

REGIONAL WEBINAR

Zoonotic Influenza:

Advancing a One Health Approach to Strengthen
Collaborative Surveillance, Preparedness and Response



Welcome

REGIONAL WEBINAR

Objectives

The webinar aims to:



Provide an update on the global and regional situation of zoonotic influenza, including recent human infections.



Highlight the importance of collaboration between the human and animal health sectors for influenza surveillance, preparedness and response.



Share experiences from WHO Collaborating Centers on influenza surveillance, laboratory findings, virus characterization, emerging technologies, Studies on the Ecology of Influenza in Animals and surveillance at human-animal environmental interface .



Showcase country experiences and good practices in strengthening collaboration between the human and animal health sectors.



Promote technical exchange and regional collaboration among Member States and partners.

REGIONAL WEBINAR

Global updates on zoonotic influenza



PRESENTED BY

Dr Aspen Hammond

Veterinarian and Public Health Specialist



Global Influenza Programme



World Health Organization



Influenza epidemiology
and surveillance,
including seasonal
and zoonotic influenza



Zoonotic influenza
data management and
regular risk assessments
with animal health
partner organizations



Supporting WHO efforts on
influenza pandemic preparedness
through investigations and
surveillance guidance



Developing data standards
and reporting mechanisms
to strengthen global
influenza surveillance

Global update on zoonotic influenza: situation overview and public health risk

1 September 2026

Aspen Hammond

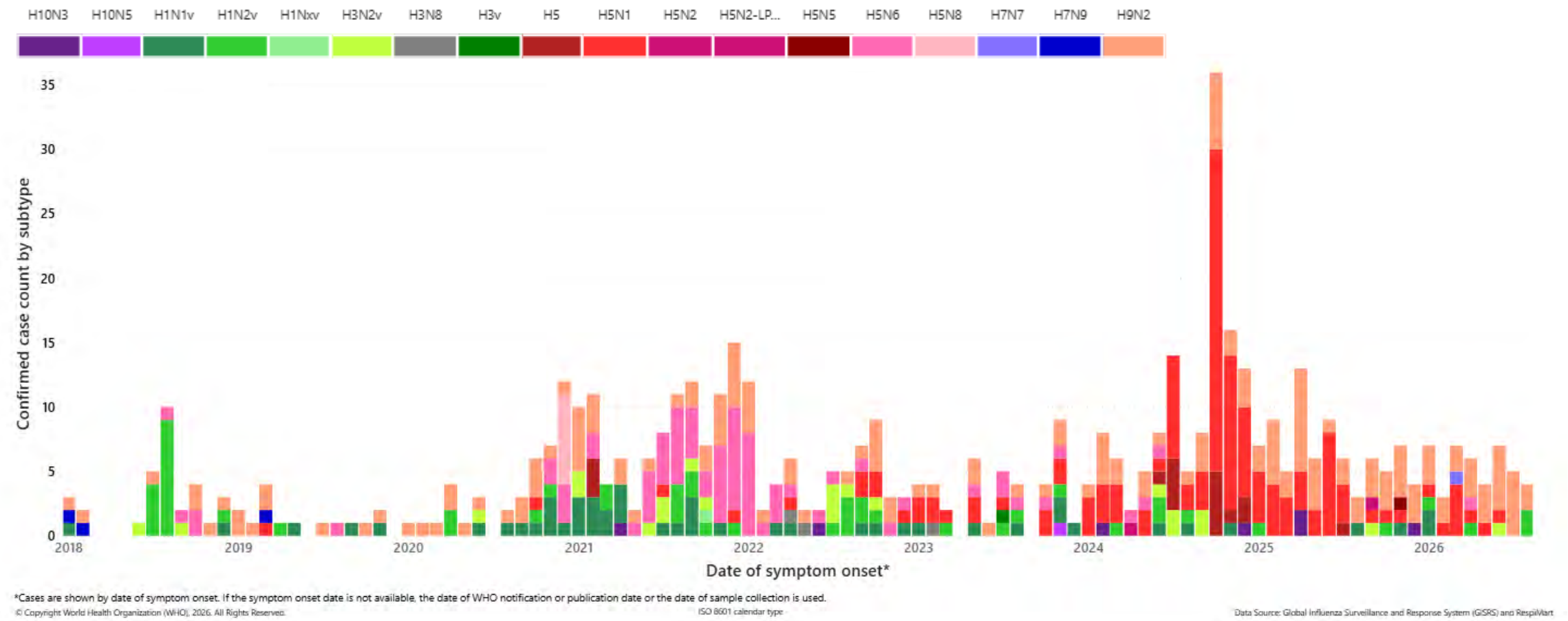
Global Influenza Programme



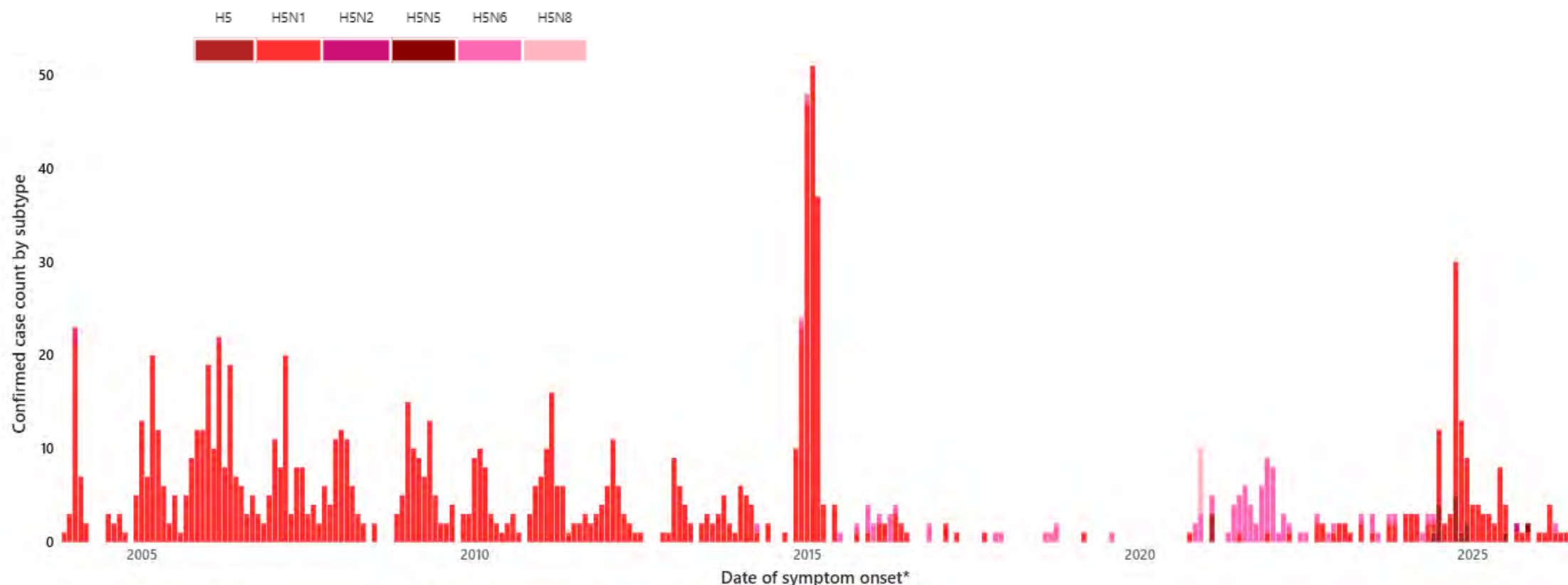
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Detections of zoonotic influenza A viruses in humans

2018 to 2026



Detections of zoonotic influenza A(H5) Gs/Gd lineage viruses in humans 2003 to 2026



*Cases are shown by date of symptom onset. If the symptom onset date is not available, the date of WHO notification or publication date or the date of sample collection is used.
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ISO 8601 calendar type

Data Source: Global Influenza Surveillance and Response System (GISRS) and RespiMap

Summary of current global situation

- >1000 detections of **A(H5N1) in humans** reported from 25 countries since 2003.
 - **Sporadic** with direct or indirect **exposure** to infected animals or contaminated environments.
 - Infections **can be severe** and even fatal.
 - Available genetic sequences of the **virus from the human** cases **similar to** those from local **animals**.
 - **No** sustained human-to-human transmission.
- Avian influenza A(H5N1) viruses, especially those of clade 2.3.4.4b, continue to **diversify genetically** and **spread geographically**.
- **It is a concerning, evolving situation but not an influenza pandemic.**
- Other subtypes of influenza viruses, including **swine influenza viruses**, continue to circulate in animals and occasionally infect humans at the interface.
- **Prompt & thorough investigations** are critical, **early identification** of any unusual events that could signal person-to-person transmission of the virus and **timely reporting** are **key** to optimal outcome of response.
- **Severity of illness** likely due to many factors, such as surveillance, details of exposure, availability and timing of testing, etc.

Ongoing FAO-WHO-WOAH avian influenza risk assessments

Last updated 18 May 2026

- Based on currently available information, FAO/WHO/WOAH assess the global public health risk posed by Gs/Gd-like high pathogenicity avian influenza (HPAI) A(H5) viruses as **low**. The risk of infection for occupationally or frequently exposed persons (e.g., with backyard poultry) is assessed as **low to moderate** depending on local epidemiologic conditions and the risk mitigation and hygiene measures in place.
- Transmission among animals continues and sporadic human infections at the human-animal-environment interface continue to be reported. While additional human infections associated with exposure to infected animals or contaminated environments are expected, the overall global public health impact of such infections is currently considered minor. **The assessment may change rapidly as new epidemiological or virological information becomes available.**

This risk is reliant on strong surveillance, timely detection and sharing of information, sequences and viruses.



[Updated joint FAO/WHO/WOAH public health assessment of recent high pathogenicity avian influenza A\(H5\) virus events in animals and people](#); assessment based on data as of 1 March 2026



Food and Agriculture
Organization of the
United Nations

World Health
Organization

World Organisation
for Animal Health

Updated joint FAO/WHO/WOAH public health assessment of recent high pathogenicity avian influenza A(H5) virus events in animals and people

Assessment based on data as of 1 March 2026

18 May 2026

Key points

Based on currently available information, Food and Agriculture Organization of the United Nations (FAO)/World Health Organization (WHO)/ World Organisation for Animal Health (WOAH) assess the global public health risk posed by Gs/Gd-like high pathogenicity avian influenza (HPAI) A(H5) viruses as low. The risk of infection for occupationally or frequently exposed persons (e.g., with backyard poultry) is assessed as low to moderate depending on local epidemiologic conditions and the risk mitigation and hygiene measures in place. Transmission among animals continues and sporadic human infections at the human-animal-environment interface continue to be reported. While additional human infections associated with exposure to infected animals or contaminated environments are expected, the overall global public health impact of such infections is currently considered minor. The assessment may change rapidly as new epidemiological or virological information becomes available.

This joint FAO/WHO/WOAH risk assessment updates the transmission risk using new global information available since the previous assessment of 28 July 2025. Given the potential risk to human health and the wide-ranging impacts on wild birds and mammals, poultry, livestock and other animal populations, timely notification to global authorities and the application of a One Health approach remain essential to monitor and characterize virus circulation, limit transmission within species and between species, reduce spread among animals, and prevent human infections.

Infections in animals

To date, HPAI A(H5) viruses have been detected in birds and/or mammals across all continents except Oceania. The predominant H5 virus clades currently circulating worldwide derive from clades 2.3.2.1 and 2.3.4.4. Between 1 July 2025 and 1 March 2026, an additional 185 A(H5N1) events in animals (including birds and bovines) have been reported to WOAH. Of these, 1204 outbreaks occurred in poultry (of any farming system), 6326 outbreaks in wild birds and nine outbreaks occurred in bovines.

H5 clade 2.3.2.1 viruses

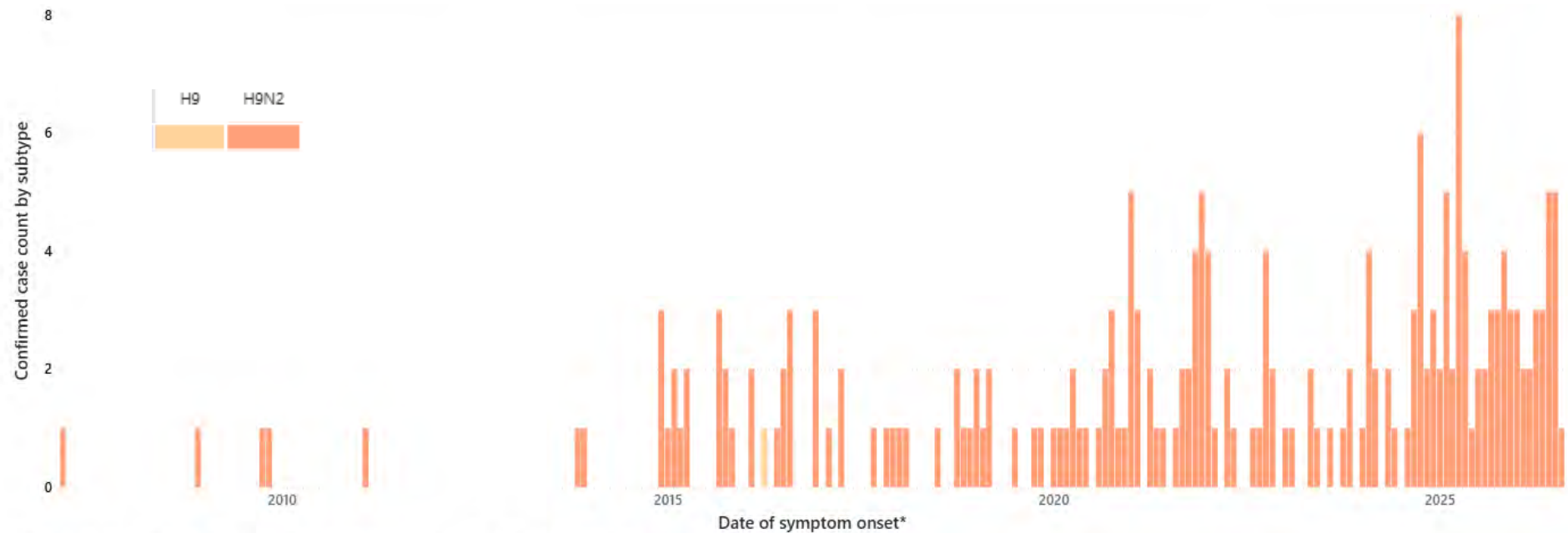
Between 1 July 2025 and 1 March 2026, A(H5N1) clade 2.3.2.1a viruses were detected in poultry in Bangladesh and India, while A(H5N1) clade 2.3.2.1b viruses were detected in poultry in Cambodia.

*An event includes all related epidemiologically related outbreaks reported from the time of the immediate notification through to the final report. Separately the total number of outbreaks is also stated.

1 of 10

Detections of zoonotic influenza A(H9) viruses in humans 2003 to 2026

- Around 210 human cases since 2003
- 168/210 cases under 18 years of age
- 144/176 cases where severity is known = mild
- 3 fatal cases in persons with underlying conditions
- Majority have reported exposure to animals or contaminated environments, in areas where the virus is known to circulate in animals
- No sustained human-to-human transmission

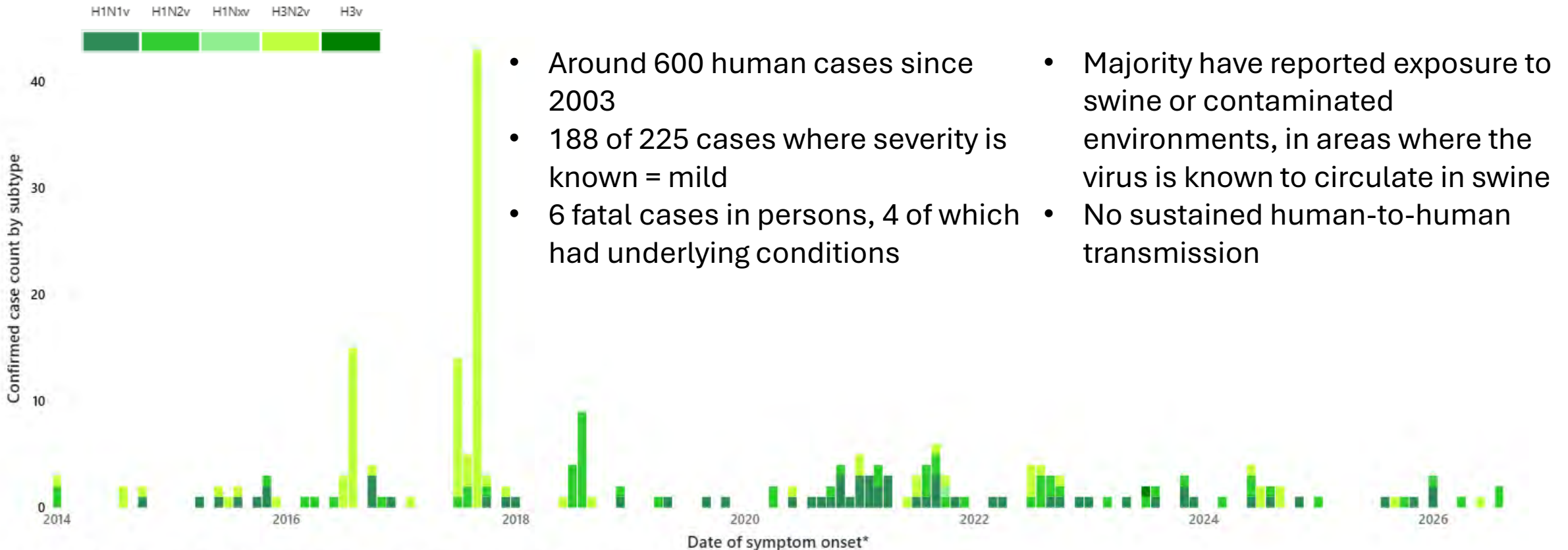


*Cases are shown by date of symptom onset. If the symptom onset date is not available, the date of WHO notification or publication date or the date of sample collection is used.
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ISO 8601 calendar type

Data Source: Global Influenza Surveillance and Response System (GISRS) and RespiSurf

Human infections with swine variant influenza viruses 2014 to 2026



*Cases are shown by date of symptom onset. If the symptom onset date is not available, the date of WHO notification or publication date or the date of sample collection is used.

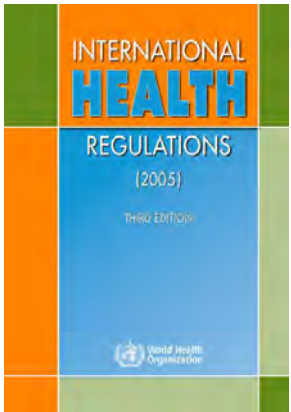
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ISO 8601 calendar type

Data Source: Global Influenza Surveillance and Response System (GISRS) and RespiMart

Global coordination

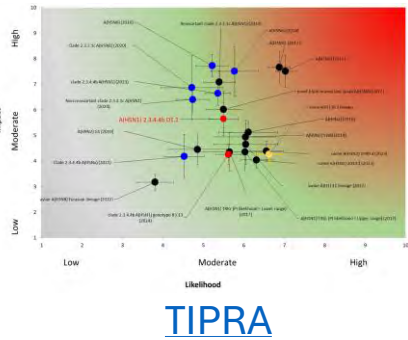
IHR requirements



Risk assessments



Rapid risk assessment



One Health approach and collaboration with FAO, WOA, UNEP



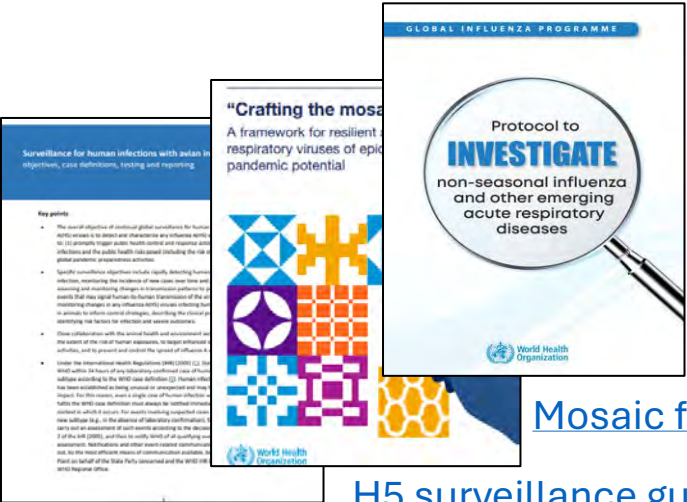
Food and Agriculture Organization of the United Nations



World Organisation for Animal Health



Guidance: surveillance and response

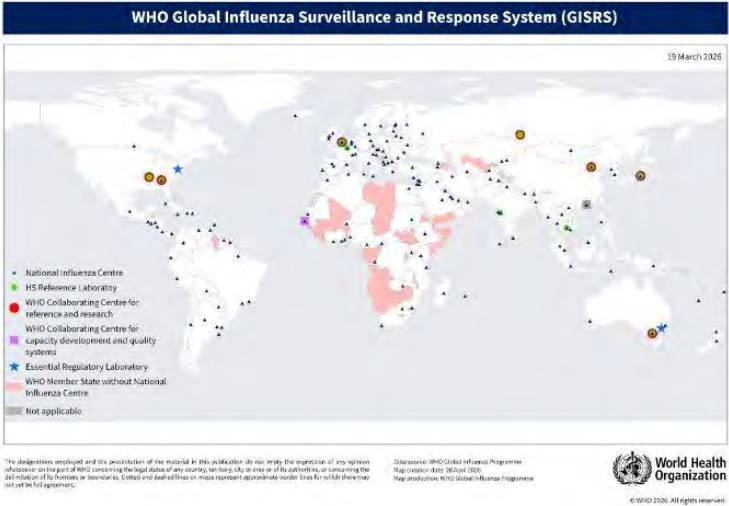


Outbreak investigation

Mosaic framework

H5 surveillance guidance

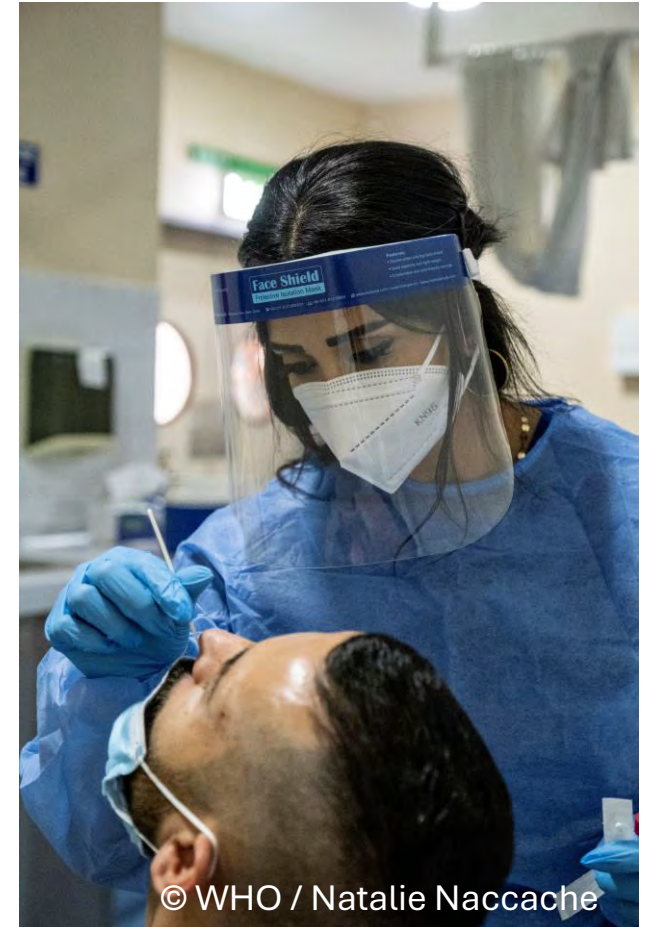
Global Influenza Surveillance and Response System (GISRS)



- Laboratory confirmation, virus sharing and characterization
- Candidate vaccine virus selection for pandemic preparedness
- Global alert mechanism

Early detection and risk assessment is critical

- Human infections can be severe and appropriate clinical management should be provided.
- Need to understand the epidemiology: who is at risk for infection and severe disease and why?
- Need to understand the virology: how similar is the virus to that infecting local animals or are there changes that might indicate increased transmission or adaptation to humans?
- To understand transmission: is the virus spreading from person to person?
- To respond and control outbreaks: prevent further spread among animals and humans.
- Pandemic potential: critical information needed for risk assessment



Essential immediate public health actions

- **Case management:** report suspected cases to health authorities and managed with appropriate clinical care
- **Public health response:** initiate surveillance, case investigation, contact tracing to assess transmission risk and implement response and control measures
- **Enhance surveillance temporarily:** in the community and health facilities to better understand the outbreak characteristics
- **Zoonotic surveillance:** If the influenza virus is also infecting animals, countries should have an approach in place for assessing and monitoring the health of individuals at risk of potential exposure to infected, or presumed to be infected, animals
- **International reporting:** use the [IHR](#) decision instrument contained in Annex 2 of the IHR; communicate with the State Party's National IHR Focal Point for further notification to WHO
- **Timely virus sharing:** share clinical specimens and/or virus isolates (if available) with WHO Collaborating Centres & H5 Reference Laboratories under the PIP Framework ([WHO Operational guidance on sharing influenza viruses with human pandemic potential](#) (IVPP))



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Thank you

Resources

Global Influenza Programme	https://www.who.int/teams/global-influenza-programme
Global Influenza Programme Surveillance and monitoring	https://www.who.int/teams/global-influenza-programme/surveillance-and-monitoring
Global Influenza Programme Human-Animal Interface	https://www.who.int/teams/global-influenza-programme/avian-influenza
Public health resource pack for countries experiencing outbreaks of influenza in animals: revised guidance	https://www.who.int/publications/i/item/9789240076884
Protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases	https://apps.who.int/iris/handle/10665/275657
WHO Disease Outbreak News	https://www.who.int/emergencies/disease-outbreak-news
Zoonotic influenza outbreak toolkit	https://www.who.int/emergencies/outbreak-toolkit/disease-outbreak-toolboxes/zoonotic-influenza-a-virus-outbreak-toolbox
Manual for the laboratory diagnosis and virological surveillance of influenza	https://apps.who.int/iris/rest/bitstreams/52982/retrieve
Laboratory biosafety manual, 4th edition	https://apps.who.int/iris/rest/bitstreams/1323419/retrieve
Operational Guidance on Sharing Influenza Viruses with Human Pandemic Potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework	https://apps.who.int/iris/rest/bitstreams/1091180/retrieve
“Crafting the mosaic”: a framework for resilient surveillance for respiratory viruses of epidemic and pandemic potential	https://www.who.int/publications/i/item/9789240070288
Implementing the integrated sentinel surveillance of influenza and other respiratory viruses of epidemic and pandemic potential by the Global Influenza Surveillance and Response System: standards and operational guidance	https://iris.who.int/handle/10665/379678

ZOONOTIC INFLUENZA:

Regional update on the recent human infections and their public health Implications

Strengthening One Health Surveillance, Preparedness and Response



South-East Asia Region

HEALTHY PEOPLE
HEALTHY ANIMALS
HEALTHY PLANET

PRESENTED BY



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Pandemic & Epidemic Management (PEM) Unit,
WHO Health Emergencies Programme (WHE),
World Health Organization,
Regional Office for South-East Asia (SEARO),
New Delhi - India

PRESENTATION OVERVIEW

01



SURVEILLANCE LANDSCAPE

Influenza surveillance in SEAR and the data generated across epidemiological, laboratory and event-based systems.

02



FROM DATA TO INTELLIGENCE

How surveillance information is integrated to support situational awareness and risk assessment.

03



REGIONAL COLLABORATION & CAPACITY STRENGTHENING

WHO SEARO support, WHO Collaborating Centres, laboratory strengthening, training and regional coordination.

04



RECENT HUMAN INFLUENZA EVENTS

What recent H5 human cases in the Region tell us about zoonotic influenza and pandemic risk.

05



CHALLENGES & THE WAY FORWARD

Key gaps in surveillance, One Health coordination, virus sharing and translating evidence into public health action.

INFLUENZA SURVEILLANCE SYSTEMS ACROSS SOUTH-EAST ASIA REGION

Strengthening influenza surveillance, laboratory capacity and One Health collaboration

ILI SURVEILLANCE
Influenza-like illness (outpatients)

SARI SURVEILLANCE
Severe acute respiratory infection (inpatients)

NIC NETWORK
National Influenza Centre (Year of recognition)

NEW NICs RECOGNISED IN 2023
Bhutan • Maldives • Timor-Leste

Content and data: WHO SEARO. All tools were used solely to support visual design and layout

DETECT
Epidemiological Surveillance

- ILI surveillance in all 10 Member States
- SARI surveillance in all 10 Member States
- Sentinel and national systems strengthening early detection



CHARACTERIZE
Laboratory & NIC Network

- NICs in all 10 Member States
- Virus detection, characterization and monitoring
- Contributing to GISRS and global influenza response



CONNECT
One Health Approach

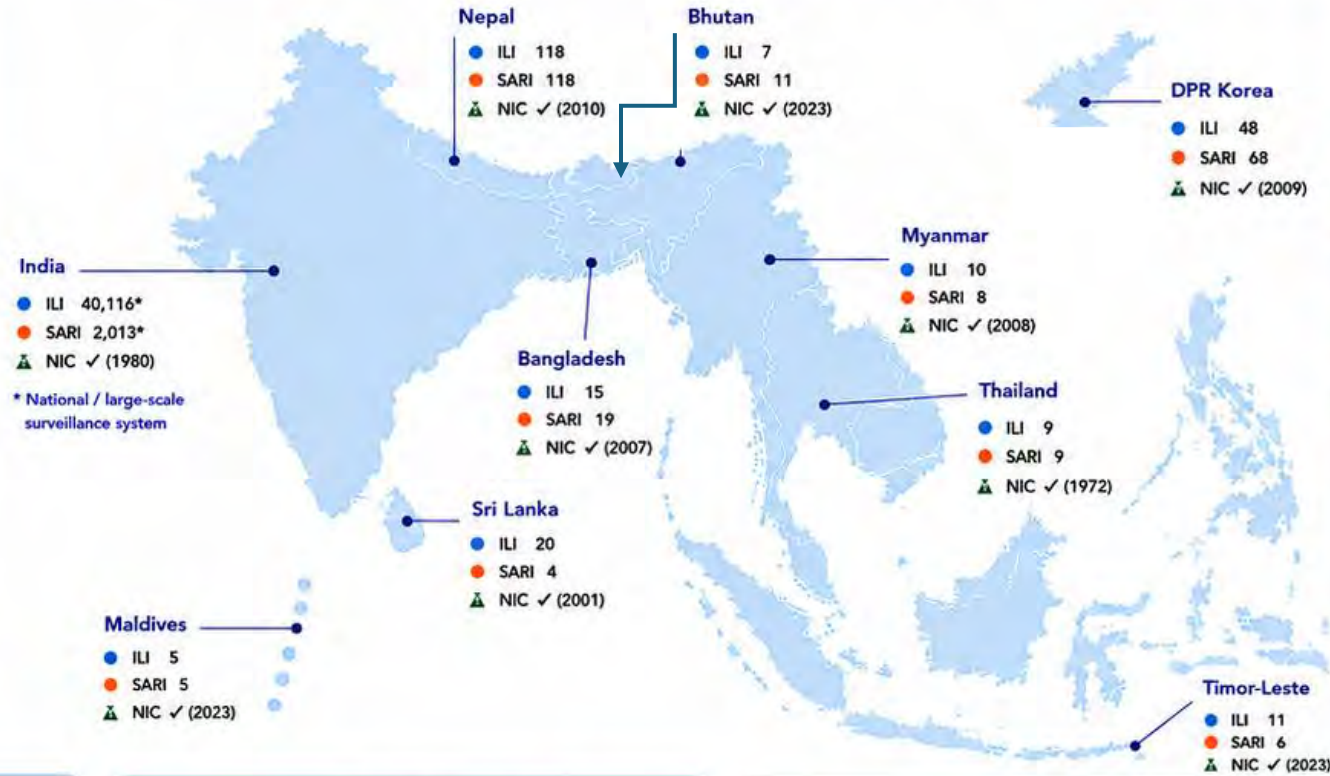
- Surveillance at the human–animal interface
- Cross-sectoral collaboration
- Joint risk assessment and preparedness
- Strengthening readiness for zoonotic influenza threats

H5 REFERENCE LABORATORIES

 **NIV Pune - India**
 **NIC Thailand**



-  **NATIONAL COVERAGE**
National / universal system or 100% population coverage
-  **BROAD GEOGRAPHIC COVERAGE**
Multiple administrative areas and/or substantial population coverage
-  **SENTINEL NETWORK**
Selected sentinel sites with limited documented coverage
-  **COVERAGE NOT QUANTIFIED**
Geographic / population coverage data not available

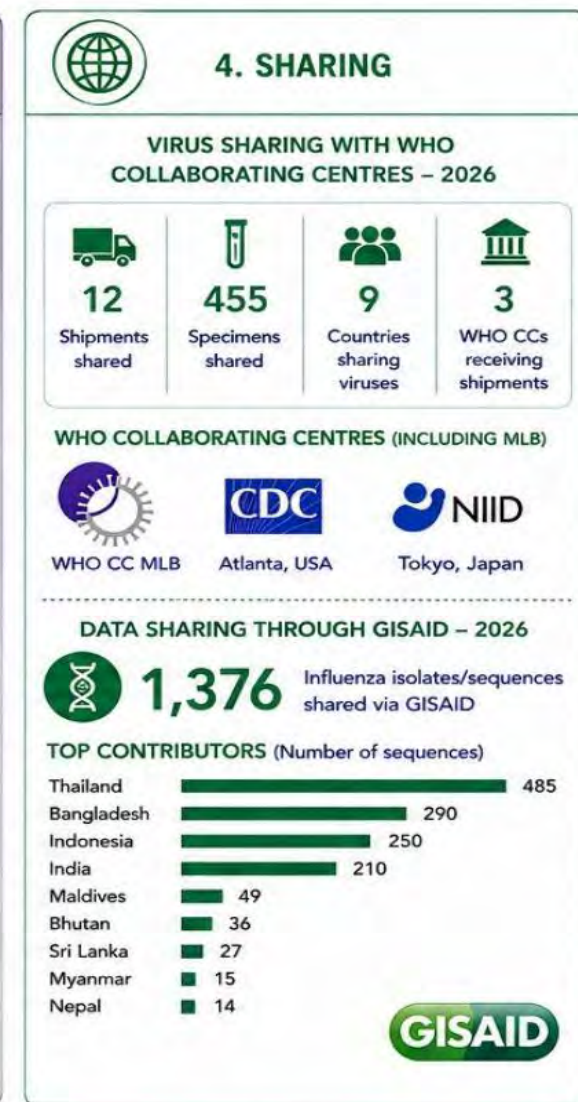
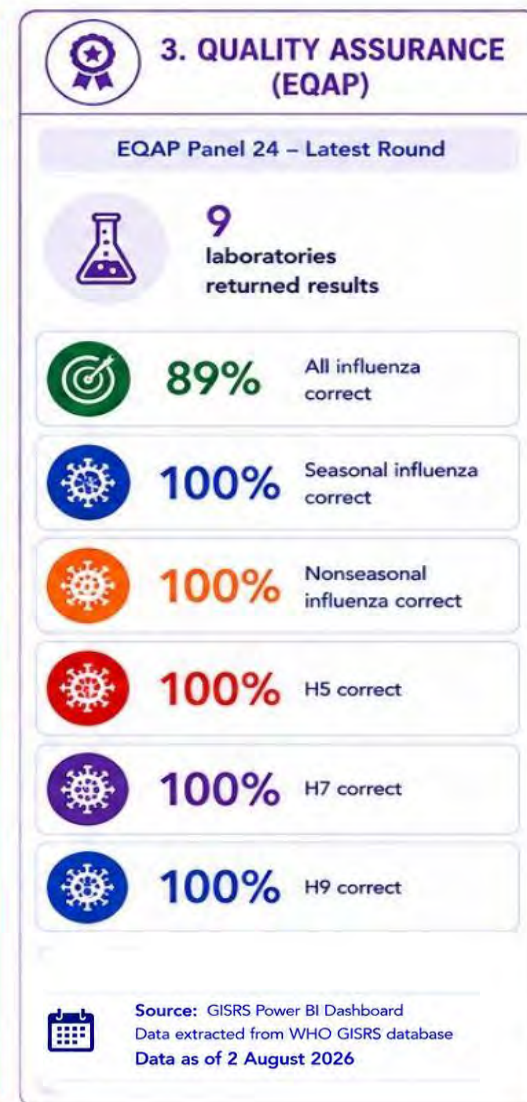
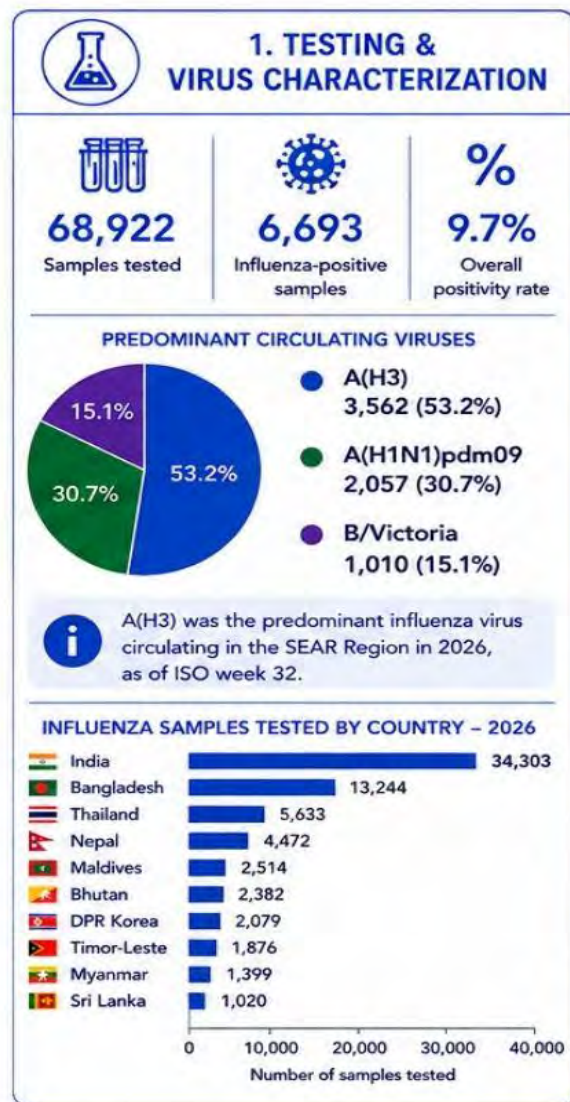


Note: Coverage based on country reports (Status of Influenza – 2023)

 India	 NATIONAL COVERAGE
 DPR Korea	 NATIONAL COVERAGE
 Maldives	 NATIONAL COVERAGE
 Sri Lanka	 BROAD GEOGRAPHIC COVERAGE
 Bhutan	 BROAD GEOGRAPHIC COVERAGE
 Timor-Leste	 BROAD GEOGRAPHIC COVERAGE
 Bangladesh	 SENTINEL NETWORK
 Nepal	 COVERAGE NOT QUANTIFIED
 Myanmar	 COVERAGE NOT QUANTIFIED
 Thailand	 COVERAGE NOT QUANTIFIED

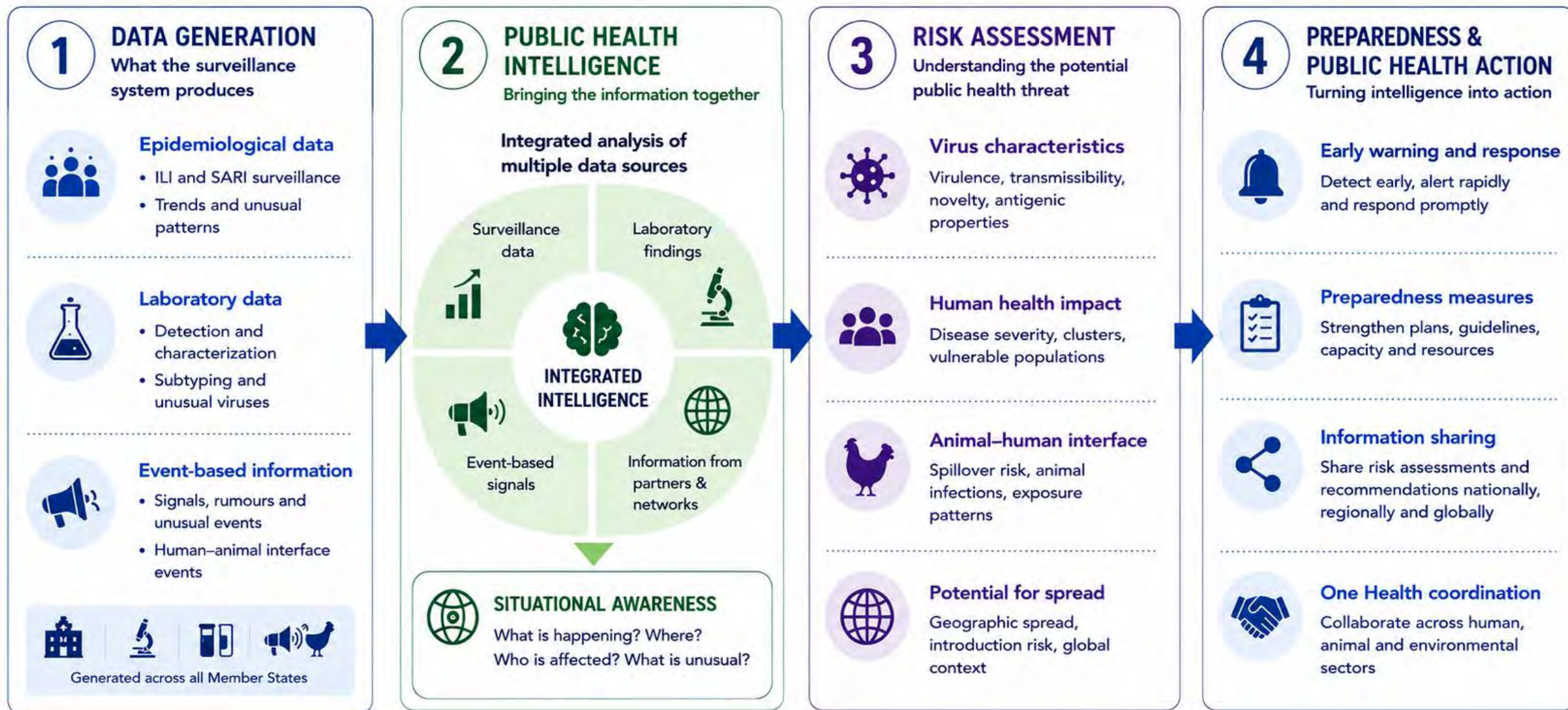
PERFORMANCE OF THE INFLUENZA SURVEILLANCE SYSTEM – 2026

South-East Asia Region | As of ISO week 32 (Data as of 2 August 2026)



FROM SURVEILLANCE DATA TO PUBLIC HEALTH INTELLIGENCE

Generating evidence for intelligence, risk assessment and action



COLLABORATION IN ACTION

1 TARGETED TECHNICAL SUPPORT *Bringing expertise to Member States*



Myanmar

In collaboration with
NIID, Japan



NIID
NATIONAL INSTITUTE OF
INFECTIOUS DISEASES
JAPAN

- NIC capacity assessment
- Integrated influenza (and SARS-CoV-2) surveillance
- Laboratory and data systems
- Reporting and pandemic preparedness



Timor-Leste

In collaboration with
WHO CC VIDRL,
Melbourne, Australia



VIDRL
WHO Collaborating Centre
for Reference and Research
on Influenza – MLB

- NIC and laboratory assessment
- Surveillance systems strengthening
- Reporting and data quality
- Training and sustainable capacity building

2 SCIENTIFIC & TECHNICAL COLLABORATION *Generating evidence, strengthening laboratory capacity*

ICMR–NIV, India ×
WHO CC VIDRL, Melbourne



icmr
INDIAN COUNCIL OF
MEDICAL RESEARCH



VIDRL
WHO Collaborating Centre
for Reference and Research
on Influenza – MLB

Validation of ICMR–NIV Multiplex 5-Gene Assay



Influenza A



Influenza B



RSV A/B



SARS-CoV-2

90 clinical samples evaluated against relevant
CDC reference RT-PCR assays.

Target	Sensitivity	Specificity
Influenza A (FluA)	100%	100%
Influenza B (FluB)	100%	100%
RSV A/B	100%	100%
SARS CoV-2 (SC2)	82%	100%



WHO SEARO Supported Training

Training on phenotypic antiviral
resistance testing for influenza



10–14 March 2025

NIC laboratory scientists
from SEAR countries

Improving capacity in
phenotypic antiviral
resistance testing
for influenza in
Thailand and in
the region.

3 REGIONAL KNOWLEDGE EXCHANGE & COORDINATION *Connecting the regional network*



Regional Webinar on Vaccine Composition & Influenza Surveillance

30 March 2026

- Coordinated webinar with WHO HQ, WCOs, NICs, VoO NIGs and WHO CCs (Melbourne & Tokyo)
- Shared virological trends and key surveillance developments
- Discussed 2026 SH & 2026–2027 NH vaccine compositions and implications for the Region



Monthly Regional Influenza Coordination Calls

Jan – Jun 2026

- Coordinated monthly calls with WCO influenza focal points
- Updates on PIP Advisory Group, CDC communications and influenza activities
- Review of surveillance, testing and PIP-PC implementation
- Shared country progress, challenges and 2026–2027 priorities

4 DATA & INFORMATION CAPACITY *Improving the quality and use of surveillance information*



RespiMart & Data Management Training

21–22 April 2026

- Coordinated regional virtual training with WHO HQ/GIP
- Data uploading in RespiMart
- Introduction to Excel Power Query
- Addressed challenges in data cleaning, integration, timeliness and accuracy
- Improved quality and usability of influenza surveillance data

Current surveillance approaches used in SEAR for detecting human spill-overs



1. Event based surveillance

- Detect, verification and Assessment



2. ILI /SARI Sentinel surveillance

- General focus – low yield
- Sites located in areas of high-risk populations /high risk occupations
- In migratory bird pathways



3. Human animal interface surveillance

- Poultry workers, swine workers , wet market workers



4. Genomic surveillance

- Representative isolates/specimens
- Un-subtypable influenza viruses.
- Non-seasonal influenza viruses
- Zoonotic influenza viruses (e.g., H5N1, H7N9).
- Viruses from unusual outbreaks or severe infections.



5. Wastewater surveillance

- current efforts for using for multiple pathogens in SEAR



6. Sero-surveillance

- Periodic testing of high-risk populations for antibodies against avian influenza viruses.



One Health

Volume 20, June 2025, 100975



Development of a zoonotic influenza distribution assessment and ranking system (ZIDAR): Technical application in Nepal to support cross-sectoral risk-based surveillance

BMJ Public Health

Visit this
Journal

BMJ

► BMJ Public Health. 2025 Jun 18;3(1):e002330. doi: [10.1136/bmjph-2024-002330](https://doi.org/10.1136/bmjph-2024-002330)

Implications for influenza A virus surveillance in Southeast Asian Region countries: a scoping review of approaches for the surveillance of swine influenza viruses at human-swine interfaces

Subarna Roy^{1,9}, Mohammad Mahmudul Hassan^{2,6,9}, Gulam Mohd³, Abdulkader Suliankatchi Rizwan³, Muthappan Sendhil Kumar⁴, Jasmine Beryl Lydia³, Janana Priya³, Manickam Ponnaiah³, Pushpa Ranjan Wijesinghe⁵, Edwin Ceniza Salvador⁶, Nilesh Buddha⁶, Ricardo Soares Magalhaes^{2,7}, Manish Kakkar^{5,*}, Manoj Murhekar^{3,*}

H5 HUMAN CASES IN SEAR – 2025–2026 UPDATE

All reported human H5 cases in 2025 and 2026 (to latest available date)



Reporting period:
1 January 2025 – 20 May 2026
(to latest available date)



DETECTION PERIOD

1 Jan 2025 –
20 May 2026



TOTAL HUMAN H5 CASES

10

CASES BY COUNTRY



7

Bangladesh



3

India



OUTCOMES

7 Recovered

3 Deceased



REPORTING

10 / 10 IHR reported

10 / 10 WHO EIS notified

DETAILS OF H5 HUMAN CASES (NEWEST TO OLDEST BY DATE OF DETECTION)

#	DATE OF DETECTION	DATE REPORTED	COUNTRY	LOCATION	AGE / SEX	EXPOSURE SOURCE	CLADE	OUTCOME	IHR / WHO EIS	VIRUS ISOLATED	SAMPLE SENT TO CC	CC
1	20 May 2026	11 Jun 2026	Bangladesh	Habiganj District, Sylhet Division	 7 years / Female	No recent travel history and no reported exposure to poultry	Not recorded	Recovered	Yes / Yes	Yes	In process	US CDC – CC
2	29 Mar 2026	23 Apr 2026	Bangladesh	Sylhet Division	 18 months / Male	History of exposure to household poultry; close relative was a poultry vendor with unsold poultry at home	2.3.2.1a	Recovered	Yes / Yes	Yes	In process	US CDC – CC
3	28 Mar 2026	1 Apr 2026	India	West Bengal	 2 years / Male	Undetermined (in source)	2.3.2.1a	Recovered	Yes / Yes	Yes	In process	MLB
4	7 Feb 2026	8 Feb 2026	Bangladesh	Chattogram Division	 11 months / Male	History of exposure to backyard poultry	2.3.2.1a	Deceased	Yes / Yes	Yes	In process	US CDC – CC
5	1 Aug 2025	1 Aug 2025	Bangladesh	Sylhet Division	 1.5 years / Male	No backyard poultry; however, the family would buy poultry in a market	Awaiting GSD	Recovered	Yes / Yes	Yes	Yes	US CDC – CC
6	21 May 2025	28 May 2025	Bangladesh	Cumilla Sadar Upazila, Chittagong	 1 year / Male	History of exposure to backyard poultry	Awaiting GSD	Recovered	Yes / Yes	Yes	Yes	US CDC – CC
7	24 Apr 2025	1 May 2025	Bangladesh	Ramnagar, Jashore Sadar, Khulna Division	 8 years / Male	Sentinel surveillance (SARI)	2.3.2.1a	Recovered	Yes / Yes	Yes	Yes	US CDC – CC
8	3 May 2025	1 May 2025	India	Manipal, Udupi District	 41 years / Male	Raw chicken	2.3.2.1a	Deceased	No	Yes	In process	MLB
9	1 Mar 2025	1 May 2025	India	Mangalagiri, Andhra Pradesh	 2 years / Female	Raw chicken	2.3.2.1a	Deceased	Yes	Yes	In process	MLB
10	1 Feb 2025	1 May 2025	Bangladesh	Jhikargacha, Jashore, Khulna Division	 10 months / Male	Sentinel surveillance (SARI)	2.3.2.1a	Recovered	Yes / Yes	Yes	Yes	US CDC – CC



KEY HIGHLIGHTS

- 10 human H5 cases reported in SEAR during 2025–2026 (to 20 May 2026).
- Bangladesh reported 7 cases; India reported 3 cases.
- All cases (9 with data) are H5 clade 2.3.2.1a or awaiting GSD (2 cases).
- 7 recovered and 3 deceased.
- All 10 cases were reported through IHR; all 10 notified to WHO EIS.



LABORATORY & VIROLOGICAL INFORMATION

- All cases: Human cases of Highly Pathogenic Avian Influenza (HPAI)
- Virus isolated: Yes (all 10 cases)
- Samples sent to WHO Collaborating Centre:

Key Challenges and Gaps in Influenza and Zoonotic Influenza Surveillance



Detection of Human and Zoonotic Spillover Events

- Under-detection of human zoonotic influenza infections due to reliance on general ILI/SARI surveillance.
- Limited surveillance at the human–animal–environment interface (HAEI).
- Delayed detection and investigation of potential spillover events.



Laboratory and Virus Characterization Capacity

- Gaps in influenza A subtyping capacity at some NICs and sub-national laboratories.
- Limited genomic surveillance and bioinformatics capacity at country level.
- Need for stronger capacity to detect and characterize unusual, novel and zoonotic influenza viruses.



Timely Information and Virus Sharing

- Delays in sharing influenza viruses of pandemic potential with WHO Collaborating Centres.
- Regulatory, administrative, biosafety, technical, operational and logistical barriers to virus sharing.
- Delayed or incomplete sharing of sequences and metadata through global platforms.



One Health Coordination and Event-Based Surveillance

- Delayed information sharing between human, animal and other relevant sectors.
- Challenges in joint verification, risk assessment and intersectoral validation.
- Operational delays affecting IHR notification and response processes.



From Surveillance Data to Public Health Action

- Sub-optimal systems for rapidly converting surveillance data into intelligence.
- Limited use of surveillance information for:



Risk
assessment



Public health
recommendations



Targeted
investigations



Epidemic and
pandemic preparedness



Policy and
decision-making

“

'Human health does not exist in a vacuum, and nor can our efforts to protect and promote it. The close links between human, animal, and environmental health demand close collaboration... to transform One Health from a concept to concrete policies.'

WHO Director-General
Dr. Tedros Adhanom Ghebreyesus

Thank you



REGIONAL WEBINAR

Global and regional updates on animal influenza



PRESENTED BY

Dr Gounalan Pavade

Veterinarian (DVM, PhD in Veterinary Pathology)
Senior Scientific Coordinator for Avian Influenza
World Organisation for Animal Health (WOAH)



World Organisation for Animal Health (WOAH)



Headquarters, Paris



Scientific coordination
of regional and
international activities
on avian, swine and
equine influenza



Managing the global
animal influenza
network OFFLU
(www.offlu.org)



Collaborating with
WHO influenza network
on human-animal
interface activities



Supporting evidence-
based risk assessment
and information
sharing on animal
influenza

Global and regional updates on avian influenza

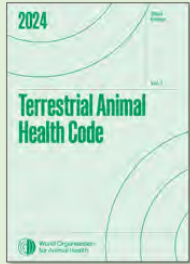
WHO SEARO Webinar on Zoonotic Influenza

1 September 2026

Dr Gounalan Pavade
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WOAH Headquarters, Paris



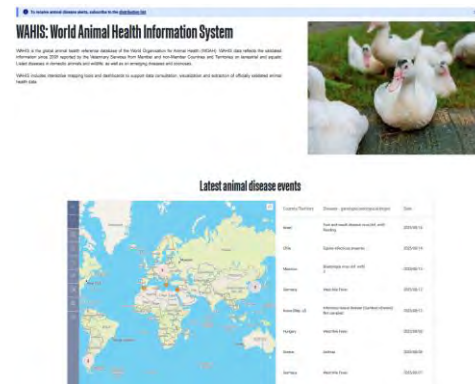
WOAH-listed disease notification by Members



In accordance with WOAH Terrestrial Code, WOAH Members are required to notify WOAH-listed disease outbreaks.

Early Warning
report (immediate
notification,
follow-up report)

Within
24 hours



Six-monthly report

Every six
months

Transparency of avian influenza situation



WAHIS: World Animal Health Information System

Fostering transparency in the animal
disease situation worldwide

We collect official avian influenza outbreak information from all Members and make it publicly available through WAHIS

- *Infection* with high pathogenicity avian influenza viruses
- *Infection* of birds other than *poultry*, including wild birds, with influenza A viruses of high pathogenicity
- *Infection* of domestic and captive wild birds with low pathogenicity avian influenza viruses having proven natural transmission to humans associated with severe consequences

Avian influenza monitoring systems in WOA



World Organisation
for Animal Health

WAHIS

Analytics Reports WOA 7 EN FR ES

To receive animal disease alerts, subscribe to the distribution list.

Need help or have a question? Contact WAHIS Support.

WAHIS: World Animal Health Information System

WAHIS is the global animal health reference database of the World Organisation for Animal Health (WOAH). WAHIS data reflects the validated information since 2005 reported by the Veterinary Services from Member and non-Member Countries and Territories on terrestrial and aquatic Listed diseases in domestic animals and wildlife, as well as on emerging diseases and zoonoses.

WAHIS includes interactive mapping tools and dashboards to support data consultation, visualization and extraction of officially validated animal health data.



Poultry and wild birds

Latest animal disease events



World Organisation
for Animal Health

Events notified to WOA according to Articles 1.1.5 of the Terrestrial and Aquatic Codes

Clear all filters

Country or territory	Animal type	Disease (as submitted)	Submission reason	Date report received	Event
Svalbard & Jan Mayen Islands	Terrestrial	Highly pathogenic avian influenza	Unusual host (not in case definition)	15/09/2025	NOR_20250915
United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	11/09/2025	USA_20250911_01
United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	11/09/2025	USA_20250911_02
Japan	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds)(2017-)	Unusual host (not in case definition)	03/09/2025	JPN_20250903
Svalbard & Jan Mayen Islands	Terrestrial	Highly pathogenic avian influenza	Unusual host (not in case definition)	07/08/2025	NOR_20250807
Uruguay	Terrestrial	PPMV-1, Pigeon paramyxovirus 1	Mass mortality events	24/07/2025	URY_20250724
United Kingdom	Terrestrial	Influenza A	Unusual host (not in case definition)	15/07/2025	GBR_20250715
United States of America				10/07/2025	USA_20250710_03
United States of America				10/07/2025	USA_20250710_01

Mammals as unusual hosts

Instructions: Click on an event of interest. You will then be able to use the button to the right to see the information available for the event.
To see summary results for avian influenza in mammals, use the bookmark button to the left.

See details

As Emerging disease



Infection of bovines with HPAI as per

HIGH PATHOGENICITY AVIAN INFLUENZA (HPAI)

Situation Report 76

Period covered:

October 2025

This report provides an update of the high pathogenicity avian influenza (HPAI) situation, according to the information submitted to the World Organisation for Animal Health.

Key messages and Recommendations

- The new high pathogenicity avian influenza (HPAI) season started in October 2025 with 72 outbreaks reported in poultry and 154 outbreaks in non-poultry birds and in mammals in Americas, Europe, Asia and Africa. About 3,444,691 poultry birds died or were culled during the month, mostly in the Americas.
- The number of new outbreaks and new events in both poultry and non-poultry notified worldwide has increased in October, which is consistent with the known seasonality of HPAI in poultry. A new strain of the disease in the country (H7) was reported in Portugal and two outbreaks were reported in mammals during this month. The World Organisation for Animal Health (WOAH) continues to pay close attention to the situation of HPAI in all species across the world.
- Given the spread of HPAI across the globe, continued surveillance in wild and domestic species is warranted. As this pathogen is impacting wildlife, livestock, and public health, a One Health approach to management would be beneficial. WOA recommends that Members maintain their surveillance efforts, implement biosecurity and preventive measures at farm level, and continue timely reporting of avian influenza outbreaks in both poultry and non-poultry species.
- Considering the situation in mammals, WOA also recommends:
- including avian influenza as a differential diagnosis in mammals with high risk of exposure to the viruses;
 - reporting to WOA outbreaks of avian influenza in all animal species including unusual hosts;

Avian influenza (HPAI) global and regional situation



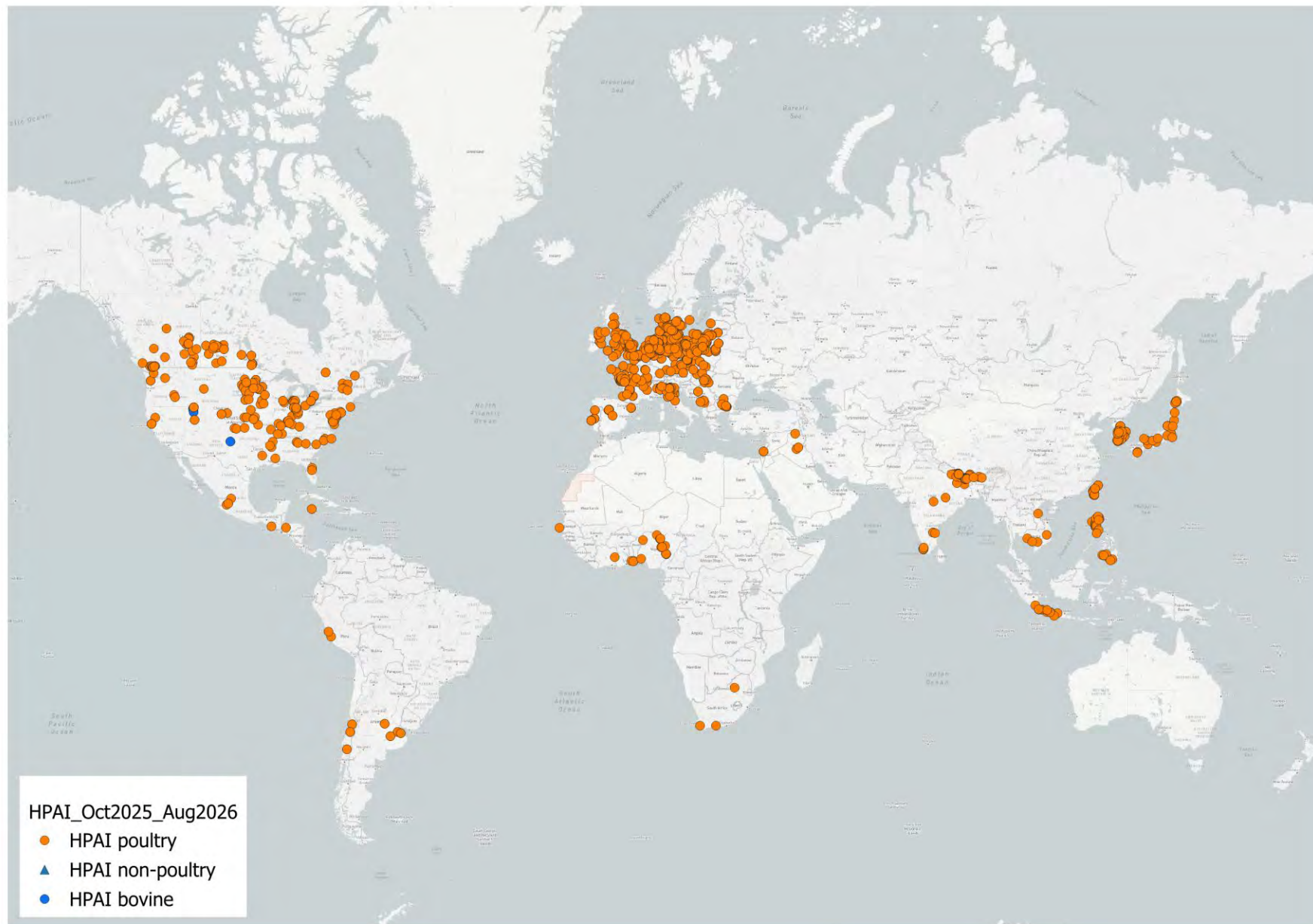
Last three HPAI seasons



	01 Oct 2023 - 30 Sep 2024	01 Oct 2024 - 30 Sep 2025	01 Oct 2025 – 31 July 2026
Countries and territories reporting HPAI in poultry	39	51	46
No. of HPAI outbreaks in poultry	851	1,431	1,614
Countries and territories reporting HPAI in wild birds	55	55	58
No. of HPAI outbreaks in wild birds	1,076	1,926	7,379

HPAI key figures for the current seasonal wave and the two previous waves

Current season - October 2025 – August 2026 poultry



Current season: October2025 to August 2026 poultry



OB Poultry	Africa	Americas	Asia and the Pacific	Europe	Middle East	Grand Total
Oct	15	75	10	129	1	230
Nov		109	10	259	1	379
Dec	8	50	50	134		242
Jan	4	36	35	102	1	178
Feb	2	55	42	64		163
Mar	3	59	57	52		171
Apr		15	30	66		111
May	2	26	22	33		83
Jun	1	17	32	1		51
Jul	5	11	7	1		24
Grand Total	40	453	295	841	3	1632

Current season: October 2025 to August 2026 poultry

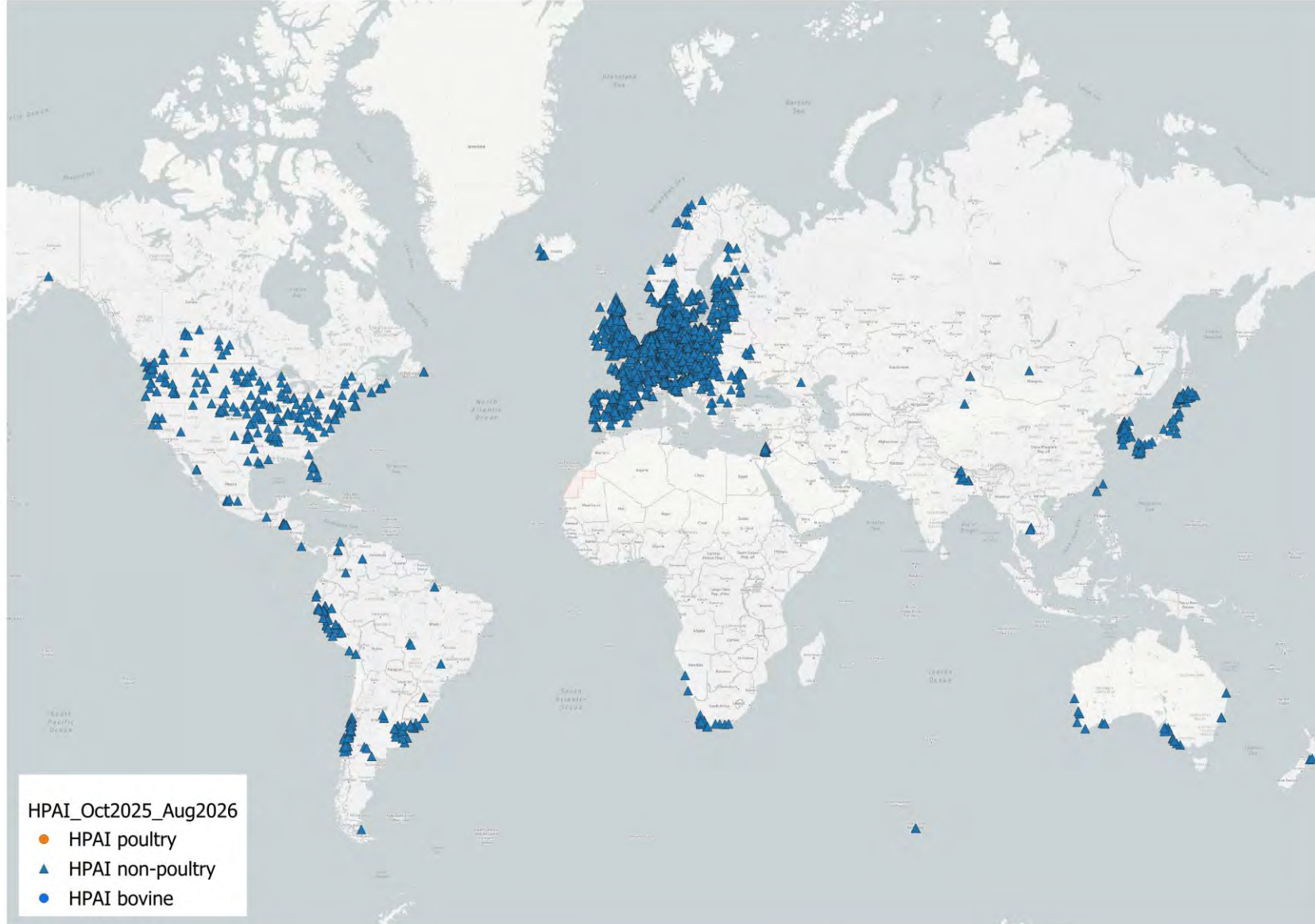


Cases poultry	Africa	Americas	Asia and the Pacific	Europe	Middle East	Grand Total
Oct	14112	89584	7489	767197	12000	890382
Nov		38014	5969	876941	400	921324
Dec	12032	31697	81735	2584655		2710119
Jan	3477	214913	29690	3917005	5000	4170085
Feb	9850	25161	11259	539624		585894
Mar	107400	5172	87538	443168		643278
Apr		2687	106167	3342349		3451203
May	62	4752	20290	1940391		1965495
Jun	1400	3662	46814	1809		53685
Jul	15041	260	2980	15		18296
Grand Total	163374	415902	399931	14413154	17400	15409761

Losses poultry	Africa	Americas	Asia and the Pacific	Europe	Middle East	Grand Total
Oct	14112	4958632	660993	4669348	74000	10377085
Nov		2313564	1669049	5164490	125000	9272103
Dec	12449	1325488	4606163	6454984		12399084
Jan	3547	5424562	1465257	7918473	60000	14871839
Feb	9850	11774472	3465397	1708985		16958704
Mar	107400	5787442	1767223	1000696		8662761
Apr		629162	702071	3360141		4691374
May	83	272468	51941	2088297		2412789
Jun	1400	66807	216368	49841		334416
Jul	15040	1491500	21580	5		1528125
Grand Total	163881	34044097	14626042	32415260	259000	81508280

Current season – October 2025 – August 2026 non-poultry

**NON-
POULTRY
BIRDS (incl.
wild birds)**



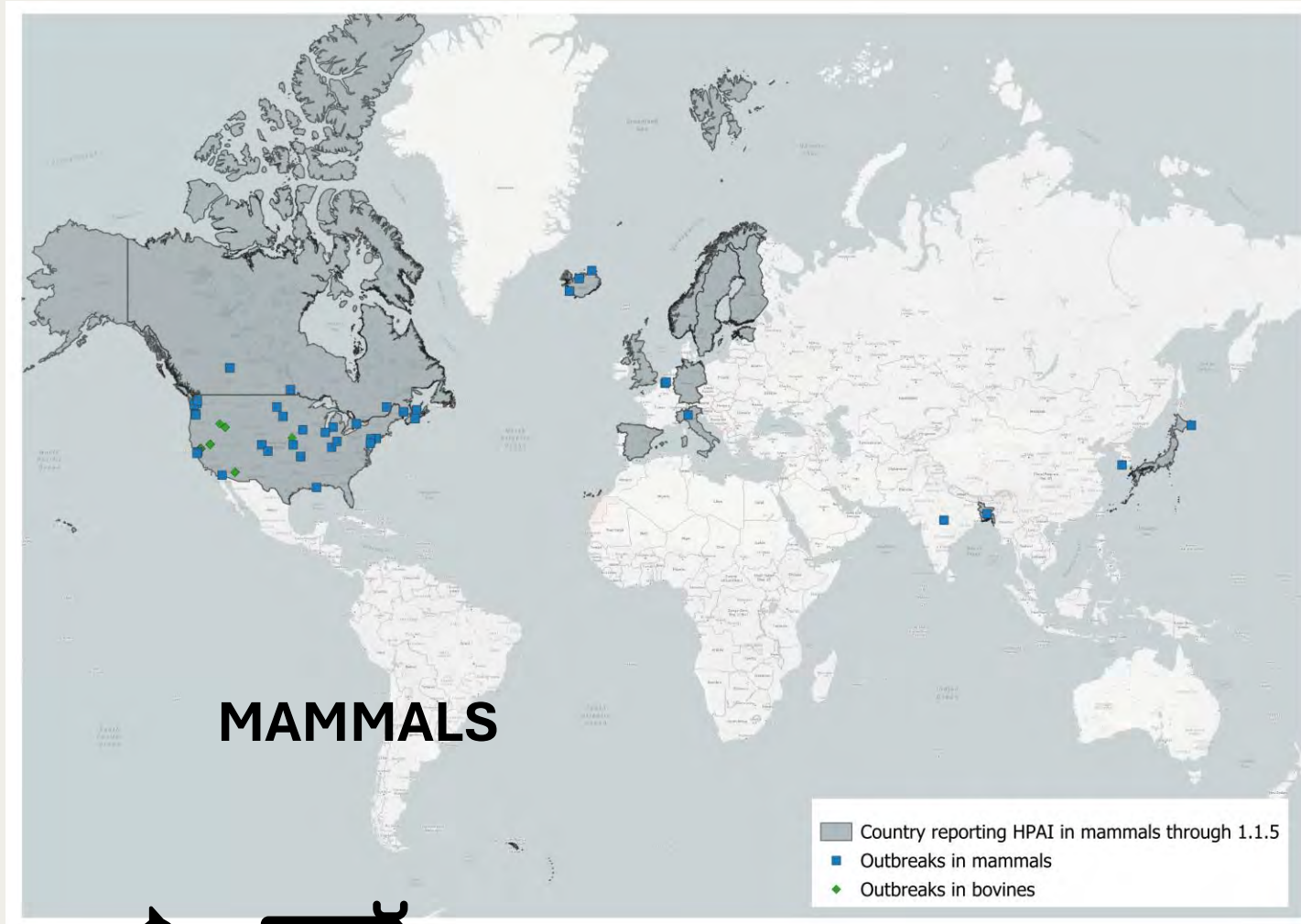
Current season (outbreaks): October 2025 to August 2026 non-poultry



OB Non-poultry	Africa	Americas	Asia and the Pacific	Europe	Grand Total
Oct	9	33	15	1639	1696
Nov	1	54	51	1786	1892
Dec	1	61	27	970	1059
Jan		35	44	827	906
Feb	3	36	37	1084	1160
Mar	1	48	52	588	689
Apr	3	43	19	158	223
May	4	27		60	91
Jun	1	12	6	64	83
Jul		5	21	24	50
Grand Total	23	354	272	7200	7849

Cases non-poultry	Africa	Americas	Asia and the Pacific	Europe	Grand Total
Oct	144	306	38	2470	2958
Nov	1	337	70	2916	3324
Dec	1	155	23	2390	2569
Jan		141	385	1905	2431
Feb	2	416	96	2043	2557
Mar	5	1727	104	994	2830
Apr	3	559	21	728	1311
May	4	256		161	421
Jun	1	733	14	97	845
Jul		225	24	529	778
Grand Total	161	4855	775	14233	20024

HPAI outbreaks in mammals: an evolving interface



Data source : [WAHIS](#) & official communications from Members to WOA

In 2025

- **92** outbreaks in 14 mammalian species reported through WAHIS
- **14** countries/territories reported HPAI in over **40** different species via Article 1.1.5
- The United States of America reported **143** outbreaks in bovines
- In Antarctica, **47** confirmed cases in 26 different wildlife species

In 2026 (January – 4 May)

- **6** countries/territories reported HPAI outbreaks in **15** different species via Article 1.1.5
- USA reported **170** outbreaks (cumulative) in bovines as of 24 July 2026.

Source : WAHIS

Current season – October 2025 – May 2026 unusual hosts



 World Organisation for Animal Health		Events reported to WOAHA according to Articles 1.1.5 of the Terrestrial and Aquatic Codes				Clear all filters
 Filters	Country or territory	Animal type	Disease (as submitted)	Submission reason	Date report received	Event
	Canada	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	14/05/2026	CAN_20260514
	United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	23/04/2026	USA20260423_01
	United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	23/04/2026	USA20260423_02
	United States of America	Cetaceans or sirenians	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	05/03/2026	USA_20260305_03
	United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	05/03/2026	USA_20260305_01
	United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	05/03/2026	USA_20260305_02
	United States of America	Terrestrial	Influenza A viruses of high pathogenicity (Inf. with) (non-poultry including wild birds) (2017-)	Unusual host (not in case definition)	02/01/2026	USA20260102_01
 Avian influenza in mammals		Instructions: Click on an event of interest. You will then be able to use the button to the right to see the information available for the event. To see summary results for avian influenza in mammals , use the bookmark button to the left.				See details

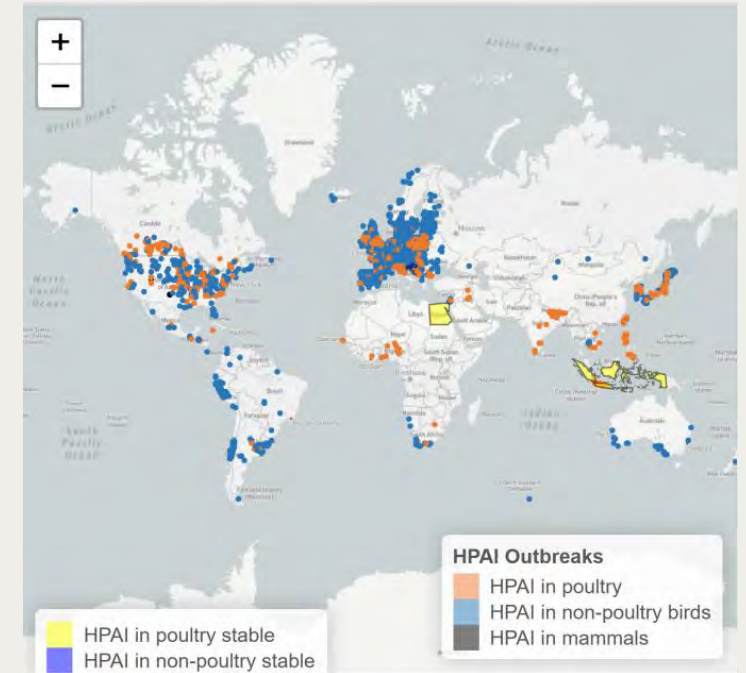
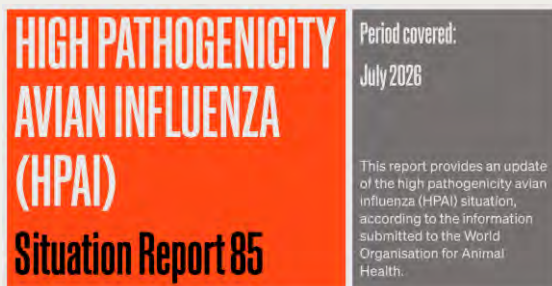
MAMMALS



Source : WAHIS

Conclusion: Key figures on the current HPAI epidemic wave

- The current HPAI season appears to be larger than the 2024-2025 one in terms of the number of reported outbreaks, particularly among non-poultry birds.
- The current HPAI season that started in October 2025 registered as of June 2026:
 - **1,614 outbreaks** reported in poultry and **7,379 outbreaks** in non -poultry birds
 - Around **81.5 million losses**
- Europe the region reporting most of the outbreaks
 - **52%** of outbreaks reported in poultry (followed by the Americas **28%**) (Asia **18%**)
 - **92%** of outbreaks reported in non-poultry (Asia **3.5%**)
- The regions reporting most losses are the Americas (**42%**) and Europe (**40%**) (Asia **18%**)
- H5N1 is reported in **98%** of the events
- New outbreaks reported in **unusual hosts** reported through article 1.1.5 by **6 countries / territories**



Thank you

Acknowledgement:

Dr Paolo Tizzani
Senior Veterinary Epidemiologist
WOAH - Data Integration and Analytics Department



World Organisation
for Animal Health



Recent Advances in Understanding the Ecology, Evolution, Transmission Barriers, and Cross-Species Transmission Risk of Non-Seasonal Influenza Viruses:

Implications for the WHO South-East Asia Region

PRESENTED BY

Thomas Fabrizio, Ph.D.

Scientist, St. Jude Children's Research Hospital
WHO Collaborating Center for Studies on the Ecology of Influenza in Animals



Ph.D. in Molecular Virology, University of Tennessee Health Science Center; Post-doctoral training at St. Jude Children's Research Hospital focused on interspecies transmission dynamics of zoonotic influenza viruses.



Research focuses on the molecular signatures of influenza infection, pathogenesis and transmission, particularly for zoonotic viruses with pandemic potential.



Since 2019, leads genetic analysis of influenza surveillance samples submitted to or collected by the St. Jude WHO Collaborating Center.



Provides valuable data to support selection of zoonotic candidate vaccine viruses at the biannual WHO vaccine composition meetings.

KEY AREAS



Molecular signatures of influenza infection and pathogenesis



Interspecies transmission dynamics of zoonotic influenza viruses



Genetic analysis of influenza surveillance samples



Support to zoonotic candidate vaccine virus selection



Evidence for WHO influenza vaccine composition meetings



Ecology, Evolution, Interspecies transmission of Influenza Viruses with Pandemic Potential

Tom Fabrizio

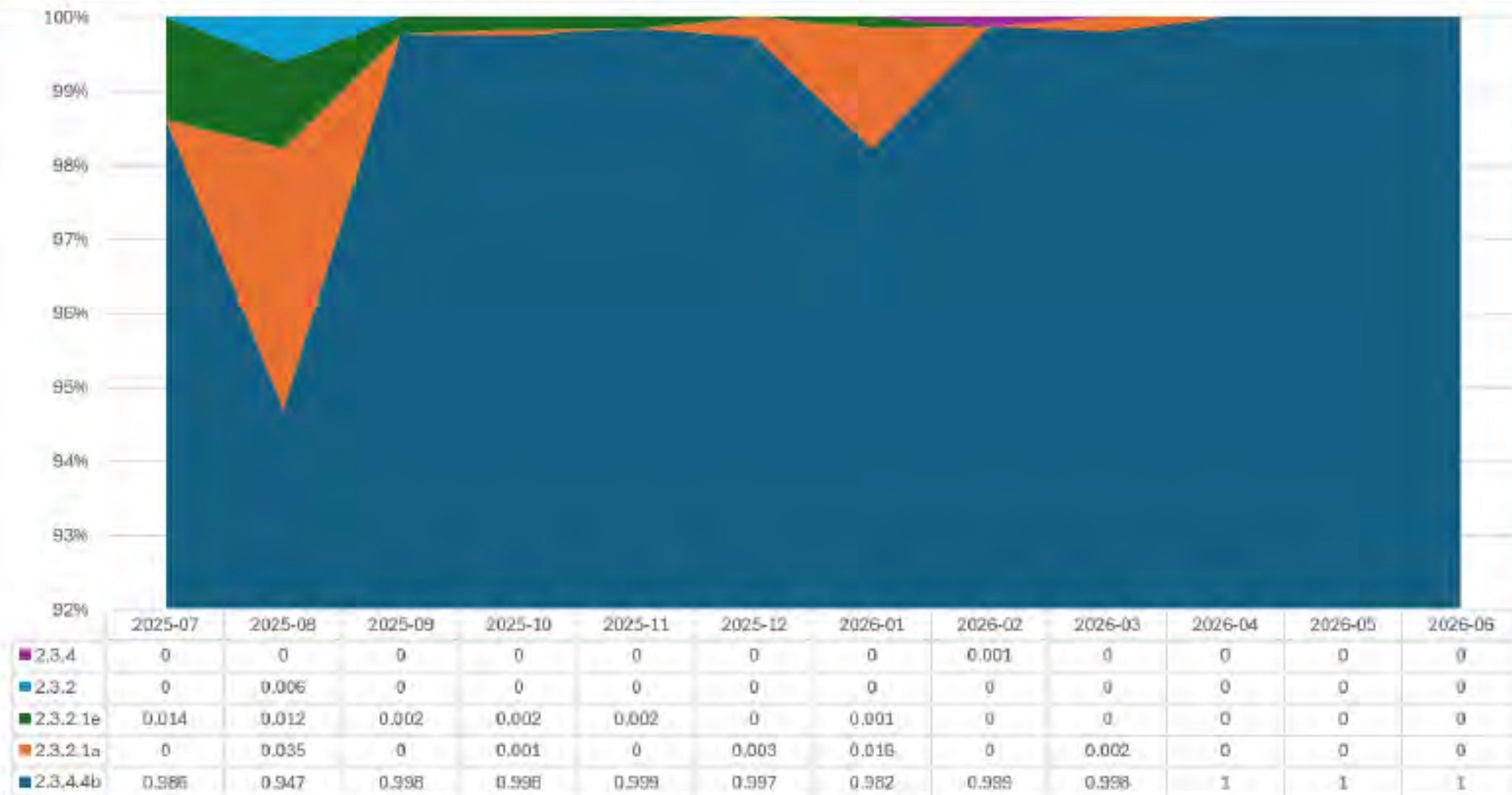
WHOCC: St. Jude Children's Research Hospital

Influenza and Other Respiratory Threats:

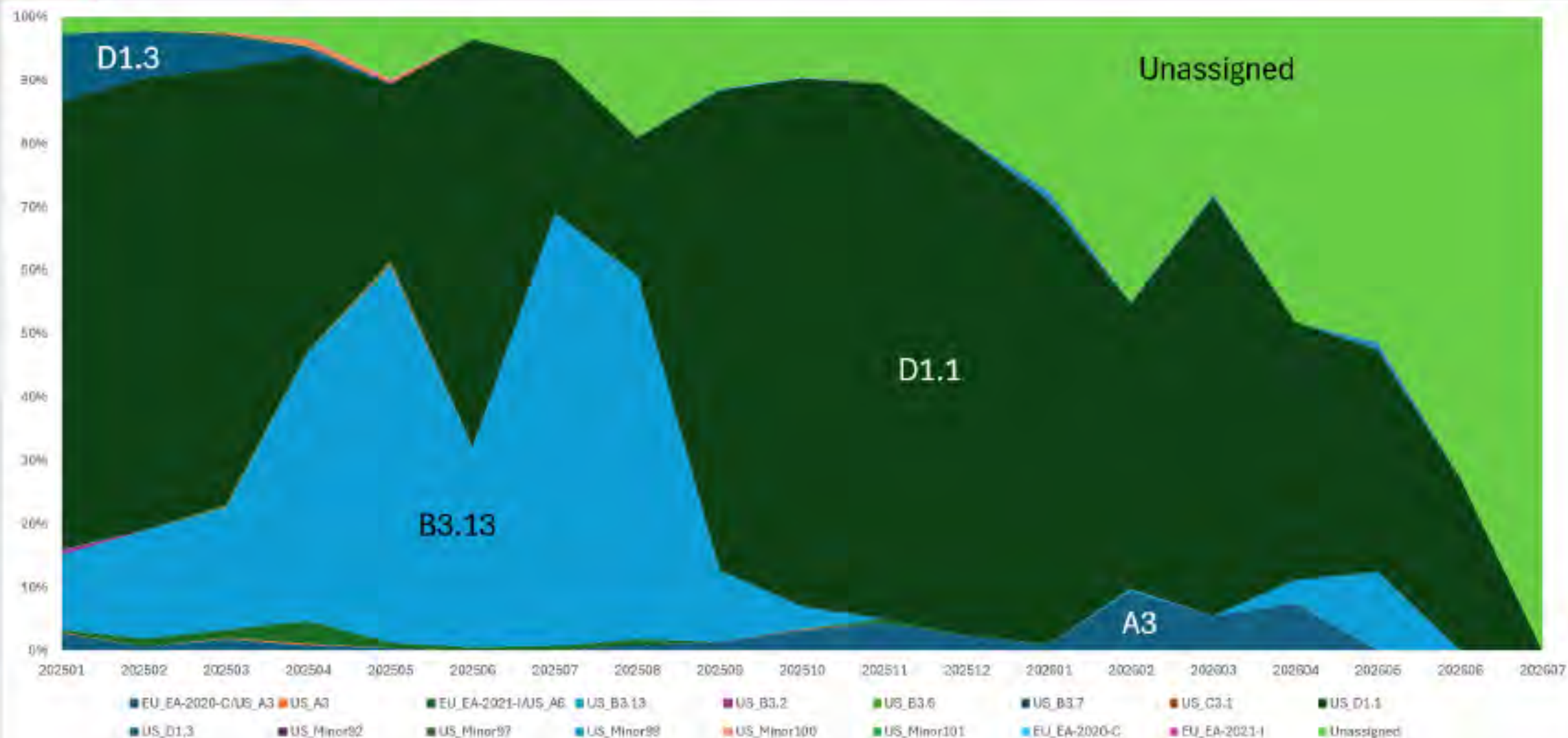
Quarterly Regional Webinar Series in the WHO South-East Region

01 September 2026

H5 global clade progression since July 2025



American Genotypes from January 2025



Diversity of genotypes detected in the Americas since July 2025

Genotype	PB2	PB1	PA	HA	NP	NA	MP	NS	Detections July 2025-2026
A1	ea1	ea1	ea1	ea1	ea1	ea1	ea1	ea1	0
B3.13	am2.2	am4	ea1	ea1	am8	ea1	ea1	am1.1	272
B3.2	am2.1	am1.2	ea1	ea1	am1.4.1	ea1	ea1	am1.1	Australia
A3	ea3	ea3	ea3	ea3	ea3	ea3	ea3	ea3	159
D1.1	am24	ea3	am4	ea3	am13	am4N1	ea3	ea3	2573
D1.11	am18	ea3	am12	ea3	am13	am12N5	ea3	ea3	1
Minor97	am24	ea3	am4	ea3	ea3	am4N1	ea3	ea3	1
Minor99	am2.2	ea3	am4	ea3	am13	am4N1	ea3	ea3	11
A6	ea6	ea6	ea6	ea6	ea6	ea6N5	ea6	ea6	4

Eurasian Origin 

American Origin 

A1 introduced into the Atlantic flyway in December of 2021 and last detected in December of 2023

B3.2 First detected in North America in the Mississippi flyway in March of 2022 and spread across all flyways Introduced into South America in April of 2022

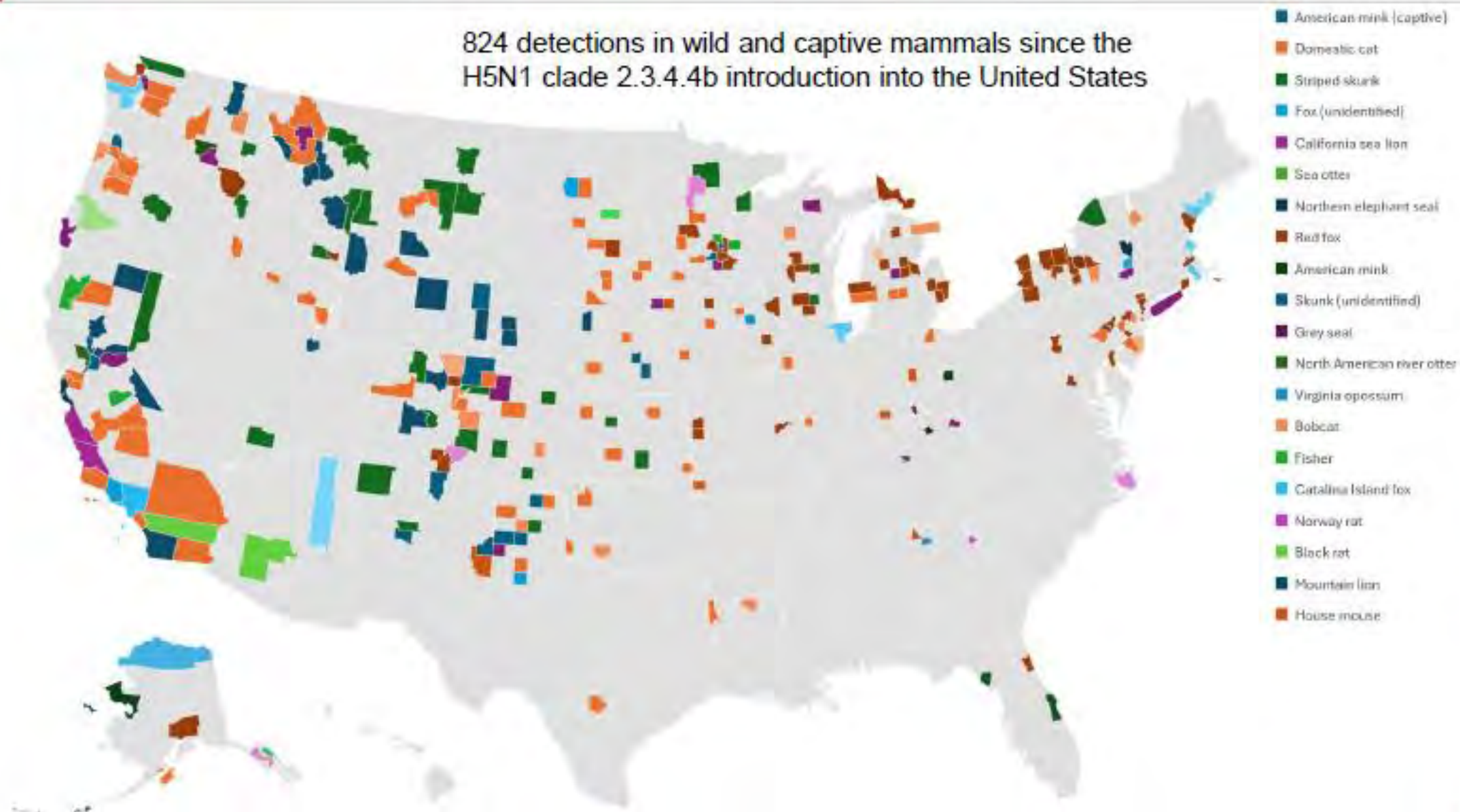
A3 introduced into the Pacific flyway in April of 2022 and last detected in December of 2024

D1.1 currently being detected in the Pacific, Central, and Mississippi flyways

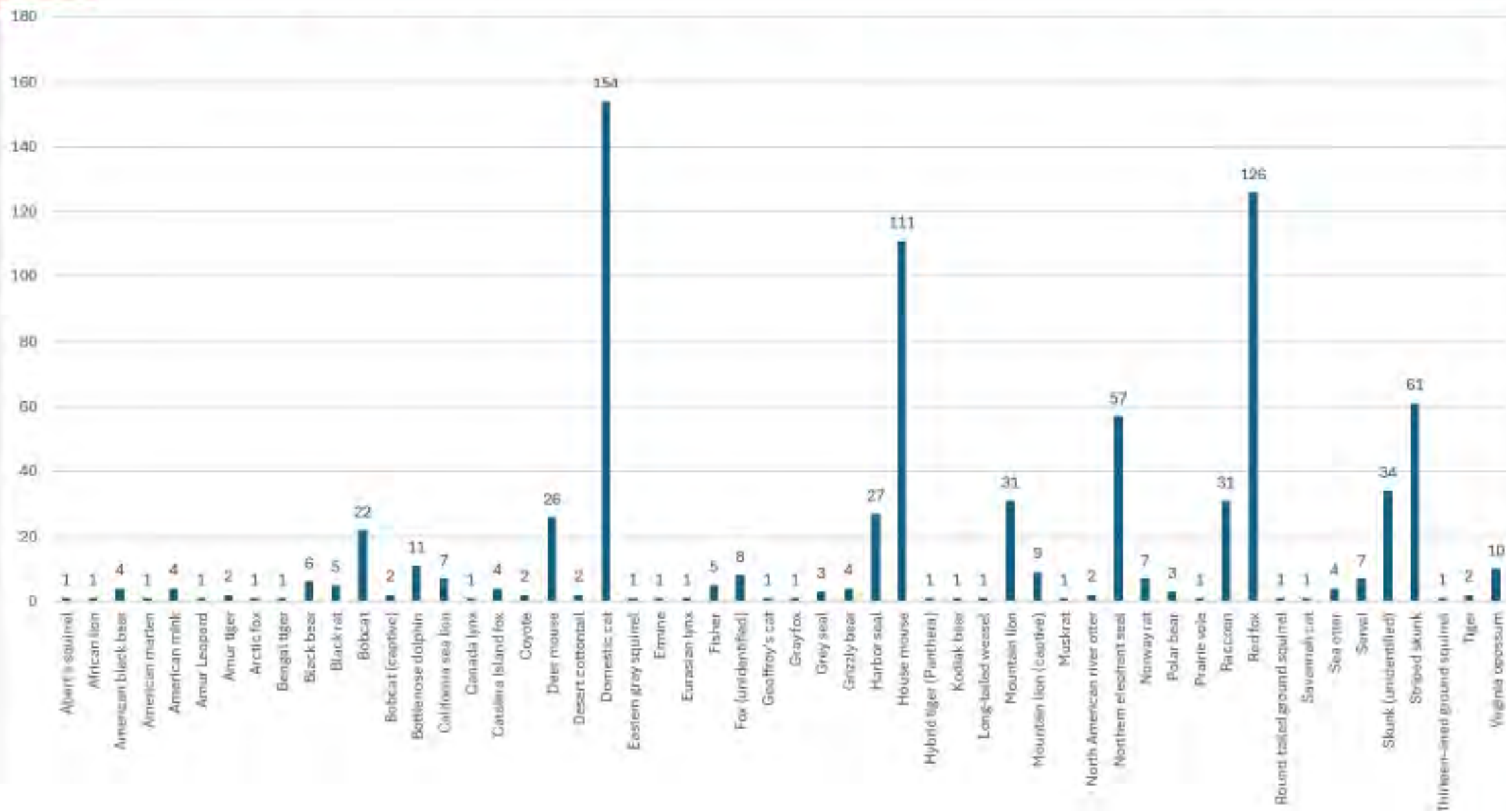
A6 (H5N5) introduced into the Atlantic flyway in January of 2023. Sporadically detected and resulted in a fatal human infection – WA November of 2025

H5N1 mammalian distribution since 2022

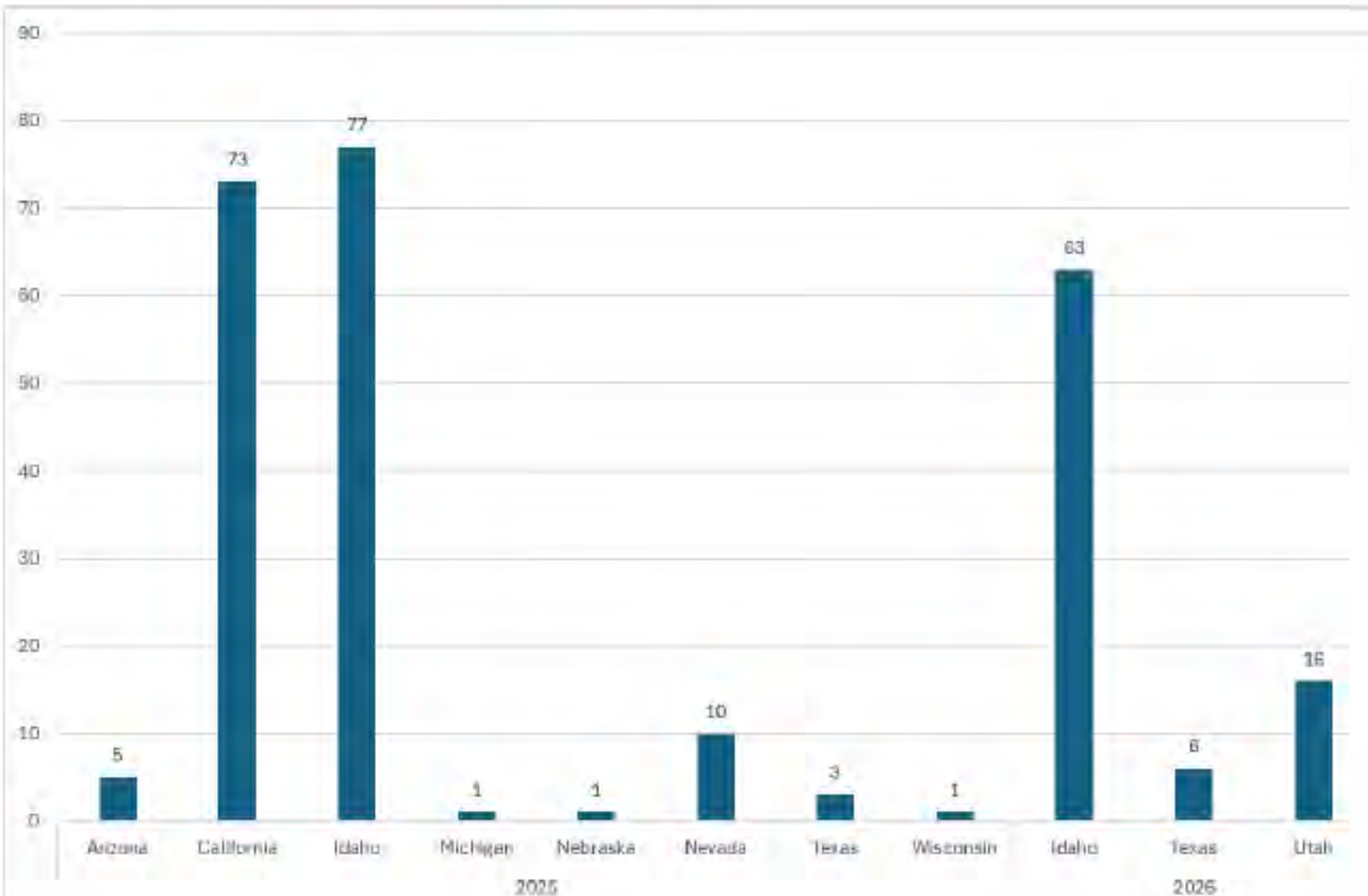
824 detections in wild and captive mammals since the
H5N1 clade 2.3.4.4b introduction into the United States



July 2025-2026 non-human mammalian H5N1 detections



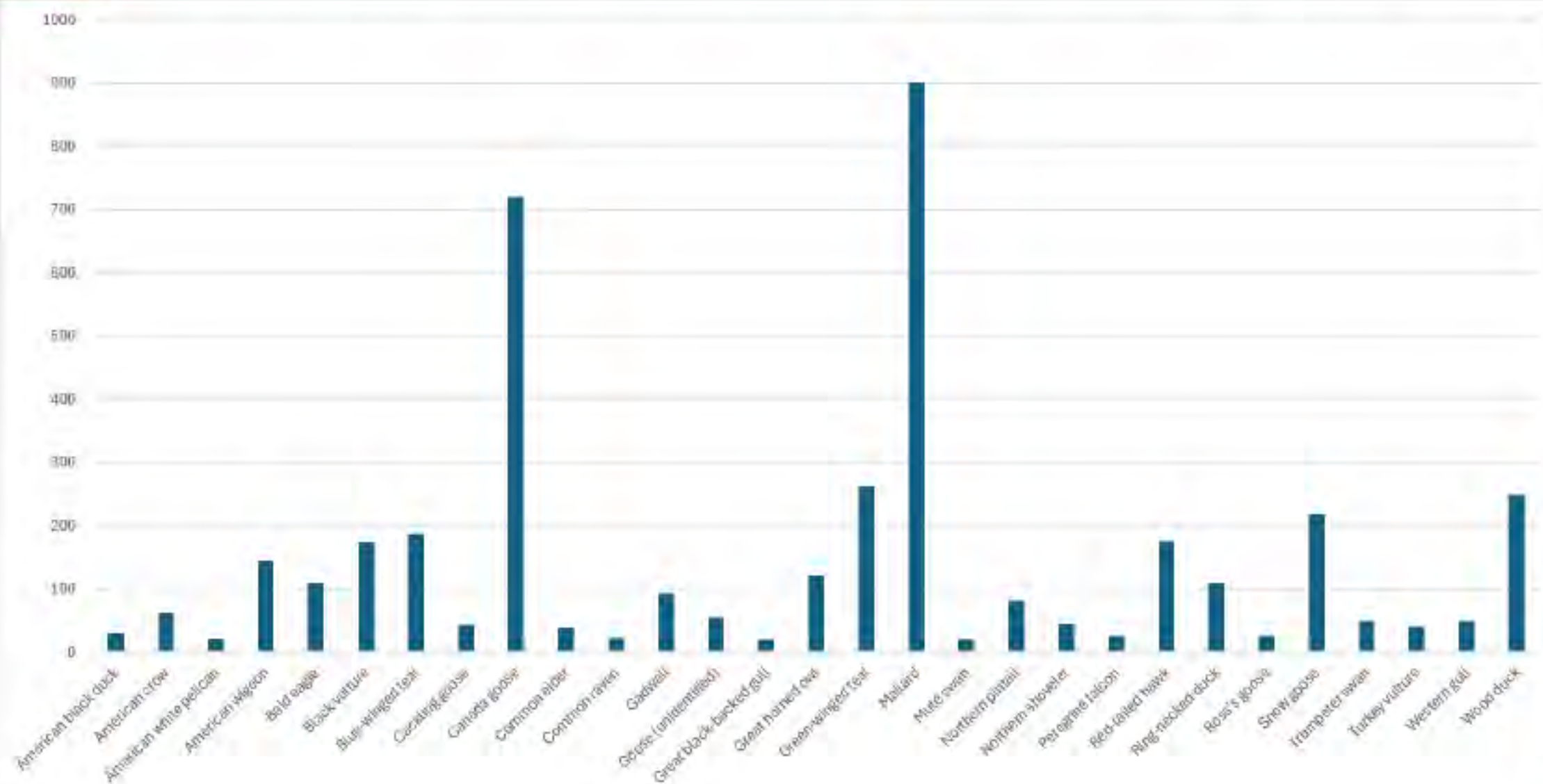
H5N1 dairy farm detections



Wide geographic range of wild birds for H5N1 since July 2025



Wide wild bird host range for H5N1 since July 2025



H5N1 Seasonal trends in wild birds

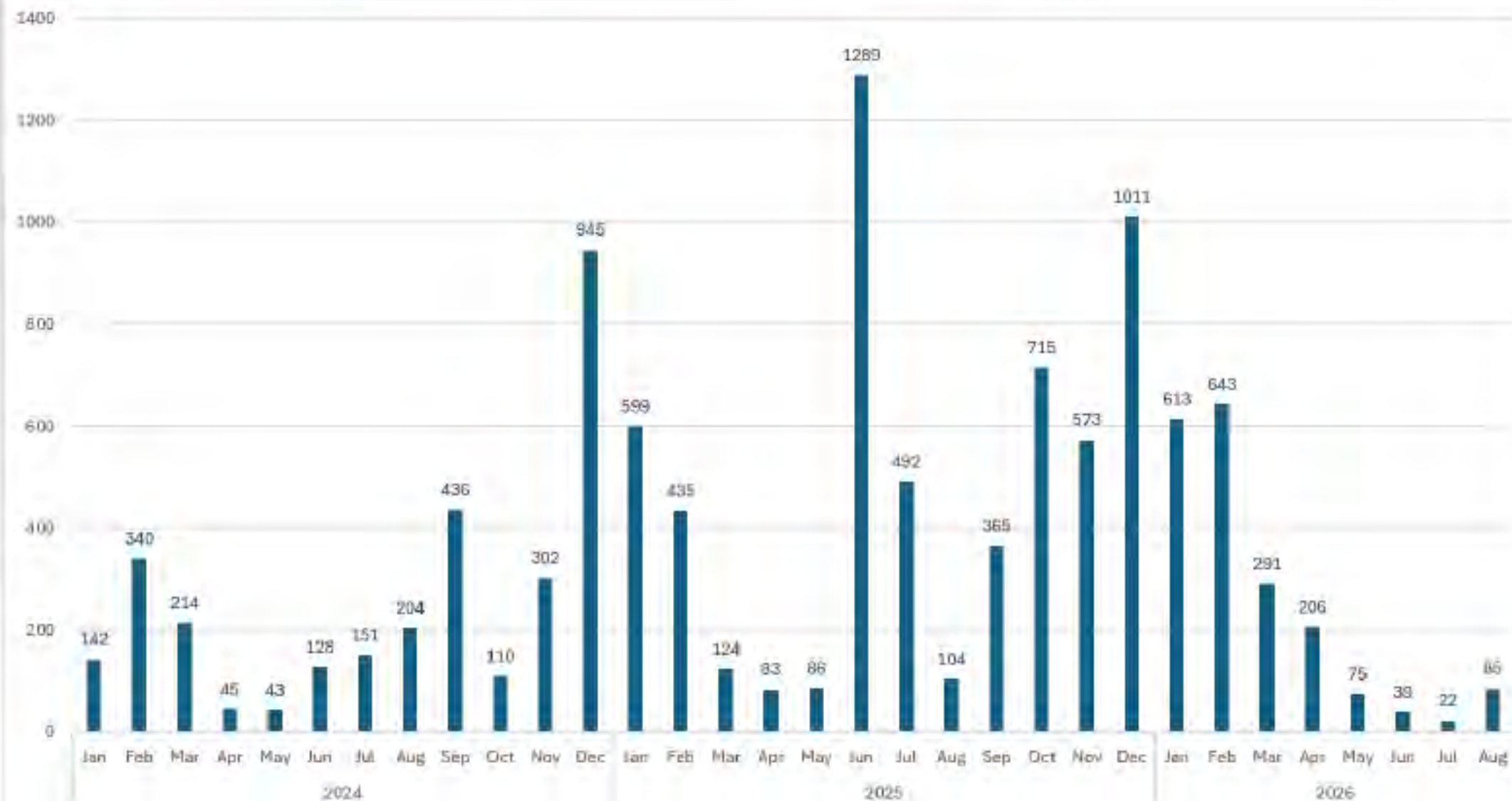
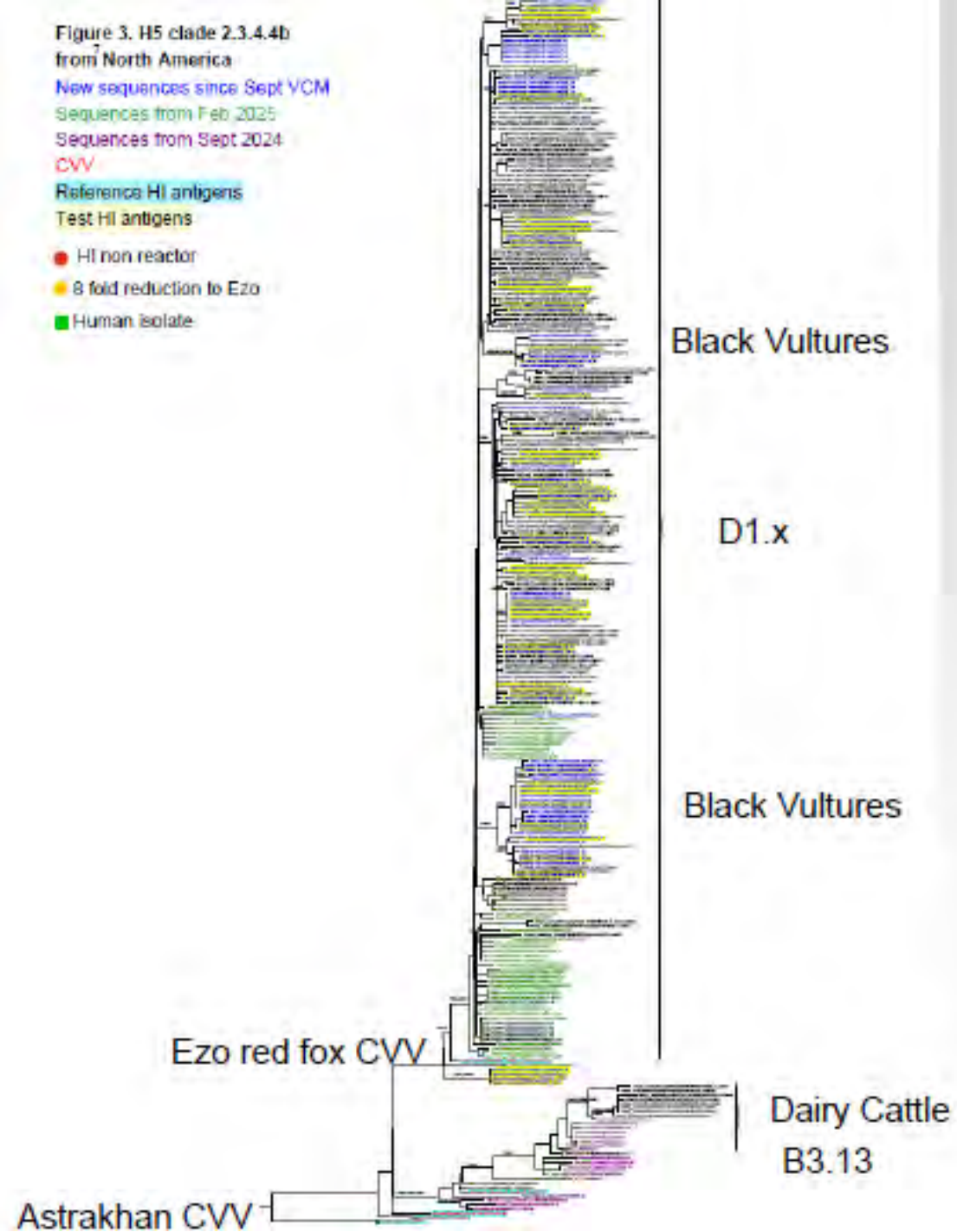


Figure 3. H5 clade 2.3.4.4b
from North America
New sequences since Sept VCM
Sequences from Feb 2025
Sequences from Sept 2024
CVV
Reference HI antigens
Test HI antigens

- HI non reactor
- 8 fold reduction to Ezo
- Human isolate



Influenza viruses from black vultures have reduced reactivity to CVVs

Table 8. Hemagglutination inhibition assay of clade 2.3.4.4b viruses from North America at 4°C with 0.5% chicken RBC

		Subtype	Clade	Astrakhan	Am. Wigeon	ck/Ghana	Ezo red fox	Collection Date	Passage History	Subst ref. ezo
Reference antigen										
1	DCCG-RG71A (A/Astrakhan/3212/2020-like)	H5N8	2.3.4.4b	40	10	40	<		V1E2/E2	
2	DCCG-RG78A (A/Am wig/SC/22-000345-001/2021-like)	H5N1	2.3.4.4b	40	160	160	80		V1E2/E1	
3	DCCG-RG80A (A/ck/Ghana/AVL-763_21VIR7050-39/2021-like)	H5N1	2.3.4.4b	20	20	100	10		V1E2/E1	
4	NIID-002 (A/Ezo red fox/Hokkaido/1/2022)	H5N1	2.3.4.4b	40	80	80	80		LLC15PE2/E1	
Test antigen										
5	A/black vulture/North Carolina/W25-709A/2025	H5N1		10	20	40	20	9/6/2025	E1	Not seq
6	A/black vulture/North Carolina/W25-709B/2025	H5N1		10	<	20	<	9/6/2025	E1	Not seq
7	A/black vulture/North Carolina/W25-709C/2025	H5N1		<	10	20	10	9/6/2025	E1	Not seq
8	A/blue-winged teal/Louisiana/UGA125-1592/2025	H5N1	2.3.4.4b	10	40	80	20	9/20/2025	E1/E1	
9	A/Canada goose/Kansas/W25-910/2025	H5N1	2.3.4.4b	10	20	40	20	10/10/2025	E1	
10	A/mallard duck/Minnesota/UGA125-1672/2025	H5N1	2.3.4.4b	10	40	80	40	09/18/2025	E1/E1	
11	A/black vulture/Virginia/W25-914A/2025	H5N1		<	<	40	10	10/9/2025	E1	Not seq
12	A/black vulture/Virginia/W25-806B/2025	H5N1	2.3.4.4b	<	<	40	10	09/24/2025	E1	M226I:D236N
13	A/black vulture/Virginia/W25-988B/2025	H5N1	2.3.4.4b	<	<	40	10	10/23/2025	E1	M226I:D236N
14	A/black vulture/West Virginia/W25-864A/2025	H5N1	2.3.4.4b	<	<	40	20	10/1/2025	E1	M226I:D236N
15	A/black vulture/North Carolina/W25-989/2025	H5N1	2.3.4.4b	20	40	80	40	10/15/2025	E1	M226I:D236N
16	A/black vulture/West Virginia/W25-945/2025	H5N1	2.3.4.4b	<	<	40	10	10/20/2025	E1	M226I:D236N
17	A/ring-necked duck/Nevada/UGA125-1682/2025	H5N1	2.3.4.4b	10	40	80	40	9/16/2025	E1/E1	
18	A/black vulture/Virginia/W25-950B/2025	H5N1	2.3.4.4b	10	20	80	20	10/16/2025	E1	
19	A/redhead duck/Nevada/UGA125-1683/2025	H5N1	2.3.4.4b	<	40	80	20	9/16/2025	E1/E1	
20	A/black vulture/Virginia/W25-966A/2025	H5N1	2.3.4.4b	<	<	40	10	10/16/2025	E1	D236N:M531I
22	A/black vulture/Kentucky/W25-970B/2025	H5N1	2.3.4.4b	<	10	80	10	10/15/2025	E1	P136S
23	A/black vulture/Kentucky/W25-994B/2025	H5N1	2.3.4.4b	<	<	40	10	10/27/2025	E1	P136S
Serum production: P=prime, B=boost, B*=boost + adjuvant, C= concentrated; NA=Not Available; ***= low reactors				P/B*/B*	P/B*	P/B*	P/B*			

≤ 2 fold

4 fold

8 fold

≥ 16 fold

Closest CVV

No strong genetic signature for low reactors

Figure 4. Clade 2.3.4.4b HA substitutions



Bangladesh -Transmission dynamics of avian influenza viruses at the wild bird- poultry-human interfaces in Bangladeshi Live Bird Markets and Duck Farms

LBM - Environmental samples collected from water troughs in cages
Duck farms - Fecal and water samples collected from areas where wild, migratory birds and domestic ducks forage.

H5N1 and H9N2 viruses are the dominant subtypes identified in the markets.

Non-H9 LPAI viruses are the most commonly isolated from the wetlands.



Location of surveillance in Bangladesh: dots represent LBMs and blue circle represents wetlands area.



Population density:
~1400 people/km²



Chickens in live bird market
Dhaka, Bangladesh



Free-range duck farm in
Tanguar Haor



Free-range ducks and wild
birds intermingle in Tanguar
Haor

Subtypes detected during Bangladesh surveillance (as of June 2026)

Subtypes	Grand Total
H10N1*	1
H10N2	4
H10N3	4
H10N4	10
H10N5	8
H10N6	1
H10N7	22
H10N9	4
H11N3	5
H12N5	1
H15N9*	2
H1N1	3
H1N2	2
H1N3	4
H1N5	1
H1N7	18
H2N2	1
H3N1	6
H3N2	2
H3N6	6
H3N8*	30
H4N2	1
H4N6	11
H5N1*	616
H5N2	4
H5N6	35
H5Nx	6
H6N1	3
H6N2	5
H6N7*	1
H7N1*	5
H7N2	1
H7N3	2
H7N4	1
H7N5*	1
H7N6	1
H7N7	34
H7N9	6
H8N4	2
H9N2	1369
H9N9	1
Grand Total	2,248

Flu Mixtures & Others	Grand Total
H1N2/H9	1
H1N2/N3	1
H1N3/H9N2	1
H3/H6/H5N1	1
H3/H9N2	1
H3/NDV	1
H3N2/H5N1	1
H3N8/H9N2	1
H4N2/N6	1
H4N6/H10N6	1
H5N1/H3N1	1
H5N1/H3N2	6
H5N1/H4N6/H9/NDV	1
H5N1/H6N7	1
H5N1/H7N7	1
H5N1/H9N2*	200
H5N6/H10N7	1
H7N1/H9	1
H7N1/N5	1
H7N5/N6/N7	1
H7N9/H1N1	1
H9N2/H4N6	1
H9N2/N1	3
not flu	41
TBD	4
unknown	26
Grand Total	301

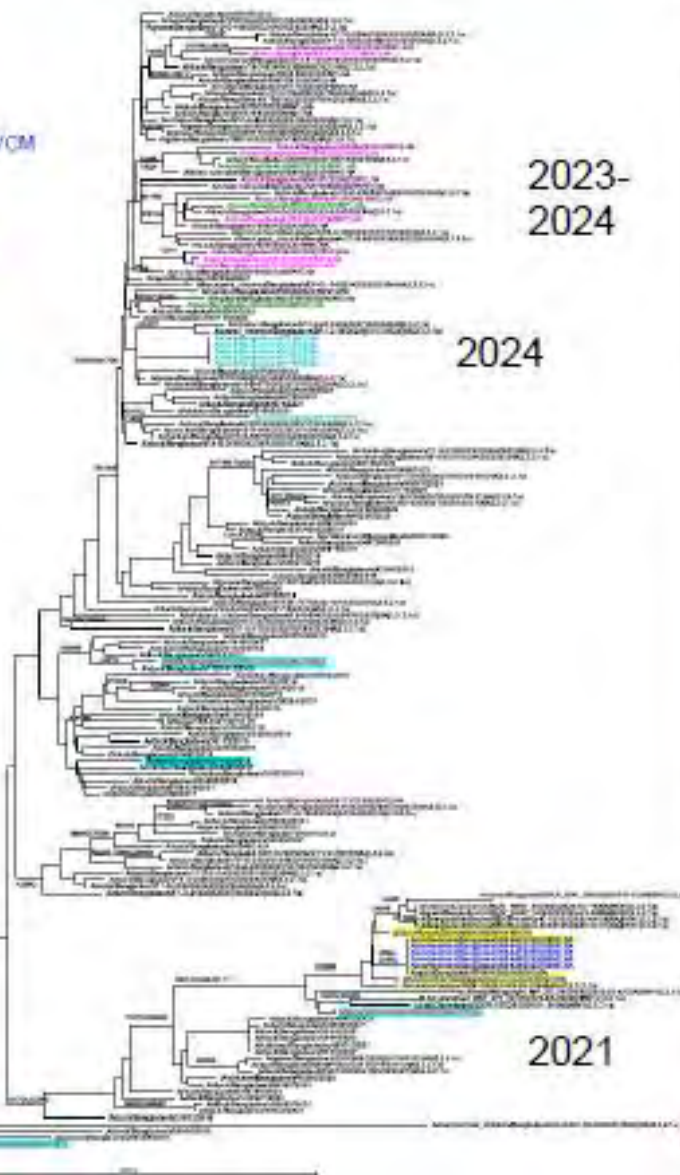
*presence of NDV in at least one isolate

H5 2.3.2.1a human infections in Bangladesh and India appear more similar to older Bangladesh surveillance viruses

Location ● Andhra Pradesh ● Chattogram ● Comilla ● Jessore ● Karnataka ● Sylhet



Figure 1. H5 clade 2.3.2.1a
New sequences since Sept VCM
Sequences from Feb 2024
Sequences from Sept 2020
Sequences from Sept 2024
CVM
Reference HI antigens
Test HI antigens
● HI non reactor
■ Human isolate



Subtype	HA Clade	Age (years)	Sex	Country	Location	Latitude	Longitude	Disease Onset Date	Outcome	Epidemiology
HSN1	2.3.2.1a	2	Female	India	Andhra Pradesh	16.296731	80.050759	Friday, February 28, 2025	Fatal	Exposure to poultry
HSN1	2.3.2.1a	45	Male	India	Karnataka	14.786614	75.777663	Saturday, April 26, 2025	Fatal	Unknown
HSN1	2.3.2.1a	0.67	Male	Bangladesh	Jessore	23.164564	89.205827	Tuesday, April 22, 2025	Hospitalized, Recovered	Exposure to poultry
HSN1	2.3.2.1a	0.83	Male	Bangladesh	Jessore	23.164564	89.205827	Monday, January 13, 2025	Hospitalized, Recovered	Exposure to poultry
HSN1	2.3.2.1a	1.1	Male	Bangladesh	Comilla	23.449906	91.184021	Sunday, May 18, 2025	Hospitalized, Recovered	Exposure to poultry
HSN1	2.3.2.1a	1.5	Male	Bangladesh	Sylhet	24.90567	91.859788	Sunday, July 27, 2025	Hospitalized, Recovered	Unknown
HSN1	2.3.2.1a	0.93	Male	Bangladesh	Chattogram	22.37634	91.831281	Wednesday, January 21, 2026	Fatal	Exposure to poultry



Bangladesh H5s are well covered by CVVs

Table 5. Hemagglutination inhibition assay of recent clade 2.3.2.1a viruses from Bangladesh (0.5% chicken RBC)

Table 3. Hemagglutination-inhibition assay of recent clade 2.3.2.1a viruses from Bangladesh (0.15% chicken RBC)												
		clade	Hubei/1	DK/Bd/35439	DK/Bd/15097	DK/Bd/1701012	BS/HK/1161	DK/MN/NCVD-1584	Victoria/149	Passage history	Mutations relative to VIC	
[No Title]												
Reference antigen												
1	rg-A/Hubei/1/2010 (IDCDC-RG30)	2.3.2.1a	640	160	320	160	320	640	>	V1E2/E3		
2	A/duck/Bangladesh/35439/2018 669360	2.3.2.1a	<	320	<	40	80	40	>	E4		
3	A/duck/Bangladesh/19097/2013 (SJ007)	2.3.2.1a	160	40	160	<	160	320	>	VEROCEK2E1/E3		
4	A/duck/Bangladesh/17D1012/2018 (IDCDC-RG63A)	2.3.2.1a	<	640	80	1280	320	160	>	V1E2/E1		
5	rg-A/barn swallow/Hong Kong/1161/2010 (SJ008)	2.3.2.1b	80	160	160	80	640	320	>	GMP/E2		
6	rg-A/duck/Vietnam/NCVD-1584/2012 (NIBRG-301)	2.3.2.1c	320	160	320	160	320	640	<	V1E2/E2		
7	A/Victoria/149/2024 (NIID-005)	2.3.2.1a	<	80	<	<	20	20	320	LLCISPE2/E1		
Test antigens												
8	A/environment/Bangladesh/68239/2025	2.3.2.1a	<	40	<	<	<	10	<	2/28/2025	E3	N189K
9	A/duck/Bangladesh/68252/2025	2.3.2.1a	<	80	<	<	<	20	160	2/28/2025	E1	
10	A/quail/Bangladesh/69438/2025	2.3.2.1a	<	40	<	<	<	<	80	4/18/2025	E1	
11	A/environment/Bangladesh/69443/2025	2.3.2.1a	<	40	<	<	<	10	80	4/18/2025	E1	
12	A/chicken/Bangladesh/69775/2025	2.3.2.1a	<	40	<	<	<	<	80	8/20/2025	E1	
Serum production: P=prime, B= boost, B*= boost + adjuvant, C= concentrate; NA=Not Available												
			P/B*	P/B*/B*	P/B/B*	P/B*	P/B*	P/B/B*	NIID			

≤ 2 fold

4 fold

8 fold

≥ 16 fold

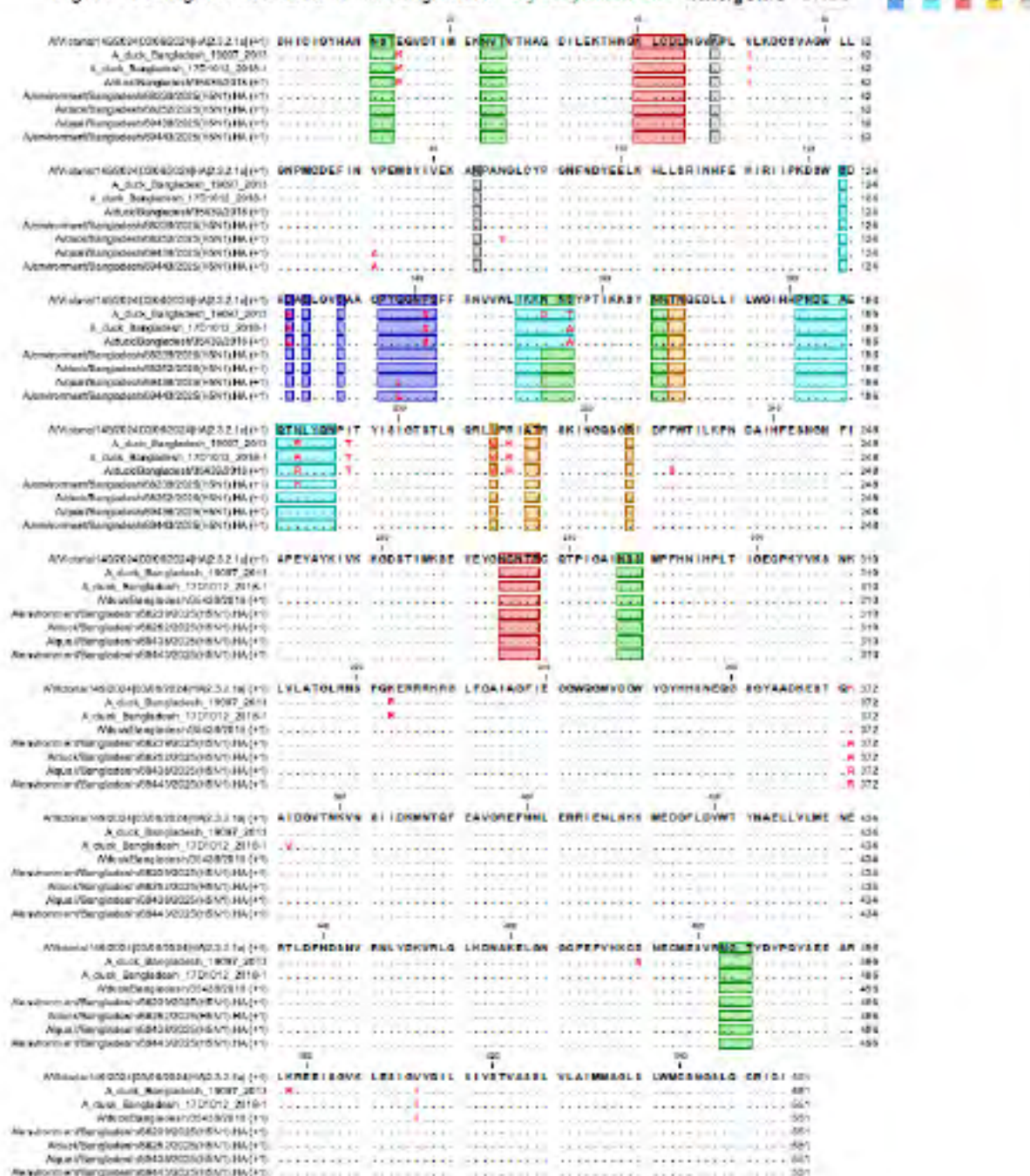
Closest CVV

Figure 2. Bangladesh 2321a H5 HA alignment

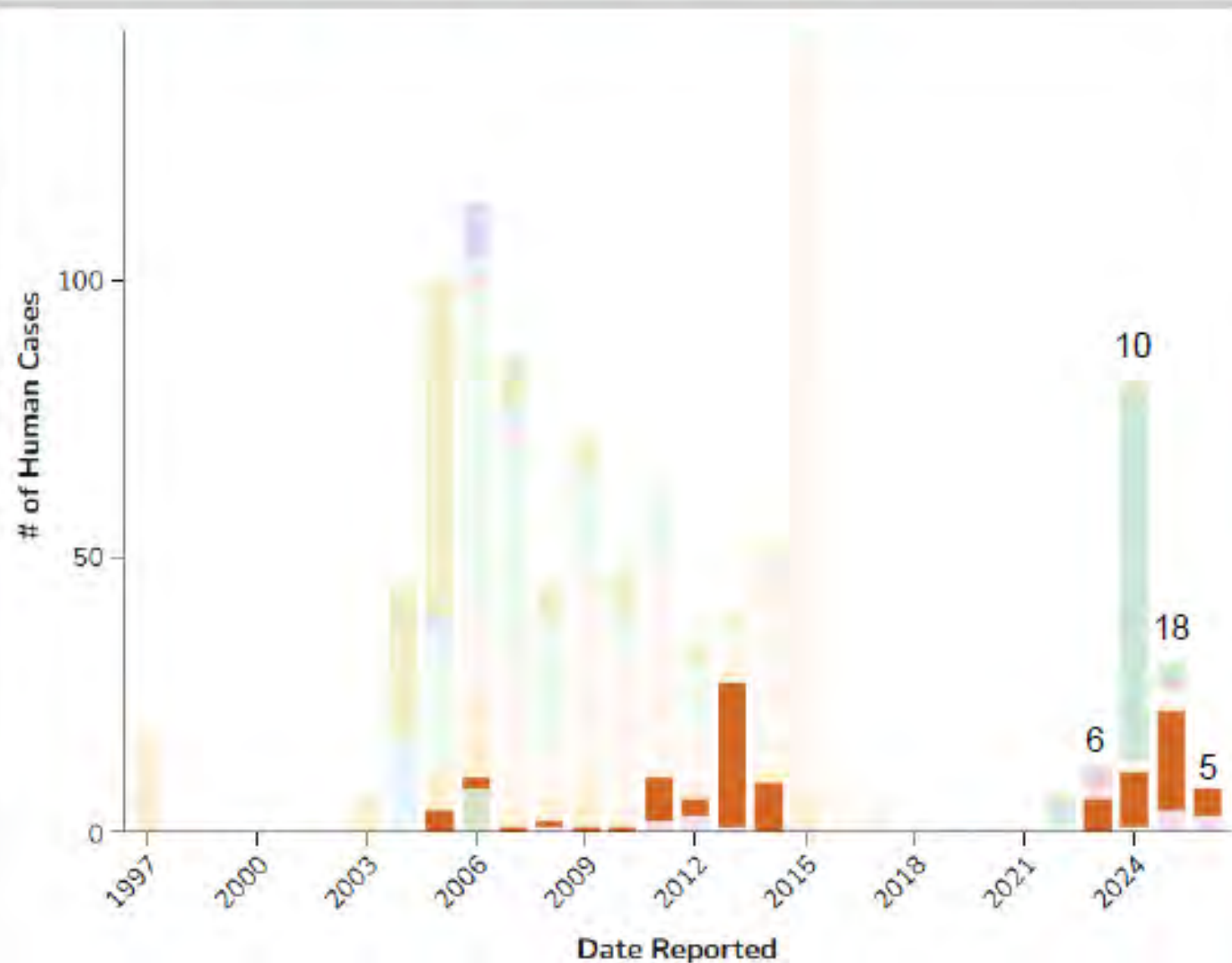
Glycosylation site

Antigenic Sites

A B C D E



Human H5N1 cases in Cambodia



Human H5N1 cases in Cambodia

Phylogenetically cluster with poultry viruses identified in Cambodia indicating zoonotic infections

These H5N1 2.3.2.1e viruses are spreading throughout South-East Asia including in Lao PDR and Viet Nam.

Figure 4. H5 HA 2.3.2.1c

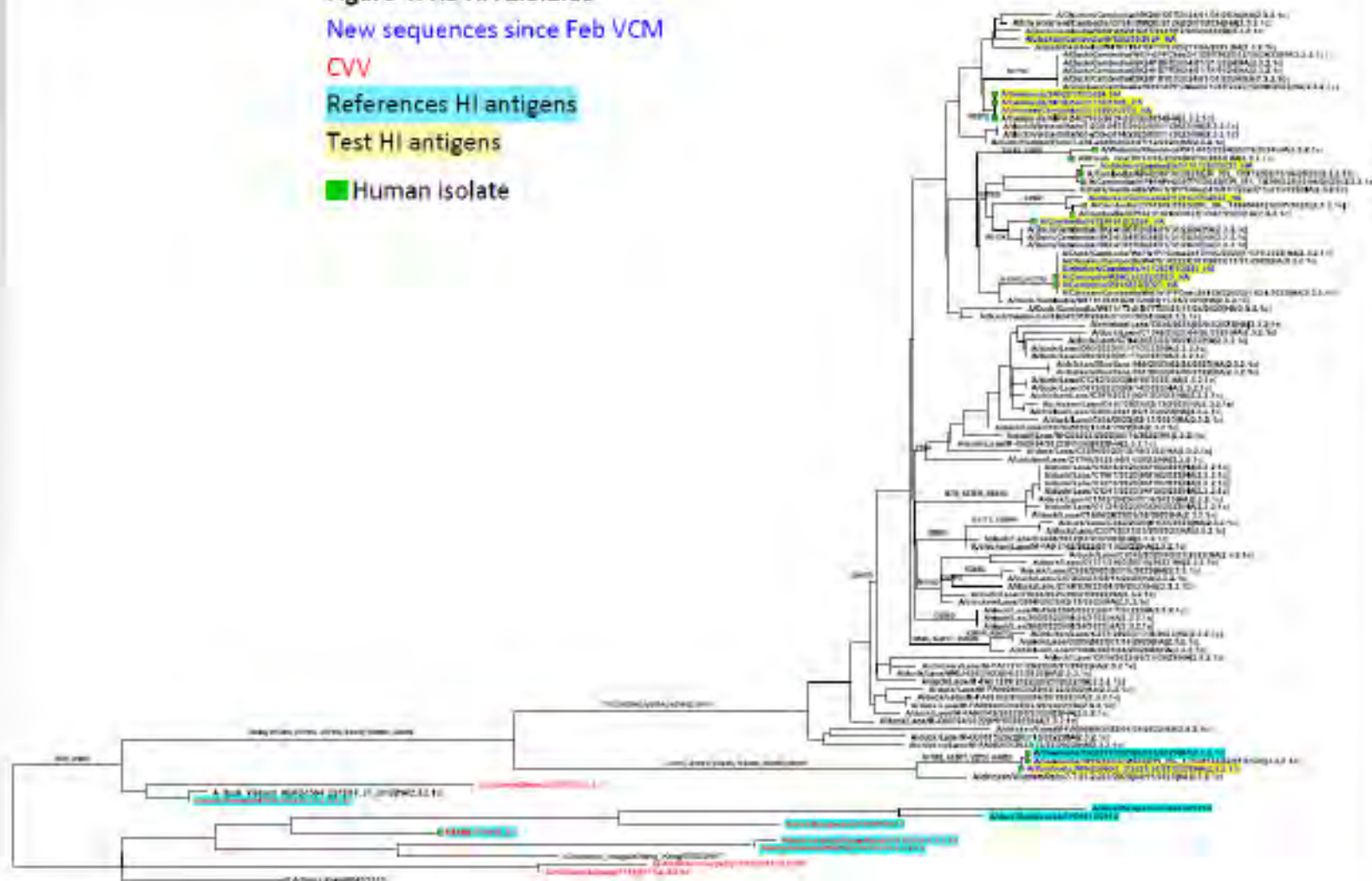
New sequences since Feb VCM

CVV

References HI antigens

Test HI antigens

Human isolate



Human H5N1 cases in Cambodia

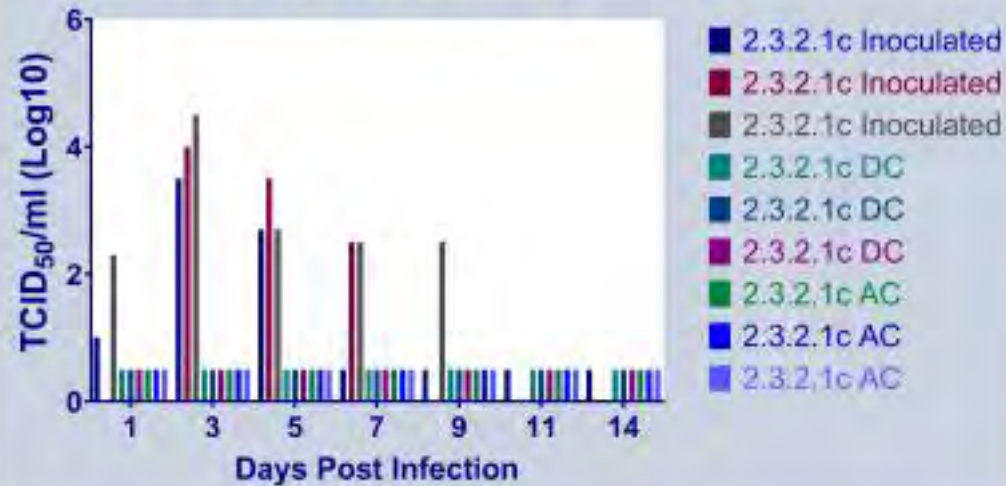
Human and Poultry viruses remain antigenically similar to anti-serum raised against current candidate vaccine viruses.

Table 6. Hemagglutination inhibition assay of recent (clade 2.3.2.1c) virus (0.5% chicken RBC)

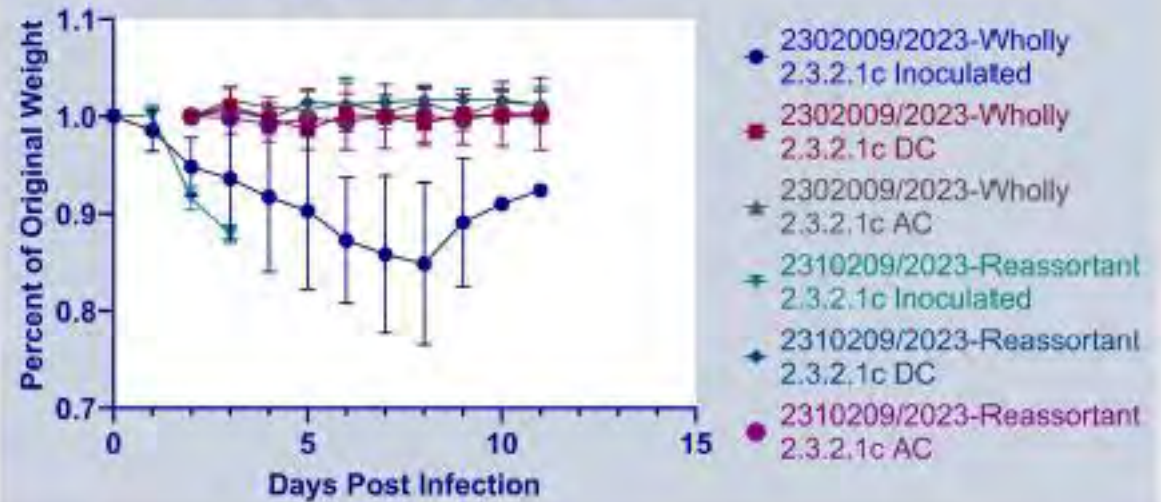
	clade	Hubel/1	Dk/Bd/354	Dk/Bd/190	Dk/Bd/1701012	BS/HK/1161	Dk/VN/NCVD-1584	Cambodia/2302009	Collection Date	Passage history
Reference antigens										
1	g-A/Hubel/1/2010 (IDCDC-RG30)	2.3.2.1a	160	80	20	320	640	40		V1E2/E2
2	A/duck/Bangladesh/35439/2018	2.3.2.1a	20	160	20	160	40	40		E3
3	A/duck/Bangladesh/19097/2013 (SI007)	2.3.2.1a	80	80	<	640	640	20		VEROCEK2E1/E2
4	A/duck/Bangladesh/1701012/2018 (IDCDC-RG63A)	2.3.2.1a	80	640	80	640	160	160		V1E2/E1
5	g-A/barn swallow/Hong Kong/1161/2010 (SI003)	2.3.2.1b	20	80	160	10	160	20		GMP/E2
6	g-A/duck/Vietnam/NCVD-1584/2012 (NIBRG-301)	2.3.2.1c	80	160	20	320	320	40		V1E2/E1
7	A/Cambodia/2302009/2023	2.3.2.1c	160	1280	80	1280	640	320	Jan. 2023	Ex/E1
Test antigens										
8	A/chicken/Cambodia/0216260/2024	2.3.2.1c	<	640	160	1280	40	320	Feb. 2024	E1/E1
9	A/Cambodia/24020179/2024	2.3.2.1c	<	640	160	1280	40	320	Feb. 2024	E1/E1
10	A/Cambodia/NPHL24020155/2024	2.3.2.1c	10	2560	320	2560	160	640	Feb. 2024	E1/E1
11	A/chicken/Cambodia/0129255/2024	2.3.2.1c	<	640	80	640	20	160	Jan. 2024	E1/E1
12	A/Cambodia/01250010/2024	2.3.2.1c	80	160	640	40	160	1280	Jan. 2024	E1/E1
13	A/chicken/Cambodia/h1126251/2023	2.3.2.1c	80	320	320	40	320	640	Nov. 2023	E1/E1
14	A/Cambodia/2311257/2023	2.3.2.1c	80	160	320	40	160	640	Nov. 2023	E1/E1
15	A/Cambodia/KSH230332/2023	2.3.2.1c	80	160	320	40	320	640	Nov. 2023	E1/E1
16	A/chicken/Cambodia/h1017250/2023	2.3.2.1c	40	160	160	20	80	640	Oct. 2023	E1/E1
17	A/chicken/Cambodia/h1010251/2023	2.3.2.1c	80	160	320	40	80	640	Oct. 2023	E1/E1
18	A/Cambodia/NPH230032_P2e3b/2023	2.3.2.1c	160	1280	160	1280	640	320	Feb. 2023	Ex/E1
Serum production: P=prime, B= boost, B*= boost + adjuvant, C= concentrate; NA=Not Available										
		P/B*	P/B*/B*	P/B/B*	P/B*	P/B*	P/B/B*	P/B*		

Australian AA Seq similar to Astrakhan and Ezo Red Fox CVVs

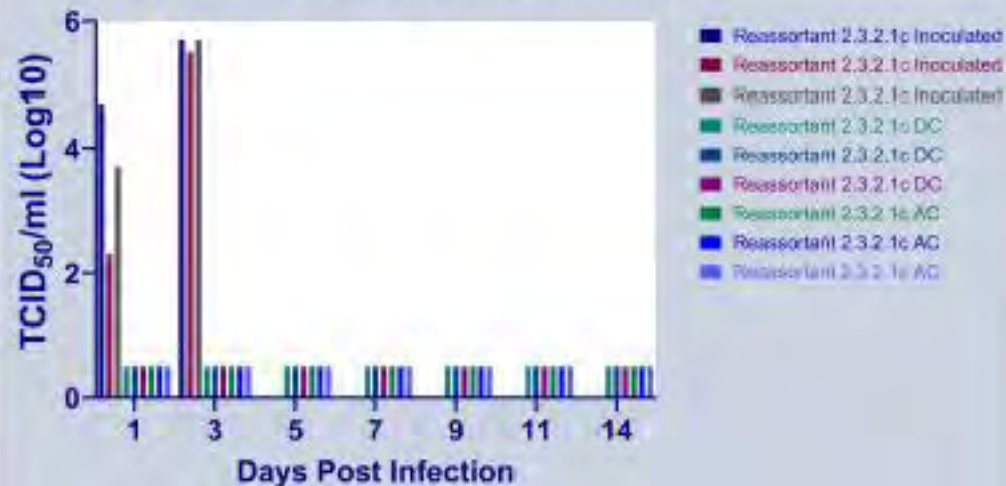
2.3.2.1c Virus Shedding



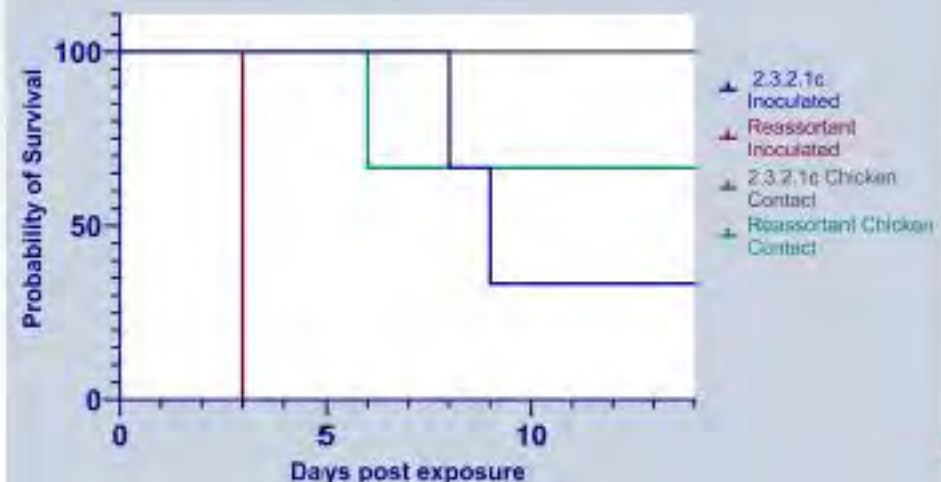
Ferret-to-ferret Weight loss



Reassortant 2.3.2.1c Virus Shedding



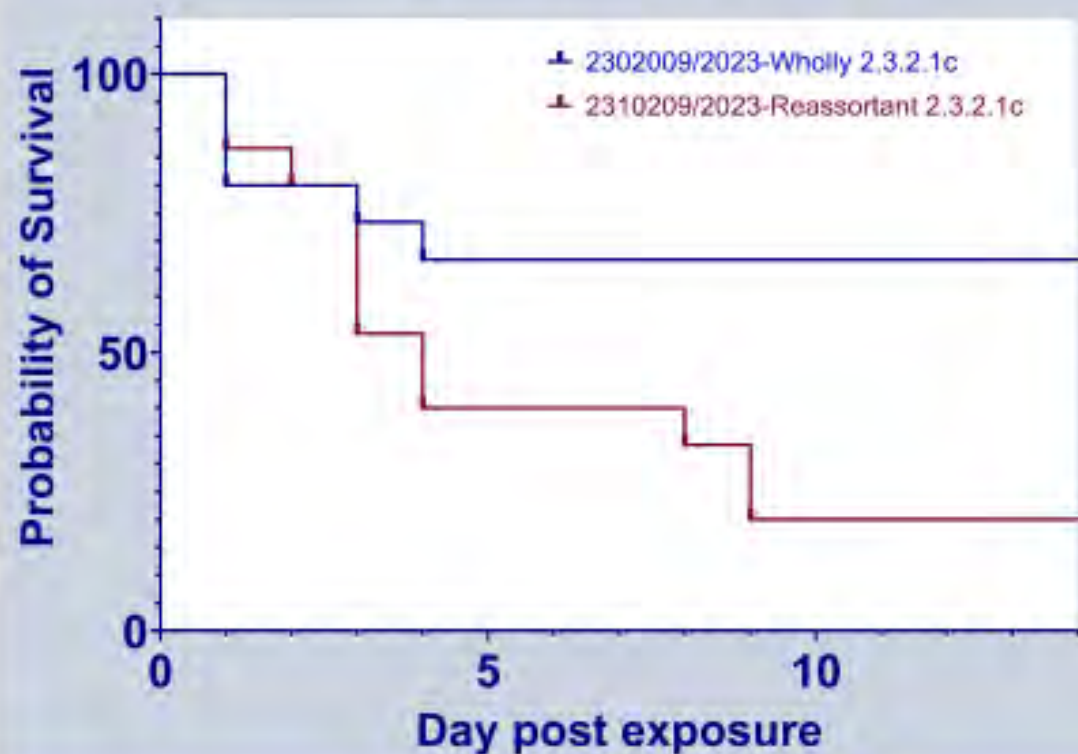
Ferret Survival



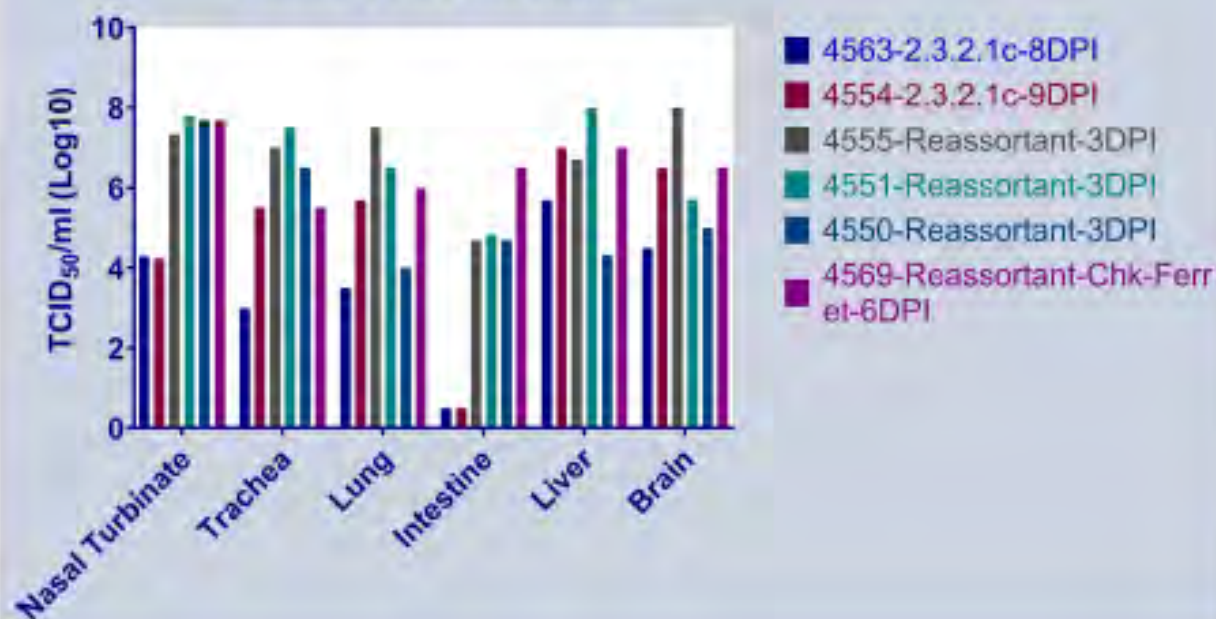
ng children.

Australian AA Seq similar to Astrakhan and Ezo Red Fox CVVs

Chicken Survival



Tissue Virus Titrations



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Webby Lab



Finding cures. Saving children.

REGIONAL WEBINAR

Virological Surveillance of Influenza Viruses at the Animal-Human Interface: Experiences from a WHO Collaborating Centre , Lessons and recommendations for SEAR Member States – WHO CC Russia



PRESENTED BY

Maria Bragina, Research Scientist



WHO Collaborating Centre for
Studies on Influenza at the Animal-human Interface



Department of Zoonotic Infections and Influenza,
Federal Budgetary Research Institution - Novosibirsk
region Russian Federation



Surveillance of influenza
viruses at the animal-human
interface: approaches and
key activities



Experiences and key
findings from the WHO
Collaborating Centre
(Russia)



Lessons learned and
best practices in
influenza surveillance



Recommendations for SEAR
Member States to strengthen
influenza surveillance at
the animal-human interface

State Research Center of Virology and Biotechnology VECTOR

Virological Surveillance of Influenza Viruses at the Animal-Human Interface: Experiences from a WHO Collaborating Centre, Lessons and recommendations for SEAR Member States – WHO CC Russia

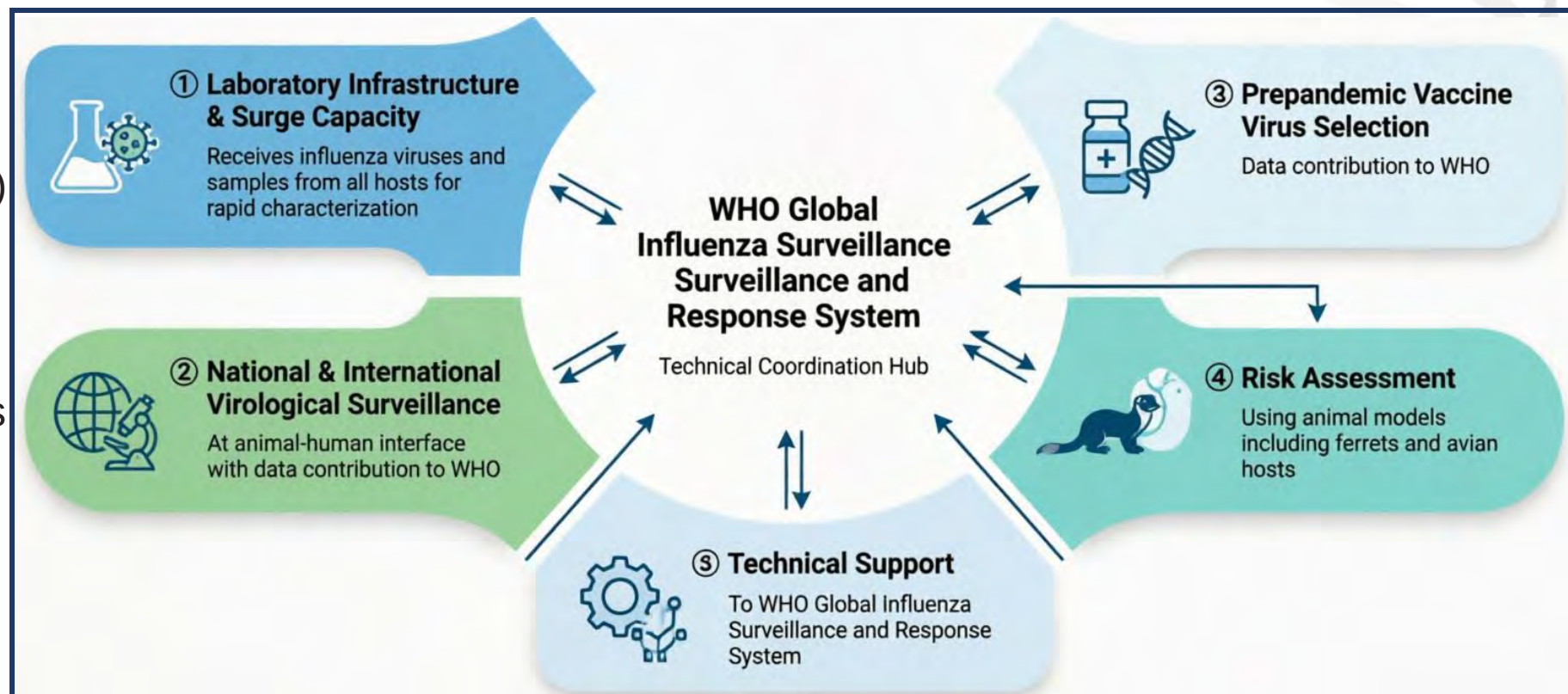
WHO Collaborating Centre for Studies on Influenza at the Animal-human Interface



Department of Zoonotic Infections and Influenza

FBRI SRC VB "VECTOR", Rospotrebnadzor, Russian Federation:

- WHO CC for Studies on Influenza at the Animal-Human Interface (since 2021)
- Integrated into GISRS, PIP Framework, and GISAID
- Core functions: Surveillance, TIPRA risk assessment, Virus characterization, EQA, CVV development.

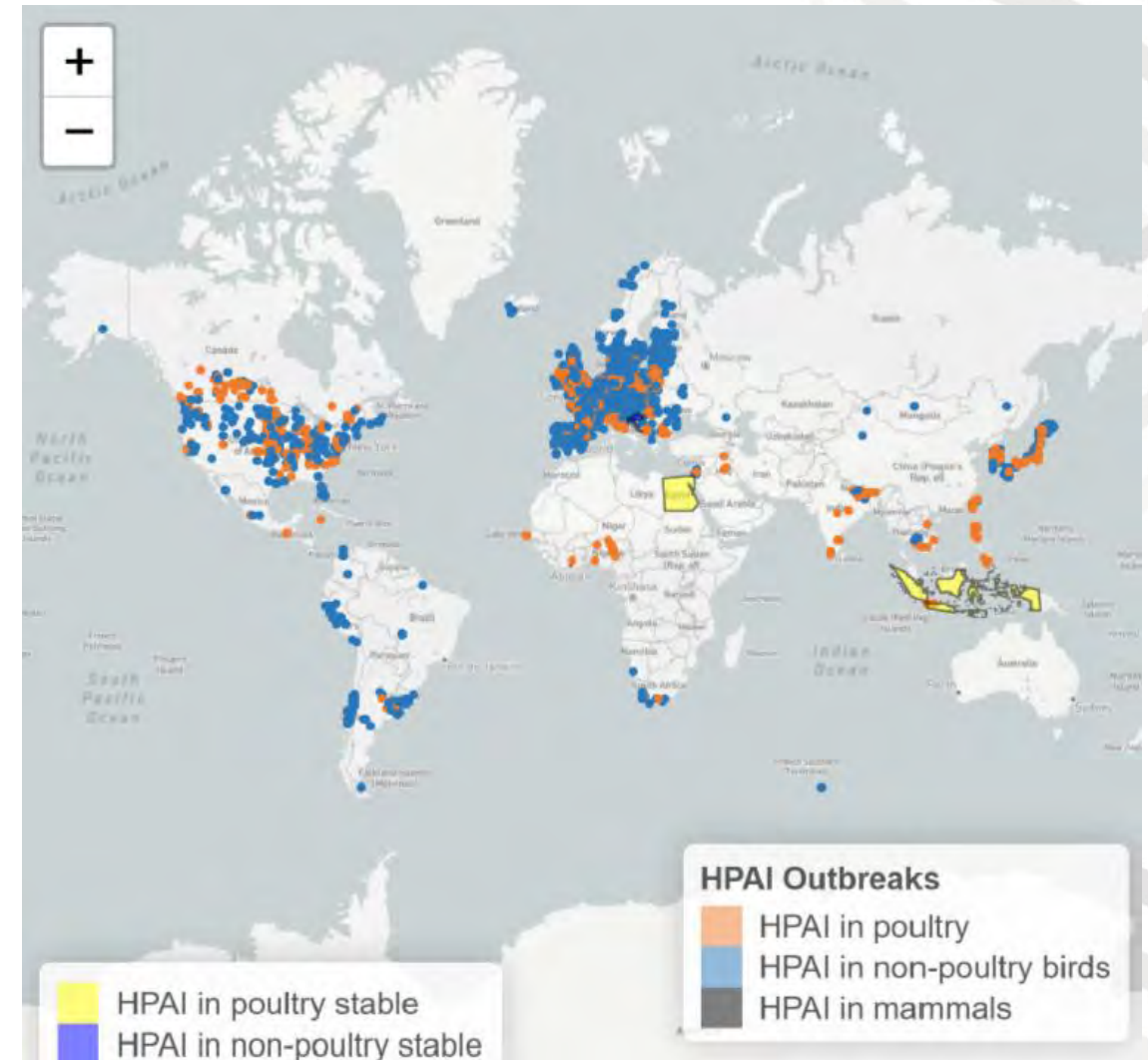


The status of the WHO Collaborating Centre for Influenza Research at the Human-Animal Ecosystem Interface was extended in 2025

- **Dominance:** A(H5N1) clade 2.3.4.4b in 75+ countries
- **Host expansion:** Wild/domestic birds → mammals (foxes, seals, cattle)
- **Human risk:** Sporadic zoonotic cases(H5N1/H9N2) but no sustained human-to-human transmission

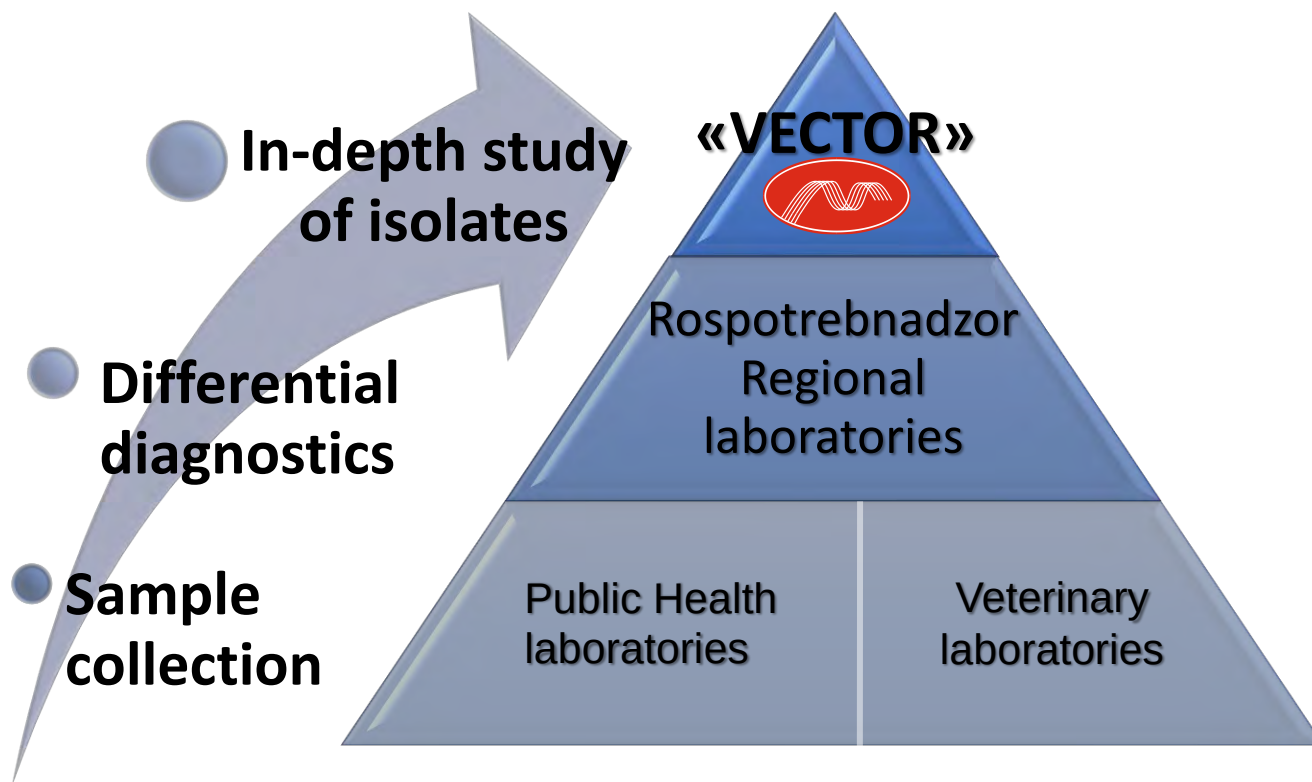
Cases of human infection

	2022	2023	2024	2025	2026	Total
H5N1	6	12	81	30	5	1021/479
H5N6	18	6	3		1	94/58
H9N2	16	9	21	39	12	173/2
H5N2			1	1		2
H10N3			3	3	1	7
H5N5				1		1
N7N7					1	1



**Spread of avian influenza in 2025-2026
(according to WOA)**

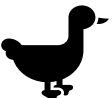
National Zoonotic Influenza Virus Surveillance System in Russian Federation



Organizing and ensuring continuous readiness to detect influenza viruses with pandemic potential:

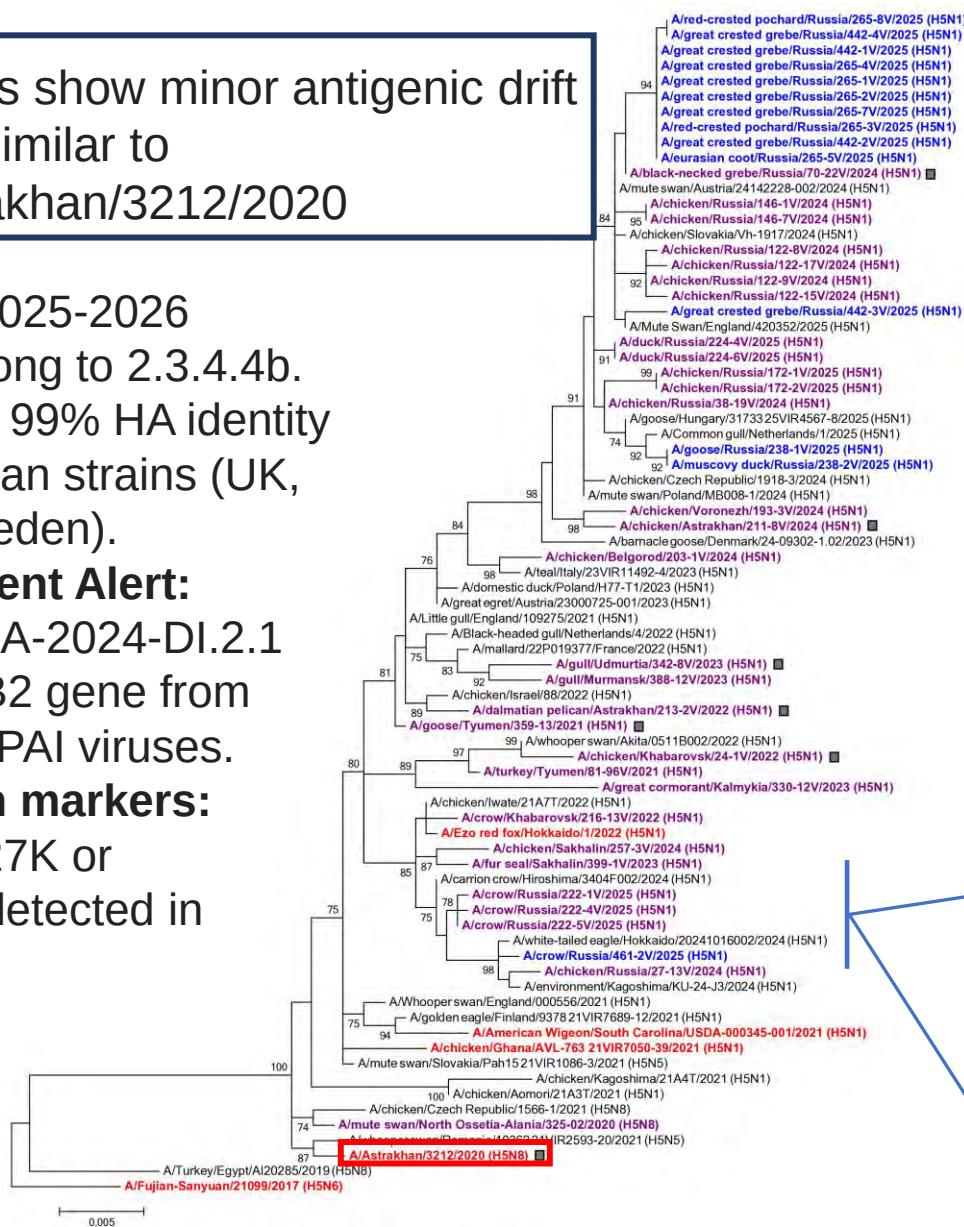
- Studying the specificity of influenza viruses for human respiratory tract cell receptors using biolayer interferometry;
- Studying influenza virus transmissibility in laboratory animals;
- Studying drug resistance in influenza viruses;
- Studying the state of population immunity in the Russian Federation to new influenza viruses, including animal influenza viruses;
- Studying the virological and molecular genetic properties of the influenza virus.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Biomaterial from "risk groups" with ARVI during the non-epidemic period for influenza A	2317	2025	2970	801	1407	2671	2990	2870	2562	291
Serological testing of "risk groups" for influenza H5 and H7	5008	4217	2338	900	3409	4069	4101	4973	4293	596
Biomaterial from birds, pigs and seals for the presence of influenza A virus RNA in RT-PCR	6458	8658	8541	3069	3086	6106	5338	5806	13643	496
Isolates of avian influenza virus	84	35	37	57	85	70	97	120	96	20
Regions where monitoring was carried out	35	42	48	26	45	39	42	38	48	48

In 2025-2026:							
	1026	791	48 Regions	>5,000 Samples	96 Viruses	19 Regions	0 Human Cases
			Nationwide monitoring coverage	Tested at Vector Reference Centre	Fully characterized & sequenced	With confirmed H5N1 circulation	Zero spillover infections
	117	2943					

2025 isolates show minor antigenic drift but remain similar to CVV A/Astrakhan/3212/2020

- **Clade:** All 2025-2026 isolates belong to 2.3.4.4b.
- **Homology:** 99% HA identity with European strains (UK, Austria, Sweden).
- **Reassortment Alert:** Genotype EA-2024-DI.2.1 acquired PB2 gene from European LPAI viruses.
- **Mammalian markers:** No PB2-E627K or NP-N319K detected in 2025-2026.



Viruses	Subtype	Clade	Референс сыыворотка хорька							
			A/gyrfalcon/Washington/41088-6/2014	A/Astrakhan/3212/2020	A/goose/Tyumen/359-13/2021	A/dalmatian pelican/Astrakhan/213-2V/2022	A/chicken/Khabarovsk/24-1V/2022	A/gull/Udmurtia/342-8V/2023	A/chicken/Astrakhan/211-8V/2024	A/black-necked grebe/Russia/70-22V/2024
			2.3.4.4c	2.3.4.4b	2.3.4.4b	2.3.4.4b	2.3.4.4b	2.3.4.4b	2.3.4.4b	2.3.4.4b
Reference antigens										
A/gyrfalcon/Washington/41088-6/2014	H5N8	2.3.4.4c	320	160	640	320	160	320	640	320
A/Astrakhan/3212/2020	H5N8	2.3.4.4b	160	160	640	160	160	320	640	160
A/goose/Tyumen/359-13/2021	H5N1	2.3.4.4b	160	320	320	80	160	160	320	160
A/dalmatian pelican/Astrakhan/213-2V/2022	H5N1	2.3.4.4b	640	640	1280	640	1280	1280	1280	640
A/chicken/Khabarovsk/24-1V/2022	H5N1	2.3.4.4b	<10	20	160	40	160	80	160	40
A/gull/Udmurtia/342-8V/2023	H5N1	2.3.4.4b	80	80	80	40	80	80	160	80
A/chicken/Astrakhan/211-8V/2024	H5N1	2.3.4.4b	320	320	1280	320	320	320	640	320
A/black-necked grebe/Russia/70-22V/2024	H5N1	2.3.4.4b	160	320	1280	320	320	640	640	160
Test antigens										
A/chicken/Russia/122-8V/2024	H5N1	2.3.4.4b	20	20	80	40	80	40	80	80
A/chicken/Russia/122-9V/2024	H5N1	2.3.4.4b	20	20	320	80	160	160	320	80
A/chicken/Russia/122-15V/2024	H5N1	2.3.4.4b	40	40	320	80	160	160	160	80
A/chicken/Russia/122-17V/2024	H5N1	2.3.4.4b	40	40	640	160	160	320	320	160
A/chicken/Russia/146-1V/2024	H5N1	2.3.4.4b	40	40	160	40	80	40	160	80
A/chicken/Russia/146-7V/2024	H5N1	2.3.4.4b	160	160	320	80	160	160	320	160
A/chicken/Russia/172-1V/2025	H5N1	2.3.4.4b	20	20	320	160	160	160	320	160
A/chicken/Russia/172-2V/2025	H5N1	2.3.4.4b	10	20	160	80	160	80	160	80
A/crow/Russia/222-1V/2025	H5N1	2.3.4.4b	160	160	640	160	160	160	320	160
A/crow/Russia/222-4V/2025	H5N1	2.3.4.4b	160	320	320	80	160	160	320	80
A/crow/Russia/222-5V/2025	H5N1	2.3.4.4b	80	160	320	80	160	160	160	80
A/duck/Russia/224-4V/2025	H5N1	2.3.4.4b	80	160	640	160	160	320	320	160
A/duck/Russia/224-6V/2025	H5N1	2.3.4.4b	160	160	1280	160	320	640	640	320
A/goose/Russia/238-1V/2025	H5N1	2.3.4.4b	20	20	160	40	80	80	160	80
A/muscovy duck/Russia/238-2V/2025	H5N1	2.3.4.4b	80	80	320	80	160	160	160	80
A/great crested grebe/Russia/265-1V/2025	H5N1	2.3.4.4b	40	80	160	40	160	80	160	80
A/great crested grebe/Russia/265-2V/2025	H5N1	2.3.4.4b	20	20	160	40	160	80	160	80
A/great crested grebe/Russia/265-4V/2025	H5N1	2.3.4.4b	20	40	80	40	160	80	160	80
A/great crested grebe/Russia/265-7V/2025	H5N1	2.3.4.4b	20	20	160	40	160	80	160	80
A/great crested grebe/Russia/442-1V/2025	H5N1	2.3.4.4b	<10	40	80	20	80	20	40	40
A/great crested grebe/Russia/442-2V/2025	H5N1	2.3.4.4b	20	40	320	80	160	160	320	80
A/great crested grebe/Russia/442-3V/2025	H5N1	2.3.4.4b	40	40	320	80	160	80	160	80
A/great crested grebe/Russia/442-4V/2025	H5N1	2.3.4.4b	10	20	160	40	160	40	160	80
A/crow/Russia/461-2V/2025	H5N1	2.3.4.4b	160	160	640	160	320	320	320	160

Since 2021, cases of circulation of viruses containing the **NP-N319K marker** of adaptation to mammals (associated with increased virulence for mammals) has been recorded in the Russian Federation

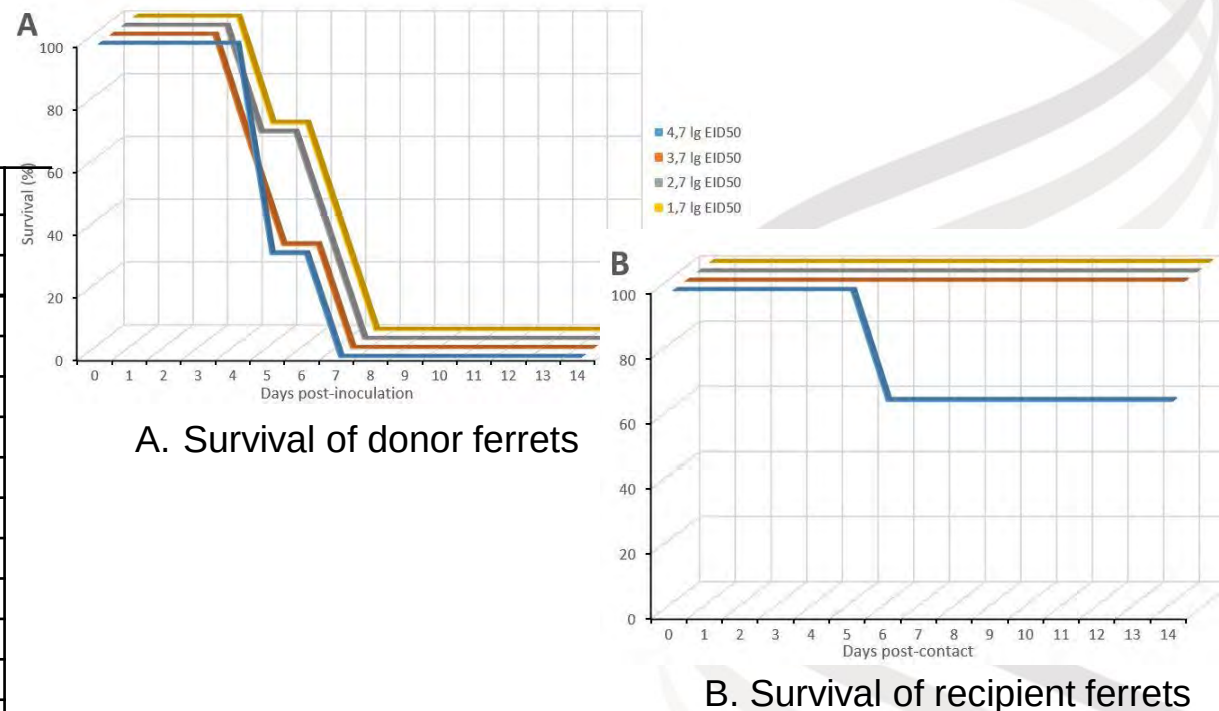
Receptor specificity of influenza viruses identified in 2025

	Virus	Subtype	$\alpha 2,3$	$\alpha 2,6$
1	A/goose/Russia/238-1V/2025	H5N1	0.48	>300
2	A/muscovy duck/Russia/238-2V/2025	H5N1	0.24	>300
3	A/great crested grebe/Russia/265-1V/2025	H5N1	0.40	>300
4	A/great crested grebe/Russia/265-2V/2025	H5N1	0.61	>300
5	A/red-crested pochard/Russia/265-3V/2025	H5N1	0.18	>300
6	A/great crested grebe/Russia/265-4V/2025	H5N1	0.35	>300
7	A/eurasian coot/Russia/265-5V/2025	H5N1	0.12	>300
8	A/great crested grebe/Russia/265-7V/2025	H5N1	0.17	>300
9	A/red-crested pochard/Russia/265-8V/2025	H5N1	0.11	>300
10	A/great crested grebe/Russia/442-1V/2025	H5N1	1.17	>300
11	A/great crested grebe/Russia/442-2V/2025	H5N1	1.49	>300
12	A/great crested grebe/Russia/442-3V/2025	H5N1	1.17	>300
13	A/great crested grebe/Russia/442-4V/2025	H5N1	1.10	>300
14	A/crow/Khabarovsk/461-2V/2025	H5N1	0.04	>300



All strains studied in 2025 had preferential binding to $\alpha 2,3$ cellular receptors of the “bird” type.

For the virus containing the **PB2-E627K mutation** (2023) (associated with increased virulence, pathogenicity, and viral replication in mammalian cells), limited airborne transmission between ferrets was demonstrated in a transmissibility assay:



In all the viruses studied, no mutations associated with reduced sensitivity to antiviral drugs - neuraminidase inhibitors (oseltamivir and zanamivir) and baloxavir marboxil - were detected.

- Annual **serological monitoring** in high-risk groups (poultry workers, cullers)
- **H5N1/H8**: Sporadic/Zero antibodies detected in recent years
- **H9N2**: Regular detection of antibodies to A(H9N2)

Positive results of HAI with influenza viruses from September 2025 to August 2026.

Total samples tested: 3,946



Sample collection period	Total number of samples	Percentage (number) of samples seropositive for A/H5Nx	Percentage (number) of samples seropositive for A/H9N2
2023	4101	<0,01 % (1)	1 % (39)
2024	4647	0,08 % (4)	1,23 % (57)
2025	4293	0,0 % (0)	1,54 % (66)
2026	596	0,0 % (0)	0,84 % (5)

H9N2 acts as a persistent zoonotic threat and a major gene donor for reassortants.

Outbreaks of Influenza A(H5N1) Among Dairy Cattle in The United States (2024-2026)



**19
states**

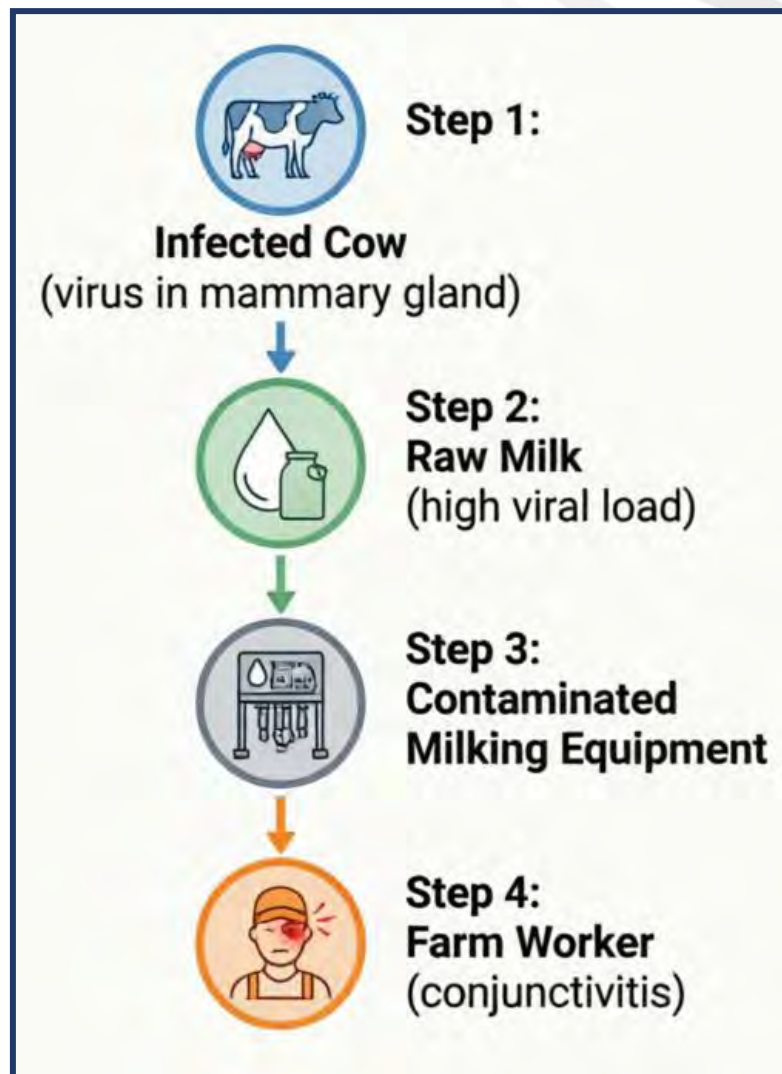


**> 1,000
herds**

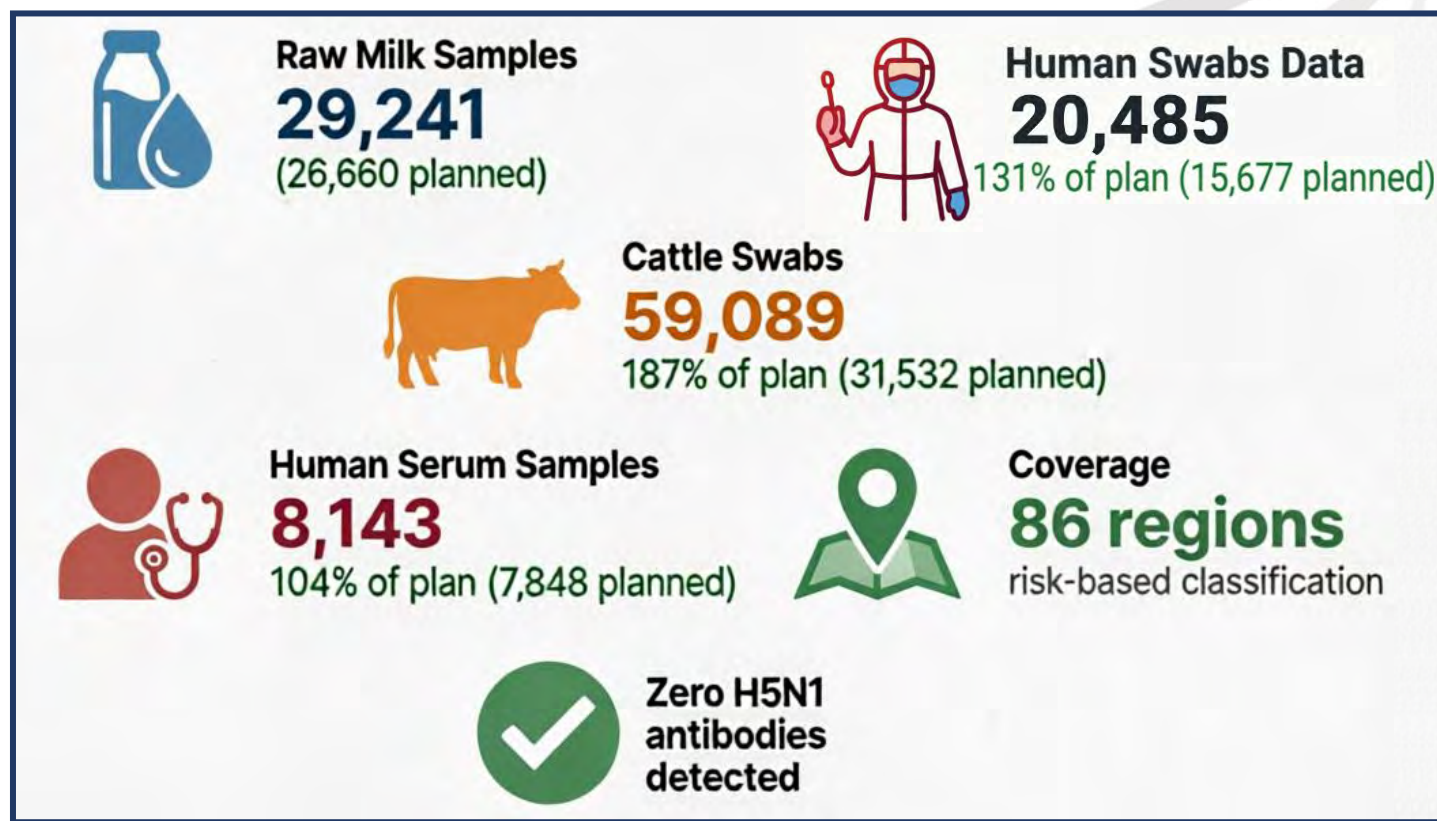
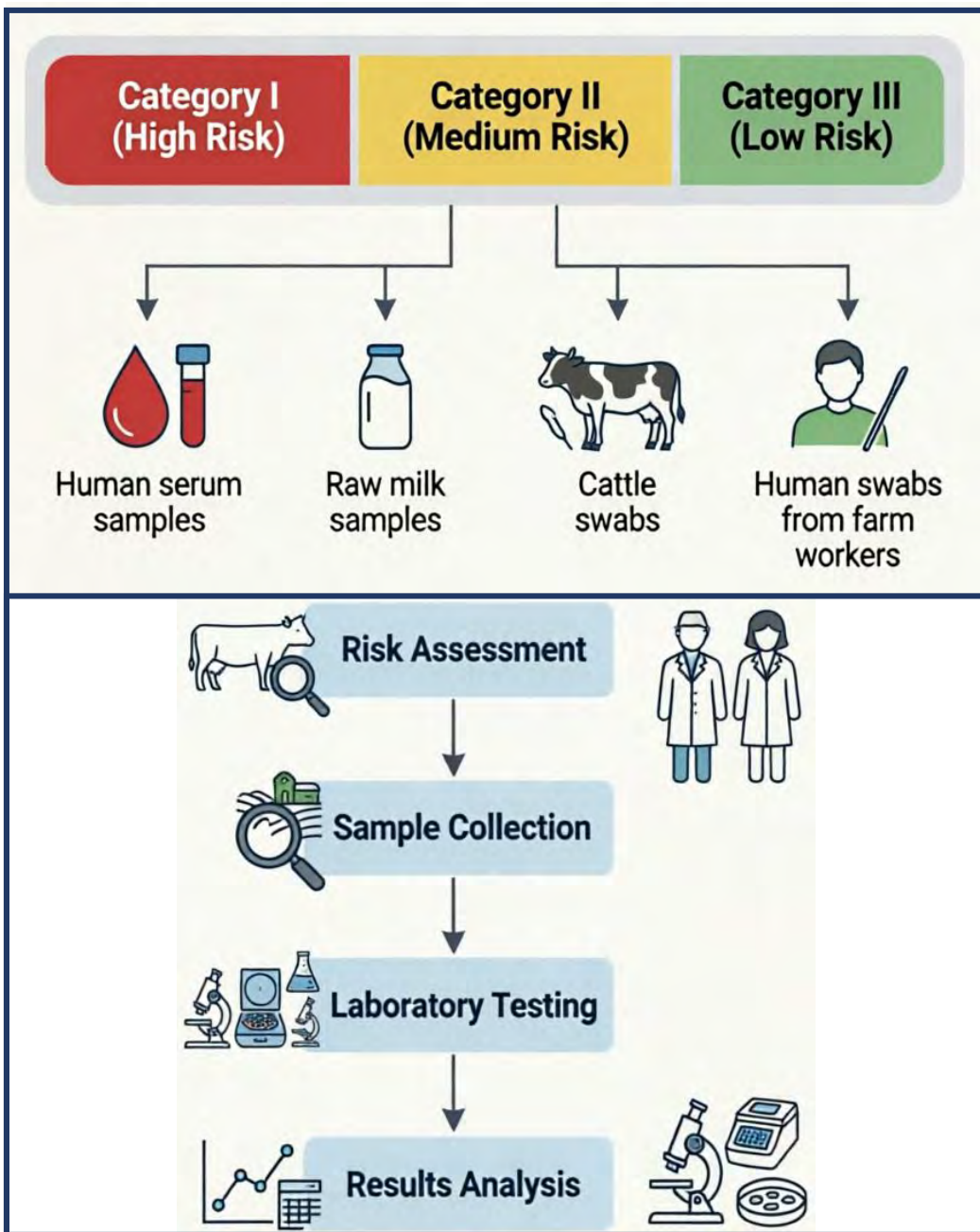


**41 confirmed
human cases**

- The A(H5N1) clade 2.3.4.4b virus continues to spread among dairy cattle in the United States.
- The virus, which caused outbreaks in cows, has also been detected in human farm workers (41 cases since March 2024).
- As of June 2026, the A(H5N1) virus has been detected in more than 1,000 herds in 19 US states.



Organization of monitoring of avian influenza circulation among cattle in 2026



Strengthening Surveillance Capacity

Key Steps Towards Improving The National Surveillance System



Annual EQA Program - PCR Diagnostics

Seasonal and avian influenza
in regional laboratories



Annual EQA Program - HIA Diagnostics

Antibodies to seasonal and
avian influenza



**National
Surveillance
System**



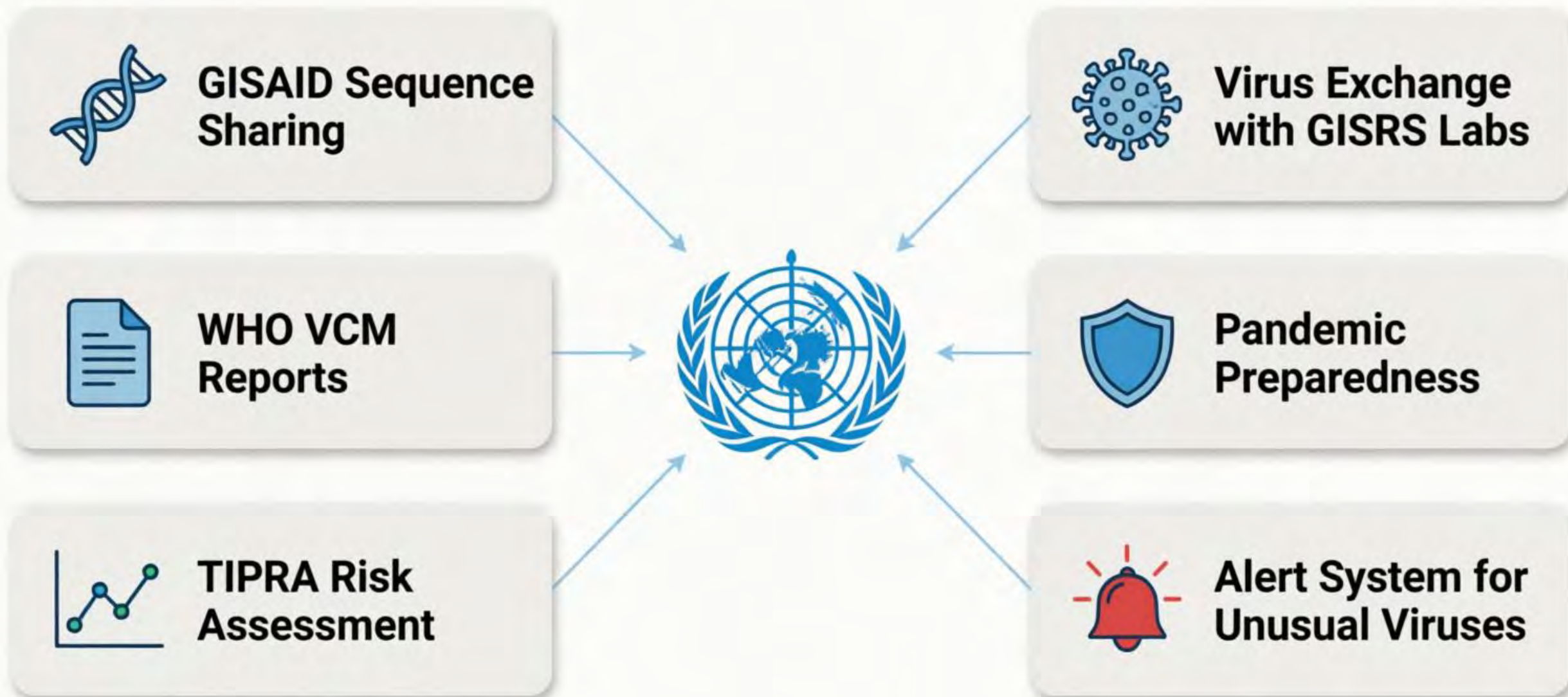
Technical Support

Laboratories handling
animal-human interface
viruses



Information Exchange

With Federal Service for
Veterinary Surveillance
(Rosselkhoznadzor)





Thank you for your attention!

630559, Koltsovo,
Novosibirsk region,
Russia

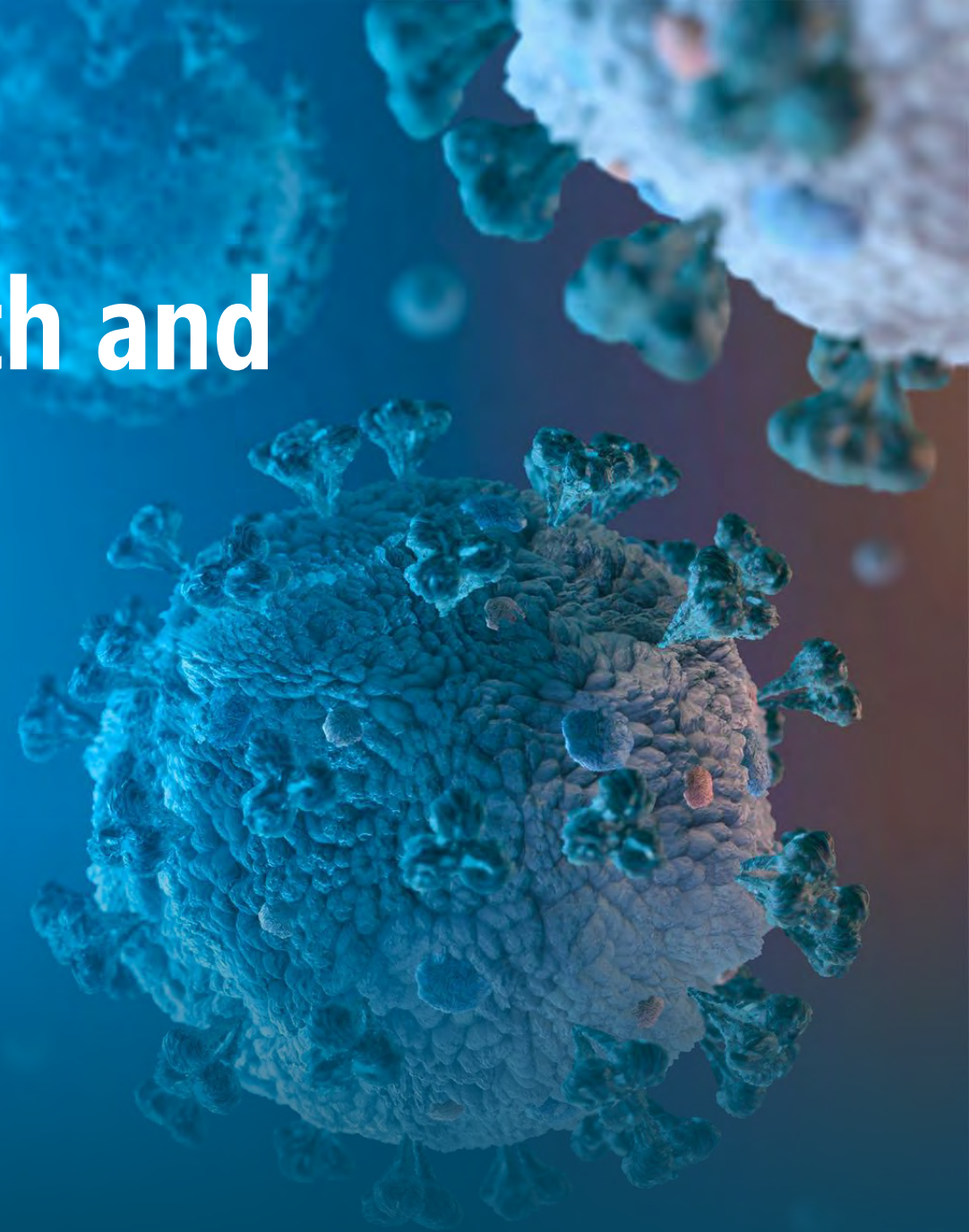
marchenko@vector.nsc.ru

Avian Influenza, One Health and Quadripartite partnership

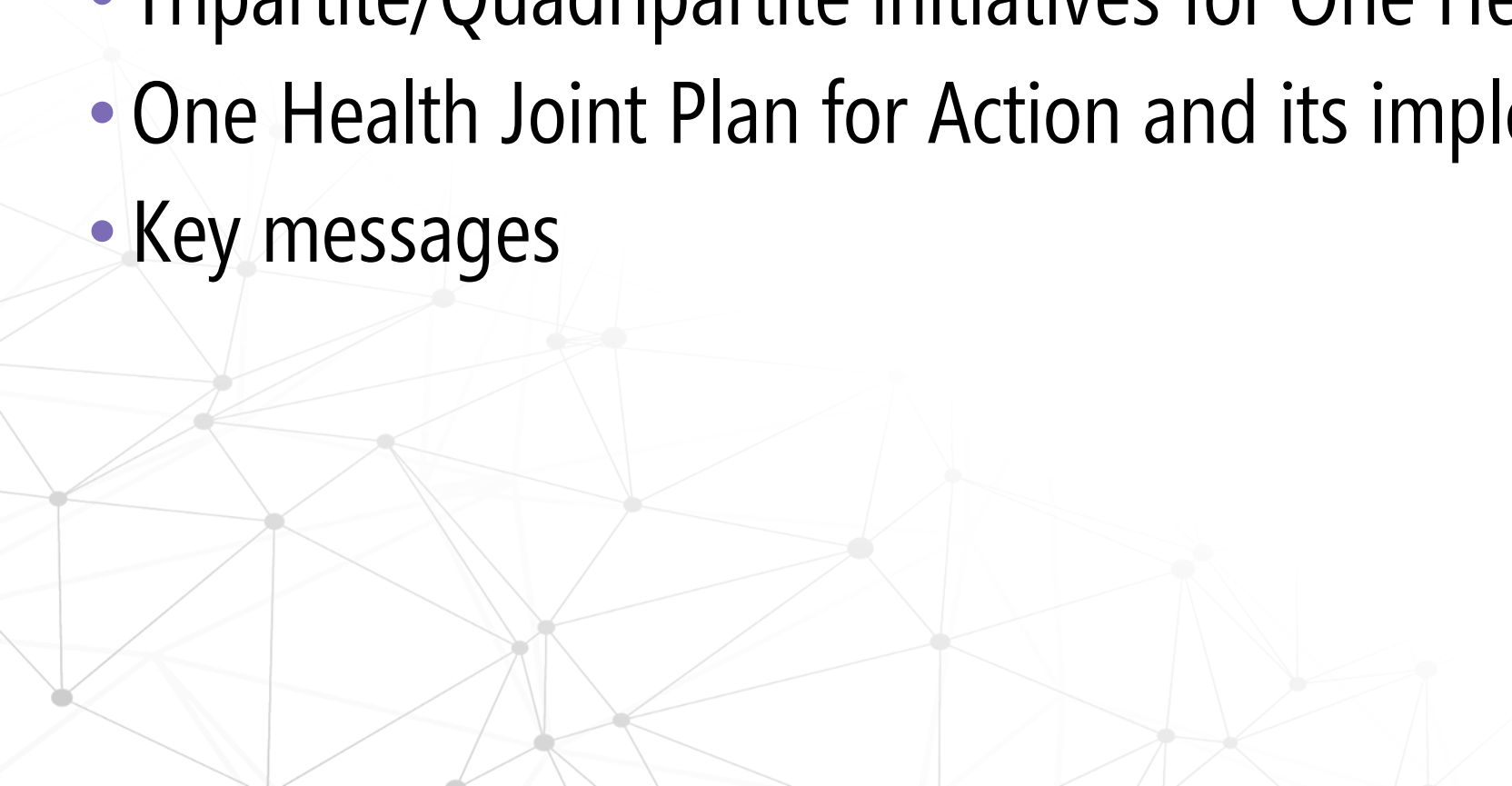
Gyanendra Gongal

Senior Public Health Officer

WHO Regional Office for South-East Asia



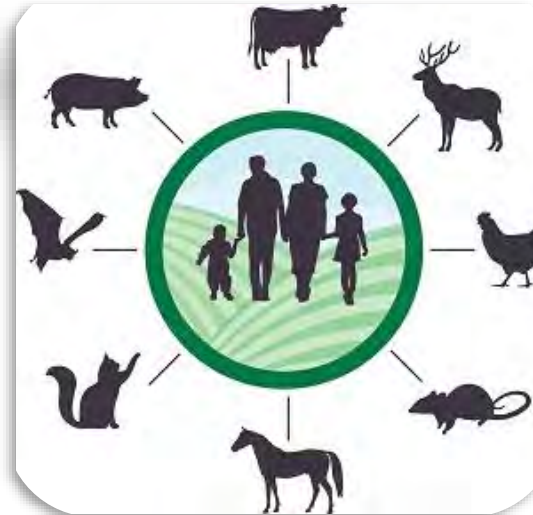
Outlines

- Why One Health
 - Genesis of One Health and Asia
 - Tripartite/Quadripartite initiatives for One Health
 - One Health Joint Plan for Action and its implementation
 - Key messages
- 

Emerging challenges demand multisectoral collaboration!



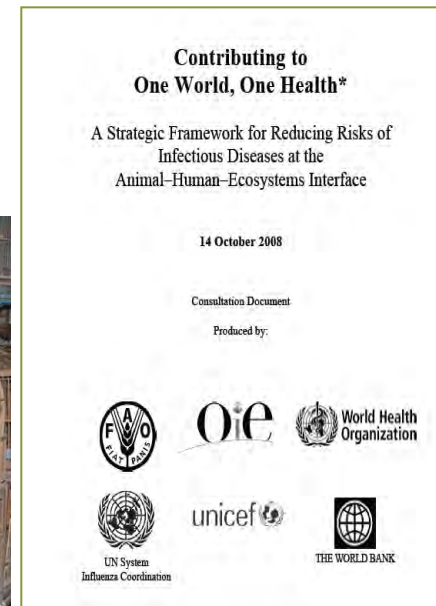
2004 – SARS CoV
2010 – H1N1 influenza
2012 – MERS CoV
2013 – Avian influenza
2014 – Ebola
2016 – Zika
2017 – Ebola
2020 – SARS-CoV-2



INCREASED GLOBAL INTERACTIONS @ THE HUMAN-ANIMAL-ENVIRONMENTAL INTERFACE

Avian influenza: Mother of the One Health

- **Avian influenza A(H5N1)** is the mother of the One Health movement in Asia
- *"It is clear that no one discipline or sector of society has enough knowledge and resources to prevent the emergence or resurgence of diseases in today's globalized world."*
- **Tripartite collaboration (FAO/OIE/WHO)** since 2006
- **Joint Statement of Intent** to Coordinate (2020) to strengthen One Health implementation in the Region



IMCAPI, New Delhi, India
Recognition of the potential of OH in disease control and pandemic preparedness
"Promoting one Health could be the natural extension of the global response to AI"

IMCAPI, Sharm-el-Sheikh, Egypt
One Health becomes a recommended strategic approach



Presentation of the **FAO/OIE/WHO Strategic Framework**

Last IMCAPI, Hanoi, Vietnam
Interministerial Declaration
"focus on the health systems' capacity for rapid inter-disciplinary action and coordination in line with the requirements outlined in IHR 2005 and the OIE standards"



FAO/OIE/WHO Tripartite Concept Note

2006



IMCAPI, Beijing, China

Agreement on financing framework for a clearer approach
Integrated National Action Plans agreed on for human influenza

2007

2008



FAO–OIE–WHO Joint Technical Consultation on Avian Influenza at the Human Animal Interface, Verona, Italy

2009



"One World, One Health: from ideas to Action", Winnipeg, Canada

Building on the Strategic Framework: one government's initiative to implement One Health

2010



"Operationalizing 'One Health': Taking Stock & Shaping an Implementation Roadmap", Stone Mountain, USA

One Health working groups are set up for a 3-year period



Second FAO–OIE–WHO Joint Technical Consultation on AI at the Human Animal Interface, Verona, Italy

Regional Tripartite Collaboration for One Health in Asia

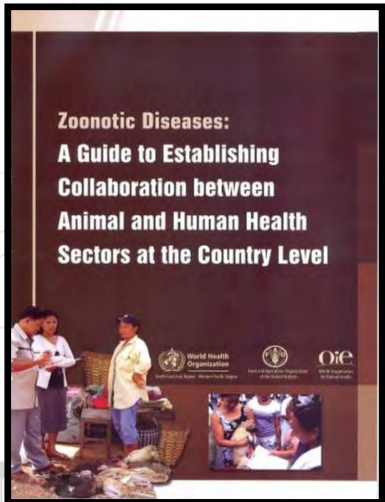
Place	Year	Lead Agency			Remarks
		FAO	OIE (WOAH)	WHO	
1. Sapporo (Japan)	2010			WPRO	Hokkaido Univ.
2. Chiang Mai (Thailand)	2012				
3. Bali (Indonesia)	2012				
4. Kathmandu (Nepal)	2013			SEARO	
5. Bangkok (Thailand)	2014				
6. Sapporo (Japan)	2015				Hokkaido Univ.
7. Manila (Philippines)	2017			WPRO	
8. Bangkok (Thailand)	2019				

ASEAN Rabies Meeting, SAARC Rabies Meeting, Webinar on rabies, Zoonotic Influenza Workshop, Regional AMR Workshop, tripartite missions

Global recognition of the Tripartite Initiative in Asia

THE SOUTHEAST ASIA RABIES CONTROL STRATEGY

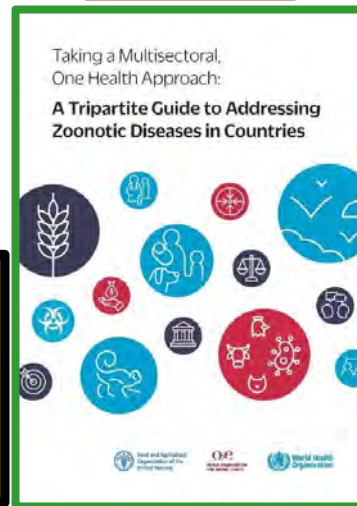
2008



Regional context

Tools and mechanisms for
collaboration
Coordination
Communication

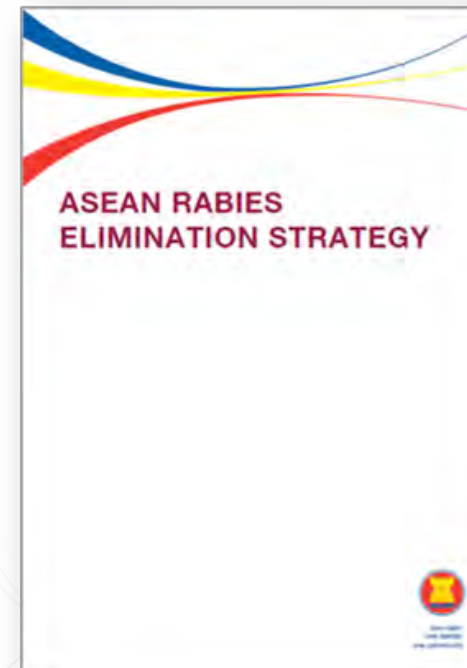
2019



Global context

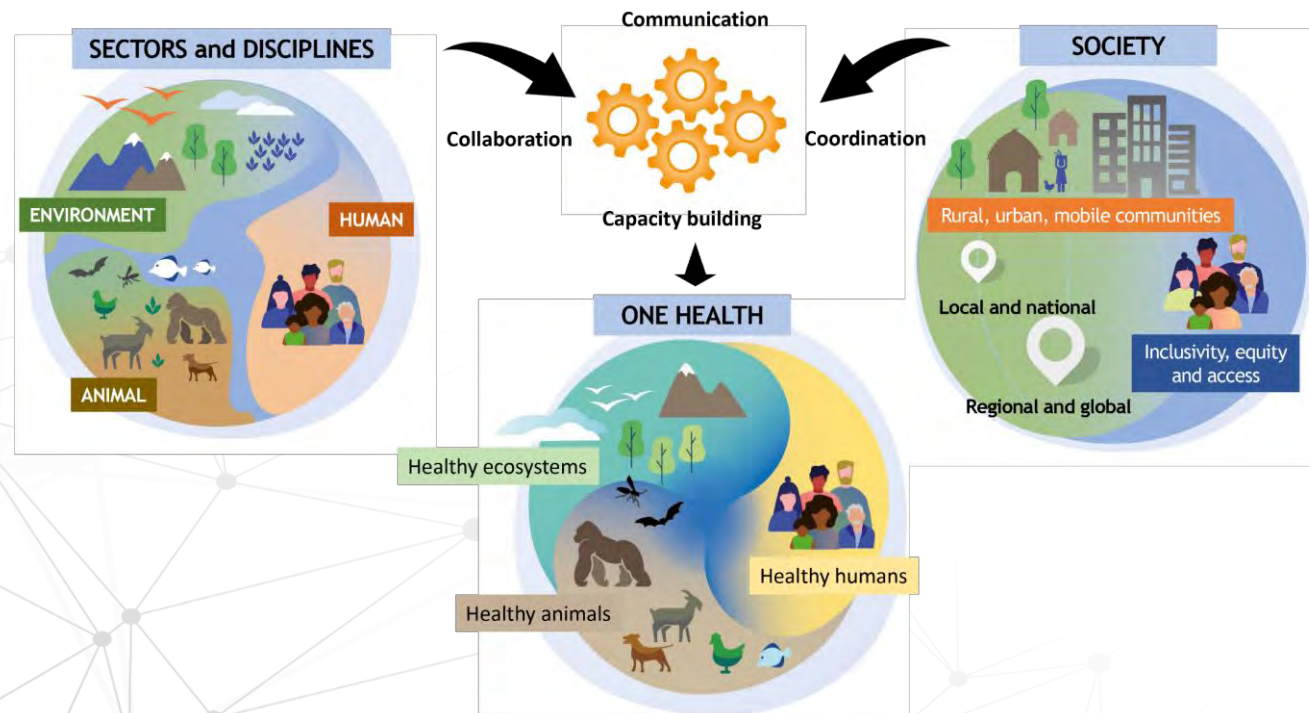


SOCIO-CULTURAL, TECHNICAL, ORGANISATIONAL, AND POLITICAL FRAMEWORK TO ELIMINATE DOG RABIES



One Health Definition (OHHLEP)

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the **health of people, animals and ecosystems**. It recognizes the **health of humans, domestic and wild animals, plants, and the wider environment** (including ecosystems) are closely linked and **interdependent**.



One Health Joint Plan of Action: Six Action Tracks

Action Track 1: Enhancing One Health capacities to strengthen health systems

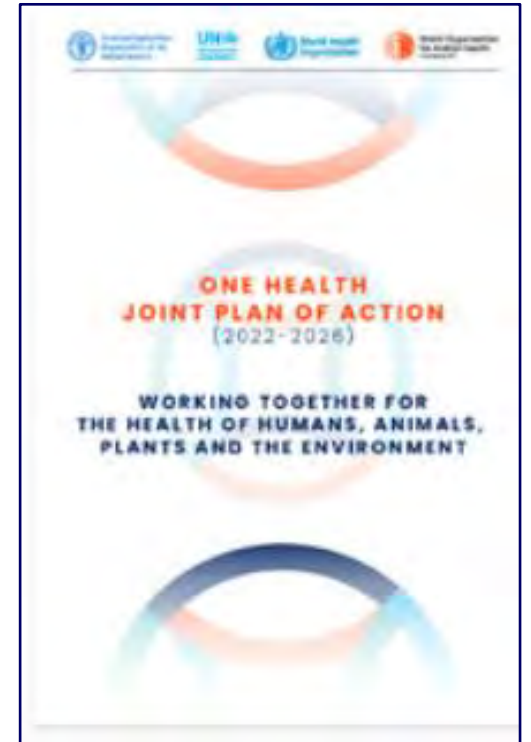
Action Track 2: Reducing the risks from emerging and re-emerging zoonotic epidemics and pandemics

Action Track 3: Controlling and eliminating endemic zoonotic, neglected tropical and vector-borne diseases

Action Track 4: Strengthening the assessment, management and communication of food safety risks

Action Track 5: Curbing the silent pandemic of Antimicrobial Resistance (AMR)

Action Track 6: Integrating the environment into One Health



Regional Quadripartite Coordination for One Health in Asia and the Pacific



Food and Agriculture
Organization of the
United Nations



UN
environment
programme



World Health
Organization



World Organisation
for Animal Health
Founded as OIE

GLOBAL QPT

Global QPT Executive + Global QPT Secretariat

Regional One Health QPT Coordination Group for Asia Pacific

REGIONAL PARTNERS

- FAO
- WOA (RRAP and SRR-SEA)
- WHO (SEARO and WPRO)
- UNEP

QPT Management Group (8 Members)
QPT Coordination Group (+40 Members)
Technical Working Groups (6+1)

COUNTRIES IN ASIA PACIFIC

- FAO/WHO/UNEP teams and focal points
- National counterparts (Ministries)
- Other national stakeholders

REGIONAL PARTNERS

- Donors
- Agencies
- Academia
- NGOs
- ...

Regional Quadripartite Technical Working Groups



AT #1 One Health
Governance and
Capacity Building



AT #2 Emerging,
epidemic and
pandemic
diseases



AT #3 Endemic
zoonoses and
vector-borne
diseases



AT #4
Food Safety



AT #5
Antimicrobial
Resistance



AT #6
Environment
and Climate
Change



**Advocacy, Risk
Communication and
Community Engagement**

A regional platform for One Health



**Asia Pacific Quadripartite One Health Workshop
5-8 September 2023
Bangkok, Thailand**

ASIA PACIFIC Quadripartite One Health Workshop



Report of the Workshop
5-8 September 2023
Bangkok, Thailand



Second Quadripartite One Health Workshop 2026, Bangkok (Thailand)



Supported by



Funded by
the European Union



SEAR Multicountry Pandemic Fund Consultation Meeting, 28 November 2025

Key messages

- One Health is not a new concept but a **holistic approach** to address issues and challenges
- There is **growing recognition** of One Health; however, it has to be translated from **concept into actions** through country-level activities
- **Ownership, leadership, and partnership** are essential for One Health collaboration
- Consider country **context, needs and priorities while developing OH Joint Action Plan**
- Consider biomedical as well as **sociocultural dimensions** of EID/zoonoses prevention and control
- Think globally, **act locally**

Popular Thoughts on One Health

**Coming together is the beginning
Staying together is progress, and
Working together is a success**

Henry Ford

**“If you want to go fast, go alone,
if you want to go far, go together”**

African Proverb – Martha Goedert

Thank You!

Gyanendra Gongal

Senior Public Health Officer

Unit Head, Environmental Determinants, Climate Change and One Health

Health Promotion, Disease Prevention & Control (HDC)

WHO Regional Office for South-East Asia

New Delhi, INDIA

Email: gongal@who.int

Web: www.who.int/southeastasia

REGIONAL WEBINAR

Strengthening One Health Collaboration for Zoonotic Influenza Surveillance, Risk Assessment and Outbreak Response: Priorities for Countries in the Asia-Pacific Region

PRESENTED BY

Filip Claes

Officer-in-charge FAO ECTAD Asia | Lab Coordinator | Pirate Scientist | One Health Champion



FAO Emergency Centre for Transboundary Animal Diseases (ECTAD) Asia
Food and Agriculture Organization of the United Nations



Bangkok, Thailand



Strengthening One Health
Collaboration for Zoonotic
Influenza Surveillance, Risk
Assessment and Outbreak
Response: Priorities for
Countries in the Asia-Pacific
Region



FAO expert for OFFLU,
the OIE/FAO network
of expertise in
animal influenza



Advisory Board member
of the African swine fever
(ASF) Partnership Platform



Driving laboratory
excellence, innovation,
and resilience to combat
emerging infectious
diseases



STRENGTHENING ONE HEALTH COLLABORATION FOR Zoonotic influenza surveillance

Risk assessment and outbreak response: Priorities for countries in the Asia-Pacific region

Filip CLAES, Regional manager One Health in Agrifood Systems, FAO RAP

Asia-Pacific: where influenza risks converge

Biological opportunity plus extraordinary connectivity.

- Dense poultry and livestock production
- Live bird markets and complex value chains
- Wildlife–domestic animal–human interfaces
- Rapid movement of animals, people and viruses
- Uneven surveillance and response capacity

One Health is more than three circles

Collaboration is not the objective.

Joint decisions and action are.

SHARED SIGNALS → SHARED DECISIONS → SHARED ACTION

Connect the signals

Animal surveillance is often our earliest opportunity for warning.

Poultry, swine, wildlife and human signals

Event-based plus risk-based approaches

Target interfaces, not just sample numbers

Connect data across sectors

Design surveillance to trigger action

From detection to intelligence

Laboratories should answer operational questions,
not only produce test results.

DETECT → CHARACTERIZE → INTERPRET → SHARE → ACT

What is it? Is it changing? Where is it spreading? What does it mean?

Turn data into decisions

Joint risk assessment is the bridge between information and action.

INPUTS

- Epidemiology
- Genomics
- Animal health
- Human health
- Wildlife / ecology

DECISIONS

- Surveillance
- Control measures
- Preparedness
- Risk communication

If the assessment does not change a decision, ask what it was for.

Act before sectors finish coordinating

The first days are not the time to negotiate roles, pathways and permissions.

- Activation triggers
- Clear roles and leadership
- Sample and data pathways
- Joint investigation protocols
- Surge and logistics
- Coordinated communication

PRE-AGREE IT. TEST IT. THEN USE IT.

Viruses don't respect borders

National preparedness is necessary.
Regional connectivity makes it effective.

Cross-border surveillance • Data sharing • Laboratory networks • Joint risk assessment • Coordinated preparedness

Five priorities for countries

A practical agenda for stronger zoonotic influenza preparedness.

1

DETECT AT THE SOURCE

Risk-based surveillance at animal–human–wildlife interfaces

2

CONNECT LABS + EPIDEMIOLOGY

Detection → characterization → interpretation → action

3

INSTITUTIONALIZE JOINT RISK ASSESSMENT

Routine multi-sector assessment of emerging signals

4

PREPARE JOINT RESPONSE

Agree triggers, roles, information flows and surge before events

5

CONNECT NATIONALLY + REGIONALLY

Share intelligence and use networks across borders

FROM BUILDING CAPACITY TO USING IT

CONNECT IT.
USE IT.
USE IT FASTER.

SURVEILLANCE → INTELLIGENCE → JOINT RISK ASSESSMENT → DECISION → RESPONSE



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ROYAL CENTERS FOR DISEASE CONTROL
Ministry of Health | Royal Government of Bhutan



Moving beyond SARI and ILI SURVEILLANCE

*Strengthening Bhutan's capacity for Early Detection and Response to
Zoonotic Influenza*

Chimi Wangmo
National Influenza Centre, RCDC



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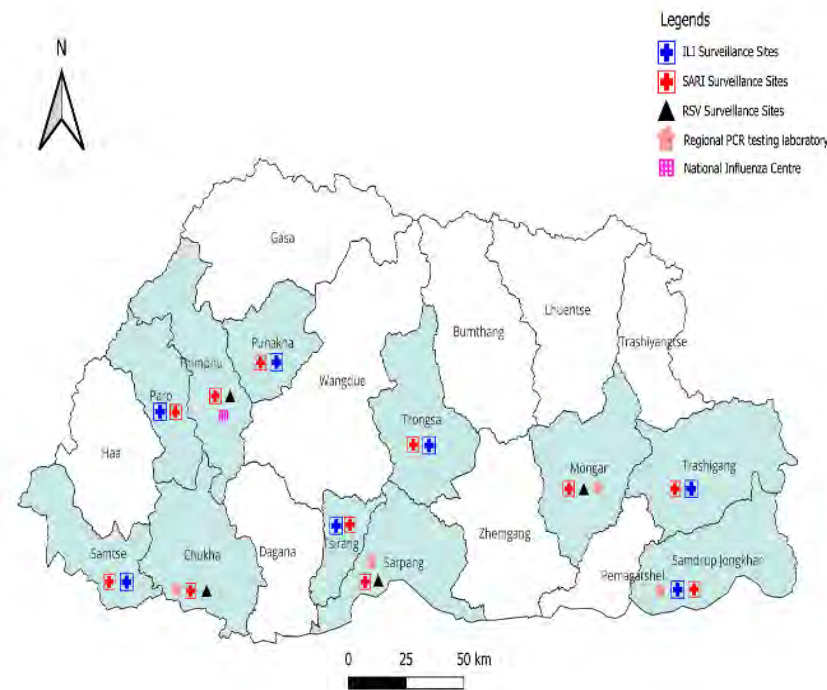
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Integrated Surveillance System

- National Respiratory Virus Sentinel surveillance(NRVSS) integrates 7 ILI and 11 SARI sentinel sites across Bhutan.
- Clinical specimens(nasal and throat swabs) are collected weekly and shipped under cold chain to the laboratory.
- Testing and genomic analysis are performed at the National Influenza Centre at Royal Centre for Disease Control.
- NIC sends virological data to WHO Global Influenza Surveillance and Response System(GISRS) and RespiMart.



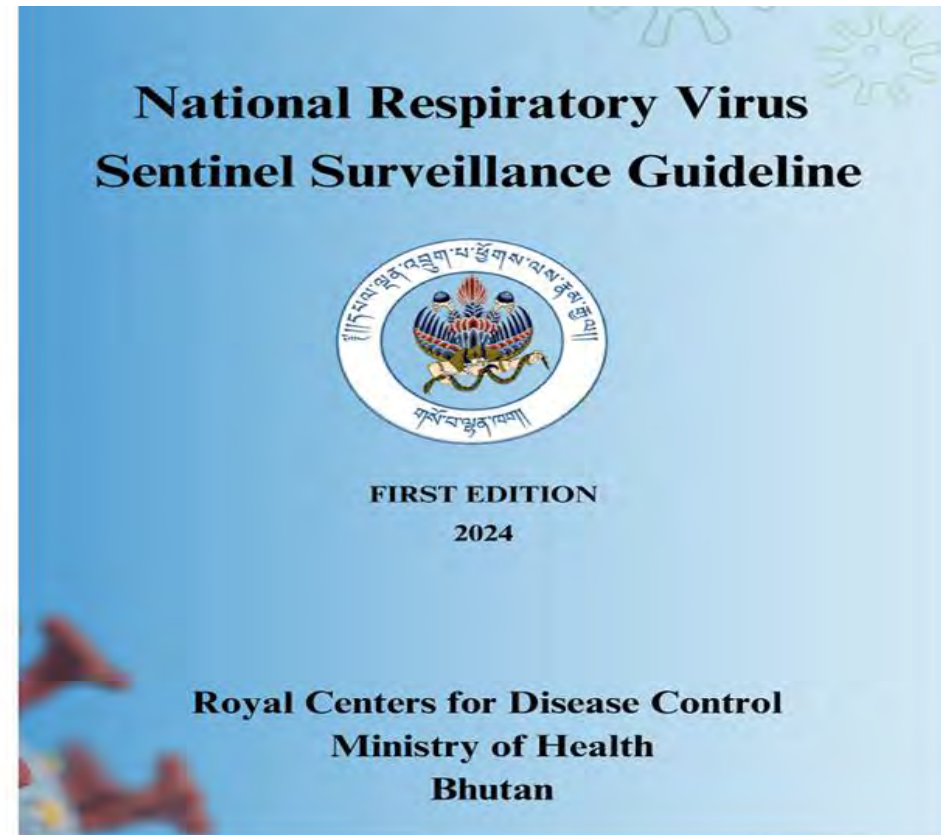
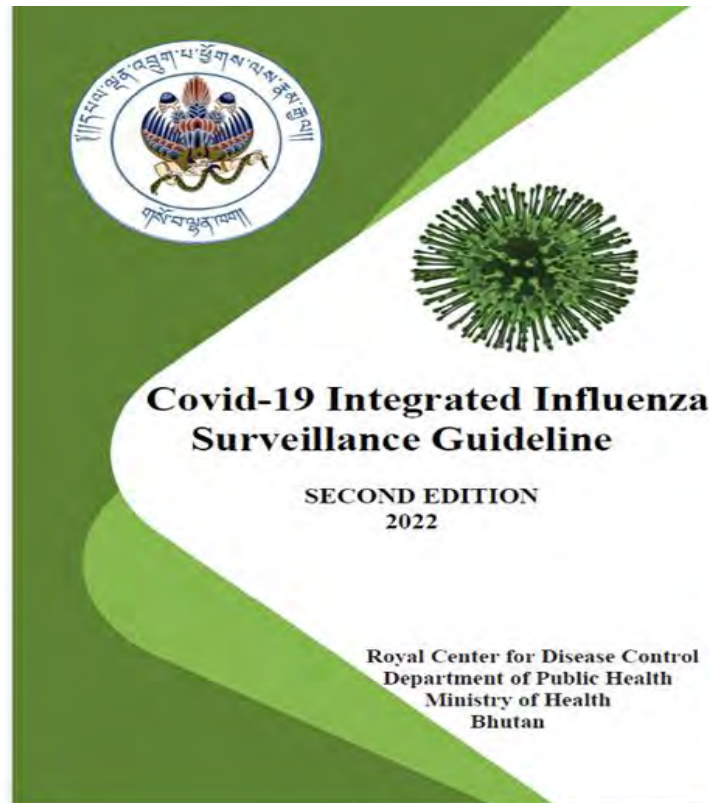
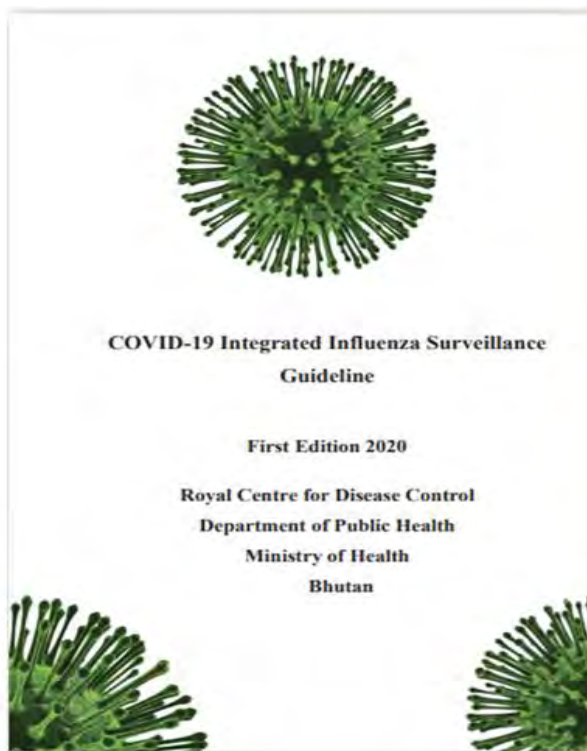
- 11 SARI sites
- 7 ILI sites
- 4 RSV sites
- 4 Regional PCR lab
- 1 NIC



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National Respiratory Virus Sentinel Surveillance Guideline





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Surveillance Overview

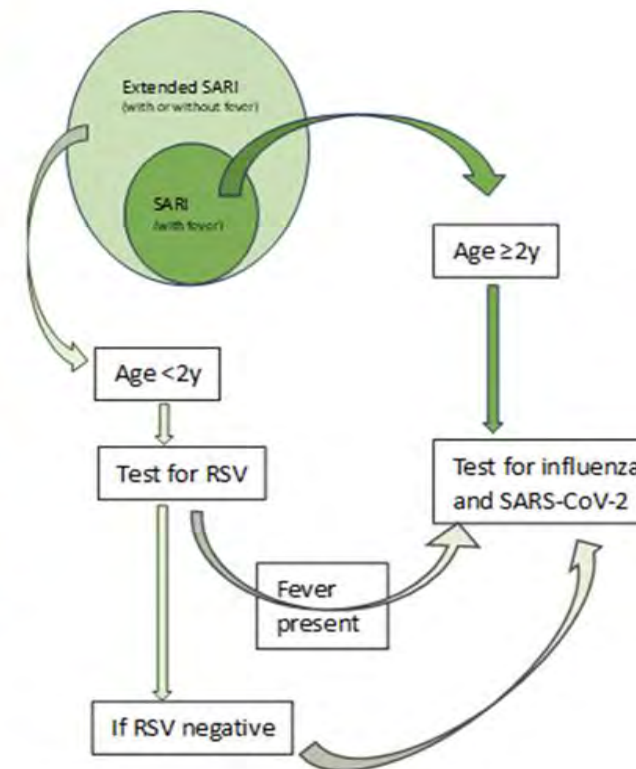
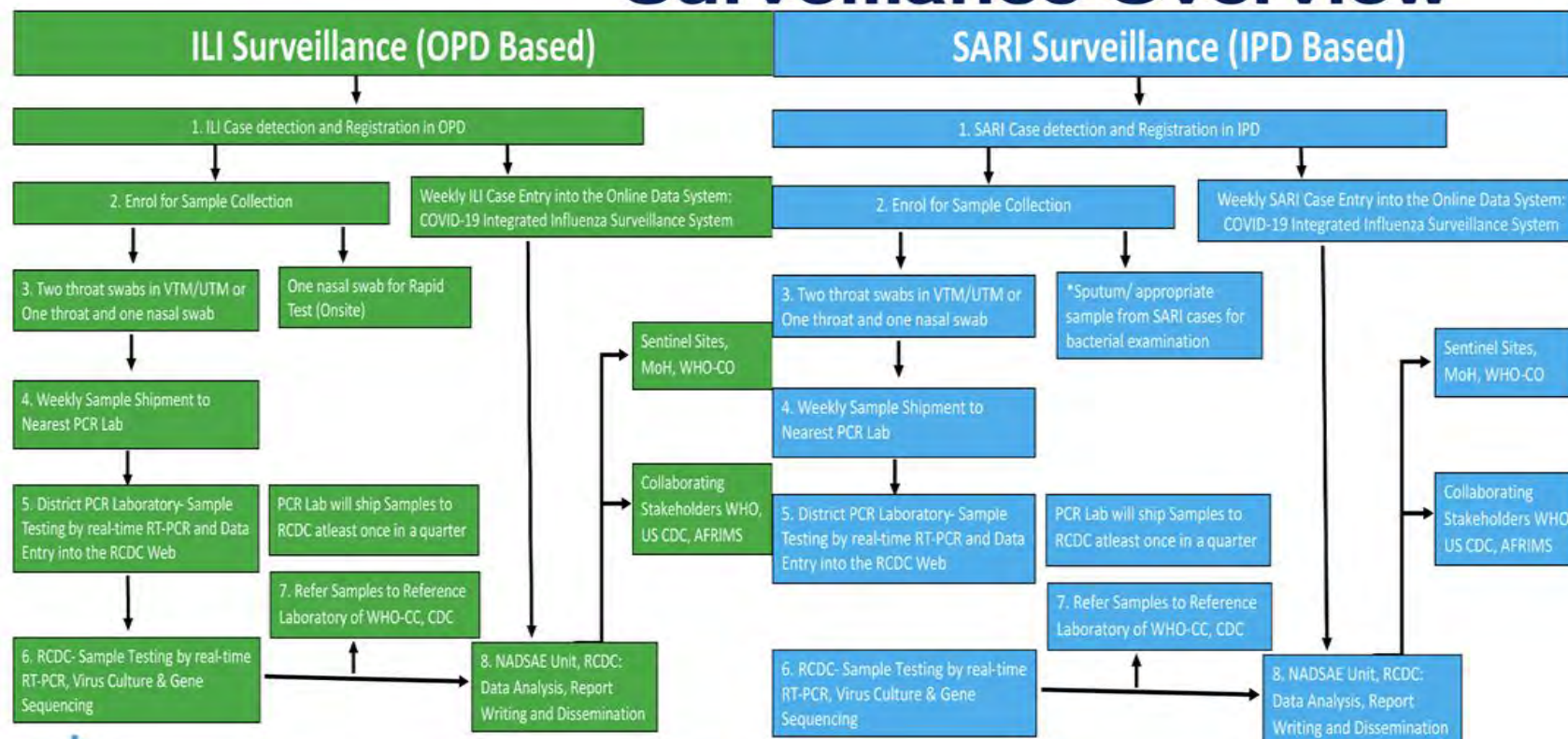


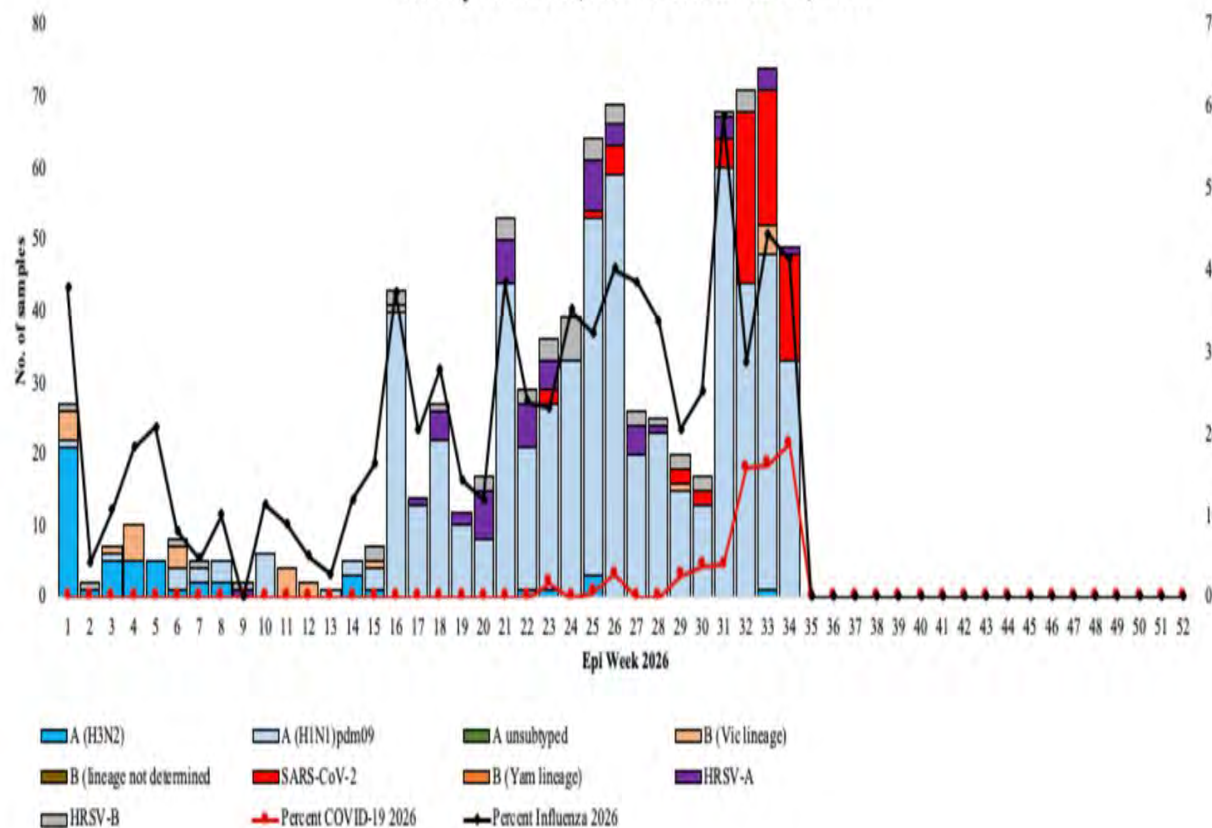
Figure: National Respiratory Virus Sentinel Surveillance Guideline First Edition 2024



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Weekly Influenza, RSV & SARS-CoV-2, 2026



RECENT SURVEILLANCE TRENDS(Biweekly report week 33 and 34, 2026)

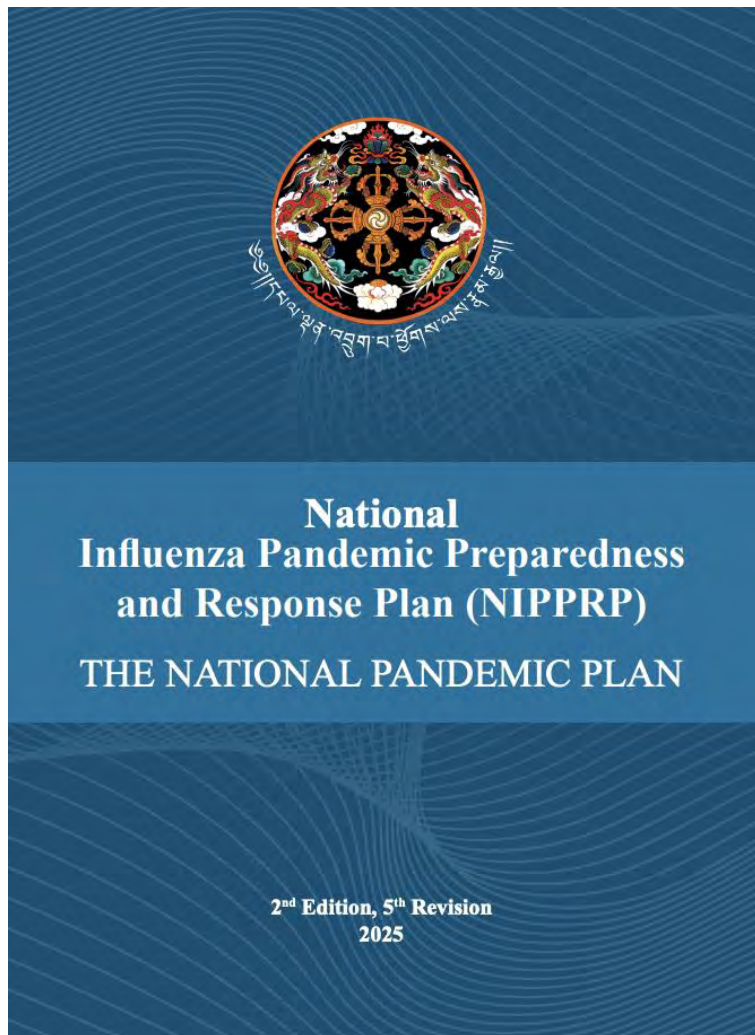
- Influenza Activity:** Influenza positivity decreased over the weeks, decreasing from 44.4% (52/117) in week 33 to 41.2% (33/80) in week 34.
- Other Respiratory Pathogens:** Respiratory syncytial virus (RSV) positivity was recorded at 14.3% (4/28), whereas SARS-CoV-2 positivity was recorded at 17.26% (34/197) during the testing weeks.
- Surveillance Testing:** A total of 197 respiratory samples (ILI- 136, SARI- 33 & eSARI- 28) were tested for Influenza, SARS-CoV-2, and RSV using multiplex real-time RT-PCR.



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Purpose

The NIPPRP 2025 provides Bhutan with a national framework for the early detection, preparedness, and coordinated response to influenza threats, using a multisectoral and One Health approach to minimize their health, social and economic impacts.

Key approaches

- Whole-of-government and whole-of-society approach
- One Health approach
- Early detection and surveillance
- Preparedness and response capacity
- Incident Command System (ICS)
- Pandemic phases and action plans



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One Health collaboration

- Interministerial Committee for one health
- One health Secretariat
- One health technical committee
- Cross Sectoral Disease Surveillance and information sharing
- Joint outbreak investigation and response
- Joint training and capacity building(FETP)
- Regular meetings and workshops
- District/field level coordination
- Integrated surveillance and early warning system.



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Moving Beyond Traditional ILI/SARI Surveillance: Opportunities and Challenges

Opportunities	Challenges
❖ Strong existing influenza surveillance	❖ Traditional case definitions may miss unusual/asymptomatic infections
❖ Growing One Health coordination	❖ Identifying high-risk populations
❖ Laboratory and genomic capacity	❖ Limited workforce and resources
❖ Event-based and targeted surveillance	❖ Geographic and cross-border challenges
❖ Current Investment	❖ Ensuring sustainability



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Situation Overview: Avian Influenza A(H5N1) Outbreak in Bhutan

Animal Health

- A poultry outbreak of avian influenza A(H5N1) was detected in Dewathang, Samdrup Jongkhar District, Bhutan, an area bordering India.
- According to the World Animal Health Information System (WAHIS), approximately 1,100 domestic birds died during the outbreak.
- Samples were tested at the National Centre for Animal Health (NCAH) and were confirmed positive for H5N1 by RT-PCR on 12 June 2026.
- Response measures included:
 - Disinfection of affected areas
 - Restriction of animal and poultry movement
 - Enhanced surveillance within the restricted zone

Human Health

- As part of the public health response, the National Influenza Centre (NIC), RCDC received three specimens from primary human contacts associated with the outbreak.
 - All three contacts were asymptomatic at the time of specimen collection.
 - All three specimens tested negative for influenza and SARS-CoV-2 (COVID-19).



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Key Message

The event highlights the importance of coordinated One Health surveillance and the capacity to rapidly detect potential zoonotic influenza spillover events among exposed human contacts.

ONE HEALTH COORDINATION

Animal Health + Human Health + Environmental + Laboratory Surveillance + Rapid Response



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Thank You

For more information, please contact:

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chimiw@moh.gov.bt/kunzangdorji@health.gov.bt

Influenza and respiratory pathogen surveillance reporting in Nepal and the application of ZIDAR findings

WHO Country Office, Nepal

Dr SAUGAT SHRESTHA

National Professional Officer- Infectious Hazard
Management (NPO-IHM)



World Health
Organization

Brief overview of **influenza** and **respiratory pathogen** surveillance reporting in Nepal

Five Surveillance Lenses



Syndromic

ILI, SARI and priority disease monitoring at sentinel sites



Laboratory

Testing, specimen referral and pathogen subtyping



Event-based

Clusters, unusual events and immediate alerts



Genomic

Sequencing pipelines and variant signal detection



One Health

Human–animal–environment risk interface monitoring

Early Warning and Reporting Systems (EWARS)

- hospital-based sentinel surveillance platform
- 134 hospitals
- weekly reporting of SARI

National Integrated Influenza-SARS-CoV-2 Surveillance Network (NISN):

- led by National Influenza Centre (NIC)
- Network of 15 sites i.e. 7 testing labs (PPHLs) linked to sentinel hospitals
- Covers all 7 provinces
- Weekly testing and reporting

Information Products | Influenza and respiratory pathogen surveillance

EWARS | SORMAS

WEEKLY



EWARS Bulletins

- ILI/SARI trends
- Completeness tracking
- Alerts and flags

ANNUAL



EWARS Reports

- Seasonality patterns
- Geographic distribution
- Surveillance gaps

EVENT



Situation Reports

- Outbreak-specific assessment
- Response documentation
- Event-triggered publication



NISN

LAB



NIC Newsletters

- Testing & positivity
- Subtypes & epi-week trends
- Referral data

DATA



Datasets & Genomic Outputs

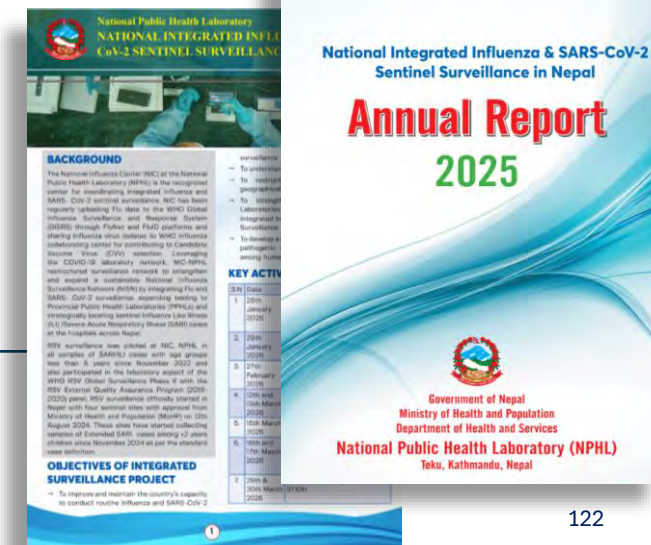
- Influenza | RSV | SARS-CoV-2
- Sequencing outputs
- Variant signals

GUIDANCE



SOPs & Technical Guidance

- Case definitions & sampling
- Biosafety protocols
- Referral pathways



Dashboards and visualization approaches used in Nepal (**EWARS** | **SORMAS**)

- Summary of reported syndromes and diseases
- Epi-week trends
 - [Syndromic](#) | ILI, SARI, AGE, Fever with Rash, Febrile Illness with Jaundice,
 - [Disease specific](#) | Dengue, Scrub Typhus, Influenza, Visceral Leishmaniasis
- Province wise distribution

SYNDROMES BY NUMBER OF CASES



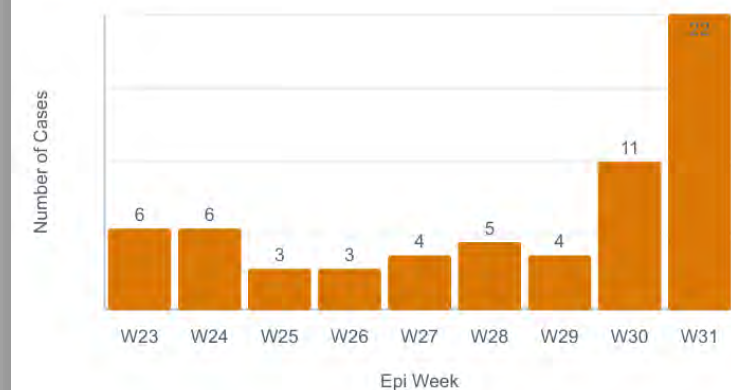
Total selected epi week Number of Cases: 1999

DISEASES BY NUMBER OF CASES



Total selected epi week Number of Cases: 400

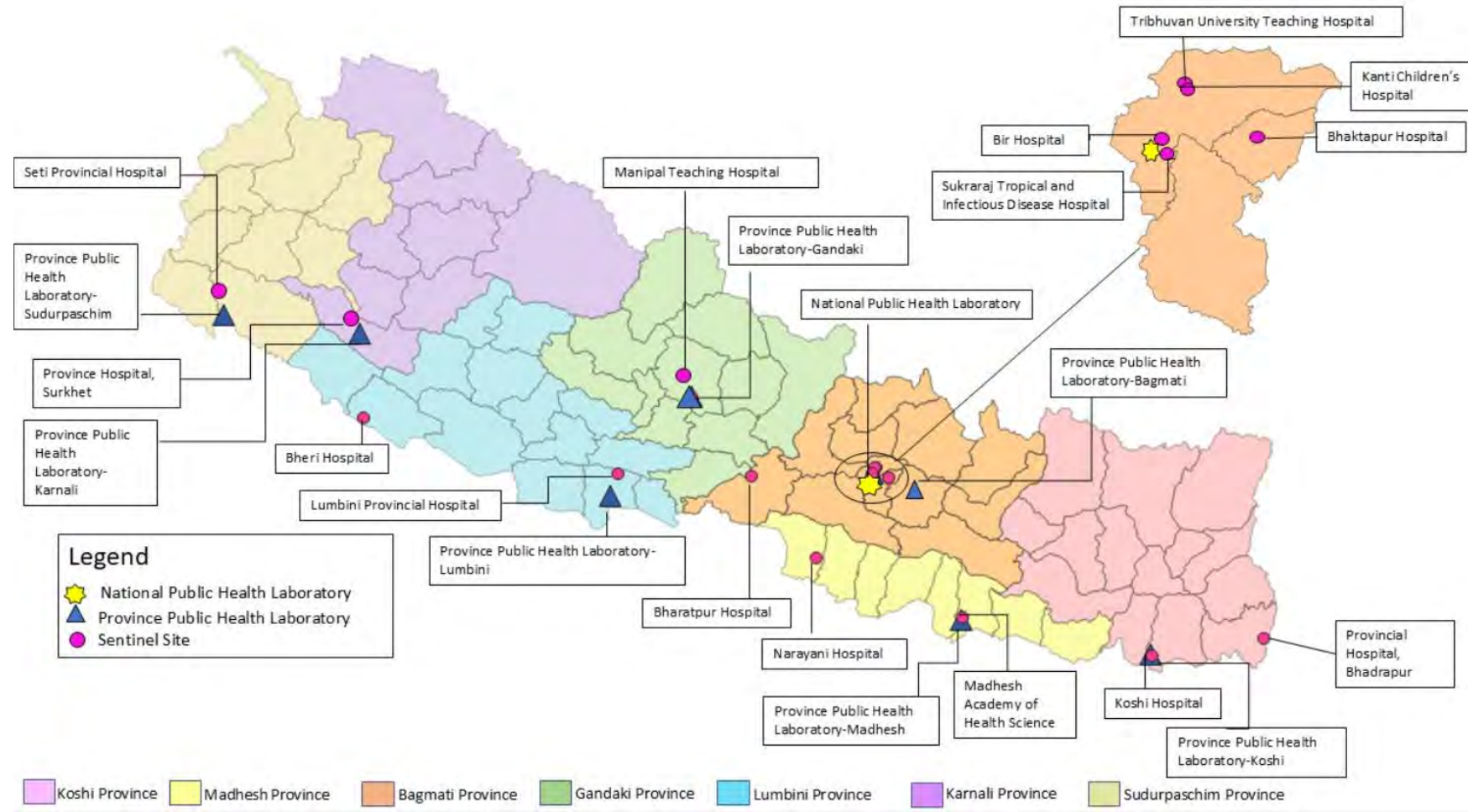
Influenza



Dashboards and visualization approaches used in Nepal (NISN)

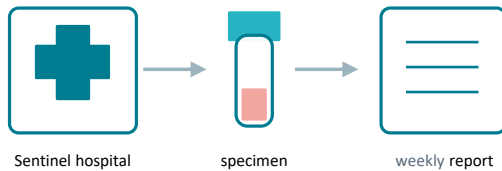
National Integrated Influenza-SARS-CoV-2 Surveillance Network (NISN)

- 15 sites
- 7 testing laboratories
- 7 provinces
- **Weekly** Testing and reporting



Dashboards and visualization approaches used in Nepal (NISN)

01 DATA GENERATION



NISN sentinel surveillance

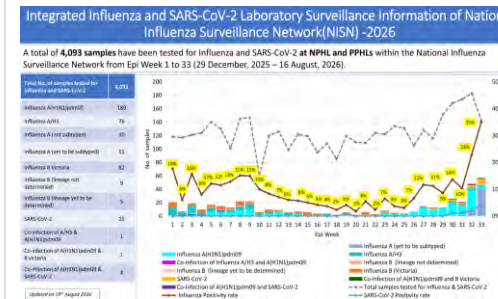
- ILI and SARI cases identified at sentinel hospitals
- Specimens collected using standard case definitions
- Weekly clinical and epidemiological reporting
- Provincial testing (typing) and/or referral to NIC/NPHL (subtyping)

02 NIC / NPHL ANALYSIS

Integrated laboratory + epidemiological analysis

- Clean, validate, and link laboratory and epidemiological records
- Detect and characterize influenza A/B; subtype where available
- Interpret with SARS-CoV-2 and other respiratory-virus results
- Monitor completeness, volume, positivity, and turnaround time

03 VISUALIZATION PRODUCTS



Routine surveillance outputs

- Weekly influenza and respiratory-virus trends
- ILI/SARI activity, number tested, positivity
- Type/subtype and other virus distribution
- Sequencing/variant summaries where available
- Timeliness, completeness, sites, and specimen adequacy

04 SHARING & USE

OUTPUTS

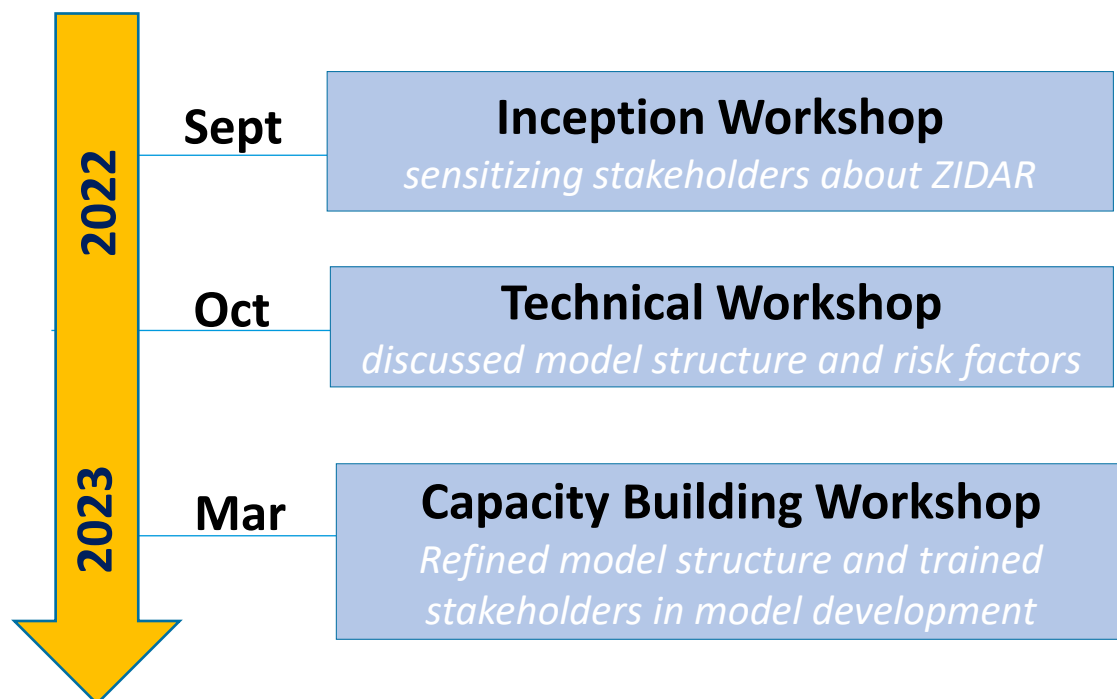
EDCD / MoHP
WHO / GISRS
NISN

Dissemination for decision-making

- NPHL website: influenza, RSV, and genomic surveillance data
- Integrated influenza + SARS-CoV-2 surveillance newsletters
- Regular sharing with national, provincial, site, WHO, and partner users
- Supports risk assessment, preparedness, laboratory planning, outbreak investigation, and global surveillance

ZIDAR in Nepal

ZIDAR extends the national surveillance architecture by integrating One Health data to rank high-risk interfaces and target resources.



Pic: One health and ZIDAR workshop, Sept 2022

Objective:

Develop a zoonotic influenza distribution assessment and ranking model to enhance surveillance and preparedness in Nepal.

to enhance the understanding of zoonotic influenza risks and improve public health responses through data-driven insights and stakeholder collaboration.

Using **ZIDAR** for Risk-Based Surveillance



Integrates

Human · animal · wildlife · environment data unified into a single risk-informed picture



Data inputs across all sectors:

Human surveillance · Veterinary / animal health · Wildlife monitoring · Environmental indicators



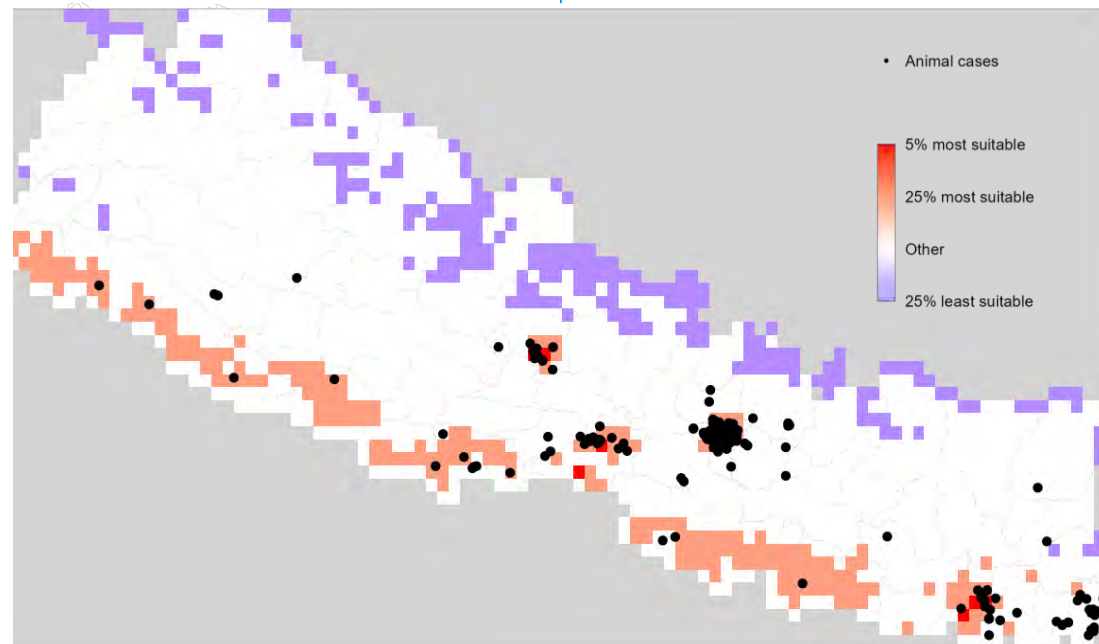
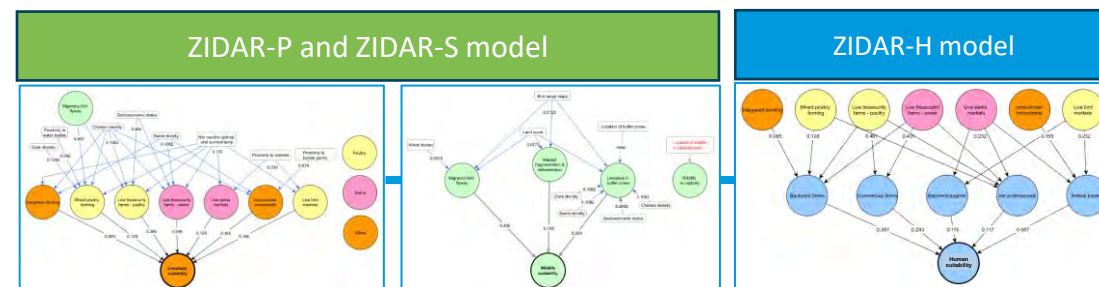
Ranks

High-risk interfaces and locations scored by modelled risk — not intuition



Targets

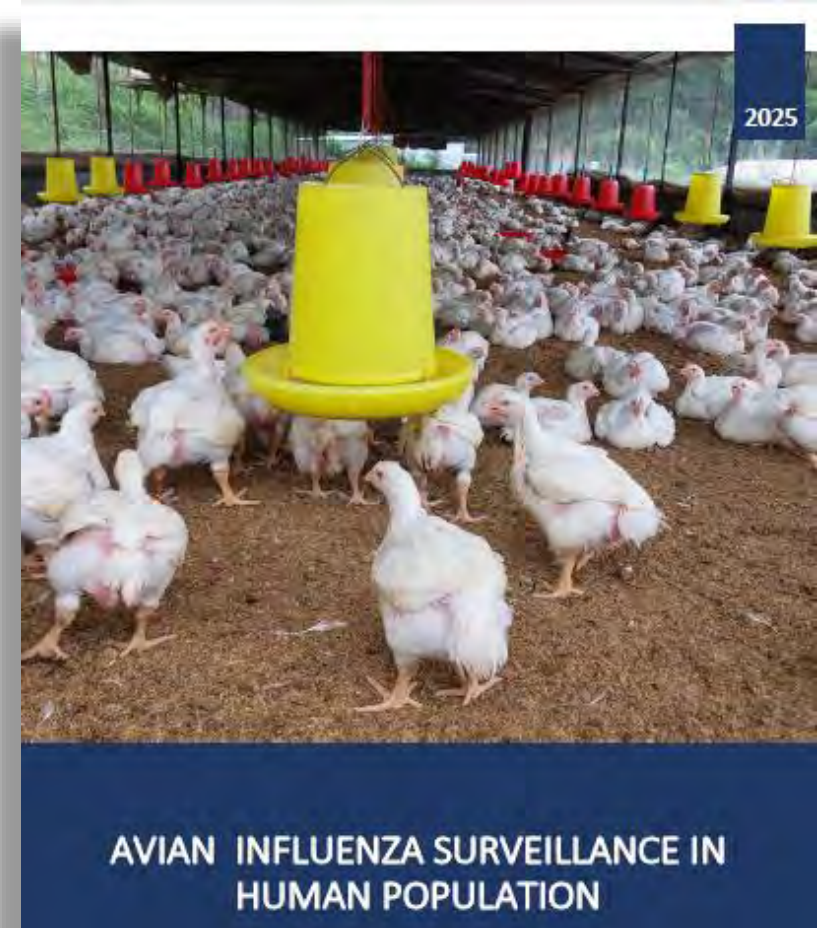
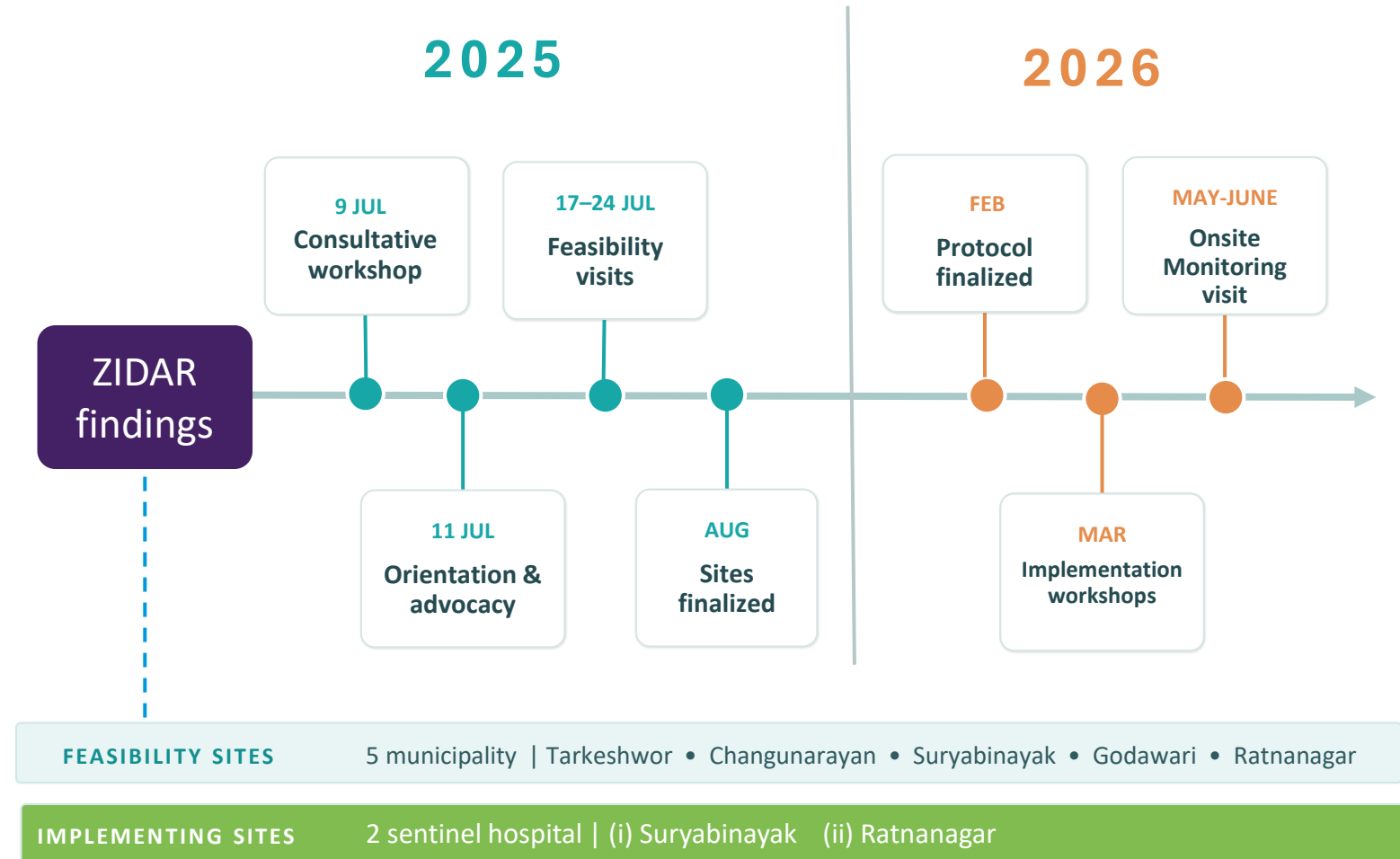
Sampling, investigation and resources directed toward priority zones and populations



*Source: [Development of a zoonotic influenza distribution assessment and ranking system \(ZIDAR\): Technical application in Nepal to support cross-sectoral risk-based surveillance - ScienceDirect](#)

Avian Influenza Surveillance in Human population

From consultation to implementation



PROGRESS

Protocol → Implementation → Monitoring

Lessons Learned

1

Better products increase data value

Timely · interpretable · denominator-aware · linked to action

2

Visualization must be action-oriented

What changed · where · confidence · explanation · next step

3

National ownership sustains use

Co-development builds trust, interpretation and institutional memory

4

Integrated systems is better

Connect detection → verification → risk assessment → response

Way Forward

Support to
MoHFS

- 1 INTEGRATE** Strengthen influenza into national disease surveillance
- 2 INTEROPERATE** EWARS · SORMAS · laboratory systems · NIC datasets · animal health
- 3 PLATFORM** Single platform for monitoring, identifying triggers/events, and response efforts
- 4 TARGET** Combine sentinel coverage | Identify operational issues
- 5 SUSTAIN** Subnational capacity · One Health governance · evaluate decision impact

A stylized illustration of a woman with long white hair, wearing a colorful, patchwork dress. The dress features various icons representing health, science, and community, such as a heart, a microscope, a house, and a globe. She is holding a small blue object in her right hand.

PANEL DISCUSSION and Questions & Answers

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