

Animal Health Intelligence in Singapore

WOAH Epidemic Intelligence Webinar: Event-Based Surveillance for Animal Health in the Asia-Pacific

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World Organisation
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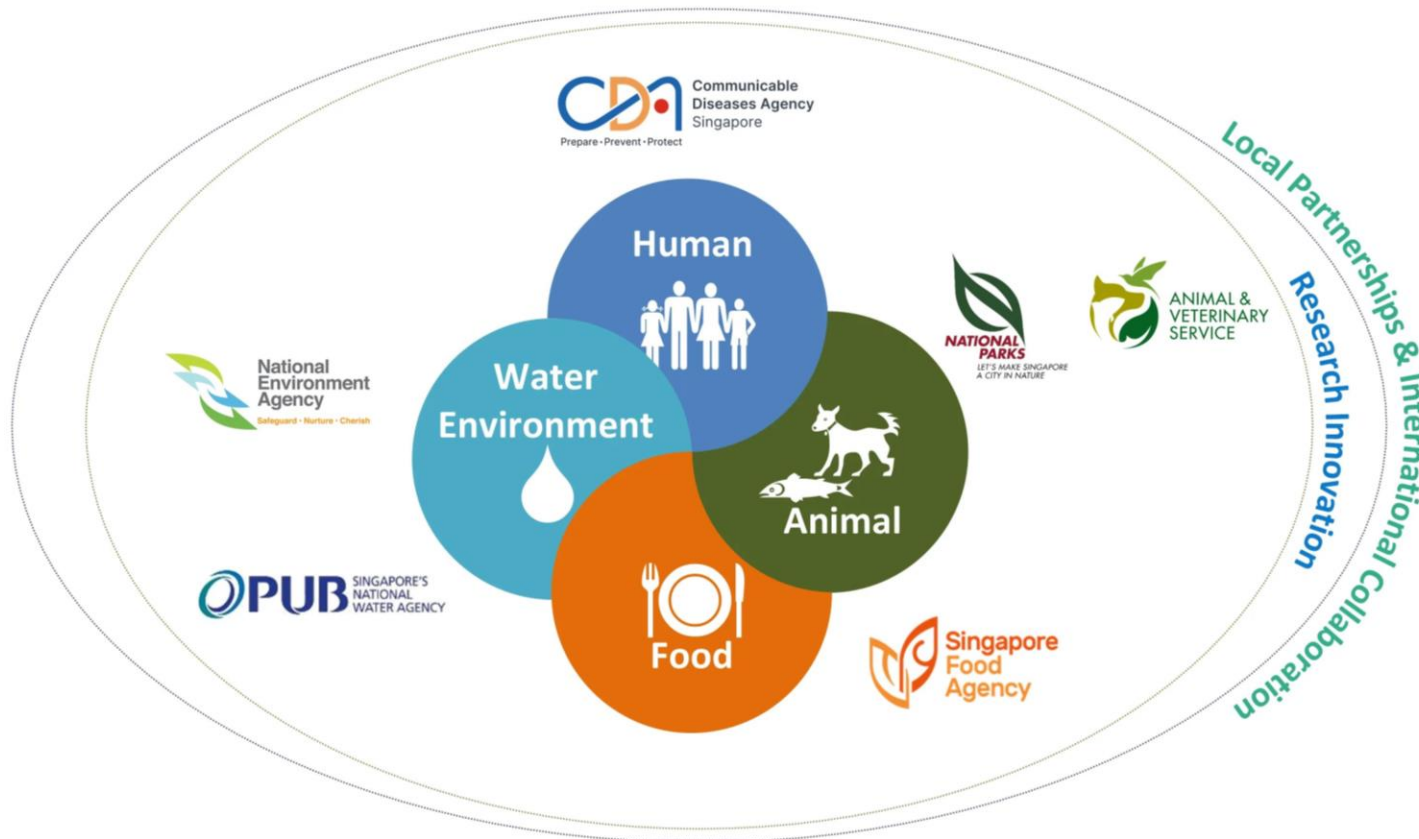




The Animal and Veterinary Service (AVS), a cluster under the National Parks Board, is the national authority for animal health and wildlife management

- One of three WOAHC Collaborating Centres on wildlife in the Asia Pacific region
- Part of the One Health network in Singapore

WOAH Collaborating Centre for
Wildlife Trade and Wildlife Health



Launched in 2025, One Health for Singapore (ONEHealthSG) commits to **anticipate, prevent, prepare against, respond to, and recover** from shared One Health threats to build health resilience for humans, animals, and environment

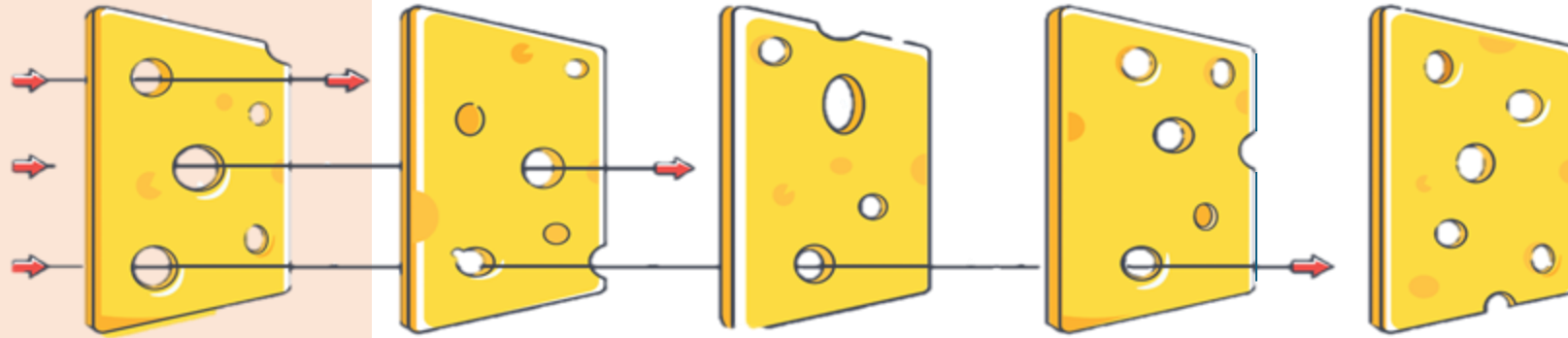
<https://www.cda.gov.sg/professionals/one-health/singapore-one-health-master-plan/>

Horizon scanning is an integral component of Singapore's multi-layer approach to safeguarding animal and public health

Singapore is a **major transit point** for migratory wildlife and import and export of animals and animal products

Increased likelihood of disease due to **global risk drivers** (e.g., climate change, international trade and travel, incl. smuggling)

Increase in **animal/ wildlife populations**, displacements, and interactions



Pre-Border

Anticipate and assess upstream risk as part of forward defence

Border

Safeguard border biosecurity during import of live animals & animal products

Post-Border

Prevent, detect, respond to and mitigate threats in local animal populations

To guide the surveillance of public health threats, One Health agencies have prioritised a list of diseases for close monitoring

ONE HEALTH ONE HEALTH ZOO NOTIC DISEASE PRIORITIZATION WORKSHOP

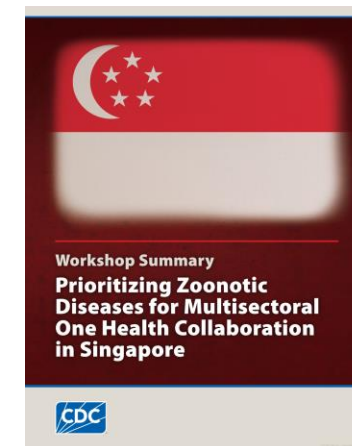
Singapore • 19 to 21 April 2023



The One Health Zoonotic Disease Prioritization (OHZDP) Process uses a **mixed methods prioritisation process** developed by the U.S. Centers for Disease Control and Prevention's (CDC) One Health Office.

Top 5 One Health zoonoses of priority

- Avian Influenza
- Coronavirus disease (COVID-19)
- Salmonellosis (non-typhoidal)
- Yellow Fever
- Leptospirosis



Source: CDC USA

10 other zoonoses to be monitored closely

Categories (Main transmission route)	Zoonotic diseases
Animal Borne Diseases	• Nipah virus • Rabies
Vector Borne (Mosquito) Diseases	• Japanese Encephalitis • Dengue Fever • Zika Fever
Rodent Borne Disease	• Hantavirus Disease
Food Borne Diseases	• Campylobacteriosis • Hepatitis E
Droplet Borne Diseases	• Severe Acute Respiratory Syndrome (SARS) • Middle Eastern Respiratory Syndrome (MERS)

Report Link: cdc.gov/one-health/media/pdfs/2026/01/351541-A_NCEZID_Singapore-OHZDP-Report-508PASS.pdf

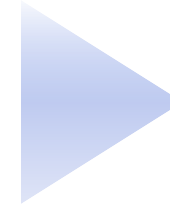
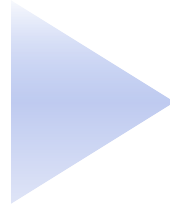


Diverse sources for horizon scanning and communication and sharing of outcomes with multiple stakeholder groups, with rapid escalation where warranted



Filtering by **key parameters**:

- Priority diseases
- Key animal hosts
- Clinical signs
- Location of events
- Relevant foreign language(s)



1. **International organisations:** WOAHA (e.g., WAHIS, Wildlife Situation Reports), FAO, WHO (e.g., Avian Influenza Update) etc.
2. **National government** websites
3. **Industry platforms** e.g., species-specific news sites
4. **Academic journals** and preprint servers
5. **News outlets** and other media platforms

Daily internal report with news summary and comprehensive list of relevant animal disease events

Fortnightly summary report of key animal disease events and research to wider stakeholder groups (e.g., One Health agencies, conservation)

Monitoring and escalation of news alerts for further rapid risk assessment and management

* The above processes are supported by the use of whole-of-government artificial intelligence tools where relevant



Joint One Health risk assessments for emerging diseases

MONKEYPOX MULTI-COUNTRY OUTBREAK

- Monkeypox is a viral zoonotic disease that occurs primarily in central and west Africa in the past. The disease is enzootic in susceptible mammals, including non-human primates, in the tropical rainforests of Africa.
- Zoonotic transmission occurs primarily through direct contact with infected animals or humans.
- The disease is caused by the monkeypox virus (MPV), which is a member of the Poxviridae family.
- The disease is characterized by a prodrome of fever, malaise, and lymphadenopathy, followed by a skin rash that progresses to pustules and eventually scabs.
- In 2022, a multi-country outbreak of monkeypox was reported, with cases primarily in Europe and North America.
- On 23 July 2022, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern.

AVIAN INFLUENZA A(H5N1)

- Avian influenza or "bird flu" is a disease caused by infection with influenza Type A viruses which primarily affects birds, particularly wild aquatic birds and domestic poultry.
- This assessment focuses on avian influenza A(H5N1), which is a high pathogenicity avian influenza (HPAI) subtype that is deadly to birds.
- Avian influenza A viruses do not normally infect humans. However, sporadic cases of human infections with human infection with bird flu viruses do arise, typically among individuals who work with poultry and birds. The first cases of human infection with avian influenza A(H5N1) were reported in 1997, in Hong Kong.
- Human infections with avian influenza A(H5N1) have resulted in severe illness, with a case fatality rate (CFR) of about 52%.
- Avian influenza A(H5N1) circulates in birds in the South-East Asia region. At present, there is an ongoing global outbreak that has also caused significant number of deaths in some mammal species.
- As with all avian influenza viruses, the avian influenza A(H5N1) virus may constitute a pandemic threat due to its high mortality and potential for human-to-human transmission since majority of humans do not have immunity to the virus.
- To date, no animal cases of avian influenza A(H5N1) have been detected in Singapore. There has been detections of other avian influenza viruses (i.e. low pathogenicity avian influenza subtypes) in wild birds and imported poultry that either cause no signs of disease or mild disease in birds.
- To date, no human cases of avian influenza, including avian influenza A(H5N1), have been detected in Singapore. The One Health agencies work closely to maintain vigilance and have in place precautionary measures to reduce the risks associated with the incursion of avian influenza via birds, and importation of human cases.



SITUATION UPDATE

Since 2020, there has been an unprecedented

Consequently, the global outbreak has persisted into 2023, with at least 70 outbreaks in poultry and 90 events involving other birds reported from Europe, the Americas, and Asia in the first three weeks of January

Risk assessment reports for public stakeholders:

<https://www.cda.gov.sg/resources/situational-and-risk-assessment-report-for-one-health-hazards>

Case Study: Nipah Virus (2026)

- Arising from the outbreak of Nipah virus in West Bengal and Bangladesh in early 2026, a One Health risk assessment was conducted on the potential introduction of Nipah into Singapore
- Inputs were sought from One Health agencies based on current understanding of transmission pathways through bats and at-risk products from Nipah-endemic countries or jurisdictions

Nipah virus: No cases detected in S'pore, authorities closely monitoring situation in Bangladesh

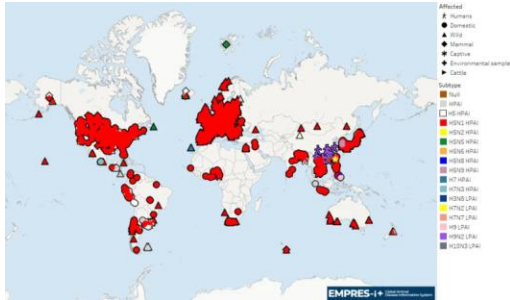
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Source: Straits Times

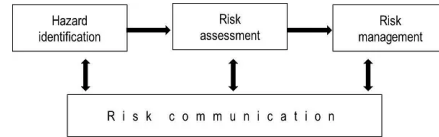
NParks was responsible for assessing the risk of incursion from movement of animals, animal products and wildlife, including bat ecology, ongoing surveillance programmes and import statistics

Horizon scanning and risk assessment also guide other downstream event-based surveillance and emergency preparedness activities



Source: FAO

Monitor global and regional HPAI situation, including emerging scientific information on new clades



Source: WOA

Update risk assessment for Singapore based on new developments

Event-based Surveillance for HPAI in Singapore



Source: Singapore Food Agency

Poultry Layer Farms: Monitoring of mortality and production indicators serves as a trigger for further field investigation, complementing active sampling programmes for HPAI



Wild Birds: Coordinated monitoring of mortality and morbidity in wild birds in collaboration with wildlife and conservation partners, guided by reporting thresholds, with a focus on higher-risk species (e.g., water birds, birds of prey). Aided by whole-of-government digital tools.



FormSG: digital forms for data collection



Plumber: connects multiple applications to automate repetitive tasks

Data is consolidated from multiple sources, analysed and monitored in AVS's **animal health information system**

Enhancing Emergency Preparedness

- Review of vaccination programmes, vaccine stockpile and diagnostic tests
- Simulation exercises and training

Some birds in Mandai Wildlife Reserve to be vaccinated against deadly bird flu in pilot

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Source: Straits Times



Summary

- Horizon scanning serves as a critical **early warning tool within a multi-layered biosurveillance and biosecurity framework**
- Effective horizon scanning must be grounded in **local disease priorities and understanding of relevant risk pathways**, supported by **escalation protocols** to ensure threats are acted upon swiftly
- A **collaborative, prompt One Health approach** integrating intelligence sharing and risk assessment across sectors is essential to comprehensively monitor and manage risks at the human-animal-environment interface
- **Artificial intelligence is playing an increasingly important role** in enhancing the speed, scale, and accuracy of horizon scanning, offering new capabilities to detect and analyse emerging signals across diverse data sources

Thank you



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