Towards an Integrated Response in the Asia-Pacific Region to Emerging and Re-Emerging Disease Outbreaks, with emphasis on COVID-19 and a One Health Approach: Lessons Learned, Challenges and Opportunities

Final Report

APEC Health Working Group

August 2025

Asia-Pacific
Economic Cooperation

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Executive Summary

The seminars covered key topics, methodologies, and innovations, including the One Health approach, the impact of the HPAI H5N1 epizootic, economic impacts of the COVID-19 pandemic, and women's involvement in the One Health approach. Workshops focused on preparedness, epidemiological surveillance, control and response strategies, information systems, and multisectoral coordination.

Some critical findings and learnings throughout the event were identified and highlighted through the different sessions and dialogue tables, such as,

- Economic Impact of COVID-19: The pandemic caused significant economic disruption, with varying impacts across economies, highlighting the need for strategies to mitigate future economic shocks.
- One Health Approach: The interconnectedness of human, animal, and environmental health is crucial for effective disease prevention, surveillance, and control.
- Zoonotic Diseases: Factors like environmental disruption and increased human-wildlife interaction are driving the emergence of zoonotic diseases.
- Gender Disparities: Health crises disproportionately affect vulnerable populations, particularly women, exacerbating inequalities in resource access.
- Importance of Collaboration: Effective disease control requires collaboration across economies, sectors, and disciplines.
- Health Supply Chain Resilience: Strengthening health supply chains is essential for pandemic preparedness and response.
- Data Management and Surveillance: Effective data management, information sharing, and surveillance systems are critical for early detection and response.
- Community Engagement: Engaging communities and leveraging technology can enhance surveillance and response efforts.
- Antimicrobial Resistance (AMR): Addressing AMR requires a coordinated One Health approach.

Several key recommendations were made, including:

- To promote continued dialogue and knowledge sharing: the value of creating open dialogue and sharing experiences among different economies, as this facilitates learning and collaboration, is emphatic.

- To strengthen collaboration and networking: the importance of establishing and maintaining connections among experts and consultants to foster collaboration on integrated responses to disease outbreaks.

- To enhance capacity building: workshops were particularly beneficial for developing economies, suggesting a need for continued support to enhance their disease prevention, surveillance, and control systems.

- To adopt a One Health approach: the significance of the One Health approach, which recognizes the interconnectedness of human, animal, and environmental health, in addressing emerging and re-emerging diseases.

- To focus on key areas: There are several key areas that should be prioritized, including preparedness, epidemiological surveillance, control and response strategies, information systems, and multisectoral coordination.

- Invest in resilient healthcare systems and health supply chains.

- Develop and implement gender-sensitive policies and promote women's leadership.

- Leverage IT tools and digital platforms to improve surveillance and collaboration.

- Foster regional and global cooperation to address health security threats

These recommendations highlight the importance of collaboration, capacity building, and an integrated approach to effectively address emerging and re-emerging disease outbreaks in the Asia-Pacific region.

Introduction

The project, which took place on 13-14 August 2024, included seminars, workshops, and dialogue tables. Following each session, there was a discussion period where attendees asked questions, and the presenter answered them.

The overall purpose of the project was to share experiences and knowledge on prevention, surveillance, and control of emerging and reemerging diseases with an emphasis on the COVID-19 pandemic, as well as the importance of the One Health approach, and to establish strategic collaboration links through the identification of expert consultants, networks, and technologies with potential for collaboration to achieve an integrated response that can help mitigate the economic and social impact of future outbreaks of emerging and reemerging diseases in the Asia-Pacific region.

There were 3 important defined objectives:

- To create a space for opening dialogue, sharing experiences, knowledge and lessons learned on prevention, surveillance, and control of emerging and reemerging diseases with an emphasis on the COVID-19 pandemic, through One Health approach.
- Establish strategic collaboration links through the identification of expert consultants, networks, and technologies to achieve an integrated response towards emerging and reemerging diseases through One Health approach.
- Contribute to mitigate the economic and social impact of future outbreaks of emerging and reemerging diseases in the Asia-Pacific region.

The project yielded benefits for all participating economies by providing access to knowledge, tools and collaborative linkages that improved prevention, surveillance and control of emerging and re-emerging diseases in their economies.

Representatives from several economies had the opportunity to interact, engage and share knowledge on several topics, such as information systems, multisectoral coordination, integrated response, control and response, epidemiological surveillance, and preparedness, during our workshop.

The workshop proved particularly beneficial for APEC developing economies, as they have experienced the most severe impact of the COVID-19 pandemic and may require additional support to enhance their disease prevention, surveillance, and control systems. This aligns with APEC's capacity building goals, which mentions: 1. to attain sustainable growth and equitable development in the Asia-Pacific region, and 2. to deepen the spirit of community in the Asia-Pacific.

Highlights of the Seminars

Session 1: One Health: Challenges and opportunities for prevention and control of emerging and re-emerging diseases

This presentation by Jessica Gálvez-Durand Besnard discussed the One Health approach, lessons learned, challenges, and opportunities in the context of emerging and re-emerging diseases, with a specific focus on the impact of the Highly Pathogenic Avian Influenza (HPAI) H5N1 epizootic on Pelecanus thagus populations in Chile and Peru.

This presentation highlighted the global emergence of HPAI around 1996 in Asia and its spread through Europe, Africa, and the Americas, following wild birds' migratory routes. It then explores the impact of the HPAI H5N1 epizootic on Pelecanus thagus, also known as the Peruvian pelican, in Chile and Peru. In Chile, HPAI was detected along the entire geographic range of P. thagus, while in Peru, the P. thagus population decreased by at least 40%.

Dr. Gálvez-Durand outlined the risk factors for HPAI emergence and spread, noting that in Peru, coastal regions with a high concentration of the poultry industry also have many Ramsar sites where migratory and resident wild birds are found.

The response to the HPAI H5N1 outbreak in Peru was initially coordinated by a multisectoral commission focused on the prevention and control of zoonotic diseases. Subsequently, a working group specifically focused on HPAI H5N1 was created, including institutions involved in human, animal, and environmental health, with technical and logistical support from the FAO.

This presentation also detailed the support provided by the Emergency Centre for Transboundary Animal Diseases (ECTAD) to the Peruvian government. ECTAD, established in 2005, plans and delivers FAO animal health emergency and development programs to prevent and mitigate the impact of animal diseases using a One Health approach. ECTAD's activities in Peru, established in September 2022 and financially supported by USAID, are distributed across six technical areas: antimicrobial resistance (AMR), zoonotic diseases (ZD), epidemiological surveillance (SUR), human resources (HR), biosafety/biosecurity (BIO), and the laboratories network (LAB).

Key outcomes of ECTAD's support in Peru include supporting the multisectoral prioritization of zoonotic diseases, developing an antimicrobial resistance legal framework, and supporting the multisectoral response against HPAI H5N1. Ongoing and upcoming activities include the implementation of tools for assessing human and animal health laboratories' capabilities, the establishment of a multisectoral project

implementation committee, and the implementation of the One Health Assessment Tool and the Surveillance Evaluation Tool.

The presentation concluded by discussing lessons learned, challenges, and opportunities. Lessons include the susceptibility of migratory wild birds to new HPAI types, the necessity of collaboration among human, animal, and environmental health institutions, and the significant role of humans in ecological and environmental change. Challenges include legal frameworks that do not adequately support joint work, limited resources, and the impact of political circumstances on government institutions. Opportunities include the willingness of young professionals to learn about and support the One Health approach, good relationships among government institutions, and international cooperation supporting the implementation of the One Health approach

Session 2: Women's involvement in One Health approach

This presentation by Dr. Claudia Brito focused on the involvement of women in the One Health approach, particularly in the Latin America and Caribbean (LAC) region. The presentation highlights the gender disparities that exist in access to resources and the disproportionate impact of various crises on women.

The presentation began by emphasizing that women's access to assets and resources is generally lower than men's. For instance, men are more likely to own land, and in 40 out of 46 economies, men own more land than women. Additionally, legal protections for women's land rights are weak in more than half of the LAC economies. This disparity extends to technology, with a persistent gender gap in mobile internet access in low- and middle-income groups. In agriculture the disparity shows, as farms of the same size managed by women are less productive than those managed by men, with a productivity difference of up to 24% in some economies.

The presentation further discussed the disproportionate impact of the COVID-19 pandemic on women in the LAC region. Women faced increased unpaid domestic care responsibilities due to service disruptions and school closures, which increased the overall care burden on women. Approximately 49% of women reduced their paid work hours during the pandemic. Additionally, female-headed households experienced greater income losses due to climate-related events like heat stress and flooding. The pandemic also exacerbated gender-based violence against women and girls.

Dr. Brito also addressed sexual and reproductive health challenges in the LAC region, noting that the progress made in reducing maternal mortality was slowed by the pandemic. Many abortions in the region are performed under high-risk conditions,

contributing to a maternal mortality ratio three times higher than in developed regions. Gender inequalities also increase women's vulnerability to HIV.

Furthermore, the presentation discussed the need to recognize women as subjects of rights within agri-food systems and to move away from approaches that narrowly focus on women's roles in family nutrition. The COVID-19 pandemic deepened the gender gap in food insecurity in LAC. Women in the region also face challenges related to obesity, anemia, and unequal working conditions in agri-food systems.

To address all the challenges mentioned above, the presentation proposes several key actions and policy highlights.

- Gender transformative approaches are cost-effective, viable and can change discriminatory social norms.
- Closing gaps in land tenure has benefits in employment, investment, natural resource management, access to services, resilience, food security and gender-based violence.
- Access to formal childcare services positively influences the employment and income of mothers in agri-food systems.
- Gender responsive social protection can increase women's employment and improve resilience.

Session 3: Economic COVID-19 post pandemic impact

The global economic growth experienced a significant decline of 2.8% in 2020, according to estimates from the International Monetary Fund (IMF). Production losses varied across economies, with Peru experiencing a notable economic slowdown characterized by declines in GDP growth. The presentation included a figure illustrating the evolution of real GDP between 2010 and 2028 for several economies, using projections from the World Economic Outlook of April 2023 for the period 2023-2028.

In Peru, the pandemic disrupted economic trends, leading to a decline in GDP growth, increased unemployment rates, and inflation fluctuations. The economy implemented several measures to tackle the crisis, including the acquisition and distribution of essential medical supplies, an increase in ICU bed capacity, and the creation of temporary hospitals. Telehealth services and mental health support programs were also implemented, and epidemiological surveillance was strengthened.

The pandemic's economic impact included direct costs on healthcare systems, such as increased healthcare spending and hospitalizations, particularly in intensive care

units, and increased costs of personal protective equipment. Indirect costs, such as loss of productivity, reduction in consumer spending, and supply chain disruptions, also affected economies to varying degrees and contributed to a substantial portion of the global GDP loss.

Furthermore, the presentation highlighted the long-term effects of the pandemic on health and the economy, including the economic burden of "Long COVID" and the exacerbation of mental health disorders.

Session 4a: Towards resilient healthcare systems: Pandemic preparedness and response through an integrated international response

This presentation by Dr. Miranda Smith, Senior Global Health Security Advisor at USAID, focused on building resilient healthcare systems through pandemic preparedness and response, with a spotlight on the role of health supply chain security.

The presentation emphasized key recommendations for APEC economies, advocating for increased investment in health supply chains, strengthening local and regional supply chain capacities, and collaborating with international partners. It also suggested implementing lessons learned from past crises and considering scenario planning and recovery strategies to enhance preparedness.

Dr. Smith outlined a path forward with a focus on long-term planning for health supply chain resilience, integrating health supply chain considerations into broader health system strengthening efforts, and continuously monitoring and adapting supply chains to ensure they can withstand future shocks.

The presentation also highlighted the critical role of health supply chains in pandemic response, detailing the various actors within the supply chain—from manufacturers and distributors to providers and patients—and their respective roles. It identified key vulnerabilities at each stage, such as raw material vulnerabilities for manufacturers, access and re-entry challenges for distributors, lack of redundancy for providers, and difficulties in finding options for patients.

Lessons learned from the pandemic emphasize its impact on public health commodities and routine health services, the adaptation of warehousing, distribution, and inventory management practices, and the integration of COVID-19 commodities into existing supply chains.

The presentation also showcased USAID's tools for health supply chain strengthening, including the USAID Global Health Supply Chain Program (GHSC) and its various projects aimed at improving different aspects of the supply chain.

Furthermore, the presentation emphasized in strategies for supply chain recovery in the face of “black swan” events, emphasizing the importance of defining disruptions, analyzing paths for recovery, conducting scenario planning with stakeholders, and executing recovery strategies. It provides principles for response and recovery, such as focusing stakeholders, thinking broadly about scenarios, having contingency plans, reducing surprises, and employing frequent planning cycles.

Session 4b: Towards resilient healthcare systems: Pandemic preparedness and response through an integrated international response

This presentation by Dr. Anibal Velasquez focused on achieving resilient healthcare systems, particularly through enhanced pandemic preparedness and response within an integrated international framework. The presentation emphasized learning from the COVID-19 pandemic to strengthen health systems across multiple dimensions.

Key lessons from the pandemic highlighted in the presentation include the importance of governance and building trust in institutions, improving data sharing, and fostering international cooperation. The need for collaboration and flexibility was also underscored, including enhancing cross-sector collaboration and private sector engagement, flexible financing mechanisms, and rapid resource mobilization.

The presentation stressed the critical role of the health workforce and the necessity to prioritize workforce retention and recruitment, as well as increasing overall investment in the health system. Furthermore, it addressed the importance of boosting supply chain resilience during emergencies, establishing specialized emergency institutions, and implementing rapid administrative procedures for response. The significance of community health services and surveillance and early warning systems was also highlighted.

Moreover, the presentation argued that investing in preparedness is cost-effective compared to the enormous costs incurred during pandemics. The presentation also advocated for innovations, instruments, methodologies, and models in the design and implementation of public policies and programs, as well as international cooperation, since it plays a crucial role in enhancing health system resilience by providing financing and resources, sharing knowledge and best practices, and strengthening institutional capacity. It also involves promoting regional and multilateral collaboration, encouraging innovation and research, incentivizing resilience policies, and facilitating rapid resource mobilization during crises.

It is emphasized that a new health system that is equipped to handle more frequent and severe shocks is needed, to ensure early detection, proactive interventions, and rapid response capabilities, base actions on lessons learned and evidence, adapt strategies to the specific context and allocate new funding to support these initiatives.

Session 5: Surveillance systems with multi-thread approach: experiences and challenges

The presentation by Dr. Ciro Ugarte discussed surveillance systems with a multi-threat approach, highlighting experiences and challenges, particularly within the Pan American Health Organization (PAHO)/World Health Organization (WHO) context in the Americas.

A key focus was on the development of frameworks for effective data management and visualization in health emergencies. This included building capacities for managing data related to health emergencies, public health events, and signals, as well as facilitating real-time regional dashboards for priority hazards. The presentation showcased examples of these dashboards, illustrating the management of public health signals and events in the Region of the Americas, and data related to chemical and radiation emergencies.

The presentation also detailed key actions to improve the economies' capacities for responding to health emergencies. These included strengthening surveillance, public health labs, and toxicologic centers, developing multisectoral chemical emergency response plans, and enhancing triage, decontamination, and clinical management capacities in hospitals. Training of public health staff via PAHO's virtual campus and simulation exercises were also emphasized. For radiation emergencies, updating the expert network, strengthening inter-sectoral coordination under IAEA guidelines, enhancing hospital capacities, and conducting simulation exercises were highlighted.

Furthermore, the presentation emphasized strengthened coordination between the health sector and other sectors, particularly under IAEA guidelines, and outlined key actions to improve the capacities in radiation emergencies.

Dr. Ugarte identified challenges in public health surveillance in the Americas, including multisectoral coordination and governance issues such as rapid spread of threats, coordination gaps, and difficulties in information access. Challenges related to surveillance systems and data management, technological integration, and workforce capacity were also discussed.

The presentation concluded by outlining key opportunities for health surveillance with a multi-threat approach, stressing the importance of collaboration, data sharing, stakeholder engagement, and using insights from past emergencies.

Detailed Overview of Workshops

The APEC 2024 Workshop 1, held under the theme “Towards an Integrated Response to Emerging and Re-emerging Disease Outbreaks”, aimed to facilitate knowledge exchange across member economies by examining the COVID-19 pandemic through the One Health approach. This paradigm underscores the interconnected nature of human, animal, and environmental health, and advocates for integrated strategies to address public health threats. The workshop sought to assess institutional experiences with pandemic preparedness, prevention, control, and surveillance, while identifying systemic gaps, innovations, and cross-sector opportunities.

The workshop featured a dynamic structure: participants were randomly assigned to five thematic groups—preparedness, epidemiologic surveillance, control and response, information systems, and multisectoral coordination. Each group included representatives from different APEC economies, fostering diversity of thought. Using a structured matrix, groups analyzed challenges, actions taken, opportunities, and lessons learned during the pandemic, and later presented their findings in plenary.

The workshop revealed significant commonalities across regions—such as the need for interoperable information systems, trust-building through public communication, and resilient multisectoral coordination. It also highlighted how the pandemic acted as a catalyst for long-overdue reforms and innovations in health governance. The outcomes offer a roadmap for bolstering regional readiness for future pandemics.

Group 1: Preparedness

This group underscored the importance of long-term investment in institutional readiness and response infrastructure as the foundation for resilient public health systems. Participants highlighted those economies that had conducted simulation exercises, established centralized decision-making mechanisms, and built cross-sectoral collaboration platforms were better able to respond quickly and effectively.

The group emphasized adaptive organizational structures, which allowed for a rapid reconfiguration of roles and responsibilities based on evolving epidemiological data. A central theme was the necessity of scaling operations up or down depending on the stage of the pandemic. Preparedness was not solely seen in terms of physical infrastructure—such as hospitals and laboratories—but also in terms of human resources and institutional memory. A well-prepared system, they argued, is one that can apply directives in localized settings through decentralized implementation.

Moreover, the group discussed how public trust and transparent risk communication were crucial. Behavioral factors played a key role in compliance with public health

measures, and successful economies integrated this understanding into their preparedness strategies. Investment in digital health platforms and real-time communication also helped reduce uncertainty and promote vaccination uptake.

Group 2: Epidemiologic Surveillance

Group 2 focused on the central role of epidemiologic surveillance in guiding pandemic response and policy. Participants described how existing surveillance systems—including notifiable disease reporting and sentinel surveillance—were stretched beyond capacity during the pandemic. In some economies, the surveillance systems were limited to human health data and lacked integration with veterinary and environmental monitoring.

The group discussed how surveillance systems had to evolve rapidly to incorporate real-time case tracking, contact tracing technologies, and digital reporting tools. The One Health approach was highlighted as a vital framework to guide the integration of animal and environmental health surveillance into integrated systems.

One critical lesson learned was the importance of interoperability between data systems, and the need for data transparency both domestically and internationally. The pandemic highlighted the risks of fragmented reporting mechanisms, which delayed response efforts and complicated international cooperation.

Opportunities for improvement included strengthening laboratory networks, investing in genomics for pathogen detection, and establishing formal multilateral data-sharing agreements. The group concluded that epidemiologic surveillance must be dynamic, cross-sectoral, and embedded in health security frameworks.

Group 3: Control and Response

The third group analyzed the direct public health interventions used to control the spread of COVID-19, emphasizing non-pharmaceutical interventions (NPIs) such as social distancing, school closures, lockdowns, and masking mandates. They observed that the timing and adaptability of control measures were critical to minimizing transmission and mortality.

One of the major challenges noted was the need to balance individual liberties with collective health goals, which often led to public resistance. The group noted that economies with more robust risk communication strategies and community engagement mechanisms experienced greater compliance.

Additionally, health system surge capacity was a recurrent issue. Many economies faced shortages in ICU beds, ventilators, and healthcare workers. Innovative approaches included the repurposing of public venues (e.g., convention centers as temporary hospitals), recruitment of retired professionals, and the use of digital health platforms for triage and telemedicine.

The group emphasized the necessity of real-time adaptability in control strategies, informed by epidemiological data. They recommended institutionalizing flexible emergency response protocols and strengthening cross-border collaboration. Importantly, lessons learned also included the value of community-led responses, particularly in rural and marginalized areas where government presence was limited.

Group 4: Information Systems

Group 4 addressed the critical role of information systems in managing large-scale health emergencies. One of the most prominent challenges identified was the reliance on paper-based systems or non-interoperable digital platforms, which significantly hampered real-time data collection and analysis during the early stages of the pandemic.

Participants noted that fragmented health systems led to data silos, making it difficult to obtain accurate, timely, and centralized information. This limitation undermined the ability to monitor outbreak trends, deploy resources efficiently, and communicate risks effectively.

However, the pandemic also acted as a catalyst for digital transformation. Several economies implemented centralized data dashboards, launched publicly accessible case tracking platforms, and improved digital reporting mechanisms at healthcare facilities. The use of social media and mobile apps to engage with the public was especially effective in disseminating health information and correcting misinformation.

The group concluded that sustained investment in modern, integrated health information systems is essential for both routine public health functions and emergency responses. They also advocated for building public trust by using transparent communication channels and involving community influencers—such as athletes or local leaders—as trusted messengers.

Group 5: Multisectoral Coordination and Integrated Response

This group explored how intersectoral collaboration significantly enhanced pandemic response outcomes. Participants emphasized that pandemics are not solely health

crises, but complex societal and economic challenges that require coordination across ministries, sectors, and levels of governance.

One example discussed was the rapid mobilization of resources through Operation Warp Speed, a U.S. initiative that pooled resources from government and private sectors to accelerate vaccine development. The success of such initiatives depended on preexisting relationships between government institutions and industry, as well as flexible regulatory frameworks that allowed for expedited approval of diagnostic tools and treatments.

The group highlighted the strain placed on healthcare facilities and workforce, which was addressed through load balancing strategies and the use of specialty hospitals. Communication also emerged as a key theme: economies that coupled public announcements with infographics and academic endorsements were able to more effectively communicate with their populations and justify policy decisions.

Additionally, the group discussed mechanisms that allowed economic activity to continue during lockdowns, such as e-payment systems, digital commerce platforms, and targeted subsidies for small businesses.

From these experiences, the group drew several lessons: the value of centralized leadership, the need for agile investment mechanisms, and the potential of cross-sectoral governance models to promote faster, coordinated responses to complex health threats.

Dialogue Tables Recap

Dialogue session 1

The presentation discussed collaboration experiences using the One Health approach in Peru. It was presented by Mary Reyes Vega, Executive Director of CDC Peru, Ministry of Health. The presentation specifically addressed priority zoonotic diseases in Peru for collaboration within the One Health framework.

The presentation outlined several steps taken to address zoonotic diseases in Peru using the One Health approach, involving collaboration among Human Health Institutions, Animal Health Institutions, and Environmental Institutions.

Products developed with a One Health approach were also presented, including guidelines for integrated surveillance and response to avian influenza, technical sheets for integrated surveillance of yellow fever in non-human primates, and other related materials.

The presentation concluded by outlining several "next steps" for advancing the One Health approach in Peru. These included conducting a joint risk assessment, developing multisectoral plans for priority diseases using the One Health framework, and establishing regulatory frameworks aligned with One Health principles, including a proposed One Health law. The formation of a multisectoral One Health working group and the development of guidelines for the surveillance, prevention, and control of zoonotic diseases were also identified as crucial future actions.

As part of the discussion, we can highlight the presentation by Ms. Sharon Ang, detailing Singapore's approach to the One Health framework, emphasizing its importance in preventing and controlling emerging and re-emerging diseases, explaining One Health as an integrated approach that acknowledges the interconnectedness of human, animal, and environmental health.

The presentation outlined the One Health Collaboration Framework in Singapore, which included the One Health Coordinating Committee and various working groups and sub-working groups. This framework aimed to develop specific action plans and policies related to issues like antimicrobial resistance (AMR).

The presentation also covered Singapore's efforts in strengthening AMR surveillance systems, including the NASFunG program and the contribution of the National Centre for Infectious Diseases (NCID). Singapore established the Communicable Diseases Agency (CDA) to oversee public health policy related to communicable diseases and the One Health Office within the CDA to coordinate One Health efforts.

Finally, the presentation highlighted Singapore's regional and global collaborations, such as its involvement in the ASEAN One Health Network and partnerships with international organizations like the FAO, UNEP, WHO, and WOAH. Singapore expressed its commitment to building capacity and expertise in One Health, both locally and regionally.

Dialogue session 2

The Dialogue table started with a presentation by Dr. Christian García focusing on emerging and re-emerging diseases surveillance experiences using a One Health approach.

He highlights the upcoming challenges, such as that zoonosis will likely increase, noting that 60% of emerging diseases are zoonotic and that three-quarters of new pathogens in recent decades have originated in animals attributing the increasement to factors that bring humans closer to wildlife, such as environmental disruption, changes in land use, increased access to wildlife areas (including tourism), and displacement of populations. He also emphasized the challenge of integrating different sectors for effective disease surveillance and response. This includes the need for One Health approaches that integrate surveillance efforts across human, animal, and environmental health sectors, the crucial role of information sharing and a comprehensive understanding of the human-animal-environment interface, as well as the challenge of establishing close collaboration with industry to protect human health, the environment, wildlife, and the economy in the face of emerging disease threats.

A specific case study on Avian Influenza in Chile in 2023 is highlighted, providing an overview of the Avian Influenza situation in birds in Chile, noting that there were 13 poultry plants with positive cases, but no new cases in industrial facilities since June 2023. It also presents data on Avian Influenza samples in wild birds in Chile in 2023, showing the number of negative and positive samples for each month.

A confirmed case of Avian Influenza (H5) was highlighted, detected in Chile on March 29th in the Antofagasta region, the epidemiological monitoring involved 1,329 people who were exposed to the virus, including 1,009 from the community and 320 from poultry plants.

The presentation emphasized several lessons and contributions from Chile's experience, including the importance of a community-centered approach, risk communication, deployment of multidisciplinary teams, engagement of key actors within communities, and the use of Go.Data for case tracking.

Furthermore, the presentation underscored the importance of visualization on geospatial platforms, case detection and follow-up protocols, data analysis, institutional collaboration, formal international collaboration, close coordination with National Labs and Agriculture, and expanding collaboration to other stakeholders. Leadership, commitment to global public health, open data, experience gained in strategy preparation and implementation, and multisectoral coordination are also identified as crucial.

Dr. García discussed future challenges, including capacity building in field epidemiology and data science, the convergence of epidemiology with other fields, climate change, technology, participatory surveillance, syndromic surveillance, event-based surveillance, signal analysis, standards, cybersecurity, and Variants of Interest (VOI). He raised the question of what we really need to know, what we will use for action, what we should measure, and how.

The presentation concluded by emphasizing the need for different capacities, complex/systems thinking, relationships between different sectors, interdisciplinarity, multi-threat responses, and a shift from outbreaks/disease-based approaches to public health threats and from agents to risks

Once the dialogue was opened, the discussion emphasized the critical role of information integration in adopting a One Health approach, citing Thailand's example of combining vector and climate data with human case information. It also highlighted the potential of academic institutions to enhance surveillance teams' capabilities through advanced data analysis, modeling, and forecasting.

A cautionary example from Malaysia illustrated the unintended consequences of successful disease control. The achievement of zero reported cases of rabies in dogs led to a perception that the problem was resolved, resulting in relaxed control measures and the subsequent reintroduction of the disease. This "price of success" underscores the need for sustained vigilance even after achieving disease control.

The importance of interagency collaboration was demonstrated by the United States' experience, where coordination between agriculture agencies and the Centers for Disease Control facilitated effective data sharing. Peru's experience during the pandemic and avian influenza outbreaks further emphasized the value of cross-sectoral integration and data sharing among animal, environmental, and human health sectors. Peru also stressed that surveillance systems should not be limited to case detection but should also provide information to drive preventive and control actions.

In conclusion, a shift towards One Health surveillance systems that promote interdisciplinarity and broaden the focus from disease-based outbreaks to public health threats and from individual agents to broader risks is recommended.

Recommendations

Several key actions and strategies crucial for strengthening the Asia-Pacific region's response to emerging and re-emerging disease outbreaks were identified during the event. Taking those into consideration, there are several recommendations that were made and take importance.

1. Enhanced Surveillance Integration and Data Sharing

   Action: Establish standardized protocols for real-time data sharing across APEC economies, focusing on interoperability of surveillance systems. This includes sharing of genomic sequences, epidemiological data, and environmental monitoring data.

   Strategy: Develop a regional platform, leveraging existing IT tools identified in the report (e.g., DHIS2), to facilitate secure and efficient data exchange. This platform should include mechanisms for data validation, quality control, and timely dissemination of analyzed information to relevant stakeholders.

2. Strengthening One Health Surveillance and Collaboration

   Action: Implement and expand One Health surveillance programs that integrate data from human, animal, and environmental health sectors. This requires investment in training personnel capable of conducting integrated risk assessments and surveillance activities.

   Strategy: Foster the creation or strengthening of One Health coordination committees with robust multisectoral representation. Develop joint operational plans for surveillance and response to priority zoonotic diseases, with clear roles and responsibilities for each sector.

3. Investing in Health System Resilience

   Action: Advocate for increased and sustained investment in strengthening health systems, particularly in areas critical for pandemic preparedness and response. This includes bolstering laboratory capacity, enhancing emergency response infrastructure, and ensuring a well-trained and adequately protected health workforce.

   Strategy: Prioritize supply chain resilience by diversifying procurement sources, establishing strategic reserves of essential medical supplies, and developing robust logistics networks. Conduct regular scenario planning exercises to identify and mitigate potential supply chain vulnerabilities.

4. Addressing Health Inequities and Promoting Gender Equality

   Action: Integrate equity considerations into all aspects of disease prevention, surveillance, and response efforts. This involves collecting and analyzing disaggregated data to identify vulnerable populations and tailor interventions to their specific needs.

   Strategy: Implement gender-sensitive policies that address the disproportionate impact of health crises on women. Promote women's leadership and participation in health decision-making processes and ensure access to essential health services.

5. Fostering Regional and Global Collaboration

   Action: Actively participate in and strengthen regional and global health networks to facilitate information sharing, technical assistance, and coordinated responses to cross-border health threats.

   Strategy: Promote collaborative research and development efforts to advance the development of new diagnostics, therapeutics, and vaccines. Support capacity-building initiatives to strengthen health systems in developing economies.

By prioritizing these actions and strategies, the Asia-Pacific region can significantly enhance its capacity to prevent, detect, and respond to emerging and re-emerging disease outbreaks, thereby protecting the health and well-being of its populations and mitigating the economic and social impacts of future pandemics.

List of Consultants

During the event a List of consultants was released, highlighting the areas of expertise. Specific names and direct contact information have been omitted in compliance with APEC publication guidelines.

Economy	Area of expertise	Organization	Job title
Thailand	Oncology, Public Health	National Cancer Institute	Director
Thailand	Epidemiology, Public health	Department of Disease Control, MOPH	Director of the Division of Epidemiology
Singapore	N/A	Ministry of Health	Head (One Health)
Thailand	Communicable disease surveillance	MOPH	Medical epidemiologist
Malaysia	Public Health	Ministry of Health Malaysia	Senior Principal Assistant Director
Malaysia	Health Security and Emergency	Ministry of Health Malaysia	Director
Republic of Korea	N/A	Korea Disease Control and Prevention Agency	Director
Republic of Korea	International Cooperation	Korea Disease Control and Prevention Agency	Assistant director
Chile	Epidemiology, Information systems	Ministry of Health	Head of the Epidemiology Department
Republic of Korea	Disease Control	Korea Disease Control and Prevention Agency	Deputy Director

IT Tools

During the event, a list of IT tools was shared, detailing the technologies designed to foster collaborative efforts among APEC economies.

1. National Cancer Institute of Thailand
    a. Economy: Thailand
    b. Institution: National Cancer Institute of Thailand
    c. Access: https://www.nci.go.th/th/New_web/index.html

2. Digital Epidemiological Surveillance Platform / Digital Disease Surveillance
    a. Economy: Thailand
    b. Institution: Ministry of Public Health
    c. Access: https://ddsdoe.ddc.moph.go.th/ddss/

3. Digital disease surveillance
    a. Economy: Thailand
    b. Institution: Ministry of Public Health

4. Integrated infectious disease system
    a. Economy: Republic of Korea
    b. Institution: N/A

5. DHIS2
    a. Economy: Chile
    b. Institution: University of Oslo
    c. Description: Tools that helps with the collection, validation, analysis, and presentation of aggregate and patient-based statistical data, tailored to integrated health information management activities.
    d. Access: https://dhis2.org/

Conclusions

The APEC project event held in Lima, Peru, in August 2024, served as a crucial platform for APEC economies to collaboratively address the multifaceted challenges posed by emerging and re-emerging infectious disease outbreaks, with a significant focus on the lessons learned from the COVID-19 pandemic and the imperative of adopting a One Health approach. The series of seminars, workshops, and dialogue tables underscored the critical importance of continued collaboration and the development of forward-looking strategies to strengthen the region's preparedness and response capabilities.

Throughout the event, open dialogue was created, and experiences were shared from the different economies in attendance. There were connections made during the event, as well as after the event, through a list of experts and consultants that were shared with the participants.

The project successfully provided participating economies with access to valuable knowledge, tools, and collaborative linkages to improve their disease prevention, surveillance, and control systems. It was particularly beneficial for APEC developing economies, which have been disproportionately affected by the COVID-19 pandemic and may require additional support to strengthen their health systems. The project aligns with APEC's goals of promoting sustainable growth and equitable development in the Asia-Pacific region and fostering a sense of community.

A key finding throughout the event was the significant and varied economic impact of the COVID-19 pandemic across the Asia-Pacific region, highlighting the need for robust strategies to mitigate future economic shocks alongside public health interventions. The discussions emphasized the direct and indirect costs associated with pandemics, including healthcare expenditures, productivity losses, and supply chain disruptions, reinforcing the interconnectedness of health security and economic stability.

The One Health approach emerged as a central tenet for effective disease prevention, surveillance, and control. The presentations and workshops highlighted the necessity of integrating human, animal, and environmental health perspectives and fostering interdisciplinary collaboration.

Moreover, the event shed light on the disproportionate impact of health crises on vulnerable populations, particularly women. The discussions revealed existing gender disparities in access to resources and the exacerbation of these inequalities during the COVID-19 pandemic. Recommendations emphasized the need for gender-sensitive data, inclusive policies, and the promotion of women's leadership in health security initiatives.

The workshops provided practical frameworks and tools for enhancing preparedness, epidemiological surveillance, control and response strategies, information systems, and multisectoral coordination. The sharing of IT tools and digital surveillance platforms among APEC economies, exemplified by Thailand's and Korea's systems, demonstrated the potential of technology to strengthen collaborative efforts.

Forward-looking strategies must integrate lessons learned from the COVID-19 pandemic, embrace the One Health approach, address existing inequalities, and leverage technological advancements. Continued dialogue, knowledge sharing, and capacity building, particularly for developing economies, are essential to building a more resilient and integrated regional response to emerging and re-emerging disease outbreaks.

Through the workshop and several presentations, participating economies were able to identify the diverse challenges encountered during the pandemic.

One of the primary challenges shared was the insufficient communication and lack of information exchange between different economies. A medium-term outcome anticipated from this project is the continued collaboration among economies to share experiences and information that can contribute to mutual support in preventing outbreaks of emerging and reemerging diseases. These objectives can be achieved through the connections established during the meeting, particularly between economies technical agencies, which can facilitate future collaborative projects.

Another medium-term change is the implementation of the One Health approach across sectors. Although this approach is increasingly discussed and gradually being introduced in various economies, it is expected that in the future, there will be a more uniform application, and it will serve as the cornerstone for several policies and projects related to prevent and control communicable diseases.

This event has been the first Workshop on One Health that has been promoted by APEC’s Health Working Group. Similar events might be considered in the future to foster ongoing collaboration and knowledge exchange among APEC economies, especially for One Health approach.