University MOHIP team for any inconsistencies and errors.

Opening Program

Organized at the conference hall of Phenikaa University (PU), the opening program was attended by over 500 students from PU, along with leaders, health experts and United States Embassy and CDC senior officials, country delegates, and representatives from several academic and nonprofit organizations. The program started with a welcome note from Dr. Ramjee Ghimire, Director of MOHIP followed by remarks from representatives of the Ministry of Health of Vietnam; vice president of Phenikaa University; and Courtney Beale, the Deputy Chief of Mission for the U.S. Mission in Vietnam. Dr. Rebecca Malouin, Global Health Institute Michigan State University (MSU) welcomed delegates and wished the success of the symposium. Shown below are some glimpses from the opening program and beyond.







Keynote Address I

Presenter: Dr. Jonathan Sleeman, One Health, and Wildlife Specialist (Food and Agricultural Organization of the United Nations, Bangkok, Thailand)

Title: Integration of the Environmental Sector into the One Health Approach

Global Health and Environmental Challenges

- **Emerging Infectious Diseases:** Environmental shifts are driving the emergence of infectious disease threats to humans, animals, and ecosystems, many originating in wildlife. Emerging USGS-investigated diseases include West Nile Virus, Monkeypox, Avian Influenza, Chronic Wasting Disease, White-Nose Syndrome, and Snake Fungal Disease.
- **One Health Joint Plan of Action (Action Track 6):** Focuses on protecting and restoring ecosystems, mainstreaming environmental health into One Health, integrating environmental data into decision-making, and training cross-sector professionals.

The Value of Wildlife & Ecosystem Services

- **Bat Decline Impacts:** Bat populations provide critical insect control, contributing up to \$50 billion annually to US agriculture. For example, Brazilian free-tailed bats provide \$750,000 worth of insect control service annually to Texas cotton farmers. White-Nose Syndrome-related deaths of 1 million bats led to a loss of ~700 tons of unconsumed insects.
- **Vulture Declines:** Cattle treatment with Diclofenac decimated vulture populations, leading to increased livestock carrion, a rise in dog/rat populations, and an estimated 50,000 excess human deaths alongside 500,000 deaths from rabies and water-borne diseases.

Systems Thinking & One Health Frameworks

- **Wicked Problems:** One Health issues involve multiple competing perspectives, longstanding failures, and unintended consequences.
- **Systems Tools:**
 - *Iceberg Model:* Uncovers underlying behavior patterns, supporting structures, and mental models.
 - *Causal Loop Diagrams:* Maps causal interrelationships and feedback loops to pinpoint leverage points.

- *Donella Meadows' Leverage Points*: Interventions range from low-impact parameters to high-impact intent and design shifts.
- **One Health Impact Pyramid**: Proposed modification to the Health Impact Pyramid by grounding it in socio-economic and environmental determinants at the base, with advocacy/awareness at the peak to prioritize long-term sustainability.

Case Studies & Nature-Based Solutions (NBS)

- **Marburg Virus**: Outbreaks tied to Ugandan caves revealed peak viral shedding in fruit bats during breeding seasons (accounting for 83% of human spillovers). Indiscriminate bat culling caused bat repopulation with higher viral prevalence; targeted access restrictions during peak shedding present a better co-existence model.



Figure 2. Nature-based solutions and One Health outcomes shared by Dr. Sleeman

- **Hendra Virus**: Climate-driven El Niño events reduce fruit bat food supplies, pushing them into urban areas and increasing Hendra virus spillover to horses.
- **Nature-Based Solutions**: Reforestation and wetland protection offer win-win strategies to reduce zoonotic transmission, preserve ecosystem services, enhance biodiversity, and mitigate climate change through multi-sector collaboration.

In closing, Dr. Sleeman recommended that NBSs represent a promising strategy for advancing One Health by addressing the interconnected health challenges facing humans, animals, and ecosystems. Conserving and restoring ecosystems, enhancing biodiversity, and mitigating climate change, approach can provide a wide range of benefits, including reducing the risk of zoonotic diseases. To maximize the potential of nature-based solutions in One Health, integrated approaches that involve collaboration, monitoring, and community engagement are required. He concluded that wildlife are vital components of the functioning ecosystems that support all life on this planet, and enhancing wildlife health promotes biodiversity conservation, protects public and livestock health, and ensures ecosystem sustainability.

The MOHIP Overview

Dr. Ramjee Ghimire gave an overview of the Mekong One Health Innovation Program (MOHIP) which is a three-year (2022–2025) Mekong-U.S. Partnership project led by Michigan State University (MSU) in three lower Mekong countries, namely, Lao PDR, Thailand, and Vietnam. Country advisors, coordinators, and international advisory boards greatly helped implement this project. The program's core goal is to enhance health security in the lower Mekong subregion by promoting an integrated One Health (OH) framework—connecting human, animal, and environmental health across transnational networks.

Program Pillars & Key Initiatives

- **Networking & Outreach (Webinars):** MOHIP hosted 21 webinars reaching 1,173 attendees across 27 countries. These sessions focused on thematic areas like surveillance, antimicrobial resistance (AMR), AI-enabled early warnings, and pandemic preparedness, among others.
- **Education & Capacity Building:** Conducted a two-week intensive online course ("Health Security, One Health, and Zoonoses") in 2023 and 2024 for early-to-mid-career professionals and students across Southeast Asia. Out of hundreds of applicants, 68 participants successfully completed all the training requirements in 2023 and 59 in 2024. The curriculum covered infectious disease preparedness, climate/environmental health, systems thinking, and data modeling, among others.
- **Targeted Regional Research:** MOHIP provided funding to country researchers to study country and region-specific issues and build capacity and pipeline epidemiological data across:
 - **Thailand:** Researched *Streptococcus suis* transmission across swine-human-environment interfaces and prevalence of zoonoses and its health risks among stateless/hill tribe populations in northern border regions connecting with Lao PDR and Myanmar.



Figure 3. MOHIP webinars materials and a talk

- **Vietnam:** Investigated microplastic-mediated AMR in aquatic systems and river basin antibiotic contamination.
- **Lao PDR:** Conducted surveillance on *Schistosoma mekongi* and brucellosis control.
- **Regional Collaboration:** Held a Regional One Health Symposium in Lao PDR (May 2024) with 69 professionals and regional university networks representatives (LAOHUN, VOHUN, THOHUN) to align research, policy, and transdisciplinary solutions.

Gaps & Strategic Recommendations

- **Programmatic Priorities:** Institutionalize OH platforms, reform environmental health regulations, establish AI/data governance frameworks, and enforce AMR governance.
- **Future Opportunities:** Expand the network to additional ASEAN countries, increase female speaker representation, secure long-term One Health financing, and build standardized Monitoring & Evaluation (M&E) frameworks.

Technical Session I

Chaired by [Dr. Pratap Singhasivanon](#), Dr. Sompadith Phavilay (Lao PDR), Dr. Theerakamol Pengsakul (Thailand), Dr. Pham Duc-Phuc (Vietnam), and Drs Chea Rortana and Seang Sokheng (Cambodia) shared their country health security status and One Health program implementation. Dr. Tongkorn Meeyam from SEAOHUN, Thailand presented about SEAOHUN's Initiatives to promote One Health in Southeast Asia.

Vietnam

- **Health Security Status:**
 - **Capabilities & Metrics:** Overall 2023 International Health Regulations (IHR) capacity score was 54 (below global average of 64). Key strengths in 2025 JEE include established multisectoral coordination and improved labs.
 - **Health Indicators:** Life expectancy is 74.7 years; healthy life expectancy is 65.4 years. NCDs cause 80% of deaths. High antibiotic consumption (top-tier in Asia).
 - **Key Challenges:** Gaps in sustained financing, subnational implementation, data sharing, and integrating the environmental sector into surveillance.
- **One Health Implementation:**
 - **Framework:** Guided by the National One Health Partnership Framework for Zoonoses (OHP 2016–2025) and National AMR Strategy (2023–2030). Operates 5 technical working groups (Pandemic, Food Safety, AMR, Animal Welfare, Research to Policy).
 - **Workforce & Training:** Robust pre-service (e.g., MPH with OH orientation) and in-service programs via VOHUN.
 - **Active Research:** I-CRECT study (2022–2025) tracking carbapenemase-producing *Enterobacterales* (CPE) colonization across hospitals, households, and livestock.

Cambodia

- **Health Security Status:**
 - **Capabilities & Metrics:** JEE scores improved from 42% (2016) to 59% (2024).
 - **Health Indicators:** Social protection covers 43.71% of the population. Hospital inpatient mortality dropped to 0.56% (2024), infant mortality

declined to 1,055 (2024), maternal mortality fell to 154 per 100,000 live births (2024), and malaria incidence dropped to 0.02 per 1,000 (2024).

- **Key Challenges:** Lack of public health workforce financing (only clinical/allied positions funded), limited subnational capacity, and minimal legal workforce training for emergencies.

- **One Health Implementation:**

- **Framework:** Led by the Interministerial Coordination Committee for One Health (IMCC-OH; signed June 2023) and Sectoral TWG (August 2023). Key strategies include the Cambodia One Health Strategy 2025–2029 and Multisectoral Action Plan on AMR 2024–2028.
- **Technical Groups:** Active TWGs for Zoonotic Diseases, AMR, Food Safety, and Wildlife Health Surveillance Network.
- **Future Focus:** Developing joint Master's/Bachelor's degrees, establishing a Global Health Research Center at UHS, and expanding participatory epidemiology.

Lao PDR

- **Health Security Status:**

- **Capabilities & Performance:** Underwent 2nd JEE (March 2025). Evaluated IHR Zoonotic Disease indicators show level 2 (limited capacity) for surveillance and response, and level 1 (no capacity) for sanitary animal production. Currently updating the National Action Plan for Health Security (NAPHS 2026–2030).
- **Health Issues:** Recurrent outbreaks including Avian Influenza (H5N1/H5N6), Anthrax, Dengue, Measles, Diphtheria, and flooding.
- **Key Challenges:** Limited laboratory capacity/staff, budget constraints, minimal environmental sector involvement, and low public awareness.

- **One Health Implementation:**

- **Framework:** Governance includes the National Committee on One Health Zoonosis TWG and the National One Health Strategic Plan (2026–2035). Supported by a cross-ministerial Memorandum of Understanding (MOU) (MOH & MAF) and joint contingency plans for zoonotic influenza and anthrax.

- **Surveillance & Tools:** Established SOPs for Event-Based Surveillance, Indicator-Based Surveillance, Rabies Community-Based Surveillance, and Wildlife Surveillance.
- **Key Initiatives:** Cross-border collaboration with Thailand (ASAMCO project), integration of Rabies prevention into school curricula, and expansion of LAOHUN university network initiatives.

SEAOHUN Snapshot & Vision

- **Network Scope:** Encompasses 8 countries, 2 associated members, 117 universities, and 236 faculties across Southeast Asia.
- **Core Mission & Vision:** Aims to serve as a regional network generating social and intellectual excellence. It builds a resilient, competent One Health workforce through education, research, training, and strategic advocacy.
- **Origin & Evolution:** Established in 2011 with support from USAID to address emerging pandemic threats by leveraging university resources.

Core Initiatives & Competency Development

- **Capacity Building:** Offers pre-service education, in-service training, experiential fellowships, early-to-mid career support, and youth/student engagement (e.g., student clubs, summits, and competitions).
- **Competency Framework:** Standardizes training across Technical Competencies (e.g., Infectious Disease Management, Ecosystem Health, Risk Analysis, AMR, Public Health) and Functional Competencies (e.g., Systems Thinking, Leadership, Collaboration, Policy Advocacy, Communication).
- **Digital Knowledge Sharing:** Hosts the Southeast Asia One Health Workforce Academies (academy.seaohun.org), offering 22 localized online courses across multiple languages (Bahasa, Khmer, Lao, Thai, Vietnamese, English) and 100+ educational resources.

Multilevel Collaboration & Future Directions

- **Partnership Ecosystem:** Operates across regional (ASEAN Network, Quadripartite, academic networks), national (Interministerial and One Health Committees), and local/community levels.
- **Key Impacts:** Strengthened outbreak preparedness, standardized regional curricula, built local workforce capacities, and expanded regional health security.

- **Future Priorities:**

- Addressing emerging threats like climate-related diseases and food security.
- Expanding digital health platforms and data management capabilities.
- Scaling private-sector partnerships and sustainable funding mechanisms.
- Deepening the integration of One Health principles into national strategies and policies.

Keynote Addresses II

Dr. John MacArthur, Regional Director, Southeast Asia Regional Office details the CDC's Southeast Asia regional strategy, emphasizing that the Mekong Region is particularly vulnerable to pathogen amplification and zoonotic spillover due to rapid urbanization, environmental disruption, and intensive livestock systems. To address these risks, the CDC employs a three-tiered One Health Prevention Framework focused on primary spillover prevention, early detection, and impact mitigation. The strategy relies heavily on direct support to ASEAN health systems by bolstering surveillance, laboratory, genomic, and workforce capacities while enhancing cross-border emergency coordination. Ultimately, this initiative aligns CDC efforts with research partners like MOHIP to advance a long-standing U.S.–ASEAN partnership committed to mitigating health security threats at their source.



Figure 4. History of CDC's One Health support in Vietnam as shared by Dr. MacArthur

In the second presentation, Lindsay Kim (MD, MPH), Acting Country Director and Global Health Security Director, U.S. CDC in Vietnam focuses on the operational opportunities and challenges of applying the One Health model within Vietnam. Building on a partnership started in 1998, the CDC works directly with Vietnam's Ministry of Health and Ministry of Agriculture and Environment to combat priority zoonotic diseases, leveraging the country's extensive outbreak experience and strong multisectoral frameworks. Key opportunities include utilizing artificial intelligence for surveillance, expanding interoperable antimicrobial resistance (AMR) monitoring, and capitalizing on local university networks. However, persistent challenges remain, such as cross-sectoral silos, outdated regulations, data integration barriers, and a critical need for local ownership and sustainable funding to transition One Health from a project-based initiative into a permanent operational standard

MOHIP Research

In this session chaired by Dr. Tongkorn Meeyam, SEAOHUN, six researchers, two each from three MOHIP countries, shared the findings of their research projects. This was in fact the major highlight of this symposium. Presented below is the summary of the five research project presentations.

1. Surveillance and Control of Brucellosis in Vientiane, Lao PDR: A One Health Approach

- **Principal Researcher:** Dr. Soulasack Vannamahaxay (National University of Laos (NUoL), Faculty of Agriculture).
- **Key Partners/Collaborators:** Yonsei University (South Korea), Chiang Mai University (Thailand), National Animal Health Laboratory (NAHL), and Lao One Health University Network (LAOHUN).
- **Major Findings:**
 - **Seroprevalence:** Rose Bengal Plate Test (RBPT) showed an overall animal seroprevalence of 48.44% (Goat: 64.56%, Cattle: 63.13%, Buffalo: 31.03%, Swine: 9.92%). ELISA tests confirmed an overall seroprevalence of 48.07%.
 - **Molecular Analysis:** Culture isolation identified *Brucella* in 17.18% of samples, while real-time qPCR detected it in 23.4% of target samples.



- **Genomics:** Whole Genome Sequencing (WGS) revealed that Lao *B. melitensis* strains phylogenetically cluster closely near Chinese strains.
- **Human Correlation & Awareness:** Weak positive correlation was found between household animal brucellosis cases and human clinical symptoms (headache, joint pain, weakness). Rural farmers exhibited low disease awareness.
- **Policy & Capacity Implications:**
 - Establish the *Brucella Isolation and Identification Laboratory* at NUoL under World Organization for Animal Health (WOAH) guidelines.
 - Build national laboratory capacity in serology, PCR, and WGS to support national surveillance strategies and outbreak control.
- **Transnational Implications:** Highlights cross-border pathogen movement/genomic ties (clustering with Chinese strains) and multi-country academic collaboration across Lao PDR, Thailand, and South Korea.

2. Prevalence of *Schistosoma mekongi* in Khong District in Lao PDR and its Control Strategy: A One Health Approach

- **Principal Researcher:** Dr. Bamphen Keomoungkhoun (Champasack University, Faculty of Agriculture and Forestry).
- **Key Partners/Collaborators:** National University of Laos, Khon Kaen University (Thailand), and Champasak Provincial Health Office.
- **Major Findings:**
 - **Animal Prevalence:** *Schistosoma spp.* eggs were detected in 4.68% of cattle and 6.00% of buffaloes, but 0% in dogs and pigs.
 - **Human & Snail Prevalence:** Human fecal infection rate was 3.92%. Snail (*Neotricula aperta*) infection was 1.35% across 1,253 tested samples.
 - **Risk Factors:** Livestock kept in extensive raising systems showed significantly higher odds of infection (OR = 2.93) than semi-intensive systems. Drinking



water sourced from the Mekong River presented significantly higher risk (OR = 4.44) compared to pond water.

- **KAP Improvement:** Over 90% of farmers lacked baseline knowledge of schistosomiasis. Targeted One Health educational intervention led to statistically significant improvements ($p < 0.01$) in knowledge scores for both farmers and secondary school students.
- **Policy & Capacity Implications:**
 - Data provides evidence to refine national schistosomiasis elimination strategies by targeting livestock reservoirs (bovine schistosomiasis) alongside human health campaigns.
- **Transnational Implications:** Contributes directly to regional Mekong basin public health targets (WHO 2030 schistosomiasis elimination goals) and cross-border research cooperation between Lao PDR and Thailand.

3. Exposures and Potential Health Risks from Animals and Environmental Exposures among Hill Tribe and Stateless People Living in Border Areas of Thailand-Myanmar-Lao PDR

- **Principal Researcher:** Dr. Tawatchai Apidechkul (Mae Fah Luang University, Thailand).
- **Key Partners/Collaborators:** Center of Excellence for the Hill Tribe Health Research, Mae Fah Luang University.
- **Major Findings:**



- **Behavioral Risks:** Consuming raw meat dishes like *Laab* or *Luu* was strongly associated with male sex (AOR = 5.39), alcohol consumption (AOR = 4.75), and specific indigenous hill tribe groups (Lahu AOR = 4.41, Lisu AOR = 3.89).
- **Health Risk Determinants:** Unknown origin fever in the past year was significantly associated with using groundwater for drinking (AOR = 17.71), fermented fish consumption (AOR = 3.06), raw meat consumption (AOR = 2.33), and keeping domestic animals in living areas (AOR = 2.11).
- **Qualitative & Environmental Data:** Qualitative reports highlighted unmonitored mass animal deaths (e.g., chickens, pigs), handling of animal

carcasses without PPE, and unprotected heavy pesticide exposure in agricultural farming.

- **Policy & Capacity Implications:**

- Demonstrated real-time community based One Health monitoring using digital tool platforms (*EpiCollect*) managed by trained local health volunteers.
- Emphasizes the need for tailored public health interventions and civil registration/health access support for stateless border populations.

- **Transnational Implications:** Directly addresses health security challenges in the porous golden-triangle border region where Myanmar, Thailand, and Lao PDR intersect.

4. Prevalence, Diversity, and Risk Factors Associated with *Streptococcus suis* Infection in Nan Province, Northern Thailand

- **Principal Researcher:** Asst. Prof. Dr. Chayada Sitthidet Tharinjaroen (Chiang Mai University, Thailand).

- **Key Partners/Collaborators:** Mahidol University, Kasetsart University, and Institut de Recherche pour le Développement (IRD, France).

- **Major Findings:**

- **Prevalence:** *Streptococcus suis* was isolated in 100% of clinical human cases, 36.13% of slaughterhouse swine, 12.82% of farm swine (higher in indigenous Thai pigs [23.33%] than European breeds [6.25%]), and 3.57% of environmental samples (soil/manure).
- **Genomic Diversity:** Identified 11 serotypes. Serotype 2 was the predominant zoonotic strain shared directly across human cases, swine, and slaughterhouses.
- **Lineages:** Whole-Genome Sequencing (WGS) revealed high-virulence benchmark lineages including Sequence Type 1 (ST1), ST104, and ST1688 (an emerging lineage causing fatal endocarditis in Thailand) within Clonal Complexes CC1 and CC104.



- **Policy & Capacity Implications:**

- Identifies swine slaughterhouses and native swine farming practices as primary critical control points.
- Provides genetic benchmark data to guide biosecurity guidelines, meat handler safety protocols, and regional livestock/human surveillance programs.

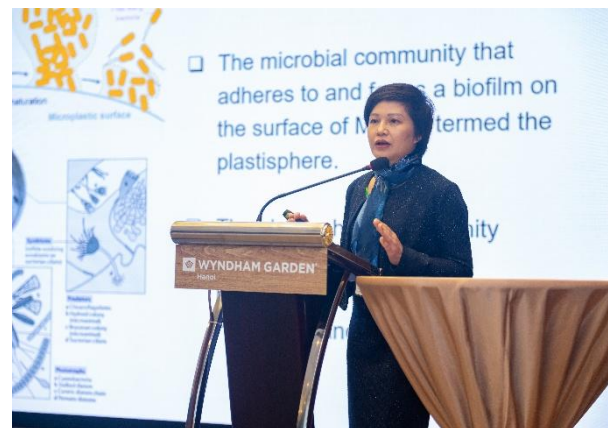
- **Transnational Implications:** Nan province borders Lao PDR, making the control of swine biosecurity and zoonotic *S. suis* strains vital for cross-border livestock trade and regional food safety.

5. Assessment of Microplastic-Associated Bacterial Communities and Antimicrobial Resistance in the Red River Delta: A One Health Approach

- **Principal Researcher:** A/Prof. Dr. Ngo Thi Thuy Huong (Phenikaa University / VNU, Vietnam).

- **Major Findings:**

- **Protocol Development:** Standardized a highly efficient biofilm detachment protocol achieving a 2,095× improvement over conventional methods.



- **Pathogen Hotspots:** Microplastics (MiPs) and Suspended Matter (SM) harbor significantly higher microbial densities than surrounding water (10^5 – 10^7 CFU/g vs. 10^2 – 10^7 CFU/mL). Confirmed opportunistic pathogens including *Pseudomonas* spp. (17.7% positivity) and *Salmonella* spp. (34.3% positivity) across 5 primary environmental hotspots.
- **Enriched AMR & Plastisphere Metagenomics:** Bacterial communities on microplastics were structurally distinct from water, showing marked enrichment of pathogenic genera (*Acinetobacter*, *Pseudomonas*, *Aliarcobacter*, *Aeromonas*) and consistently higher relative abundance of Antibiotic Resistance Genes (ARGs).

- **Policy & Capacity Implications:**

- Provides empirical evidence that microplastics act as mobile, physical vectors for pathogen propagation and AMR gene transfer across aquatic ecosystems.
- Establishes Quantitative Microbial Risk Assessment (QMRA) frameworks to assist environmental protection agencies in drafting plastic waste and AMR mitigation policies.
- **Transnational Implications:** Directly impacts transboundary river system management, as the Red River originates in China and flows through Vietnam into the Gulf of Tonkin, highlighting the global environmental dimension of One Health AMR transmission.

Table 1. Comparative Summary Table

Research Project	Country	Main Pathogen Focus /	Primary Transmission Pathway	One Health Nexus
Brucellosis Surveillance	Lao PDR	<i>Brucella spp.</i>	Animal abortion tissues, unpasteurized exposure	Human-Livestock
<i>Schistosoma mekongi</i> Control	Lao PDR	<i>Schistosoma mekongi</i>	Mekong river water contact, snail vectors	Human-Animal-Environment (Water/Snails)
Border Hill Tribe Health	Thailand / Lao PDR / Myanmar border	Zoonoses / Raw food pathogens	Raw meat (Laab/Luu), groundwater, pesticide handling	Human-Animal-Environment
<i>Streptococcus suis</i> Diversity	Thailand	<i>Streptococcus suis</i>	Raw pork ingestion, slaughterhouse handling	Human-Animal-Animal-Environment (Slaughterhouse)
Microplastics & AMR	Vietnam	Biofilm pathogens & ARGs	Waterborne microplastic vectors / Plastispheres	Human-Ecosystem-Environment (Water)

Technical Session III

This session was chaired by Mai Thi Ngan (DVM., Ph.D.), Associate Professor, Faculty of Veterinary Medicine, Vietnam National University of Agriculture, Ha Noi, Vietnam. Below is a summary of the presentations on One Health Education across Vietnam, Thailand, Cambodia, and Lao PDR.

1. Vietnam: One Health Training & Hanoi Medical University

- **Presented By:** Assoc. Prof. Hoang Thi Hai Van, MD, PhD (School of Preventive Medicine and Public Health, Hanoi Medical University).
- **Educational Integration:** Vietnam utilizes the Vietnam One Health University Network (VOHUN) to drive training across undergraduate, postgraduate (such as the Master of Public Health, OH-oriented), and short-course levels for preventive health staff.
- **Core Competencies:** Emphasizes 8 core areas: *Systems Thinking, Collaboration & Partnership, Culture & Belief, Leadership, Planning & Management, Communication & Informatics, Values & Ethics, and Policy, Regulation & Advocacy.*
- **Government Support:** Policy frameworks (e.g., TTLT 16/2013/TTLT-BYT-BNN&PTNN) establish inter-sectoral coordination for disease surveillance, outbreak response, communication, and research.
- **Key Challenges:**
 - "Siloed" single-discipline educational structures (medical vs. veterinary science fields).
 - Overloaded curricula and limited cross-disciplinary lecturers.
 - Financial constraints and a lack of dedicated, fixed field sites for student fieldwork.



2. Thailand: One Health University Network (THOHUN)

- **Presented By:** Assoc. Prof. Saengduen Moonsom (THOHUN Coordinator, Mahidol University).
- **Educational Framework:** One Health principles span formal, non-formal, and informal systems, utilizing community networks like Village Health Volunteers (VHVs) for local surveillance.
- **Training Initiatives:**
 - Knowledge is integrated into university and secondary school courses, supported by extra-curricular Student One Health Clubs and short courses.
 - Highlights an **International Short Course on Ecosystem Health** featuring three core modules (*One Health Problems, Risk Detection & Analysis, and Social Innovation, Risk Communication & Community Outreach*). Assessments show statistically significant gains in knowledge post-training.
- **Achievements:** Trained 486 multidisciplinary students, over 1,400 professionals, and 326 Village Health Volunteers across a broad network of universities and faculties.



3. Cambodia: One Health Education

- **Presented By:** Dr. CHEA Bunna (Royal University of Agriculture) & Miss MANG Sonita.
- **Government & Field Programs:** One Health is integrated into government capacity building via the Field Epidemiology Training Program (FETP - MoH), Cambodia Applied Veterinary Epidemiology Training (CAVET - MAFF), and joint One Health Rapid Response Teams (OH RRTs).
- **Academic & Community Integration:**
 - Driven by CAMBOHUN at the higher education level; note that agricultural and veterinary tertiary education requires additional resources to match human health education.
 - **School & Youth Programs:** Modules integrated into General and Technical High Schools (Grades 1–12) with 18 certified Training-of-Trainers (ToT) teachers.
 - **Other Sector Engagement:** Involves media institutions (training journalists on One Health), NGO demo sites, and targeted programs like the Mission Rabies project.

4. Lao PDR: Lao One Health University Network (LAOHUN)

- **Presented By:** Bae PHEAXAY (LAOHUN).
- **Structural Foundation:** Formed as part of SEAOHUN, linking 5 major universities Champasak University (CU), National University of Laos (NUOL), Savannakhet University, Souphanouvong University, and University of Health Sciences, Lao PDR and aligned with the national *One Health Action Plan 2026–2035*.
- **OHW-NG Program (2019–2024):** Funded by USAID to build workforce capacity around three main pillars:
 1. **Participatory Epidemiology Training:** Lecturers were trained via experiential 4-day courses featuring village field exercises.
 2. **Competency-Based Education (CBE):** Training-of-Trainers workshops to integrate One Health competencies into university curricula.



3. **One Health Student Clubs (OHSCs):** Platforms for leadership and cross-sector collaboration.
- **Digital & Research Expansion:** Launched Lao-language online learning modules via SEA-OHWA and funded research grants (OHRT).
- **Challenges:** Disruptions during COVID-19 and long-term financial sustainability after donor funding ends.

Collectively, these four presentations demonstrate that Southeast Asian Lower Mekong countries are actively institutionalizing One Health into national health security frameworks by moving beyond traditional "siloed" academic models. Through university networks (such as VOHUN, THOHUN, CAMBOHUN, and LAOHUN) backed by international partnerships, the region is standardizing competency-based education, training rapid response teams, and engaging communities through student clubs, village volunteers, and high school curricula. However, the presentations also highlight shared regional vulnerabilities, including resource disparities between human and animal health sectors, over-reliance on short-term external funding, and structural challenges in executing multi-sectoral field training.

Technical Session IV

Below is the summary of each presentation followed by the key overarching themes and a brief conclusion.

Presentation 1: Global Health Pathology Network (GHPN) (Michigan State University)

- **Goal:** Provides a framework for sustainable, international, hybrid diagnostic pathology training in resource-constrained environments to build global human and animal health capacity.
- **Methodology & Adult Learning:** Prioritizes adult learning concepts (small group case scenarios, problem-solving, reflection, and wet-lab necropsies) over traditional lectures to foster long-term retention and engagement.
- **Implementation:** Conducts multi-day workshops globally (e.g., Bangladesh, Guatemala, Namibia) and builds long-term collaborations through virtual telepathology tools and scholarships.

Presentation 2: One Team, One Health (Michigan State University)

- **Goal:** Introduces Michigan State University's (MSU) academic and research contributions to the One Health framework, highlighting interdisciplinary collaboration.

- **Key Programs & Research:** Features degrees and certificates in Global Health alongside major research initiatives, including the Center for PFAS Research, vector-pathogen ecological research, and the Mekong One Health Innovation Program (MOHIP).
- **Engagement:** Details how MSU partners globally with other academic institutions, regional networks, and health systems to solve complex health and environmental challenges.

Presentation 3: Environment & Health: Advancing One Health Connections

- **Goal:** Explores expanding the traditional One Health framework to incorporate environmental health, focusing on climate change and pollution.
- **Core Focus:** Highlights joint research between Heriot-Watt University and Vietnamese institutions (such as Phenikaa University/VOHUN) studying microplastics as vectors for pollutants and antibiotic-resistant bacteria (Plastisphere) in aquatic systems.
- **Objectives:** Seeks to establish a Southeast Asian "One Health Center of Excellence" and leverage community engagement to guide environmental and public health policy.

Presentation 4: Disease Outbreaks Prediction from Western to Eastern Medicine Perspectives

- **Goal:** Compares and integrates Western and Eastern medicine approaches to predict disease outbreaks, specifically focusing on vector-borne illnesses like dengue fever in Vietnam.
- **Western Medicine Approach:** Relies on data-driven, statistical, and epidemiological models (e.g., SIRD, machine learning, weather indicators, Google Trends) to forecast outbreaks based on mosquito life cycles and climate factors.
- **Eastern Medicine Approach:** Examines traditional framework concepts to complement modern data-driven models for comprehensive public health decision-making.

Presentation 5: One Health Approach to Anthrax: Surveillance and Vaccination Strategies

- **Goal:** Outlines integrated surveillance and vaccination strategies to control anthrax—a persistent zoonotic bacterium affecting humans, livestock, and ecosystems.

- **Strategy:** Emphasizes early detection in livestock, intersectoral data-sharing across human, animal, and environmental domains, and risk-based, spatio-temporal vaccination targeting high-incidence areas and seasonal peaks.
- **Impact:** Demonstrates how cross-border and cross-sectoral coordination prevents spillover and controls endemic zoonotic diseases.

Presentation 6: Bridging the Gap: Occupational Health and Safety (OHS) within the One Health Framework

- **Goal:** Argues for integrating Occupational Health and Safety (OHS) as a fundamental pillar within the global One Health framework.
- **Frontline Sentinels:** Identifies workers in agriculture, healthcare, recycling, and industry as frontline "sentinels" who are exposed first to environmental toxins, zoonotic spillovers, and infectious diseases.
- **Implementation:** Proposes three integration pathways: interdisciplinary education, technological/community-based monitoring tools (low-cost sensors, mHealth apps), and policy harmonization across health, labor, and environmental sectors.

Presentation 7: One Health One Water Partnership

- **Goal:** Advocates unifying the One Health model (linking human, animal, and environmental health) with the One Water approach (holistic water resource management) to support UN Sustainable Development Goals 3 and 6.
- **Impact of Water & Climate:** Highlights how water contamination, extreme weather, and climate change exacerbate antimicrobial resistance, vector-borne diseases, and waterborne illnesses.
- **Key Recommendations:** Proposes establishing national Water Applied Testing and Environmental Research (WATER) Centers and a Water Quality and Quantity Index (WQQI) to strengthen public health surveillance and water security.

Key Overarching Themes

1. **Interconnectivity Across Domains:** Every presentation highlights that human, animal, and environmental domains cannot be treated in isolation. Mitigating global health risks requires understanding shared environments, water systems, climate conditions, and exposure pathways.
2. **Frontline & Sentinel Risk Indicators:** High-risk occupational workers, local livestock populations, and environmental indicators (e.g., microplastics, water quality) serve

as vital early warning systems for emerging public health threats and zoonotic spillover.

3. **Cross-Sectoral Governance & Policy Harmonization:** Effective disease prevention and control depend on breaking down institutional silos. Success requires data-sharing and collaborative frameworks between public health, veterinary medicine, environmental agencies, and labor sectors.
4. **Capacity Building, Education & Global Networks:** Sustainable outcomes rely on active learning, interdisciplinary educational curricula, regional partnerships (such as LAOHUN, THOHUN, VOHUN, SEAOHUN), and technology-driven collaborations (telepathology, forecasting apps, low-cost sensors).

Conclusion

Together, these presentations emphasize that modern global health challenges—ranging from zoonotic outbreaks like anthrax and dengue to environmental threats like microplastics, water insecurity, and occupational hazards—are deeply entangled across ecological, social, and industrial boundaries. Addressing these complex issues requires evolving the traditional One Health framework into a more inclusive and action-oriented model. By embedding Occupational Health and Safety (OHS) and "One Water" paradigms, leveraging localized sentinel surveillance, and fostering international, interdisciplinary partnerships, global health systems can move from reactive responses to proactive, resilient, and sustainable health solutions.

Student Presentations

Students are future leaders. Educating young people early not only equips them to tackle complex challenges, but it also instills lifelong knowledge and skills that ripple outward to their families and communities. In this way, students serve as powerful catalysts for societal transformation. So said, a central component of the symposium was Session 5 ("Student-Led One Health Initiatives"), which featured four student presentations showcasing youth leadership, field research, and community-based interventions addressing complex regional health challenges.

Research and Work Highlights of Each Student Presentation

- **Aleena Buranaphol & Watcharachai Jantawan (Thailand – Naresuan University / THOHUN):**

- **Project Title:** *Collaborative Action of Student One Health Leaders in Combating Antimicrobial Resistance.*
- **Core focus area:** grassroots AMR advocacy & behavioral change
- **Highlights:** Focused on community-level antimicrobial resistance (AMR) in Ban Sao Hin, Phitsanulok, Thailand. The multidisciplinary student team conducted a door-to-door survey across 50 households, revealing frequent antibiotic misuse and a widespread misconception confusing antibiotics with anti-inflammatory drugs. To address these gaps, students conducted a walk campaign and a 6-hour participatory workshop for 53 community members (predominantly elderly residents), delivering targeted education on appropriate antibiotic usage, symptom management, and safe self-medication practices.



- **Phaithoun Bounyavong (Lao PDR – University of Health Sciences (UHS) / LAOHUN):**

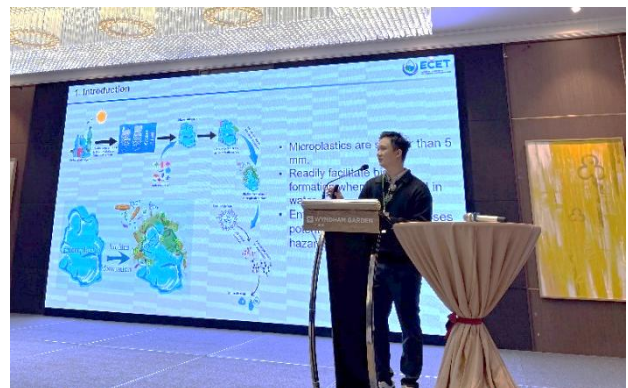
- **Project title:** *A Meaningful Milestone for UHS Students in Advancing One Health Implementation.*
- **Core focus area:** academic capacity building & network governance

- **Highlights:** Detailed the operational framework and capacity-building activities of the LAOHUN Student Club since its establishment in August 2022. Highlights included student-led workshops on One Health contributions (44 participants), youth cooperation on zoonotic disease prevention (82 participants), off-site wellness healthcare trips to secondary schools, peer teaching, and branding/marketing training. The presentation candidly outlined operational challenges in Lao PDR, such as limited professional mentorship, weak handover systems affecting club continuity, limited engagement, and inter-university collaboration hurdles.



- **Vo Hoai Hieu (Phenikaa University, Vietnam) and Phenikaa University / VOHUN:**

- **Project title:** *Bacterial Community Dynamics on Microplastic Surfaces: An In-Situ Investigation in Mangrove Forest and Aquaculture Systems, Nam Dinh, Vietnam.*
- **Core focus area:** ecotoxicology, molecular biology & vector dynamics
- **Highlights:** Investigated environmental health risks by analyzing bacterial biofilm formation on microplastics (the "plastisphere") in coastal aquaculture and mangrove ecosystems in Nam Dinh Province. The study demonstrated how microplastics act as mobile vectors for pathogenic bacteria, antibiotic-resistant bacteria (ARBs), and antibiotic resistance genes (ARGs) across aquatic food chains.



- **Nguyen Thi Ninh and Hanoi Medical University (HMU), Vietnam Team (VOHUN):**



- **Project title:** *Preventing Zoonotic Diseases through Wildlife Conservation: A One Health Perspective.*
- **Core focus area:** zoonotic spillover, wildlife health & community engagement
- **Highlights:** Examined the human-animal-wildlife interface, focusing on disease spillover risks associated with wildlife trade, habitat destruction, and illegal poaching in the Mekong basin. The presentation emphasized integrating wildlife conservation into public health policy to mitigate emerging zoonotic threats before spillover occurs.

Table 2. Themes Across Presentations

Theme	Key Indicators & Findings Across Presentations
Youth Leadership & Empowerment	Students served as proactive change agents in bridging institutional academic knowledge with grassroots public health execution.
Community-Centric Interventions	Practical outreach—such as household surveys, school visits, and workshops—tailored complex scientific issues (AMR, zoonoses) into culturally accessible terms.
Interdisciplinary Collaboration	Success relied on combining expertise across pharmaceutical sciences, public health, veterinary medicine, and environmental science.
Environmental & Zoonotic Risks	Projects focused heavily on shared regional environmental drivers, including plastisphere-mediated AMR dissemination and wildlife spillover pathways.

Highlights of Student Experiences and Reflections

As shown in the quotes below participant reports highlighted substantial professional growth, enhanced confidence, and expanded regional perspectives resulting from international presentation opportunities.

"The presentation received positive feedback from the audience, including academics and professionals from different countries. Several participants expressed appreciation for the community-based and student driven nature of the project. This experience increased my [sync.] confidence in presenting research at an international level and created a strong sense of pride in representing Naresuan University and Thailand."

"A key learning outcome from the symposium was a clearer understanding of One Health as more than a concept, but as a practical framework for designing impactful research."

"Seeing many researchers dedicate their work to improving health outcomes for humans, animals, and the environment reinforced the importance of the One Health approach."

Takeaway Messages

- **Community Context is Crucial:** Technical solutions to health security issues like AMR or zoonoses fail without local, context-specific education and community participation.
- **Institutionalize Student Support:** Student clubs require formal faculty mentorship, structured leadership transition plans, and sustainable funding to maintain continuity.
- **Environmental Inclusion:** Addressing human and livestock health remains incomplete without integrating environmental monitoring, such as microplastic contamination and ecosystem preservation.

The four student presentations at the 2025 MOHIP Final Symposium demonstrated the vital role youth leaders play in advancing the One Health paradigm across Thailand, Lao PDR, and Vietnam. By combining primary scientific inquiry with grassroots community outreach, these student initiatives proved that empowering the next generation of interdisciplinary

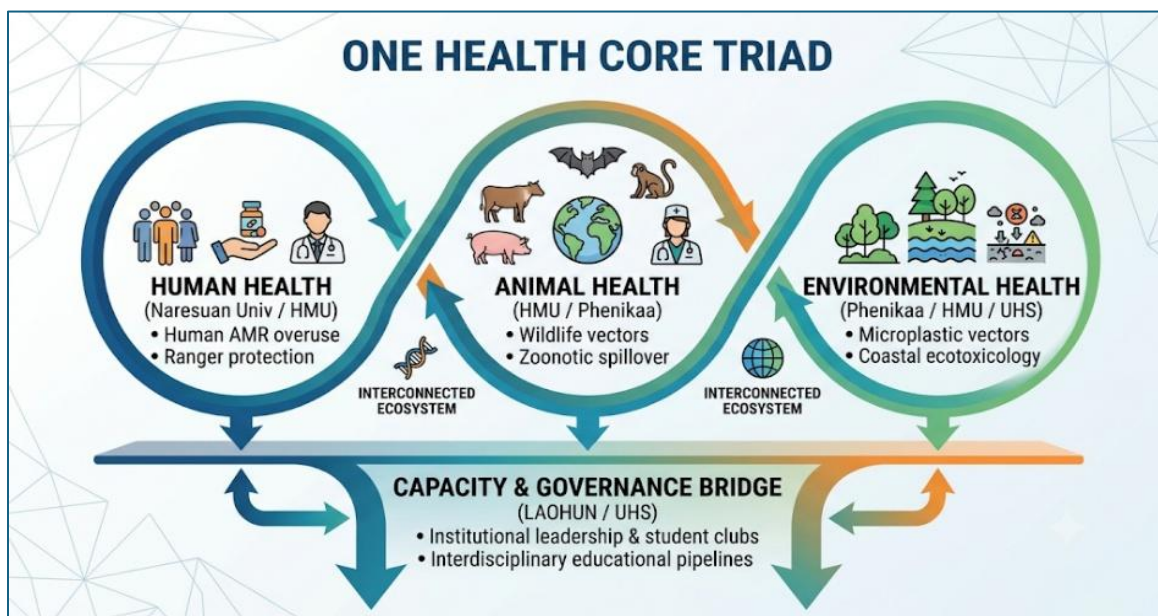


Figure 5. One Health triad highlighted in student presentations and reports (Developed using Google Gemini).

leaders is essential for building sustainable health security throughout the Lower Mekong Subregion.

Recommendations for Policy and Institutional Integration: Based on the evidence and outcomes presented by students, the following recommendations could be drawn that university administrations, ministry officials, and international One Health networks should consider for implementation.

- *Curriculum and Interdisciplinary Educational Policy:* University curricula should formalize student-led One Health projects—such as the Naresuan AMR household surveys and HMU wildlife outreach—into accredited, interprofessional course modules. National networks (e.g., VOHUN, LAOHUN, THOHUN) should allocate dedicated seed funding and administrative backing for student-run clubs, replicating the UHS LAOHUN model across regional universities.
- *Research Alignment & Methodological Expansion:* Funding bodies must support expanded, multi-season sampling of microplastic-associated biofilms in coastal and aquaculture systems to map the co-selection of pathogen virulence and antimicrobial resistance. Integrative surveillance models combining wildlife health monitoring, environmental pathogen sampling, and occupational health protocols for rangers/caretakers should be scaled nationally.
- *Community Engagement and Behavioral Interventions:* Public health agencies should leverage youth-led creative interventions (art competitions, targeted social media, localized workshops) to translate scientific data on AMR and bushmeat consumption into actionable community norms.

Breakout Sessions Discussion and Findings

To map the future of regional health security, participants convened across two consecutive workshop tracks split into designated tracking groups. These sessions evaluated existing legal policies, calculated critical workforce capacity scores, addressed structural communication barriers, and designed collaborative, co-financed regional frameworks for long-term sustainability across the broader ASEAN region. See Appendix 3 for the breakout questions. The goal of the breakout discussion was to help move from high-level policy to structural networking and ground-level execution. Breakout Sessions focused on building sustainable health systems through the role of legal frameworks, policy integration, and multisectoral cross-border collaboration; strategic planning for regional expansion through developing a comprehensive strategic plan for expanding and sustaining One Health initiatives into the broader ASEAN region.

Breakout Session Reports

Group 1: Legal, Policy, and Structural Frameworks

Focus: National Policy Integration, Structural Mapping, and Institutional Constraints.

Existing Frameworks & Baselines

- **Thailand:** Communicable Disease Act.
- **Lao PDR:** Active CDC policies and ministerial regulations.
- **Vietnam:** National Master Plan on One Health.
- **Cross-Border:** Active Memorandums of Understanding (MOUs) exist between national Ministries of Health (MOH) and Ministries of Agriculture/Environment (MOAE).

Critical Gaps Identified

- **Operational Void:** While high-level legal frameworks exist on paper, there is a lack of concrete operational guidelines to execute policies at the ground level.
- **Siloed Funding:** Structural collaborative mechanisms routinely break down due to vertical, single-ministry budgeting structures that resist cross-sector sharing.
- **Environmental Blindspot:** Environmental health integration is significantly weaker and lacks the data infrastructure available to human and veterinary diagnostics.

Key Discussion Points

- Incorporate One Health principles into national public health, veterinary, agricultural, and environmental legislation.
- Establish legally mandated interministerial coordination platforms.
- Develop national One Health strategies linked to national development plans.
- Align disease surveillance, environmental monitoring, and AMR policies under a common governance framework.
- Institutionalize One Health budget lines within government ministries.

Actionable Recommendations

- Establish dedicated, multi-sector data-sharing platforms and regional committees at the absolute inception phase of new programs.
- Invest in focused economic impact and operational research to explicitly calculate how One Health interventions affect human well-being, cost-effectiveness, and ecological footprints. Use these figures to directly pitch the financial merits of One Health to finance policymakers.

- Provide focused scientific grant writing and technical training for early-career researchers to bypass domestic resource scarcity.

Group 2: Critical Workforce Competencies & Matrix Scoring

Focus: System Capacity Matrix Evaluation, Prioritization, and Core Obstacles.

Strategic Partnerships

Government

- Ministries of Health
- Agriculture/Livestock
- Environment

Academia

- Universities
- Research institutions

Development Partners

- International organizations

- Donors

Private Sector

- Agriculture industry
- Biotechnology sector
- Information technology companies

Regional Bodies

- ASEAN mechanisms
- Regional university networks

Group 2 applied a weighted scoring methodology to rank workforce competencies from 1 to 4 against four key variables: *Effectiveness*, *Feasibility*, *Sustainability*, and *Timeline*. The combined totals yielded composite priority scores to guide regional resource allocation:

Table 3: Ranking of workforce competencies

Competency Area	Focus	Key Evaluation Parameters	Composite Score
Workforce Skills (OH Competencies)		Transitioning raw numbers into specialized, multi-disciplined clinical expertise.	14 (Top Priority)
Community Practices & Communication		Merging academic data with field-level risk communication and community engagement.	14 (Top Priority)
Technology / Digital Media		Deploying data visualization tools and modern digital communication media.	14 (Top Priority)
Data Sharing Platforms		Developing secure cross-border software interfaces and centralized nodes.	13
Data Analysis & AI Applications		Advancing machine learning models for zoonotic and predictive AMR trends.	13
Simulation Practices (Drills)		Stress-testing border health systems using synchronized outbreak containment drills.	13
Implementation Research		Moving operational academic findings from localized pilot studies into field deployment.	12
Emergency Response Capacity		Accelerating containment activation and mobilization speeds during border emergencies.	10
Policy Brief Report Capacity		Translating highly complex scientific studies into actionable policy briefs.	8
Laboratory Systems		Aligning tier-based diagnostic networks and physical lab capacities.	7

Core Workforce Bottlenecks

- Sustained funding deficits disconnected cross-border policy motivations, low numbers of technically certified field staff, and inconsistent administrative leadership commitments that stall long-term implementation.

Group 3: Capacity Building, Laboratory Networks & Diagnostics

Focus: Laboratory Infrastructure Standards, Surveillance Systems, and Rapid Risk Communications.

Capacity-Building Needs

Workforce

- One Health competencies
- Leadership training
- Risk communication

Infrastructure

- Laboratories
- Digital surveillance systems

Research

- Joint research platforms
- Regional data repositories

Emergency Response

- Preparedness training
- Simulation exercises

Laboratory Network Enhancements

- Establish standardized testing protocols across the region, focusing heavily on building uniform, tier-based facility networks capable of precise multi-pathogen identification.
- Develop and distribute "Laboratory on Field" tools—rapid, field-deployable multiplex testing kits seamlessly integrated with mobile applications to bypass delays from centralized laboratory processing.

Emergency Surveillance & Risk Communication (RCCE)

- Deploy rapid Risk Communication and Community Engagement (RCCE) pathways across regional mass communication networks (including localized Radio, TV broadcasts, and direct SMS emergency alerts) to immediately isolate breaking zoonotic incidents.
- Incorporate grassroots civic education modules into community outreach programs to build public awareness and encourage proactive reporting of local animal die-offs or unusual symptoms.

Group 4: Sustainability, Harmonization & Co-Investment

Focus: Cross-Border Program Harmonization, Financial Engineering, and MSU Infrastructure Integration.

Challenges

- Insufficient funding.
- Fragmented governance.
- Limited data interoperability.
- Workforce shortages.
- Unequal country capacities.

Group 4 focused on overcoming systemic operational friction to build a sustainable, long-term model for One Health programs:

Table 4: Friction points and their solutions for One Health programs

Identified Friction Points		Strategic Solutions
Wide Legal & Policy Variances		Co-create standardized cross-border regulatory frameworks
Financial Instability & Budget Gaps		Build concrete economic "Investment Cases" via Impact Studies
Fragmented, Short-Term Funding		Transition to Co-Investment from local governments & PPPs
Disconnected One Health Networks		Leverage regional political blocs (ASEAN/ SAARC) for execution

Institutional Contributions from Michigan State University (MSU)

- Tech Infrastructure Development:** Direct creation of a unified digital repository and regional web platform designed to host shared scientific materials, cross-border diagnostic networks, and active funding pipelines.
- Governance Standard Blueprints:** Provision of clear structural frameworks to model future multi-country governance, aiding the smooth expansion of One Health initiatives from the Lower Mekong into broader ASEAN networks.

Conceptual Map of Generated Themes

The map (Figure 6) highlights how the legal baselines and technical capacities discussed across all groups feed into a unified regional strategy.

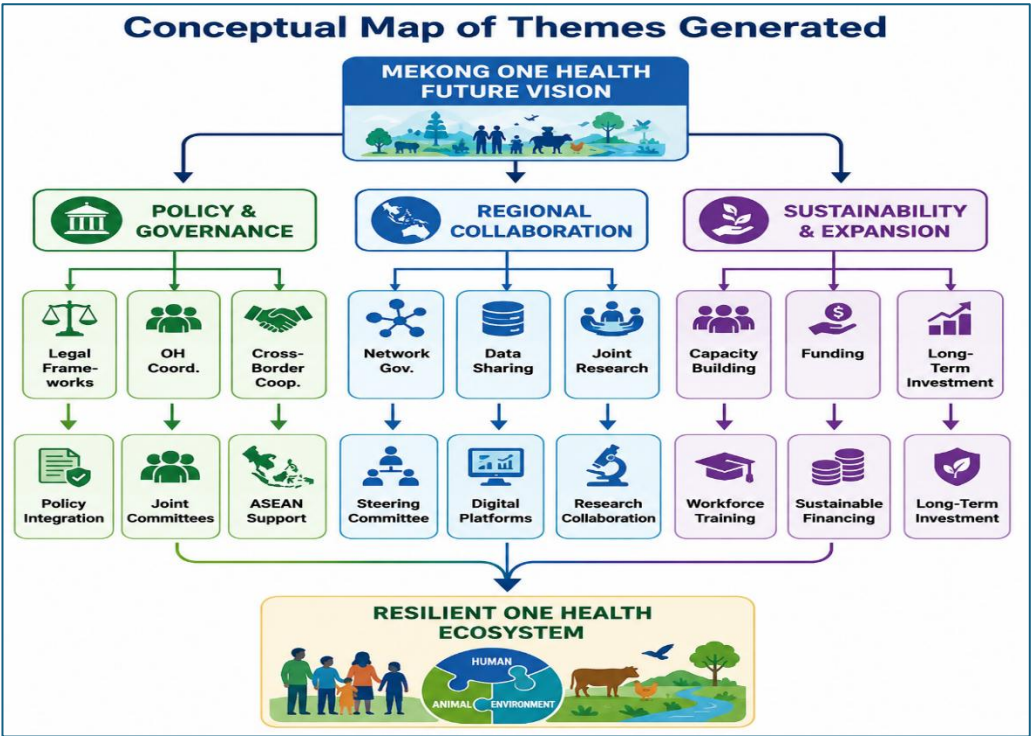


Figure 6. Concept for advancing One Health agenda as suggested in the breakout sessions (Developed using Google Gemini).

Breakout Sessions Conclusions

The three breakout sessions converged into several common priorities:

1. Institutionalization of One Health through legal frameworks and national policies.
2. Strengthened ASEAN engagement to support harmonization, technical assistance, and regional coordination.
3. Creation of a transnational One Health network with sustainable governance and financing.
4. Investment in workforce development and laboratory infrastructure.
5. Enhanced data sharing and digital transformation as foundational elements of future collaboration.
6. Long-term financing mechanisms to ensure sustainability beyond donor-funded projects.
7. Expansion of partnerships across governments, academia, civil society, and the private sector.

Collectively, participants envisioned a future in which the Lower Mekong and ASEAN region operate as an interconnected One Health community capable of preventing, detecting, and responding to complex health threats through coordinated, multidisciplinary action. The breakout sessions linked regional goals into actionable operational plan. While the Lower Mekong sub-region possesses functional foundational policies (such as Thailand's Communicable Disease Act and Vietnam's National Master Plan), these frameworks require practical operating guidelines and cross-sector funding models to work effectively during public health emergencies.

Key next steps drawn from the breakout sessions are as follows:

1. **Launch the Transnational Network:** Activate the co-governed framework outlined in the panel discussion, leveraging ASEAN as a political anchor while utilizing the MSU-supported digital repository web platform to handle daily cross-border data exchange, material sharing, and grant tracking.
2. **Deploy the MSU Tech Platform:** Immediately roll out the unified digital web repository proposed by MSU to host collaborative research, cross-border datasets, and regional funding alerts.
3. **Target High-Priority Skills:** Explore and direct regional capacity-building resources toward the top-ranked matrix competencies (Workforce Skills, Community Risk Engagement, and Digital Media Tools, which all scored a maximum 14).

4. **Bridge the Budget Silos:** Overcome financial barriers by creating comprehensive economic impact reports that prove the cost-effectiveness of One Health interventions. Use these business cases to secure long-term, co-invested funding from both government ministries and private sector Public-Private Partnerships (PPPs).
5. **Harmonize Through Regional Blocs:** Use ASEAN governance frameworks to align differing national legal codes and formalize cross-border outbreak simulation drills.

Symposium Take-Away Messages and Resolutions

- i) One Health approach is being applied. Countries are implementing but at a varied level the One Health surveillance, education, and outreach programs.
- ii) Environment and AMR are central emerging risks: Microplastics, water contamination, and ecological drivers are critical not only regional but global challenges.
- iii) Regional and global collaboration is essential: Health threats are transboundary, requiring ASEAN-scale and then global scale coordination.
- iv) Universities and students are pivotal: Future workforce development is core to continuity and sustainability of One Health systems.
- v) Policy integration is the next frontier: Scientific evidence must translate into legal frameworks, governance, and financing.

Long-term One Health sustainability in the Lower Mekong depends on transitioning from fragmented, non-binding agreements to legally reinforced, co-financed regional systems. Key success factors include expanding the technical workforce in implementation research, standardizing field-level diagnostic tools, and institutionalizing shared digital data platforms.

The delegates suggested continuing key MOHIP activities such as information and knowledge sharing through webinars and other modes such as virtual/online training, form a wider transnational network bringing other ASEAN countries and countries from South onboard, and form a multicounty core team to materialize these plans.

Appendices

Appendix 1: Symposium Program Agenda



Michigan State University
Mekong One Health Innovation Program (MOHIP)
One Health Research, Education, and Policy Symposium

"Fostering Resilient and Integrated Health Systems through One Health and Innovation"

Date:

December 10 - 11, 2025

Venue:

Phenikaa University, Hanoi, Vietnam
Nguyen Trac Street, Duong Noi ward, Hanoi, Vietnam
and
Wyndham Garden Hotel
HH01 To Huu Street, Van Phuc Ward, Hanoi, Vietnam
Phone: +84 989 320 539

Organizer:

Michigan State University, Michigan, USA

Co-organizer:

Phenikaa University, Hanoi, Vietnam

Collaborators:



Contact:

Ramjee Ghimire (DVM, PhD), ghimirer@msu.edu

Background: Endowed with diverse and abundant natural resources, rich socio-cultural heritages, and unique agrifood systems, the Mekong Region, and particularly the Lower Mekong Subregion (LMSr), holds significant potential for economic growth and overall prosperity. However, the LMSr faces numerous challenges such as climate change, waterborne and airborne disasters and diseases, food safety and security issues, migration and movement of people, trade and movement of livestock and livestock products, transboundary animal diseases, vector-borne diseases (e.g., dengue, malaria), pandemic influenza, and non-communicable diseases, among others. The Mekong U.S. Partnership (MUSP) program has initiated several transnational cooperation and efforts to address these challenges, one of which is the promotion of the One Health approach through Mekong One Health Innovation Program (MOHIP) for coordinated policy and programmatic responses.

LMSr holds a strategically important position in U.S. foreign policy and global health security. Supported by the U.S. Department of State, and as a part of the Mekong US Partnership Program (MUSP), Michigan State University (MSU) has been implementing the Mekong One Health Innovation Program (MOHIP) in Lao PDR, Vietnam, and Thailand since October 2022, collaborating with country One Health University Networks. The overarching goal of MOHIP is to create a transnational network and empower health researchers and practitioners to make informed decisions about their health security programs and policies, thereby improving health security. To achieve this goal, MOHIP connects Mekong One Health researchers and practitioners with their counterparts in the U.S. and beyond, facilitating the sharing of research, education, and outreach tools. Within these contexts, the MOHIP is organizing the MOHIP One Health research, education, and policy symposium commemorating the successful implementation of its activities and appreciating the collaboration it has established among One Health stakeholders in the Mekong region and beyond.

Purpose: The symposium has the theme "Building Resilient Health Systems through One Health Integration and Innovation." The event will celebrate the achievements of the Mekong One Health Innovation Program, share lessons learned, and chart a path forward to ensure sustainable health security in the Lower Mekong Subregion (LMSr) through continued collaboration, innovation, and capacity building.

Objectives: (i) *Reflect on Progress and Achievements:* Review the progress made by MOHIP highlighting key accomplishments in research, education, and outreach. This will include presentations of research findings, success stories, and testimonials from stakeholders in Lao PDR, Vietnam, and Thailand. (ii) *Assess Challenges and Opportunities:* Engage stakeholders in discussions about the challenges encountered during the program's implementation, including those related to capacity building, policy integration, and cross-border collaboration. Identify opportunities for further strengthening the One Health approach in the region. (iii) *Strengthen Networks and Partnerships:* Foster stronger connections between One Health practitioners, researchers, and policymakers across the LMSr and beyond. Encourage the formation of new partnerships and collaborative projects that can sustain and expand the impact of MOHIP. (iv) *Strategize for the Future:* Develop actionable strategies to ensure the sustainability of health security initiatives in the LMSr. This includes planning for the continuation of MOHIP activities, exploring new funding opportunities, and integrating One Health principles into national and regional health policies.

Expected Outcomes: (i) Increased awareness of the One Health approach among regional stakeholders contributing to more informed decision-making and policy development. (ii) Enhanced networking and open avenues for new opportunities for participants to connect, share ideas, and explore potential collaborations. (iii) Strengthened networks among One Health practitioners, researchers, policymakers, and young professionals, leading to continuing enhanced collaborations and resource sharing. This outcome will be achieved by leveraging a professional network built over the years and well-attended MOHIP webinars, including a member database (800+ strong One Health short course attendees) and a team of regional One Health leaders.

The final symposium will not only celebrate the successes of the Mekong One Health Innovation Program but also ensure that its impact continues to grow, contributing to the health security and well-being of the Lower Mekong Subregion for years to come.

Post-Symposium Activities: Develop and disseminate a comprehensive symposium report that captures key discussions, agreed-upon outcomes, and proposed strategies. The report will inform collaborators and stakeholders of the resolutions and guide efforts to strengthen health security through a One Health approach.

Date and Venue:

Date: December 10 - 11, 2025

Venue: Phenikaa University, Nguyen Trac Street, Duong Noi ward, Hanoi, Vietnam: December 10, 2025 until 1 PM. Wyndham Garden Hotel, HH01 To Huu Street, Van Phuc Ward, Hanoi, Vietnam: December 10, 1 PM onwards and December 11, 2025.

Program Agenda:

When	What	By whom
December 9, 2025	Delegates arrive and check in at the Wyndham Garden Hotel, HH01 To Huu Street, Van Phuc Ward, Hanoi, Vietnam.	
December 10, 2025	Opening Program and Technical Session I @Phenikaa University Auditorium A9-A10, 2nd Floor Technical Session II & III (after lunch) in the Wyndham Garden Hotel	
07:30 AM	Bus leaves for Phenikaa University from the Wyndham Garden Hotel.	
08:00 - 08:30 AM	Registration	
	Opening Program	Moderator: Dr. Qing Xia
08:30 - 08:35 AM	Welcome and Introduction to the Symposium	Dr. Ramjee Ghimire, MOHIP, MSU
08:35 - 08:40 AM	Welcome Remarks	Courtney Beale, Deputy Chief of Mission for the U.S. Mission in the Socialist Republic of Vietnam
08:40 - 08:45 AM	Welcome Remarks	Representative, Ministry of Health, Government of Vietnam
08:45 - 08:50 AM	Opening Remarks	President, Phenikaa University, Hanoi, Vietnam
08:50 - 09:00 AM	Opening Remarks	Dr. Rebecca Malouin, Associate Dean, College of Osteopathic Medicine; Director, Global Health Institute (GHI), MSU

09:00 - 09:40 AM	Group Photo and Tea/Coffee Break	
9:40 - 10:10 AM	Keynote Address I: Integrating the Environmental Sector into One Health: Bridging Ecosystems, Animals, and People	Dr. Jonathan Sleeman, One Health and Wildlife Health Specialist, FAO Regional Office for Asia and The Pacific, Bangkok, Thailand
10:10 - 10:30 AM	MOHIP Overview	Dr. Ramjee Ghimire, Dr. Furqan Irfan and Dr. Qing Xia, MOHIP, MSU
10:30 - 11:45 AM	Technical Session I: Health Security Status and One Health Program Implementation	Session Chair: Dr. Pratap Singhasivanon
10:30 - 10:45 AM	Health Security Status and One Health Program Implementation - Lao PDR	Dr. Sompadith Phavilay, Lao PDR
10:45 - 11:00 AM	Health Security Status and One Health Program Implementation - Thailand	Dr. Theerakamol Pengsakul, Thailand
11:00 - 11:15 AM	Health Security Status and One Health Program Implementation - Vietnam	Dr. Pham Duc-Phuc, Vietnam
11:15 - 11:30 AM	Health Security Status and One Health Program Implementation - Cambodia	Drs Chea Rortana and Seang Sokheng, Cambodia
11:30 - 11:45 AM	SEAOHUN's Initiatives to Promote One Health in Southeast Asia	Dr. Tongkorn Meeyam, SEAOHUN, Thailand
11:45 AM - 12:45 PM	Lunch Break @Phenikaa University Cafeteria D6	
1:00 - 1:30 PM	Travel from Phenikaa University to Wyndham Garden Hotel.	
	Tea/Coffee	
1:30 - 1:50 PM	Keynote Address II: 1. Regional Health Priorities and U.S. Collaboration through a One Health Lens 2. One Health in Vietnam: Challenges and Opportunities	John R. MacArthur (MD, MPH CAPT, USPHS), Regional Director, Southeast Asia Regional Office, US CDC Hanoi. Lindsay Kim, Acting Country Director, Vietnam CDC
1:50 - 3:00 PM	Technical Session II: MOHIP Research Presentations	Session Chair: Dr. Tongkorn Meeyam, SEAOHUN, Thailand
1:50 - 2:05 PM	Surveillance of antibiotic contamination, coliform bacteria and resistome in Mekong River Basin environment of Thailand and Vietnam from the One-Health perspective	Dr. Nguyen Quang Huy, University of Science and Technology of Hanoi (USTH), Hanoi, Vietnam
2:05 - 2:20 PM	Surveillance and Control of Brucellosis in Vientiane, Lao PDR: A One Health Approach	Dr. Soulasack Vannamahaxay, National University of Laos, Lao PDR
2:20 - 2:35 PM	Prevalence of Schistosoma mekongi in Khong district of Lao PDR: One Health approach	Dr. Bamphen KEOMOUNGKHOUN, Champasack University, Lao PDR
2:35 - 2:50 PM	Exposures and potential health risk from animals and environmental exposures among the hill tribe and stateless people living in border areas of Thailand-Myanmar-Lao PDR: One Health Approach	Dr. Tawatchai Apidechkul, Mae Fah Luang University, Thailand
2:50 - 3:05 PM	Prevalence, diversity, and risk factors associated with Streptococcus suis infection in the Nan province of Northern Thailand: A One Health study in humans, pigs, and the environment	Dr. Chayada Sitthidet Tharinjaroen, Chiang Mai University, Thailand

3:05 - 3:20 PM	Microplastic - Mediated Antimicrobial Resistance in Aquatic Ecosystems: One Health Implications	Dr. Ngo Thi Thuy Huong, Phenikaa University, Vietnam
3:20 - 3:50 PM	Tea/Coffee Break	
3:50 - 5:00 PM	Technical Session III	Chair: Mai Thi Ngan (DVM., Ph.D.), Associate Professor, Faculty of Veterinary Medicine, Vietnam National University of Agriculture, Ha Noi, Vietnam
3:50 - 4:02 PM	One Health Efforts in Phenikaa University	Phenikaa University
4:02 - 4:24 PM	One Health Education in Vietnam	Dr. Van Hoang Thi Hai, Hanoi Medical University
4:24 - 4:36 PM	One Health Education in Thailand	Dr. Saengduen Moosom, Thailand One Health University Network (THOHUN)
4:36 - 4:48 PM	One Health Education in Cambodia	Mr. Bunna CHEA and Ms. Mang Sonita, Cambodia One Health University Network (CAOHUN)
4:48 - 5:00 PM	One Health Education in Lao PDR	Dr. Bae PHEAXAY, Laos One Health University Network (LAOHUN)
6:30 - 8:30 PM	Reception Dinner Venue: Wyndham Garden Hotel	
December 11, 2025 @Wyndham Garden Hotel		
8:30 - 10:15 AM	Technical Session IV	Chair: A/Prof. Nguyen Vu Trung, Pasteur Institute in HCM, Ho Chi Minh City, Vietnam
8:30 - 8:50 AM	Improving Health Security through One Health in Wildlife [virtual]	Dr. Dalen Agnew, Professor, College of Veterinary Medicine, Michigan State University
8:50 - 9:10 AM	One Team, One Health: Michigan State University's Global Health Vision and Programs	Dr. Rebecca Malouin, Professor and Associate Dean, Global Health Institute, MSU
9:10 - 9:25 AM	Environment & Health: Advancing One Health Connections in Vietnam	Dr. Thomas Wagner, Heriot-Watt University (HWU) Edinburgh UK and Team
9:25 - 9:35 AM	Break	
9:35 - 9:45 AM	Disease Outbreaks Prediction from Western to Eastern Medicine Perspectives: A Dengue Case Study	Prof. Tran Ngoc Dang, University of Medicine and Pharmacy, Ho Chi Minh City
9:45 - 9:55 AM	One Health Anthrax Surveillance and Vaccination Strategy	Prof. Hoang Thi Thu Ha, National Institute of Hygiene and Epidemiology (NIHE), Ministry of Health (MOH)
9:55 - 10:05 AM	Bridging the Gap: Occupational Health and Safety within One Health Framework	Dr. Ngo Thi Thu Hien, Phenikaa School of Medicine and Pharmacy, Phenikaa University, Hanoi
10:05 - 10:15 AM	Creating a One Health and One Water Partnership [virtual]	Drs Zigmund Kozicki and Stephanie Baiyasi-Kozicki, Michigan, USA
10:15 - 10:45 AM	Tea/Coffee Break	

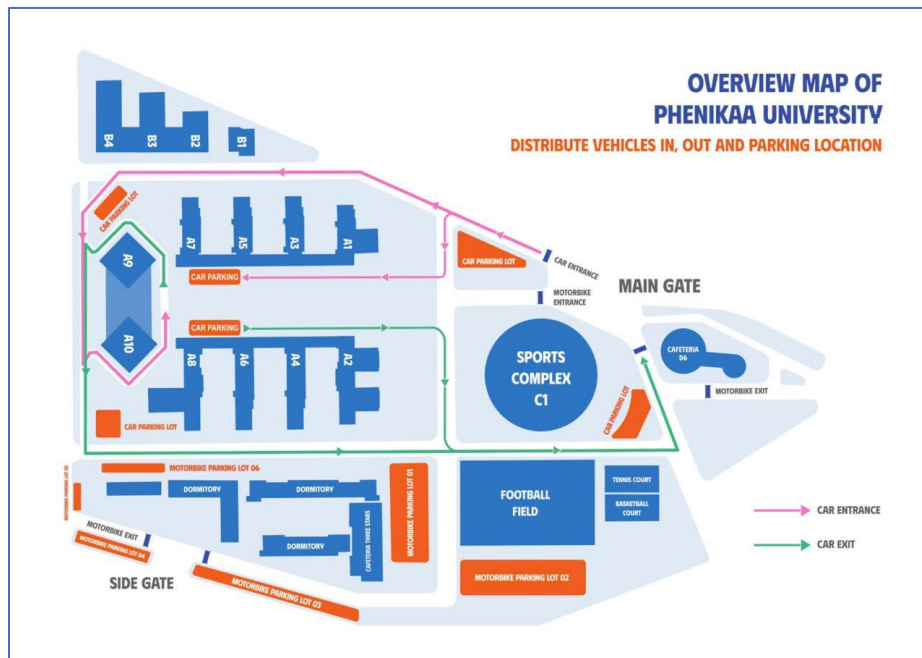
10:45 - 11:17 AM	Technical Session V: Student-led One Health Initiatives	Chair: Dr. Pham Duc Phuc
10:45 - 10:53 AM	Bacterial Community Dynamics on Microplastic Surfaces: An In-Situ Investigation in Mangrove Forest and Aquaculture Systems, Nam Dinh, Vietnam	Vo Hoai Hieu, Phenikaa University and Team Members - Le Thanh Thao, Jennifer Scott, Vu Thanh Long, Le Huy Hoang, Tony Gutierrez, Max Webb, Hoang Thi Thu Ha, Michel Kaiser, Ngo Thi Thuy Huong
10:53 - 11:01 AM	A Meaningful Milestone for UHS Students in Advancing One Health Implementation	Mr. Phaithoun BOUNYAVONG, University of Health Sciences, Lao PDR
11:01 - 11:09 AM	Collaborative action of Student One Health Leaders in combating antimicrobial resistance	Miss Aleena Buranaphol and Watcharachai Jantawan, Naresuan University, Thailand
11:09 - 11:17 AM	Preventing Zoonotic Diseases through Wildlife Conservation: A One Health Perspective	Mr. Nguyen Thi Ninh, Hanoi Medical University, Hanoi
11:17 AM - 11:30 AM	Tea/Coffee Break	
11:30 AM - 12:10 PM	Breakout Session I: Building Sustainable Health Systems: The Role of Legal Framework, Policy, and Collaboration. This discussion will focus on strategies for integrating One Health into national and regional policies and promoting cross-border cooperation	Moderators: xx Dr Furqan Irfan, Dr. Sompadith Phavilay, Dr. Pham Thanh Long, Dr. Chea Rortana
12:10 - 12:30 PM	Group Presentations	
12:30 - 1:30 PM	Lunch Break	
1:30 - 1:50 PM	One Health in South Asia: Current Implementation Challenges and Opportunities	Dr. Pratap Singhasivanon, SEAMED TROPED Network, Thailand
1:50 - 2:50 PM	Panel Discussion: Transnational One Health Network: How and Why?	Moderator: Drs Ramjee Ghimire and Furqan Irfan Panelists: Dr. Tongkorn Meeyam Dr. Rebecca Malouin Dr. Nguyen Vu Trung
2:50 - 3:20 PM	Tea/Coffee Break	
3:20 - 4:00 PM	Strategic Planning Breakout Session II: Develop a strategic plan for expanding and sustaining One Health initiatives in the lower Mekong and beyond – ASEAN region: Identify collaboration opportunities, challenges, capacity-building needs	Moderators: Dr. Saengduen Moonsom Dr. Qing Xia
4:00 - 4:20 PM	Group Presentations	
4:20 - 4:30 PM	Reflection on the symposium	
4:30 - 5:00 PM	Closing Remarks. Thank You Notes	• Dr. Mayfong Mayxay, Chair, LAOHUN • Assoc. Prof. Dr. Nguyen Phu Khanh, Vice President, Phenikaa University, Vietnam • Dr. Ramjee Ghimire, MOHIP, MSU

PARKING INFORMATION

Transportation:

Those arriving by air, here are the arrival instructions. After collecting your luggage, please proceed to the Pick-Up Area, located outside of **Lobby A2, at Pillar 15**. Kindly look for our personnel holding a placard that reads **“MOHIP DELEGATES.”** In case you encounter any difficulty locating the driver or have concerns about potential scams, please contact the hotel immediately for assistance at the Hotel Reception: (+84) 24 3666 6655. We will also try to provide you with the contact # of the driver or vehicle person (if available) before your travel. See the picture of the exit at Hanoi  airport.

For those driving their own vehicles, please find below the parking formation in the Phenikaa University. **Parking fees for all delegates attending the One**



Health Symposium will be waived. Upon arrival, kindly present your symposium invitation letter to the university security personnel at the gate. They have been informed in advance and will allow you to enter without any charges. Please follow the map and park in the designated area.

Parking in the Wyndham

Garden Hotel for symposium delegates if free. Enter through the main entrance is located at HH01 To Huu Street, Ha Dong Ward, Hanoi. In case you need any help with parking instruction, there's always (24/7) hotel staff to guide/help you. When arriving by taxi, please ask the driver to drop you off at the main entrance of Wyndham Garden Hanoi. Hotel Doorman and Reception Team will be there to assist you with luggage and check-in.



GUIDE FOR HANOI TRAVEL

Hanoi Weather:

December in Hanoi marks the beginning of its true winter. The weather is cool and misty, with average daytime temperatures between 15°C and 20°C and colder nights that can drop to 12°C or lower. Rain is light but occasional drizzle can be expected.

Tips for travelers:

- Bring a jacket or umbrella for light drizzle.
- Pack layered clothes so you can adjust to temperature changes during the day.

TOURIST ATTRACTIONS:

VAN PHUC SILK VILLAGE: It is renowned for its over 1,000-year-old silk weaving tradition. Van Phuc silk is soft, durable, and was once used in royal courts and exported internationally. Visitors can explore the traditional silk weaving process and purchase high-quality silk products.



HANOI MUSEUM: It is located on Pham Hung Street, Nam Tu Liem District, and houses over 50,000 artifacts showcasing the history, culture, and development of the capital. The museum features unique spiral architecture and is an attractive destination for those interested in learning about Hanoi's past and heritage.

The museum features unique spiral architecture and is an attractive destination for those interested in learning about Hanoi's past and heritage.

THE VIETNAM MUSEUM OF ETHNOLOGY: This museum presents a comprehensive display of artifacts from Vietnam's 54 ethnic groups. It features both indoor and outdoor exhibition areas that vividly depict the daily life, culture, and customs of these groups. The museum also hosts cultural activities like water puppet shows and traditional folk games, providing visitors with deeper insights into the distinct characteristics of

each ethnic group.



THE TEMPLE OF LITERATURE: Built in 1070 under King Ly Thanh Tong, the Temple of Literature is one of Vietnam's oldest cultural symbols and its first university. Dedicated to Confucius and renowned scholars, it features ancient architecture and stone steles honoring distinguished academics. Its serene atmosphere offers insight into Vietnam's educational history and the nation's respect for academic excellence.



THE HO CHI MINH MAUSOLEUM: It also known as President Ho Chi Minh's Mausoleum

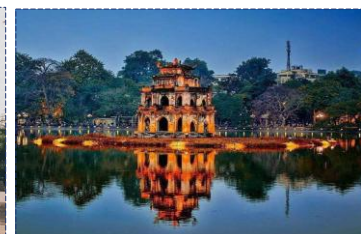
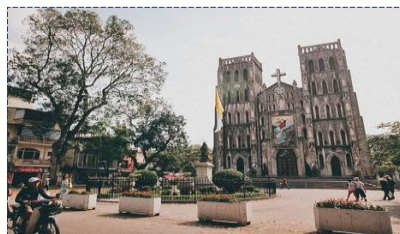


or Uncle Ho's Mausoleum, is the resting place of President Ho Chi Minh's embalmed body. The construction of the mausoleum officially began on September 2, 1973, at the location of the old grandstand in Ba Dinh Square, where President Ho Chi Minh once presided over important meetings.

THE IMPERIAL CITADEL OF THANG LONG: The Imperial Citadel of Thang Long, a UNESCO World Heritage site, is a symbol of Vietnam's enduring history and power. Built in the 11th century by the Ly Dynasty, it served as the political center of Vietnam for over 13 centuries. The site features ancient palaces, royal gates, and relics from various dynasties, showcasing a blend of architectural styles and historical significance.



HANOI'S OLD QUARTER: It is known as "36 Pho Phuong," is a lively maze of streets that once specialized in traditional trades like silk and jewelry. At its heart lies Hoan Kiem Lake, a peaceful oasis steeped in legend, where Emperor Le Loi is said to have returned his magical sword to the Golden Turtle. The lake is home to the iconic Turtle Tower and the historic Ngoc Son Temple, accessible by the charming red Huc Bridge. Just a short walk away, the impressive St. Joseph's Cathedral, built in 1886, stands as a symbol of Hanoi's French colonial past. Together, these landmarks reflect the rich cultural and historical tapestry of the city.





HOA LO PRISON, located in the heart of Hanoi, was once a place where Vietnamese revolutionaries were imprisoned during the French colonial period. Visiting this site, students can gain a deeper understanding of the struggle for independence, observe historical artifacts, and hear inspiring stories of resilience. This place serves as a vivid testament to the indomitable spirit and patriotism of the Vietnamese people.

THE ONE PILLAR PAGODA, also known as Dien Huu Pagoda, is located at Doi Can, Ba Dinh District, Hanoi, Vietnam. This unique pagoda, shaped like a lotus flower on a single stone pillar, was built during the Ly Dynasty. It holds deep spiritual significance and stands as a cultural and religious symbol of Hanoi.

CUISINE

Pho Thin Lo Duc is one of the famous and long-established pho restaurants in Hanoi, Vietnam. Known for its distinctive flavor and consistent quality, the restaurant is renowned for its stir-fried beef pho with a rich broth and tender beef.



Bun Cha is a classic Hanoi dish, featuring grilled pork patties and slices served in a fragrant broth with vermicelli noodles. Accompanied by fresh herbs and a tangy dipping sauce, this savory meal is a favorite among locals. Its smoky, flavorful pork and refreshing side vegetables make it a perfect blend of textures and tastes, representing the essence of Hanoi's street food culture.



Banh cuon in Hanoi, with its thin, silky layers and fragrant, flavorful filling, captures the hearts of any visitor traveling to the city. Hanoi boasts numerous bánh cuốn eateries where you can savor this quintessential dish, offering the most authentic taste of the capital's culinary scene.



Cháo Sườn Sụn is a beloved Hanoi institution renowned for its delectable porridge. This family-run eatery has been serving up steaming bowls of comfort food for generations. Their signature dish is the namesake porridge, featuring tender pork ribs and cartilage simmered in a flavorful broth. The porridge is often topped with shallots, cilantro, and a squeeze of lime, and is enjoyed with a variety of toppings, such as fried lime.



Bún Đậu Mắm Tôm is a popular Vietnamese dish that combines the flavors of rice vermicelli, fried tofu, and a savory fermented shrimp sauce. It's a hearty and flavorful meal that's perfect for any time of day. A delicious and satisfying meal that showcases the unique flavors of Vietnamese cuisine. It's a must-try for anyone visiting Vietnam.

Bánh tôm Hồ Tây is a popular Vietnamese dish that features crispy fried shrimp patties served with a tangy dipping sauce. The shrimp patties are made with a mixture of ground shrimp, pork, and vegetables, coated in a light batter and deep-fried until golden brown. The dipping sauce is a combination of fermented shrimp sauce, chili, lime juice, and sugar, creating a sweet and savory flavor. Bánh tôm Hồ Tây is often enjoyed with rice vermicelli, fresh herbs, and pickled vegetables.



TRANSPORTATION OPTIONS IN HANOI:

FROM MOTORBIKES TO METRO

1. Motorbike

- Renting a motorbike: Motorbikes are a flexible and popular way to explore Hanoi. Tourists can easily rent motorbikes from shops or hotels for around 100,000 - 200,000 VND per day.
- Note: An international driving license is required, and you must wear a helmet and follow traffic rules. Hanoi's streets can be crowded and challenging for beginners.



2. Technology-based motorbike taxis

- GrabBike and GrabCar: The Grab app allows tourists to conveniently book a motorbike taxi (GrabBike) or car (GrabCar) for transportation within the city.
- Advantages: Easy to book, transparent pricing, and no need for bargaining. Particularly useful for short trips within the city.

- How to use: Download the Grab app, enter your destination, and choose your preferred ride. The fare is displayed before confirming the trip.

3. Metro

- Cát Linh - Hà Đông Metro Line: Hanoi now has an elevated metro line connecting Cát Linh to Hà Đông, a modern option for traveling through key districts.
- Fare: Around 8,000 - 15,000 VND depending on the distance.
- Operating hours: From 5:30 AM to 10:00 PM.
- Advantages: Avoids traffic congestion and is suitable for long-distance trips while offering a scenic view of the city from above.



TRAVELING BY BUS IN HANOI

- Hanoi's bus system is well-developed and widely accessible, making it easy for tourists to reach famous attractions at an affordable cost.
- Ticket price: typically ranges from 7,000 to 9,000 VND per trip. Tickets can be purchased on the bus or with a monthly bus pass.
- Bus schedule: buses generally run from around 5:00 am to 9:00 pm.
- Popular bus routes:
- Route 86: Noi Bai airport - Hanoi railway station (passing through the old quarter and Hoan Kiem Lake).
- Route 32: Giap Bat bus station - Nhon (passing through the temple of literature).
- Route 34: My Dinh bus station - Gia Lam Bus Station (covering many central locations).
- Apps for route lookup: You can use apps like bus maps to check schedules and find the best bus routes.
- Buses are an affordable and convenient way to explore Hanoi, offering a relaxed pace and an eco-friendly travel option.



Appendix 2: Symposium Invitees

Country	Name	Position	Organization	Email
Vietnam	Dr. Pham Duc Phuc	Director and Former Program Coordinator	Director, Institute of Environmental Health and Sustainable Development and Former Coordinator of Vietnam One Health Network (VOHUN)	pdp@vohun.org
Vietnam	Dr. Nguyen Quoc Dinh	Acting Head, External Engagement Office	Phenikaa University, Hanoi 12116, Vietnam	dinh.nguyenquoc@phenikaa-uni.edu.vn
Vietnam	Dr. Ngo Thi Thuy Huong	Leader of Environmental Chemistry and Ecotoxicology Group	Faculty of Biotechnology, Chemistry and Environmental Engineering, Phenikaa University, Hanoi 12116, Vietnam	huong.ngothithuy@phenikaa-uni.edu.vn ; ngothithuyhuong@gmail.com
Vietnam	Dr. Nguyen Quang Huy [absent]	Deputy Director	Department of Life Sciences University of Science and Technology of Hanoi (USTH) / Vietnam - France University	nguyen-quang.huy@usth.edu.vn
Vietnam	A/Prof. Hoang Thi Thu Ha	Associate Professor	National Institute of Hygiene and Epidemiology (NIHE), Ministry of Health (MOH)	hthh@nihe.org.vn
Vietnam	Dr. Pham Thanh Long	Head	Department of Animal Health & Production (DAHP), Ministry of Agriculture and Environment (MAE)	ptlong@mae.gov.vn
Vietnam	Prof. Nguyen Vu Trung	Associate Professor	Pasteur Institute in o Chi Minh City, Vietnam	Nguyen.vu.trung@gmail.com
Vietnam	Prof. Tran Ngoc Dang (virtual)	Associate Professor	University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam	tranngocdang@ump.edu.vn
Vietnam	Dr. Nguyen Thi Minh Ngoc		Hai Phong University of Medicine and Pharmacy, Haiphong, Vietnam	ntmngoc@hpmu.edu.vn
Vietnam	Dr. Bui Thi Hien		University of Agriculture and Forestry – Hue University, Hue City	buithihien@huaf.edu.vn
Vietnam	Prof. Le Thanh Hien	Associate Professor	Nong Lam University in Ho Chi Minh City	hien.lethanhh@hcmuaf.edu.vn
Vietnam	A/Prof. Mai Thi Ngan, DVM., Ph.D.	Associate Professor	Department of Veterinary Microbiology & Infectious Diseases, Faculty of Veterinary Medicine, Vietnam National University of Agriculture, Ha Noi, Viet Nam	ngan16a@gmail.com or mtngan@vnua.edu.vn
Vietnam	Dr. Thu Thien Thi Cu		Faculty of Animal Science, Vietnam National University of Agriculture	thienthu79vn@yahoo.com
Vietnam	Dr. Hung Pham Hoang Son		Department of Veterinary Medicine, Hue University of Agriculture and Forestry	phamhoangsonhung@gmail.com
Vietnam	Vo Hoai Hieu	Student	Phenikaa University, Hanoi 12116, Vietnam	vohoaihieu96@gmail.com
Vietnam	Nguyen Thi Ninh	Student	Hanoi Medical University, Hanoi, Vietnam	ninhnguyenydd@gmail.com

UK	Prof. Thomas Wagner		Heriot Watt University, UK	t.wagner@hw.ac.uk
Thailand	Thura Kyaw	Regional Program Manager	Southeast Asian One Health University Network (SEAOHUN), Thailand	thurakyaw@seaohun.org
Thailand	Dr. Tongkorn Meeyam (Tip)	Executive Director	Southeast Asian One Health University Network (SEAOHUN), Thailand	tongkorn@seaohun.org
Thailand	Dr. Pratap Singhasivanon	Secretary General/Coordinator	SEAMED TROPED Network, Thailand	pratap.sin@mahidol.edu
Thailand	Dr. Saengduen Moonsom	Associate Professor	Faculty of Tropical Medicine, Mahidol University	saengduen.moo@mahidol.ac.th
Thailand	Dr. Theerakamol Pengsakul	Associate Professor	Faculty of Environmental Management, Prince of Songkla University, Songkhla, Thailand	theerakamol.p@psu.ac.th
Thailand	Dr. Chayada Sitthidet Tharinjaroen	Assistant Professor	Division of Clinical Microbiology, Department of Medical Technology, Faculty of Associated Medical Sciences, Chiang Mai University, Chiang Mai, Thailand, 50200	chayada.si@cmu.ac.th , poompim_555@yahoo.com
Thailand	Dr. Tawatchai Apidechkul	Associate Professor	Mae Fah Luang University, Chiang Rai, Thailand	tawatchai.api@mfu.ac.th
Thailand	Dr. Usanee Wattananandkul	Assistant Professor	Division of Clinical Microbiology, Department of Medical Technology, Faculty of Associated Medical Sciences, Chiang Mai University, Thailand"	usanee.anukool@cmu.ac.th
Thailand	Miss Aleena Buranaphol	Student	Faculty of Pharmaceutical Sciences, Pharmaceutical Care, Naresuan University, Thailand	aleenab64@nu.ac.th
Lao PDR	Prof. Dr. Mayfong MAYXAY	Professor	University of Health Sciences, Vientiane, Lao PDR	mayfong@tropmedres.ac
Lao PDR	Dr. Soulasack Vannahamaxay	Lecturer	National University of Laos, Faculty of Agriculture, Dept. of Veterinary Medicine	v.soulasack@nuol.edu.la
Lao PDR	Dr. Bamphen Keomoungkhoun	Lecturer	Faculty of Agriculture and Forestry, Champasack University, Lao PDR	bamphen@kkumail.com
Lao PDR	Dr. Sysavanh Phommachanh	Deputy Director General	Institute of Research and Education Development, University of Health Sciences and also Member of LAOHUN Committee	sysavanhmayxay@gmail.com
Lao PDR	Dr. Sompadith Phavilay	Technical Officer	Department of Communicable Disease Control (CDC), Ministry of Health	bobphavilay@gmail.com
Lao PDR	Dr. Bae PHEAXAY	Assistant Professor	Faculty of Environmental Sciences, National University of Laos	pbae2002@gmail.com , b.pheaxay@nuol.edu.la
Lao PDR	Mr. Phaithoun BOUNYAVONG	Student	University of Health Sciences, Lao PDR	phaithounnnnnnp@gmail.com

USG	John R. MacArthur, MD, MPH, CAPT, USPHS	Regional Director	Southeast Asia Regional Office, US Centers for Disease Control and Prevention	jmacarthur@cdc.gov
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Appendix 3: Breakout Sessions Discussion Questions

Four discussion-driven breakout questions tailored to your symposium agenda and the One Health policy context in Southeast Asia:

1. How can national legal and policy frameworks be strengthened to formally integrate One Health principles into public health, veterinary, and environmental governance systems?

This invites participants to reflect on legislative gaps, institutional mandates, and enforcement challenges.

2. What practical mechanisms can governments adopt to enhance coordination among human health, animal health, and environmental sectors—both within countries and across borders?

Encourage discussion about joint surveillance platforms, shared data systems, crisis-response protocols, and inter-ministerial coordination.

3. How can regional bodies (e.g., ASEAN, SEAR, Mekong Basin partnerships) support countries in harmonizing One Health policies and facilitating cross-border preparedness for outbreaks and AMR threats?

Focuses on enabling structures, regional policy alignment, and joint investments.

4. What are the most significant barriers that hinder multisectoral and cross-border collaboration, and what proven strategies or models can help overcome them?

Prompts sharing of lived experiences and solutions from participants' countries or institutions.

Four questions tailored to the theme “*Transnational One Health Network: How and Why?*”:

1. Why is a transnational One Health network essential for addressing emerging health threats in the Lower Mekong and wider ASEAN region?

Prompts participants to articulate the added value, urgency, and unique role of a regional network.

2. What core functions should a transnational One Health network prioritize—such as surveillance, rapid information sharing, workforce development, or joint research?

Helps clarify the scope and operational focus of the network.

3. What governance structure, communication channels, or coordination mechanisms would be most effective for sustaining a multi-country One Health network?

Encourages reflection on leadership models, decision-making, and resource mobilization.

4. What opportunities and challenges exist in establishing and maintaining such a network, and how can countries collaboratively address these challenges?

Guides participants to consider feasibility, political buy-in, financial sustainability, and cross-cultural or institutional barriers.

Four focused, action-oriented breakout questions tailored to the strategic planning session for One Health expansion and sustainability in the Lower Mekong and broader ASEAN region:

1. What priority areas should be included in a regional strategic plan to expand and sustain One Health initiatives in the Lower Mekong and ASEAN?

Encourages participants to identify thematic pillars such as surveillance, workforce capacity, governance, financing, and community engagement.

2. Which partnership and collaboration opportunities—across governments, academia, NGOs, private sector, and regional bodies—could most effectively accelerate One Health implementation?

Prompts mapping of actors and co-investment pathways.

3. What are the critical capacity-building needs (workforce skills, laboratory systems, data-sharing platforms, emergency response capabilities, etc.) that must be addressed to strengthen One Health systems regionally?

Help prioritize concrete investment areas and training needs.

4. What challenges currently hinder the scale-up and sustainability of One Health programs, and what practical strategies or governance mechanisms could be adopted to overcome them?

Invites participants to reflect on policy gaps, financing barriers, institutional silos, and propose realistic solutions.

Appendix 4: Select Pictures from the Symposium











