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# **H5N1 (Avian Influenza) Situation Report Webinar**

**James Lawler, MD, MPH, FIDSA  
Shelly Schwedhelm, MSN, RN, NEA-BC**

# Today's Topics

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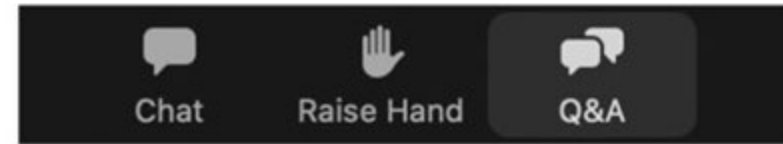
- The current H5N1 risk status.
- The growing concern from experts around the current H5N1 outbreak.
- How the UK and other nations have raised pandemic alert levels, and what U.S. hospitals and health systems should do to respond.

QUESTIONS

Q & A

ANSWERS

Zoom participants, please use the Q&A box on your screen



# Today's Speakers

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**James Lawler, MD, MPH, FIDSA**

**Medical Director, R7DHRE**



Dr. Lawler is the Director of International Programs and Innovation at the Global Center for Health Security. In 2018, he came to the University of Nebraska Medical Center following a military career in which he served as a Navy Commander and was chief of clinical biodefense research at the Naval Medical Research Center, Fort Detrick, Maryland. He was an attending physician at Walter Reed National Military Medical Center and served White House assignments as Homeland Security Council and National Security Council staff, where he worked on biodefense, pandemic response, and health preparedness. Dr. Lawler has field experience treating Ebola patients in Sub-Saharan Africa, and he served as a subject matter expert in the training of Department of Defense medical personnel working with infectious diseases patients. He is board certified in infectious diseases.

**Shelly Schwedhelm, MSN, RN, NEA-BC**

**Executive Director, R7DHRE**



Shelly Schwedhelm serves as the Executive Director of Emergency Management and Biopreparedness at Nebraska Medicine. In addition, she serves as the Associate Director for Clinical Operations and Emergency Management at the University of Nebraska Medical Center Global Center for Health Security (GCHS). Shelly has 40 years of healthcare leadership experience to include emergency, trauma, preparedness and accountability for biocontainment unit operations, and logistics during the care of repatriated Americans with Ebola virus disease in 2014-15, and leadership in collaboration with local, state and federal partners to support quarantine missions for repatriated Americans from Wuhan China and others returning from the Diamond Princess cruise ship from Japan who required care for COVID 19.





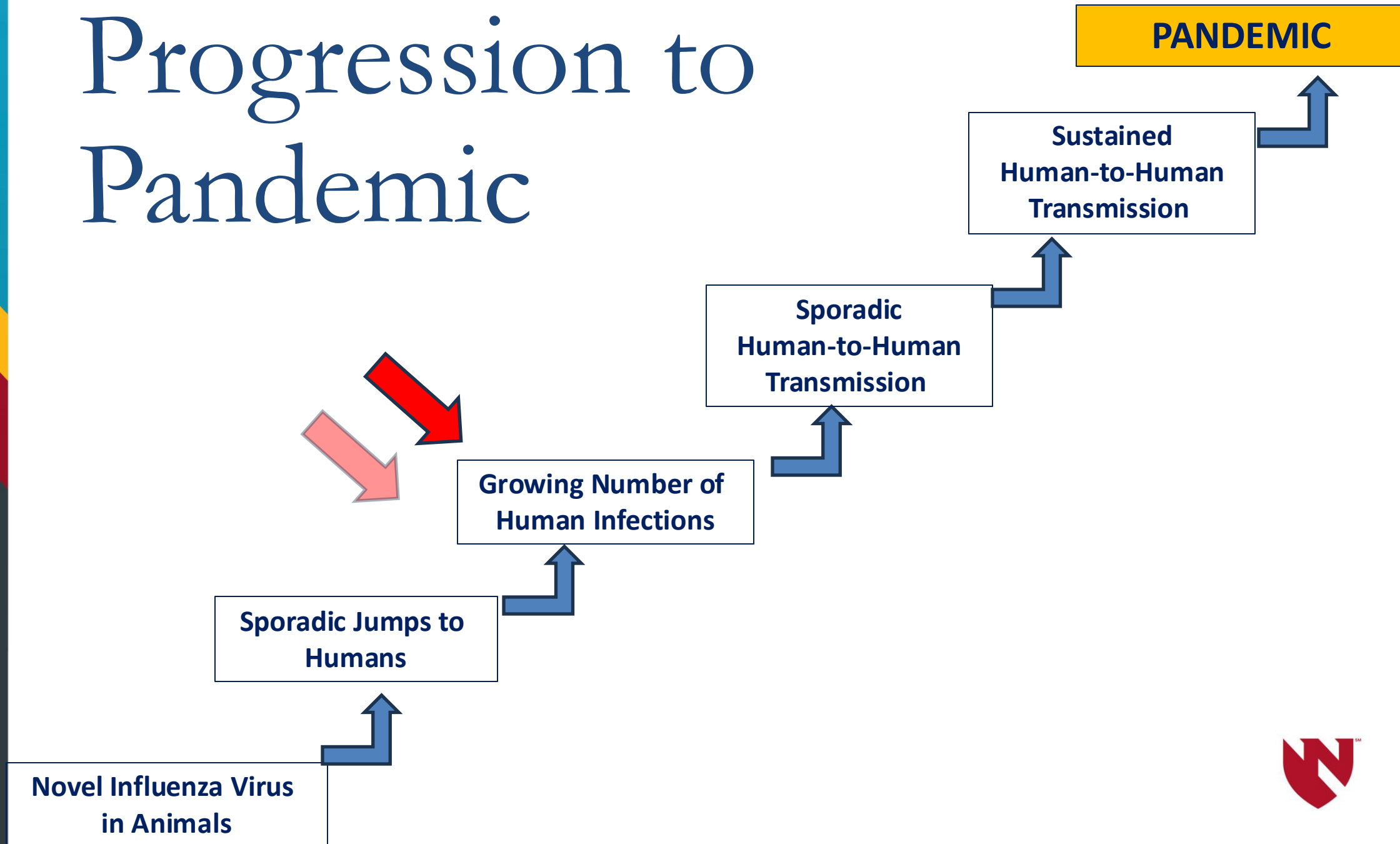
What's Up With  
Cow Flu??

August 2024

James V. Lawler, MD MPH  
Global Center for Health Security  
University of Nebraska Medical Center



# Progression to Pandemic



NATIONAL STRATEGY FOR  
**PANDEMIC  
 INFLUENZA**

**IMPLEMENTATION PLAN**



HOMELAND SECURITY COUNCIL

MAY 2006

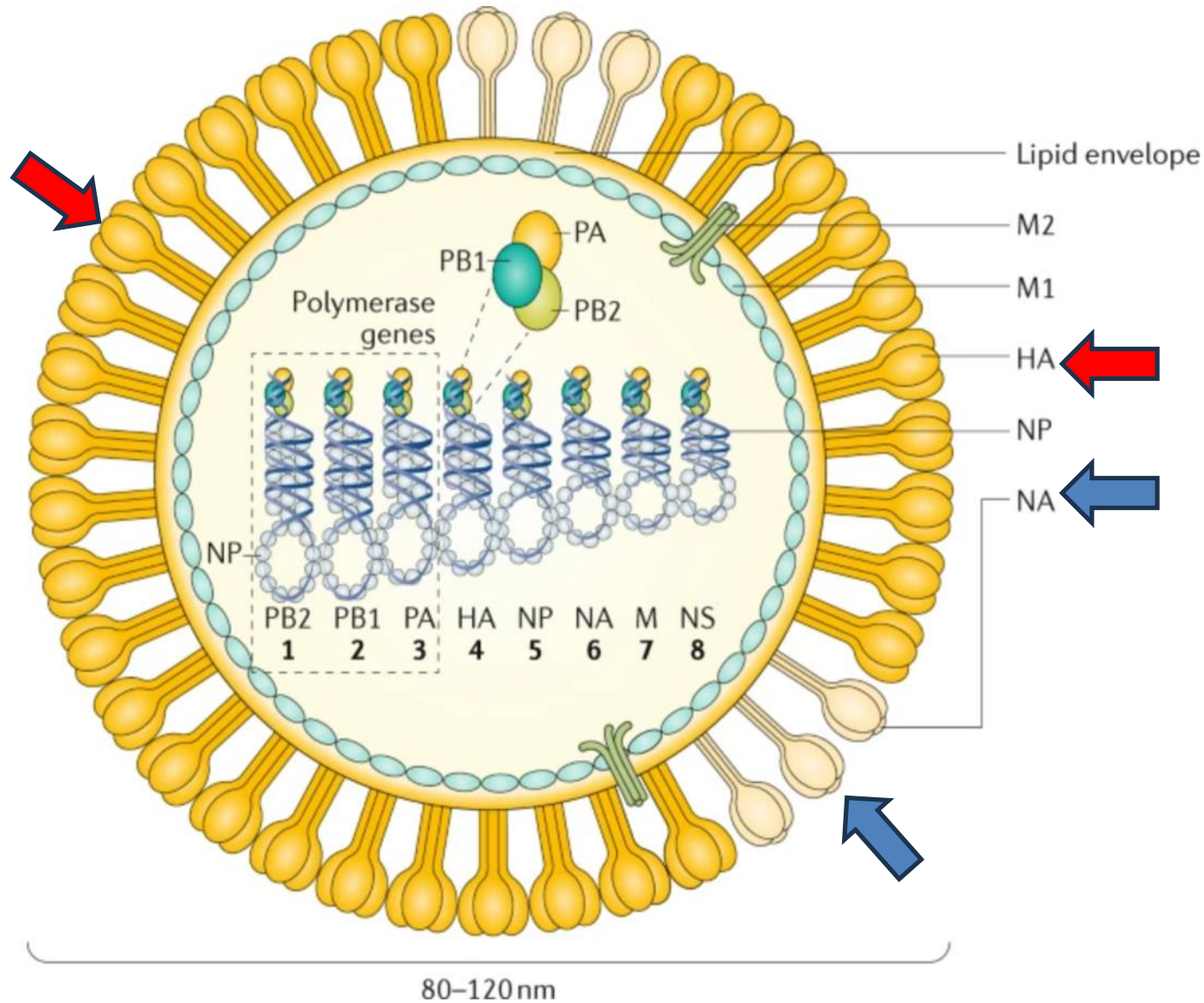
**PANDEMIC INFLUENZA**

**WHO Global Pandemic Phases and the Stages for Federal Government Response**

WHO Phases		Federal Government Response Stages	
<b>INTER-PANDEMIC PERIOD</b>			
<b>1</b>	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human disease is considered to be low.	<b>0</b>	New domestic animal outbreak in at-risk country
<b>2</b>	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.		
<b>PANDEMIC ALERT PERIOD</b>			
<b>3</b>	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.	<b>0</b>	New domestic animal outbreak in at-risk country
		<b>1</b>	Suspected human outbreak overseas
<b>4</b>	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.	<b>2</b>	Confirmed human outbreak overseas
<b>5</b>	Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).		
<b>PANDEMIC PERIOD</b>			
<b>6</b>	Pandemic phase: increased and sustained transmission in general population.	<b>3</b>	Widespread human outbreaks in multiple locations overseas
		<b>4</b>	First human case in North America
		<b>5</b>	Spread throughout United States
		<b>6</b>	Recovery and preparation for subsequent waves



**Fig. 1: Influenza A and influenza B.**



**In avian/human flu viruses:**

**16 H options  
9 N options**

**H5N1**





**Fig. 2: Influenza pandemics.**

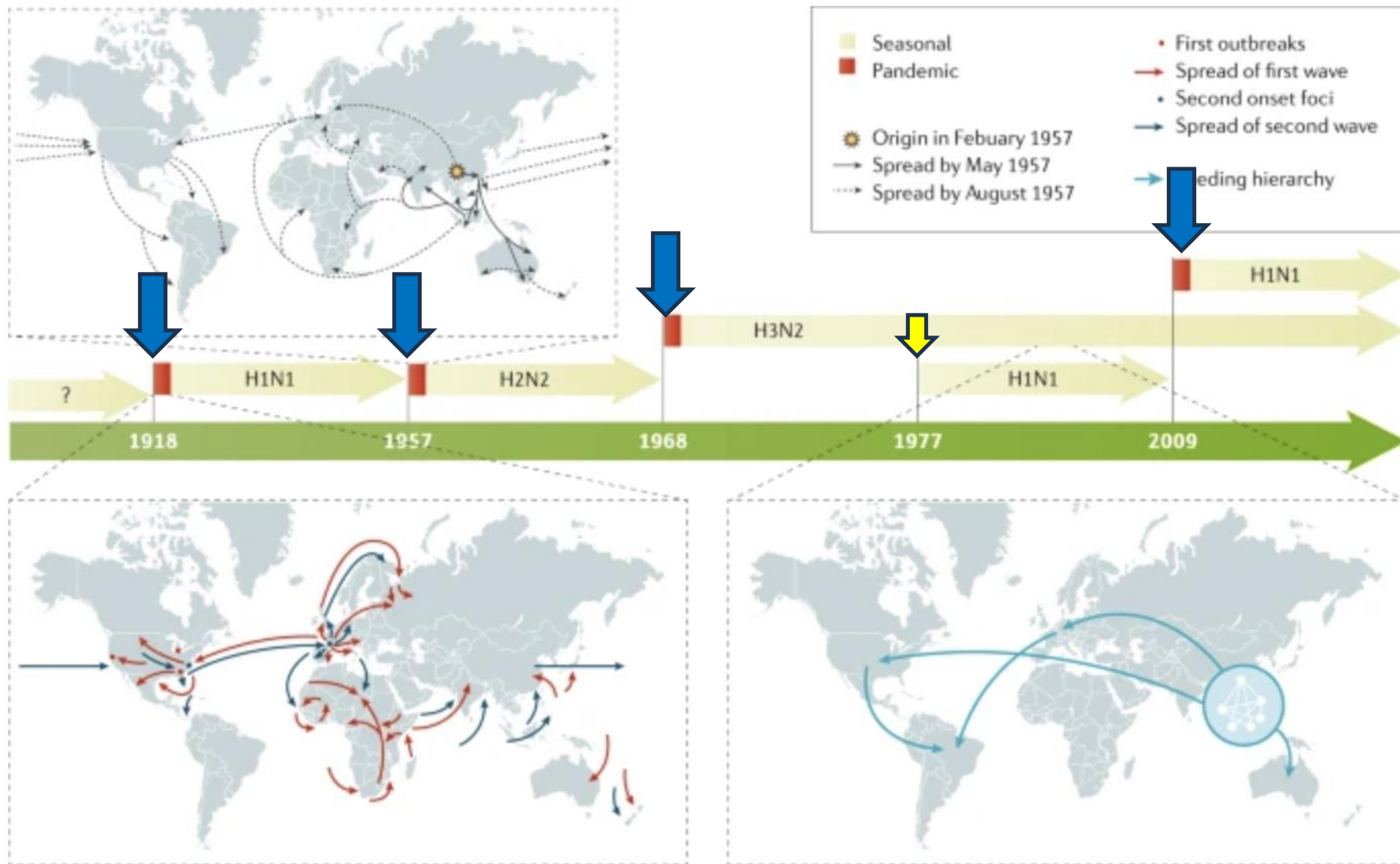
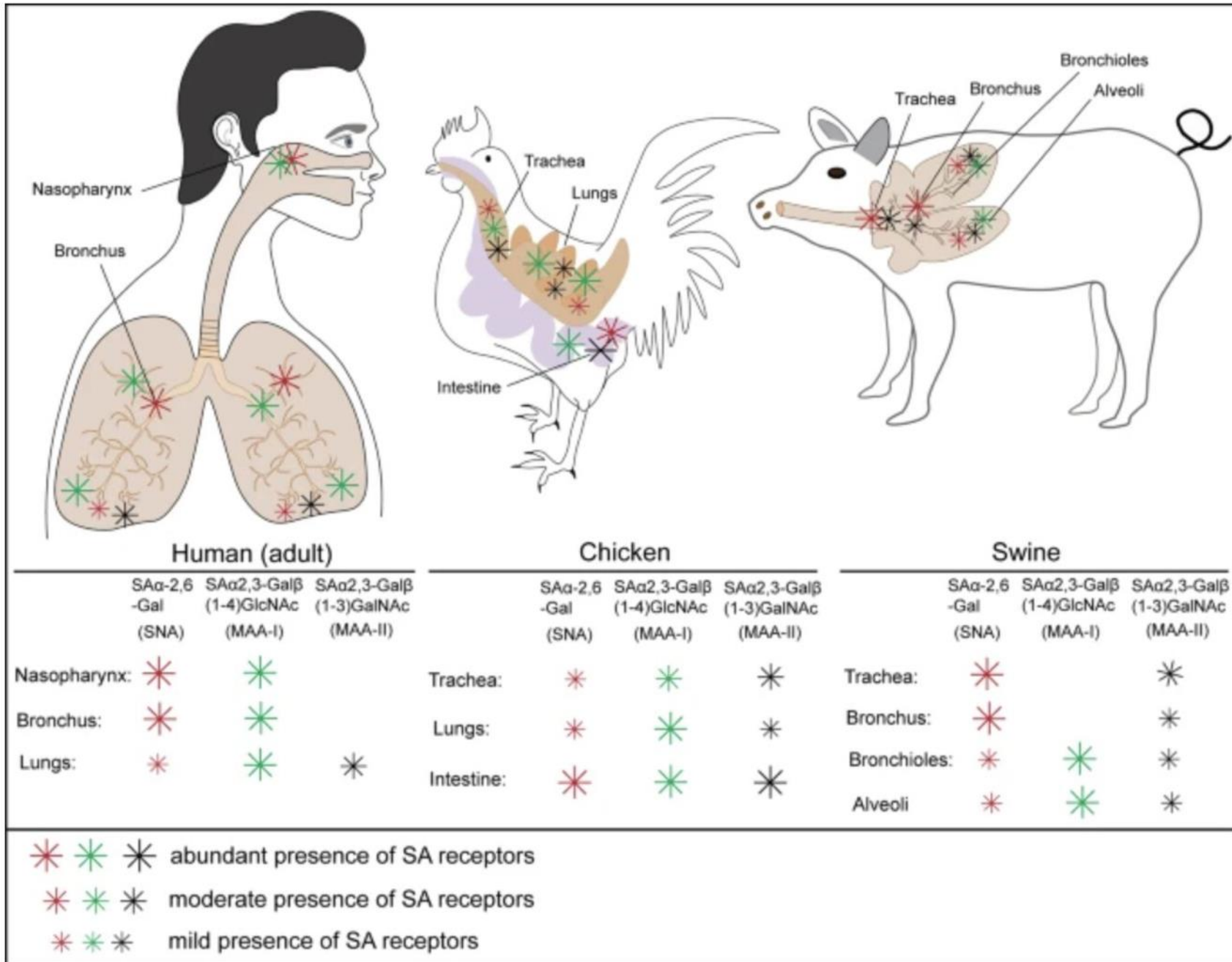
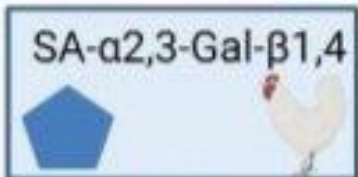


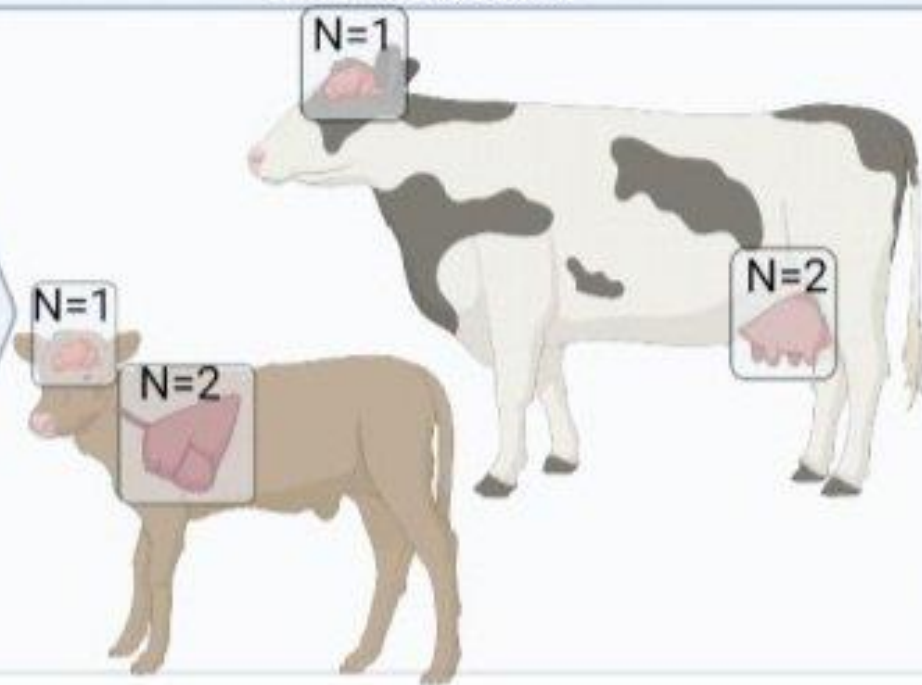
Fig. 2



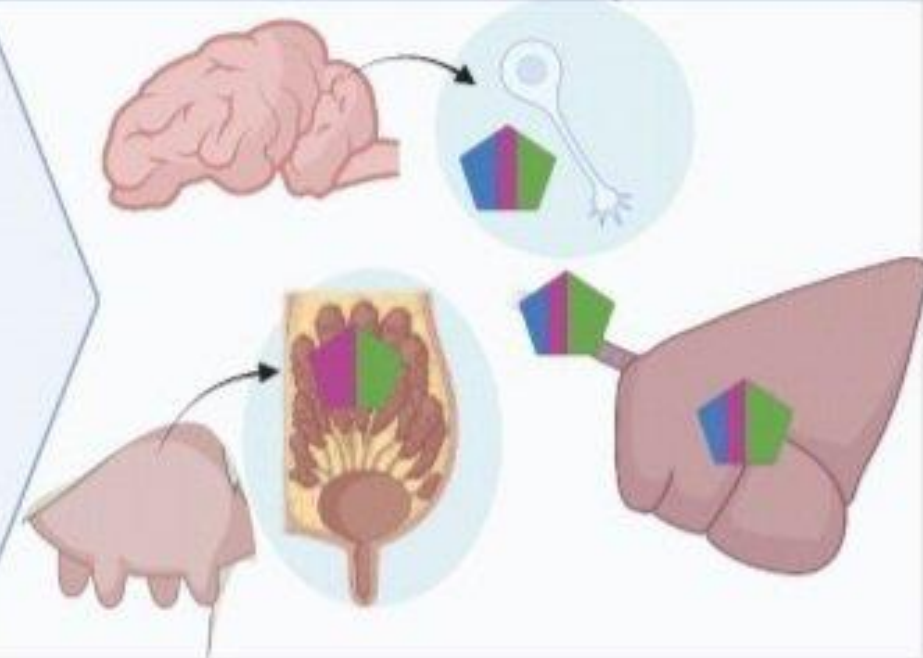
### Influenza A virus receptors



### Bovine tissues



### Distribution of receptors



## Cumulative number of confirmed human cases† for avian influenza A(H5N1) reported to WHO, 2003-2024

Country	2003-2009*		2010-2014*		2015-2019*		2020		2021		2022		2023		2024		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	5
Bangladesh	1	0	6	1	1	0	0	0	0	0	0	0	0	0	0	0	8	1
Cambodia	9	7	47	30	0	0	0	0	0	0	0	0	6	4	5	1	67	42
Canada	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Chile	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
China	38	25	9	5	6	1	0	0	0	0	1	1	1	0	0	0	55	32
Djibouti	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ecuador	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Egypt	90	27	120	50	149	43	0	0	0	0	0	0	0	0	0	0	359	120
India	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Indonesia	162	134	35	31	3	3	0	0	0	0	0	0	0	0	0	0	200	168
Iraq	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	2	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	2
Myanmar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Nepal	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
Nigeria	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Pakistan	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Spain	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0
Thailand	25	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	17
Turkey	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	4
United Kingdom	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	5	0
United States of America	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Viet Nam	112	57	15	7	0	0	0	0	0	0	1	0	0	0	0	0	128	64
<b>Total</b>	<b>468</b>	<b>282</b>	<b>233</b>	<b>125</b>	<b>160</b>	<b>48</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>12</b>	<b>4</b>	<b>5</b>	<b>128</b>	<b>887</b>	<b>462</b>

\*2003-2009, 2010-2014 and 2015-2019 total figures. Breakdowns by year available on subsequent tables.

†This count includes reported detections in asymptomatic individuals. In some cases, the confirmation of infection versus transient contamination of the nasopharynx/oropharynx with virus particles after exposure to infected birds or contaminated environment remains inconclusive. Total number of cases includes number of deaths.

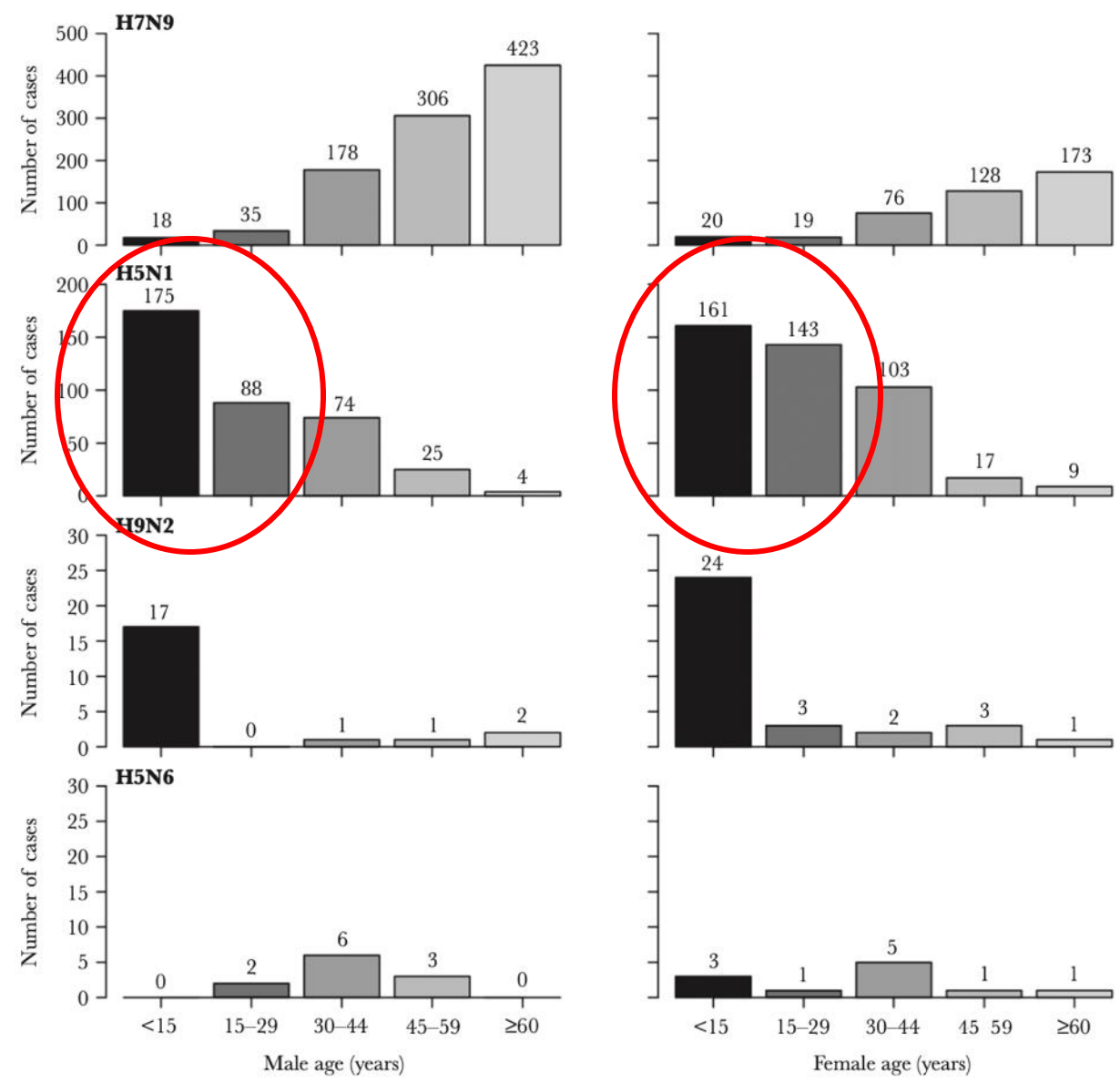
WHO reports only laboratory-confirmed cases. All dates refer to onset of illness.

Source: WHO/GIP, data in HQ as of 26 February 2024.



**CFR = 52%**





**Figure 4.** Distribution of the human cases per age categories and sex for H7N9, H5N1, H9N2, and H5N6. Subtypes are ordered according to the total number of cases reported in descending order.



# UK ups risk assessment for H5N1 in US dairy cattle

News brief | July 26, 2024

Lisa Schnirring

Topics: [Avian Influenza \(Bird Flu\)](#)

3107 H5N1 Risk assessment

0

1

2

3

4

5

6

Current UK rating

**Level 0**  
Avian influenza circulating in birds, epidemiology within seasonal norms

**Level 1**  
Avian influenza circulating in birds, epidemiology outside seasonal norms

**Level 2**  
Evidence of propensity to infect humans and/or other mammals (individual cases without onwards transmission)

**Level 3**  
Limited or facilitated mammalian transmission

**Level 4**  
Sustained and/or multispecies mammalian outbreaks; increasing human zoonotic cases or limited person to person spread, linked to zoonotic exposures

**Level 5**  
Human outbreaks (larger or without identified zoonotic links)

**Level 6**  
Sustained human to human transmission

# UK HSA Warning



“Dr Susan Hopkins, the Chief Medical Advisor of the UK Health Security Agency (UKHSA), said the US outbreak “demonstrates that influenza A (H5N1) continues to infect new mammals and spread between them.”

“But decode the language and you find that the UKHSA puts the likelihood of H5N1 crossing the threshold and evolving into a likely pandemic at somewhere **between one-in-ten and one-in-three** – barely long odds.”

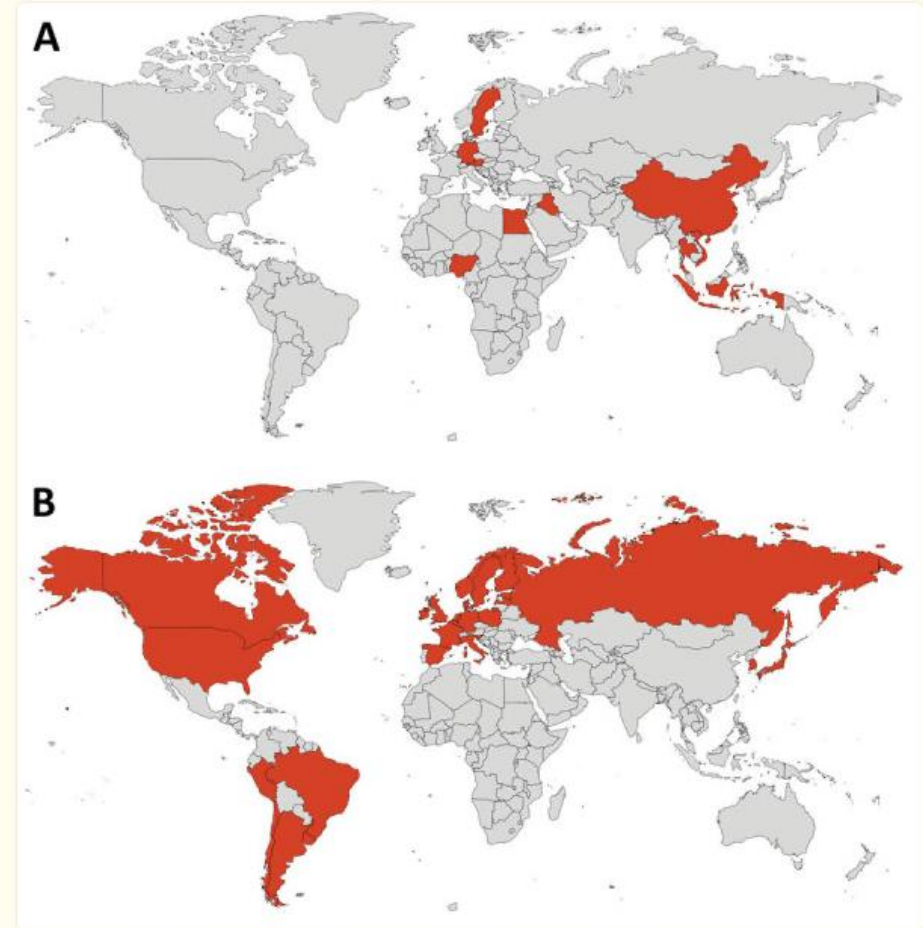
<https://www.telegraph.co.uk/global-health/science-and-disease/bird-flu-pandemic-threat-rises-experts-say-risk-is-low/>





## Recent Changes in Patterns of Mammal Infection with Highly Pathogenic Avian Influenza A(H5N1) Virus Worldwide

[Pablo I. Plaza](#), [Victor Gamarra-Toledo](#), [Juan Rodríguez Euguí](#), and [Sergio A. Lambertucci](#)



[Figure 1](#)

Geographic location of mammal species affected by highly pathogenic influenza virus A(H5N1) in previous waves of infection, 2003–2019 (A), and in the current panzootic, 2020–2023 (B).



New Results

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## Massive outbreak of Influenza A H5N1 in elephant seals at Península Valdés, Argentina: increased evidence for mammal-to-mammal transmission

Marcela Uhart, Ralph E. T. Vanstreels, Martha I. Nelson, Valeria Olivera, Julieta Campagna, Victoria Zavattieri, Philippe Lemey, Claudio Campagna, Valeria Falabella, Agustina Rimondi  
doi: <https://doi.org/10.1101/2024.05.31.596774>

This article is a preprint and has not been certified by peer review [what does this mean?].



Posted June 01, 2024.

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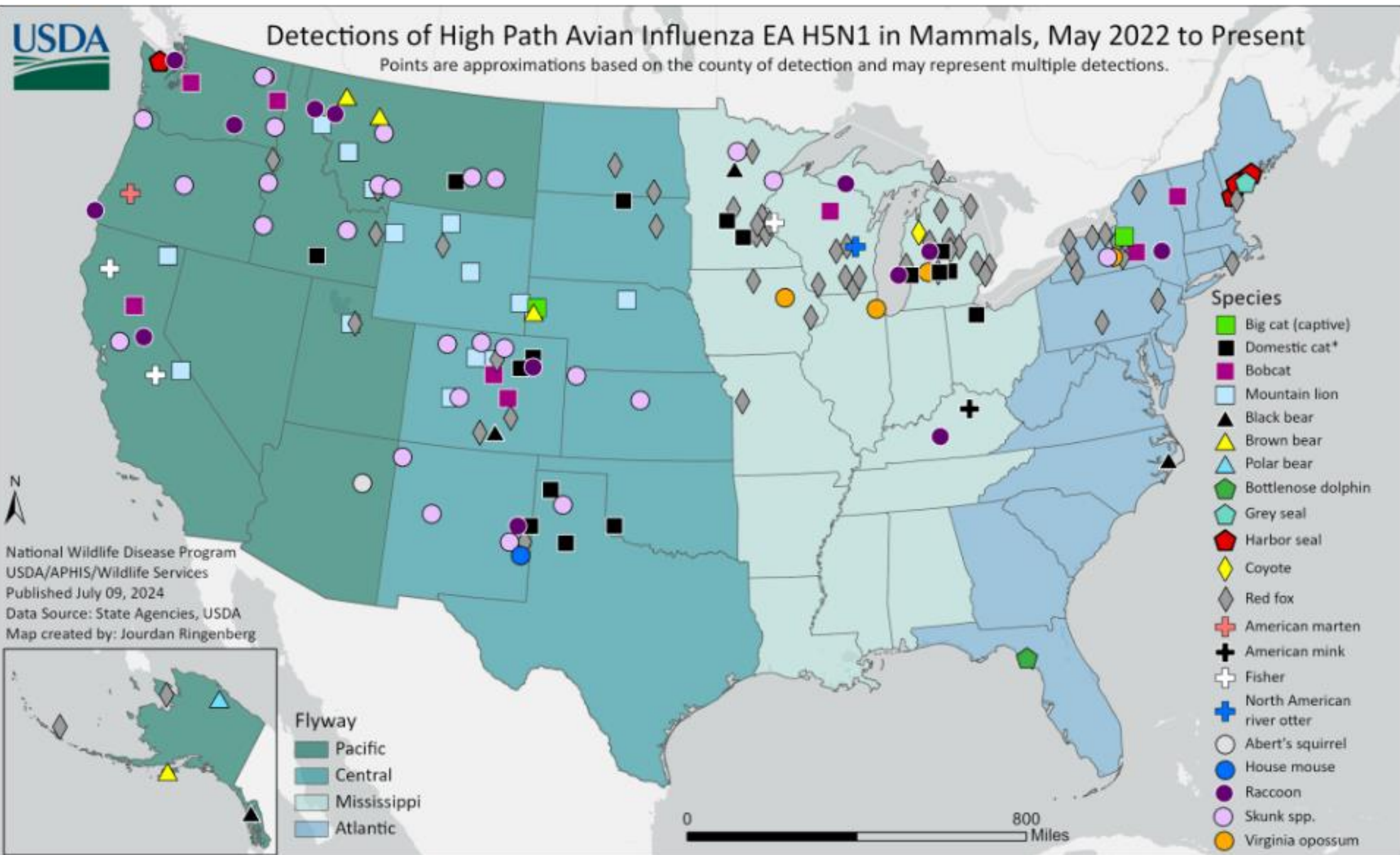
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# Detections of High Path Avian Influenza EA H5N1 in Mammals, May 2022 to Present

Points are approximations based on the county of detection and may represent multiple detections.





# Avian Influenza (Bird Flu)

EXPLORE TOPICS

## H5 Bird Flu: Current Situation

### National flu surveillance (since February 25, 2024)

Specimens tested
<b>39,500+</b> specimens tested that would have detected influenza H5 or other novel influenza viruses

**Roughly 100,000 respiratory Infections/ILI present to US healthcare per day**

### Targeted H5 surveillance (since March 24, 2024)

Total people monitored	Total people tested	Human cases
<b>4,500+</b> after exposure to infected animals	<b>230+</b> after exposure to infected animals	<b>13</b> total reported human cases in the United States

### Cumulative surveillance (since 2022)

#### Humans

Total Reported Human Cases in the United States: **14** (since 2022)

**4** following exposure to dairy cows (reported between 4/1/2024 and 7/3/2024) | [Full Report](#)

**10** following exposure to poultry (reported between 4/28/2022 and 7/25/2024) | [Full Report](#)

States with Reported Case(s): **3**

*\*9 of the 14 H5 human cases reported in the US have been confirmed as H5N1.*

[Learn More](#)

Wild Birds Detected	Poultry Affected	Dairy Herds Affected
<b>9,715</b> as of 8/6/2024   <a href="#">Full Report &gt;</a>	<b>100,712,371</b> as of 8/7/2024   <a href="#">Full Report &gt;</a>	<b>189</b> as of 8/8/2024   <a href="#">Full Report &gt;</a>

Jurisdictions with Bird Flu in Wild Birds	States with Outbreaks in Poultry	States with Outbreaks in Dairy Cows
<b>50</b>	<b>48</b>	<b>13</b>



# HPAI Confirmed Cases in Livestock Herds

as of August 13, 2024

Last reported confirmed detection Tuesday, August 6, 2024

Data updated weekdays by 12pm Eastern

[Download Data](#)

Choose time period

Total Outbreak ▾

## Situational Update

[Click for International Exports](#)

Confirmed Cases Total Outbreak

**190**

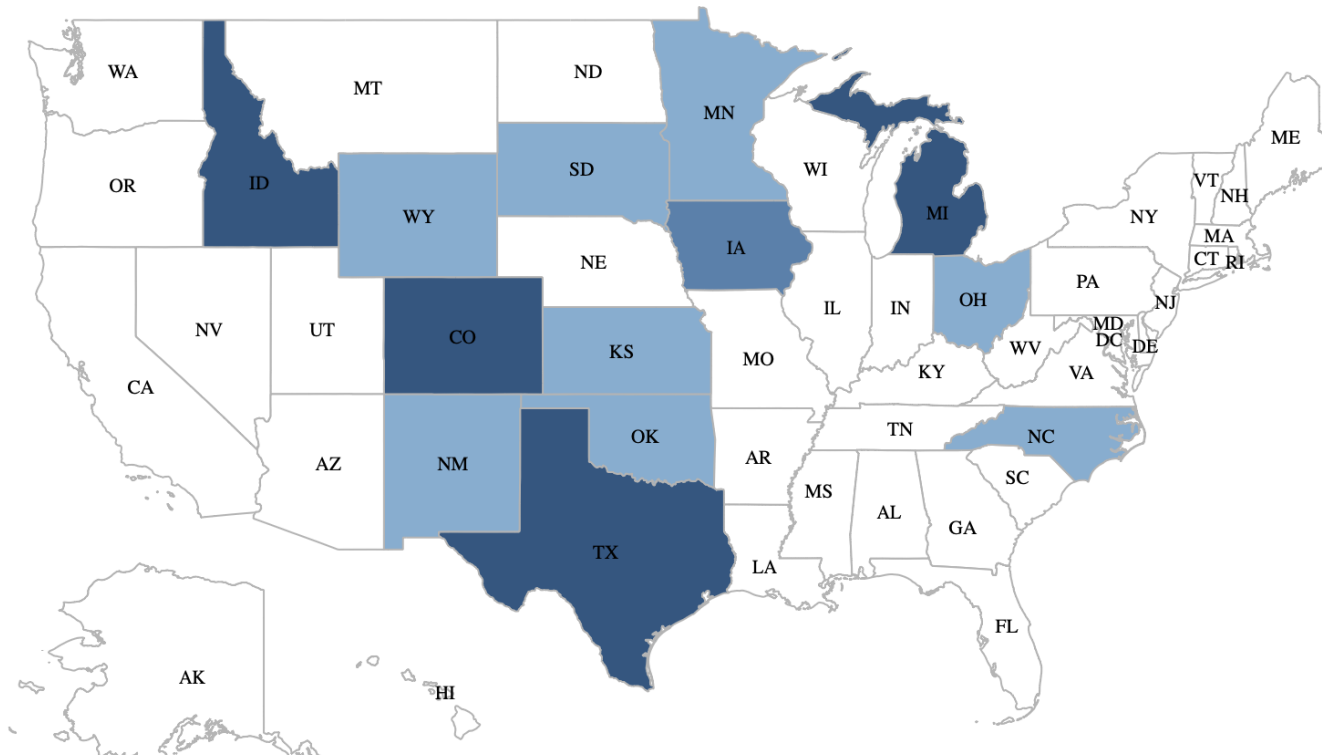
States Affected Total Outbreak

**13**

### Number of Confirmed Cases by State

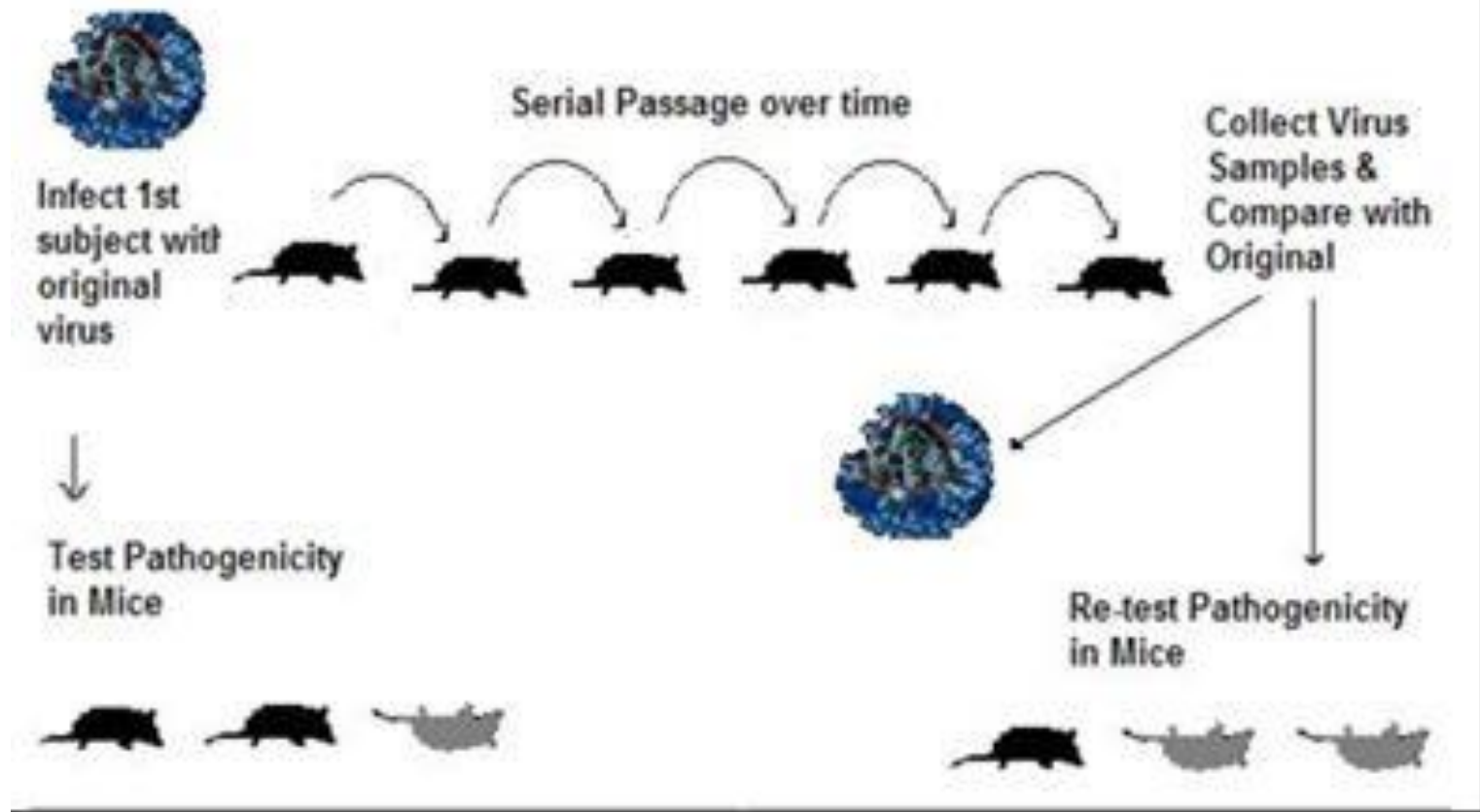
Legend

- 0
- 1 to 10
- 11 to 20
- 20+





## Serial Passage Experiment



<https://afludiary.blogspot.com/2016/09/virology-j-adaptation-of-hpai-h5n2-in.html>



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## A One Health Investigation into H5N1 Avian Influenza Virus Epizootics on Two Dairy Farms

Ismaila Shittu, Diego Silva, Judith U. Oguzie, Lyudmyla V. Marushchak, Gene G. Olinger, John A. Lednicky, Claudia M. Trujillo-Vargas, Nicholas E. Schneider, Haiping Hao,  Gregory C. Gray

doi: <https://doi.org/10.1101/2024.07.27.24310982>

**This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should not be used to guide clinical practice.**



**Abstract** Full Text Info/History Metrics  Preview PDF

Posted July 31, 2024.

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**COVID-19 SARS-CoV-2 preprints from medRxiv and bioRxiv**

Subject Area



Table 1: Demographic characteristics of participants from the two dairy farms

Participants characteristics	Farm B		
	Farm A (n=10)	(n=7)	Combined
Age in years, median (range)	38 (26 – 59)	27 (16 – 39)	33 (16-59)
Male/female number	7/3	5/2	
Ethnicity			
Latino	10 (100%)	5 (71.4%)	15 (88.2%)
American-Indian or Alaska native	-	2 (28.6%)	2 (11.8%)
Highest level of education			
Primary (grades 1-5)	1 (10%)	2 (28.6%)	3 (17.65%)
Secondary	1 (10%)	3 (42.9%)	4 (23.53%)
Tertiary	2 (20%)	1 (14.3%)	3 (17.65%)
College (2 years)	1 (10%)	1 (14.3%)	2 (5.88%)
College (4 years)	5 (50%)	-	5 (35.29%)
History of chronic breathing problems?			
Yes	-	-	
No	9 (90%)	7 (100%)	16 (94.1%)
Unknown	1	-	1 (5.9%)
Have you ever used inhaled tobacco products?			
Yes	1	2	3 (17.7%)
Previously	1	-	1 (5.9%)
No	8	5	13 (76.4%)
Any medications in the last 30 days?			
Yes (antibiotics, ibuprofen, multivitamin, cough syrup, diarrhea pills, dewormer and hear problem)	4 (40%)	1 (14.3%)	5 (29.4%)
No	6 (60%)	6 (85.7%)	12 (70.6%)

Recent respiratory illness? Yes	4 (40%)	1 (14.3%)	5 (29.4%)
Past respiratory illness (last 12 months)? Yes	5 (50%)	4 (57.1%)	9 (52.9%)
Recent respiratory illness noticed among household? Yes	6 (60%)	-	6 (35.3%)
Recent respiratory illness noticed among co-workers? Yes	4 (40%)	2 (28.5%)	6 (35.3%)
Have you received vaccination for human influenza? Yes	8 (80%)	1 (14.2%)	9 (52.9%)
Have you received vaccination for human SARS-CoV-2? Yes	10 (100%)	1 (14.2%)	11 (64.7%)
Job type on the farm?			
Calf caretaker	1 (10%)	-	1 (5.8%)
Veterinarian	-	1 (14.2%)	1 (5.8%)
Inseminator	-	1 (14.2%)	1 (5.8%)
Feeders	1 (14.2%)	1 (14.2%)	2 (11.7%)
Milkers	1 (10%)	4 (57.1%)	5 (29.4%)
Tractor driver/maintenance	4 (40%)	-	4 (23.5%)
Maternity	1 (10%)	-	1 (5.8%)
Maintenance	1 (10%)	-	1 (5.8%)
Mechanic shop	2 (20%)	-	2 (11.7%)
Cleaning services	2 (20%)	-	2 (11.7%)
Hospital	1 (10%)	-	1 (5.8%)
Breeder	-	1 (14.2%)	1 (5.8%)
Others			3 (17.6%)

Table 2. Farm workers clinical history and laboratory assay results.

Sample ID		Respiratory symptoms	Nasopharyngeal swab		MN*
number	Farm	during the last 12 months?	influenza A qRT-PCR (Ct)	MN* titer	interpretation
USH_01	Farm A	No	Negative	1:20	Negative
USH_02	Farm A	Yes	Negative	1:10	Negative
USH_03	Farm A	Yes	Negative	1:10	Negative
USH_04	Farm A	Yes	Negative	<1:10	Negative
USH_05	Farm A	No	Negative	<b>1:40</b>	<b>Positive</b> ←
USH_06	Farm A	Yes	Negative	1:20	Negative
USH_07	Farm A	No	Negative	1:20	Negative
USH_08	Farm A	Yes	Negative	1:20	Negative
USH_09	Farm A	Yes	Negative	1:20	Negative
USH_10	Farm A	Yes	Negative	<b>1:80</b>	<b>Positive</b> ←
USH_11	Farm B	No	Negative	1:20	Negative
USH_12	Farm B	No	Negative	1:20	Negative
USH_13	Farm B	Yes	Negative	NA	NA
USH_14	Farm B	Yes	Negative	NA	NA
USH_15	Farm B	No	Negative	1:20	Negative
USH_16	Farm B	Yes	Negative	1:20	Negative
USH_17	Farm B	Yes	Negative	NA	NA

\*Serologic microneutralization (MN) assays were run against recombinant H5N1 (rg-A/bald eagle/Florida/W22-134-

OP/2022 of clade 2.3.4.4b), NA = Not applicable





# Considerations for Human H5 Cases Presenting to Healthcare

- Is this a sporadic animal-to-human case (low risk)?
- Is this a virus with mutations adapting to human infection and transmission (higher risk)?
- Is this human-to-human transmission case (high risk)?



# Objectives for US Healthcare in H5N1

- Increased surveillance/detection
  - Awareness of clinical syndromes and epidemiological risk
  - Testing and subtyping influenza viruses
- Identification of PUI and appropriate response
  - Identify, Isolate, Inform
- Prevent ongoing transmission
  - Respiratory isolation
- Treatment
  - Neuraminidase inhibitors, supportive care



# FDA Approved Tests for Subtyping Influenza A\*

- BioCode (Applied Biocode, Inc)
- Idylla (Biocartis NV)
- BioFire (Biofire Diagnostics, LLC)
- ePlex/eSensor (GenMark Diagnostics, Inc)
- Verigene (Luminex Corp)
- NxTAG (Luminex Molecular Diagnostics, Inc)
- QIAstat-DX (Qiagen GmbH)
- CDC Assay

\*20 out of 93 FDA-approved influenza A assays



# What Can We Do?

- Be aware of risk and screen patients presenting with ILI, ARI, or conjunctivitis
- Identify PUIs
- Implement appropriate IPC for PUIs
- Use sub-typing influenza test for PUI if possible
  - Single influenza test isn't always enough!
- For Flu A + and H1/H3 negative results, refer immediately to CDC and further testing for H5 or sequencing
  - This result should raise concern level
- Notify public health early





# NETEC Resources

## Training, Education, and Consultation

- [NETEC Hospital SPORA](#)
- [NETEC EMS SPORSA](#)
- [PPE from A to Z: PAPRs for Respiratory Protection](#)
- [NETEC: Identify, Isolate, and Inform](#)
- [Highly Pathogenic Avian Influenza - NETEC](#)





# Highly Pathogenic Avian Influenza Resources

## Outbreak Information:

- [Current H5N1 Bird Flu Situation in Dairy Cows | Bird Flu | CDC](#)
- [The Transmission](#)
  - [Subscribe to the Transmission](#)
- [ProMED](#)
  - [Subscribe](#) to ProMED Email Newsletter

## Training, Education, and Consultation:

- [Introduction to the 2024 Joint Commission Standards for Infection Control](#)
- [Request a Training from the Region VII RESPTC](#)
  - Hospital and EMS Education Available!
- Request a Region VII RESPTC Site Visit.
  - [Jgruber@nebraskamed.com](mailto:Jgruber@nebraskamed.com)



## Contact Us:

Contact the Region VII RESPTC directly at [Jgruber@nebraskamed.com](mailto:Jgruber@nebraskamed.com)