



TECHNICAL ITEM II

One Health approaches to addressing risk: Case studies and discussions focused on Avian Influenza with the objective of implementing effective/efficient surveillance and data sharing across sectors including wildlife and the environment.

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**Technical Item II:
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with the objective of implementing effective/efficient surveillance and data sharing across sectors
including wildlife and the environment.**

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Final

Summary

High pathogenicity avian influenza (HPAI) H5N1 is spreading extensively across the globe, including in the Asia-Pacific, resulting in large-scale outbreaks in poultry and wild birds. Meanwhile, sporadic avian influenza human infections continue to occur periodically. The significant economic impacts from these outbreaks, amounting to hundreds of millions in losses for many nations, underscore the seriousness of the situation. Additionally, HPAI spillovers in multiple mammalian species are raising concerns over viral adaptation and heightened zoonotic risk.

While Asia-Pacific Members have some existing systems for avian influenza surveillance, response and prevention, critical gaps persist. Proactive surveillance and risk monitoring, timely detection, coordinated investigation across sectors, and optimized on-farm and market biosecurity measures are needed. Legal, bureaucratic, and systemic obstacles can hinder rapid and open data sharing as well as integrated analysis to inform joint decision-making.

To address these challenges, key recommendations include sustaining high-level political commitment to One Health coordination, removing barriers to collaboration, developing multidisciplinary workforces through joint training and simulations, and integrating community engagement into evidence-based control strategies. Additional priorities are equitably allocating resources, openly sharing information and best practices, and implementing science-based policies and incentives for biosafety and biosecurity. Further consideration could be to enhance early warning through environmental sampling and diagnostics.

In conclusion, containing H5N1 outbreaks requires transforming traditionally compartmentalized approaches to prevention and response. Members must embrace innovation, sustain high-level One Health commitment, share data openly, engage communities, and collaborate across disciplines. Collective action guided by science, solidarity and tailored strategies can save lives and livelihoods and build resilient pandemic preparedness systems.

Introduction

The emergence and continued spread of high pathogenicity avian influenza (HPAI) H5N1 pose a critical threat to animal and human health, livelihoods, and economies in the Asia-Pacific and globally. This unprecedented epidemic calls for strengthening One Health approaches to surveillance, data integration, risk analysis, prevention and outbreak response through enhanced multisectoral collaboration. Effective control relies upon recognizing that human, domestic animal, wildlife and ecosystem health are interconnected in the epidemiology of avian influenza (1). Only through breaking down sectoral barriers, fostering seamless coordination, sustaining high-level commitment, and pursuing evidence-based strategies can Members in Asia-Pacific combat current challenges, enhance preparedness, and mitigate impacts on public health and sustainable development.

The Technical Item “*One Health approaches to addressing risk: Case studies and discussions focused on Avian Influenza with the objective of implementing effective/efficient surveillance and data sharing across sectors including wildlife and the environment*” was selected by the Regional Commission and indicates the importance the Region places on addressing the risk of Avian Influenza through One Health approach. The same was apparent during the discussions during the Animal Health Forum on High Pathogenicity Avian Influenza at the 90th WOAHA General Session where it was highlighted that avian influenza is a One Health problem and must be tackled through a holistic ecosystems health approach (2, 3). The ongoing dynamics of the disease require work and dedication from WOAHA, its Members and all stakeholders going forward. Trust, transparency, and collaboration will be critical to address this disease threat and the challenges it brings. The continuing global epidemic of HPAI has revealed the gaps in surveillance data and associated inequities in surveillance capacity in different parts of the world which need to be addressed.

Current Situation of Avian Influenza in Asia-Pacific Region

A. Poultry/Avian Outbreaks

In 2022-2023, widespread outbreaks of highly pathogenic avian influenza (HPAI) H5N1 clade 2.3.4.4b and related viruses have impacted poultry, wild birds, and other animals globally. In Asia-Pacific Members, major H5N1 outbreaks resulting in mass culling of poultry have occurred between 2020 and 2023 in China, Indonesia, Japan, South Korea, Malaysia, Vietnam, and others (4, 5). Additional sporadic outbreaks caused by other HPAI viruses like H5N2, H5N6, and H5N8 have affected the region as well (6). Unprecedented mortality events in wild birds have also been reported across Asia-Pacific, attributed to clade 2.3.4.4b H5N1 which has demonstrated an ability to cause disease in a wide range of species (7). Some of the mass mortalities in wild birds in the region were in endangered species. Both the geographic distribution and level of impact of these outbreaks is unprecedented.

B. Human Infections

Avian influenza viruses cause sporadic zoonotic human infections, with A(H5N1) and A(H7N9) subtypes associated with severe disease and high mortality rates. From 2003 to 2023, 480 human cases with 324 deaths (CFR 68%) from H5N1 avian influenza were reported across Asia-Pacific Members, predominantly in China, Indonesia, Cambodia, and Vietnam (8). Sustained human-to-human transmission has not been detected. In addition, between 2013 and February 2022, over 1568 human cases and 616 deaths (CFR 39%) from H7N9 infection have occurred, mainly in China, although no new cases have been reported after 2019 (9). Other zoonotic subtypes like H5N6, H9N2, and H10N8 have also caused sporadic human cases in Asia-Pacific Members in recent years.

C. Economic Impacts

HPAI outbreaks can result in major economic damages for affected Members in Asia-Pacific. Estimates from past outbreaks indicate substantial losses in poultry production and associated sectors. In addition to production impacts, bans on poultry sales and consumption changes during outbreaks, as well as negative stigma impacting everything down to tourism, negatively affects local economies. However, precise cumulative economic losses across Asia-Pacific are unclear due to limited data. Overall, HPAI outbreaks have caused significant economic damages in affected Members through impacts across poultry production, distribution, and consumption. Measures to prevent and control outbreaks are important to mitigate these damages (10-12).

D. Infections in Mammals

Since 2022, influenza A(H5N1) clade 2.3.4.4b has caused outbreaks in multiple mammalian species across the world, including farmed mink, wild and captive seals and sea lions, domestic cats and dogs, and wild carnivores like foxes and otters, demonstrating an expanding host range. Over 26 mammalian species have tested positive for or seroconverted to H5N1 clade 2.3.4.4b viruses (13, 14). In Asia-Pacific, a few sporadic infections have been detected in wild mammals. Spillover beyond birds raises concerns over potential viral adaptation and evolution in mammals that could increase zoonotic risk. Continued surveillance is critical to monitor this evolving situation (14).

Current Situation of Avian Influenza Preparedness and Prevention in the Asia-Pacific Region

A. Surveillance Systems

Most Asia-Pacific Members conduct some sort of passive surveillance for HPAI focused on reporting and investigation of significant poultry and wild bird mortality events. Some delays or hesitancy exist at the grassroots level in reporting outbreaks due to economic concerns. The capacity for proactive surveillance through routine sampling of live bird markets, commercial flocks, and wild bird populations can be limited across much of the region and represents a substantial gap. Diagnostic capacity for avian influenza subtyping also varies greatly between Members. While reporting of HPAI outbreaks to WOAHP is generally timely once they are identified, some delays continue to occur. Infection with HPAI virus in poultry, wild birds and non-poultry domestic birds needs to be notified to WOAHP according to Chapter 1.3 of the *Terrestrial Animal Health Code (Terrestrial Code)*. LPAI viruses that have proven natural transmission to humans with severe consequences or those causing an unexpected increase in virulence in poultry are also notifiable. LPAI viruses in wild birds can be reported voluntarily as non-WOAHP-Listed diseases in wildlife (15).

For human surveillance, severe respiratory infection monitoring programs are in place, but integration with animal health data sources is still developing. Human infection with avian influenza is reportable to the World Health Organization under the International Health Regulations (2005) (16). Environmental surveillance represents another way to monitor high-risk areas for AIV but remains understudied and underutilized (17).

Members are encouraged to share influenza viruses with the WOAHP/FAO global network of expertise on animal influenza (OFFLU) that collaborates with WHO Global Influenza Surveillance and Response System (GISRS). OFFLU promotes effective collaboration between animal health experts and the human health sector under the One Health approach to strengthen the data available for analysis and contributes to the process for updating influenza vaccine selection. OFFLU provides for every biannual WHO influenza vaccine composition meetings a summary of epidemiological, virological and antigenic data for the previous six months on the circulating zoonotic animal influenza viruses, including H5, H7 and H9 avian influenza events and H1 and H3 swine influenza events. These data are collected from WOAHP/FAO Reference Centres and national animal health laboratories in Members representing different regions including Asia Pacific. This contribution allows crucial information from the animal health sector to be used by WHO to determine and update pre-pandemic candidate vaccine viruses for human vaccines against zoonotic viruses of concern demonstrating good data sharing across sectors (18).

B. Outbreak Response

Asia-Pacific Members typically implement stamping out measures in poultry in response to HPAI outbreaks, along with movement restrictions and epidemiological tracing (6, 19, 20). However, significant variation appears to exist between Members in deployment of these measures and timeliness (7, 21). Contingency planning, simulation exercises involving both public and private sector stakeholders, and clear protocols for response can help ensure timely and effective outbreak control. Close coordination between government agencies and the private sector, as well as pre-established compensation programs, are also important factors in mounting an efficient response.

Antiviral drugs for human cases are available, but extent of use is unknown and is limited by the need for early administration (22, 23). Most Members issue warnings on avoiding contact with sick/dead birds during outbreaks, but enhanced risk communication channels and messages tailored to diverse communities may improve compliance (24-27).

C. Prevention

Limited biosafety and biosecurity measures along poultry production and marketing chains has enabled amplification and spread of avian influenza viruses in Asia-Pacific Members. Risk factors include insufficient hygienic practices at live bird markets and slaughterhouses, extensive informal poultry trade networks, frequent cross-border poultry movement, and presence of free-ranging backyard poultry flocks. Promoting daily cleaning and disinfection in markets, restricting overnight poultry storage, periodically closing markets for cleaning, banning slaughter on site, and limiting consumer contact with live birds through enhanced shop layouts could significantly reduce virus transmission risks if properly implemented and enforced (7, 28-31). However, changing entrenched practices requires progressive policies paired with awareness raising and engagement of market managers, vendors, workers, and consumers. Optimizing biosecurity on poultry farms through separation from wild birds, all-in-all-out production systems, and restricting visitors is needed across the region (31, 32). Compartmentalization, which allows certain high-biosecurity poultry production units to continue operating during an outbreak, can help preserve continuity for key elements of production systems like breeder flocks while stamping out proceeds in affected zones. Adoption of compartments requires significant investment and oversight but enables targeted response that reduces overall impacts (15, 33). Moreover, significant variation exists between Members in availability of personal protective equipment to poultry workers, cullers, and veterinarians conducting outbreak response (34, 35). Raising awareness, promoting behavior change, developing biosecurity certification schemes, and strengthening regulations could improve compliance and reduce spillover risks (24-27).

D. Vaccination

While several Asia-Pacific Members have implemented vaccination of poultry as part of avian influenza virus (AIV) control efforts, continual evaluation and optimization of vaccine matching, delivery approaches, and monitoring systems is needed to maximize effectiveness across the diverse poultry production systems in the region (36). Vaccination should be implemented within a clearly defined vaccination strategy that outlines objectives, modalities of implementation, monitoring of vaccine coverage and effectiveness, surveillance in vaccinated flocks, and exit strategy. Optimizing vaccine efficacy requires matching vaccine strains as closely as possible to circulating field strains, while vaccine delivery methods must account for variability in production practices, flock sizes, and housing types. Rigorous monitoring of vaccine coverage and post-vaccination surveillance are critical for assessing protection levels and adjusting approaches accordingly (37, 38).

For human populations considered at high risk of zoonotic AIV infection, vaccination also remains limited in scope and effectiveness. Novel human avian influenza vaccines warrant further assessment and development to improve immunogenicity and cross-protection, especially in high-risk groups (39, 40). Overall, advancing poultry and human AIV vaccine technologies, formulations, and targeted delivery strategies is an ongoing priority across the region.

E. Compensation Mechanisms

Financial compensation can provide motivation to detect and control AIV in poultry; however, sustainability needs to be considered. Monetary rewards for early reporting, reimbursements for culled birds, government subsidies for biosecurity upgrades, and premiums for AIV-free flocks can encourage participation. Tax incentives may also promote compliance with regulations and disease response protocols. Well-designed, sustainable compensation mechanisms can strengthen AIV prevention and control by incentivizing detection, cooperation, investment, and maintenance of disease-free status (41).

Current Situation of One Health in Avian Influenza Preparedness and Prevention in the Asia-Pacific Region

A. Surveillance

While many Asia-Pacific Members acknowledge the importance of One Health surveillance, substantial gaps remain in systematic implementation. Information systems and data collection tend to remain siloed by sector, which hinders integrated analysis and sharing of animal health, human health, and environmental data (42). Mechanisms to link clinical, laboratory, and epidemiological data across human and animal health sectors are lacking in most Members. Surveillance of wildlife, domestic animals, and environmental risks at the human-animal interface is extremely limited. Active, targeted surveillance of live animal markets, commercial farms, migratory bird populations, and high-risk human groups is not routinely conducted to proactively detect spillover threats. Diagnostic capacity for characterized zoonotic pathogens is inconsistent across the region, though some Members have strong capabilities. Progress has been made on inclusive sampling frameworks, part-

nerships to promote collaborative field investigation of zoonotic cases between human, animal, and environmental authorities, and data systems in a few Asia-Pacific Members, but most have yet to make One Health surveillance universally operational (43-47).

B. Coordination

While longstanding intergovernmental frameworks such as the FAO/WOAH Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs), launched in 2004, have facilitated regional alliances and expert networks for addressing avian influenza and other zoonoses, substantive variation remains in national-level One Health coordination for zoonotic influenza across Asia-Pacific Members (48). Despite existence of global standards and regional technical resources like the WOAH/FAO Network of Expertise on Animal Influenza (OFFLU), operationalization of effective One Health strategies connecting animal and public health agencies, as well as the environmental sector, is still developing in the region.

Although GF-TADs and related global and regional entities have provided an important foundation over the past 15+ years (48), strengthening national governance and capacities for One Health collaboration remains an imperative for zoonotic influenza preparedness in Asia-Pacific. Investments should concentrate on further translating and implementing regional technical guidance into national implementation. Fundamental challenges include ingrained sectoral divisions, bureaucratic hurdles, inadequate resource allocation, limited technical capacity, and need for champions in high-level leadership and accountability. For example, data collection systems remain siloed in many Members, preventing integrated surveillance, timely data sharing, and joint risk assessment. Strategic plans promote One Health alignment, but can lack concrete mechanisms for operational coordination across ministries and agencies during outbreak response (42). Without formal procedures and protocols for collaborative decision-making, *ad hoc* coordination during emergencies strains relationships and undermines efficiency.

Examples of Success and to Enhance Current Situation of One Health in Avian Influenza Preparedness and Prevention in the Asia-Pacific Region

Strengthening multisectoral avian influenza strategies requires systematically assessing preparedness gaps, increasing awareness among senior officials, and routinely monitoring progress. Conducting joint simulation exercises and reviewing performance through after-action reports could reveal strengths, weaknesses, and opportunities for improvement. Establishing clear metrics and indicators for activities like data integration, coordinated investigations, synchronized messaging, and joint evaluations enables tracking of One Health outcomes. Sustained leadership commitment, adequate resourcing, legal frameworks, and capacity building are essential to overcome inertia and institutionalize effective coordination. A One Health approach is critical to enhance early warning, efficient response, and universal preparedness against avian influenza and other zoonotic disease threats in Asia-Pacific Members and globally.

One Health Alignment, Response, and Collaboration: Stories of Success in the Asia-Pacific

The avian influenza crisis in the early 2000s was a catalyst for promoting One Health collaboration in the Asia-Pacific region, highlighting the need for close coordination between animal health and public health sectors. Joint efforts by WHO, FAO and WOAH have promoted One Health nationally and regionally through mechanisms like workshops and tools. This has supported Members in establishing frameworks. Many Members have developed or are developing frameworks for work between the human-animal-environmental sectors, even outside of avian influenza. Overall, the One Health approach is increasingly recognized at the regional and country levels for avian and pandemic influenza preparedness and response (49). Several Members have demonstrated good practices for institutionalization and implementation of One Health, especially in outbreak and spillover response. However, challenges, as detailed above, still exist.

Moving Ahead: Novel Ways to Enhance One Health Surveillance and Response for Avian Influenza

One poignant example of ways to enhance One Health surveillance for avian influenza is the incorporation of more environmental sampling coupled with rapid, field-forward diagnostics to quickly identify areas of high-risk. Strategic implementation of techniques like air sampling, surface swabbing, and wastewater testing in markets and farms could provide continuous, non-invasive pathogen monitoring to complement existing surveillance efforts (50, 51). Air, water, and surfaces offer broad coverage for respiratory pathogens like avian influenza viruses (52-55). By using comprehensive PCR (Polymerase Chain Reaction) panels, metagenomic sequencing, and bioinformatic pipelines, these samples can be quickly analyzed to reveal the presence of any known or novel avian influenza virus threats. If concerning viruses are detected, targeted intervention and response triage could be swiftly initiated. Environmental sampling enables sustainable, proactive early warning

and outbreak prediction based on real-time data. If systems are sufficiently standardized and streamlined, continuous environmental surveillance could become a core component of avian influenza early warning within a One Health framework across Asia-Pacific (42, 56). However, stakeholder engagement and data privacy safeguards are essential for successful implementation. Overall, enhanced environmental surveillance could act as the catalyst to break down sectoral silos, integrate human, animal, and environmental data, and provide comprehensive early warning against endemic and emerging avian influenza threats.

Overview of Recommendations for Asia-Pacific Region

To optimally address the unprecedented threat posed by HPAI in the Asia-Pacific region, Members should foster high-level political commitment to mainstreaming One Health approaches across governmental sectors through advocacy, establishing accountability mechanisms, and monitoring progress; remove legal, bureaucratic, and systematic obstacles impeding timely and unencumbered sharing of surveillance data, sequences, and isolates coupled with coordinated cross-sectoral outbreak investigation; build a multidisciplinary workforce proficient in collaborative practices via joint training, simulations, and establishing formal communication pathways; develop science-based policies, incentives, certification schemes, and regulations to promote adoption of biosafety and biosecurity best-practices across poultry production and marketing chains; integrate community engagement and behavior change communication into evidence-based avian influenza prevention and control strategies; incorporate environmental sampling techniques, genomic sequencing, and rapid diagnostics to enhance early-warning surveillance systems; mobilize increased domestic and international financial and technical resources through advocacy and partnerships to equitably meet avian influenza preparedness needs; and leverage global partnerships and sustain vigilance against avian influenza through open sharing of information, resources, and best practices while adhering to WOAHA standards. Collective action guided by science, solidarity, and adherence to evidence-based strategies tailored for local contexts through intersectoral collaboration will bolster Asia-Pacific Members' ability to overcome the grave challenges posed by unprecedented spread of highly pathogenic avian influenza. Current development of the GF-TADs global strategy for HPAI will help guide regional and sub-regional adaptation to tailor the objectives to specific situations of Members in the region. While capacities are diverse, Members have a common need to strengthen intersectoral collaboration to achieve sustainable improvements in HPAI prevention and control.

Conclusion

The current global crisis caused by unprecedented spread of HPAI H5N1 calls for urgent and decisive action guided by One Health principles. No single sector can face the mounting impacts on animal and mammalian/human health, trade, and livelihoods alone. Lasting solutions require breaking down deeply embedded silos, sustaining high-level commitment, equitably allocating resources, and implementing evidence-based strategies tailored to local contexts. Members in Asia-Pacific have the opportunity to lead in transforming avian influenza prevention, mitigating obstacles to coordinated control, and enhancing regional and global health security. But seizing it requires resolute willingness to discard inefficient status quos, embrace innovation, share data openly, engage communities, and collaborate seamlessly across disciplines to safeguard the health of people, animals, and our shared ecosystems. With diligence and collective action guided by science and solidarity, we can rise to overcome the grave challenges posed by avian influenza and build resilient systems ready to detect and contain future pandemic threats.

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