AVIAN INFLUENZA UPDATE AND BIOSAFETY PRECAUTIONS

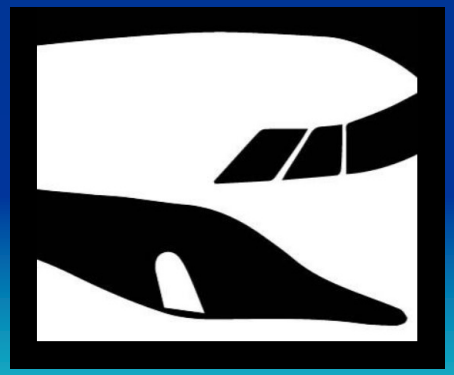
Bird Strike Committee Meeting – 8 April 2025

Jay Tischendorf DVM

American Ecological Research Institute (--AERIE)

Cell: 406-799-4405

WildlifeVetUSA@gmail.com



AGENDA

- Recommendations
- Influenza Basics and Background
- Current Situation
- Future?
- Summary and Recommendations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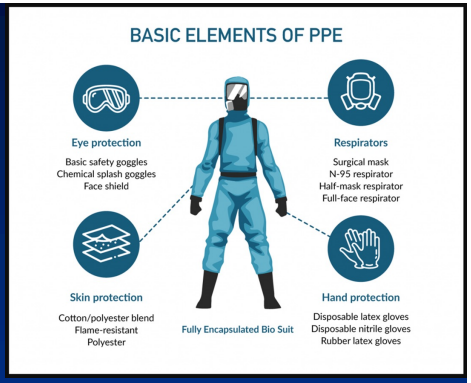
RECOMMENDATIONS



- Embrace today's opportunity
- Adopt a policy of "PROFESSIONALISM AND PROTECTION"
- Stand tall and don't apologize
- **Proudly maximize BIOSECURITY and the use of PPE**

INFLUENZA BASICS AND BACKGROUND

- Virus
- Global
- Zoonotic and mutates easily

- Viruses need cells of a host to survive and replicate

Flu | Flu | Prevention | Vaccines | Educational Resources | CDC Flu Vaccine Finder

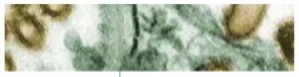
Home > Articles > **The History of Influenza**

OUTBREAK

Origins of influenza

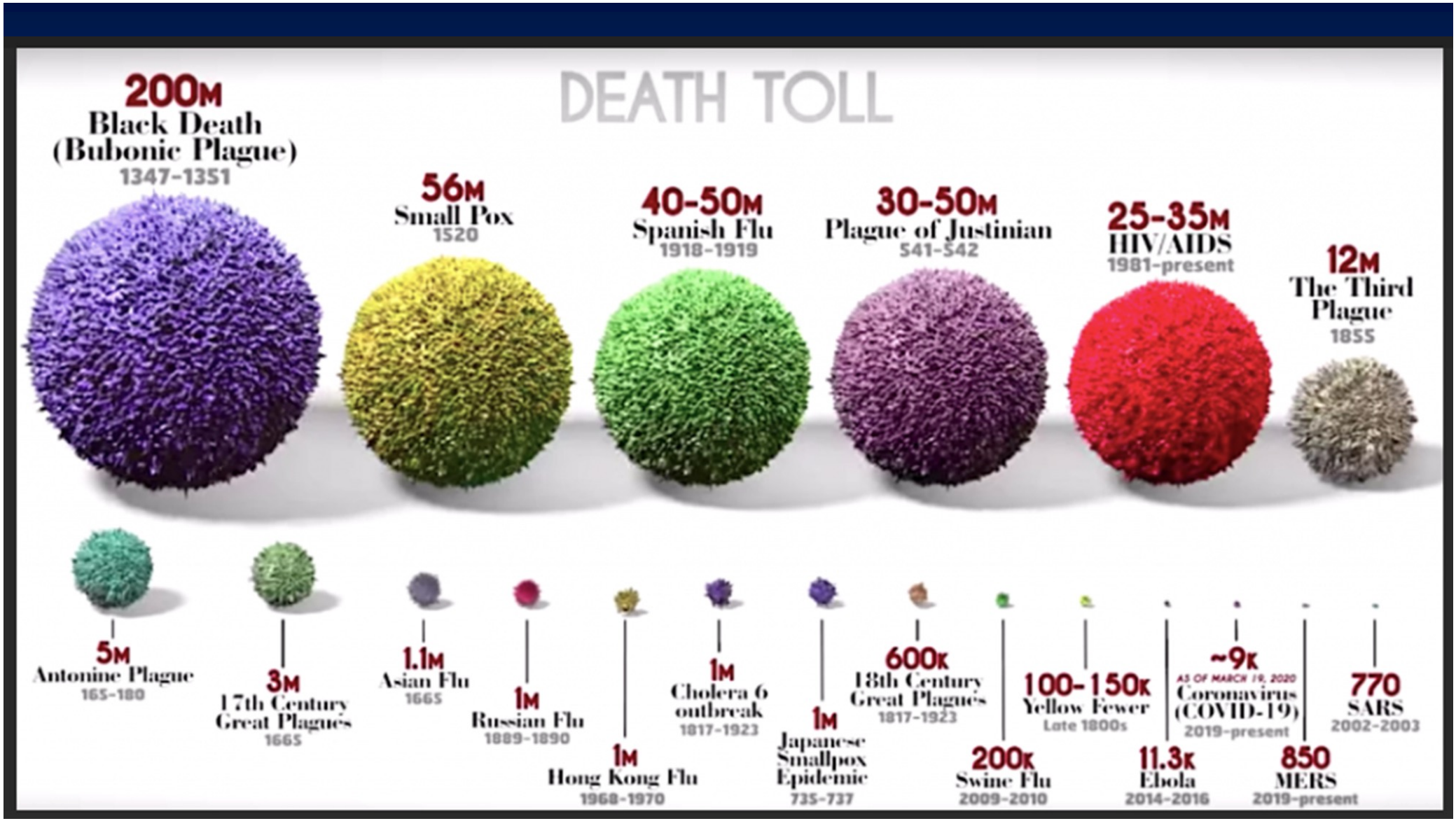
When did the influenza virus first infect humans? Some scientists hypothesize that humans probably acquired influenza when they began domesticating animals like birds and pigs. The rise of agriculture and permanent settlements provided ideal conditions to trigger a flu epidemic.

REGION: Global



Electron micrograph of avian influenza.

Cave paintings from Lascaux caves depicting animals during prehistoric times.


DEATH TOLL
200M
Black Death
(Bubonic Plague)
1347-1351
56M
Small Pox
1520
40-50M
Spanish Flu
1918-1919
30-50M
Plague of Justinian
541-542
25-35M
HIV/AIDS
1981-present
12M
The Third
Plague
1855
5M
Antonine Plague
165-180
3M
17th Century
Great Plagues
1665
1.1M
Asian Flu
1665
1M
Russian Flu
1889-1890
1M
Hong Kong Flu
1968-1970
1M
Cholera 6
outbreak
1817-1923
1M
Japanese
Smallpox
Epidemic
735-737
600K
18th Century
Great Plagues
1817-1923
200K
Swine Flu
2009-2010
100-150K
Yellow Fewer
Late 1800s
11.3K
Ebola
2014-2016
~9K
AS OF MARCH 19, 2020
Coronavirus
(COVID-19)
2019-present
850
MERS
2019-present
770
SARS
2002-2003

SPANISH FLU

RECENT INFLUENZA TIMELINE

1945

The first flu vaccines are approved for use for people who aren't in the U.S. military.

1957-1958

A new H2N2 flu strain causes another flu pandemic. About 116,000 people die in the U.S. and about 1.1. million die worldwide.

1960

In response to the flu pandemic that happened from 1957 to 1958, the U.S. Public Health Service recommends flu vaccines for people in the U.S. who are at high risk of flu complications.

1968

A new H3N2 flu strain causes another flu pandemic. This flu pandemic causes about 100,000 deaths in the U.S. and about 1 million deaths throughout the world. Researchers develop flu vaccines for the specific flu strains causing the pandemic.

1997

Bird flu (avian influenza) caused by the H5N1 flu strain infects people. This leads to the development of pandemic flu response plans in the U.S. and throughout the world.

2002

ACIP recommends that children ages 6 to 23 months old get an annual flu vaccine.

2007

The FDA approves a flu vaccine for avian influenza A caused by the H5N1 flu strain.

2008

ACIP recommends that people ages 6 months to 18 years old get an annual flu vaccine.

2009

A new H1N1 flu strain causes a flu pandemic. During 2009, the flu causes about 61 million illnesses, 274,0000 hospital stays and 12,400 deaths. Later in 2009, an H1N1 flu vaccine becomes available.

2019-2020

Flu vaccines prevent about 7 million illnesses, 3 million doctor visits, 100,000 hospital stays and 7,000 deaths.

AVIAN FLU HISTORY

- "Fowl Plague" – Italy 1878
- Flu virus identified as cause – 1955
- Further identified as Type A form – 1971
- "Avian Influenza" replaces "Fowl Plague" – 1981
- Most forms are Low Pathogenic (LPAI)
  - Mild to no disease in both wild and domestic birds
- Highly Pathogenic (HPAI)
  - Mild signs in wild birds, but severe in domestic

CURRENT SITUATION

1996-1997 H5N1 bird flu virus first detected

In 1996, highly pathogenic avian influenza H5N1 virus is first identified in domestic waterfowl in Southern China. The virus is named A/goose/Guangdong/1/1996. In 1997, H5N1 poultry outbreaks happen in China and Hong Kong with 18 associated human cases (6 deaths) in Hong Kong. This virus would go on to cause more than 860 human infections with a greater than 50% death rate.

CURRENT SITUATION

H5N1 spreads 2003-2005

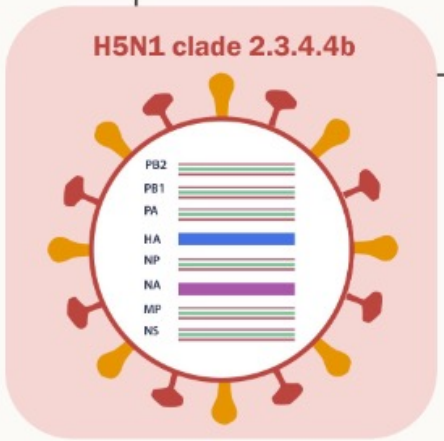
For several years, H5N1 viruses were not widely detected; however, in 2003, H5N1 re-emerges in China and several other countries to cause widespread poultry outbreaks across Asia. In 2005, wild birds spread H5N1 to poultry in Africa, the Middle East and Europe. The hemagglutinin (HA) gene of the virus diversifies into many genetic groups (clades). Multiple genetic lineages (genotypes) are detected.

CURRENT SITUATION

2014-2016 H5N6 and H5N8 viruses emerge

Gene-swapping of H5 viruses from poultry and wild birds leads to emergence/detection of H5N6 and H5N8 virus subtypes. HA diversifies further into clade 2.3.4.4 in Asia, Africa, Europe, the Middle East and North America. H5 viruses with various neuraminidase (NA) genes continue to be detected, including in U.S. wild birds and poultry.

CURRENT SITUATION



2021-2023 H5N1 found in Canada, US

A new H5N1 virus belonging to clade 2.3.4.4b with a wild bird adapted N1 NA gene emerges. Clade 2.3.4.4b H5N1 viruses become predominant in Asia, Africa, Europe, and the Middle East by the end of 2021. The virus is detected in wild birds in Canada and the United States in late 2021. In February 2022, the virus begins causing outbreaks in U.S. commercial and backyard poultry. Rare, sporadic human infections with this H5N1 virus are detected, as well as sporadic infections in mammals. More information is available:
https://www.cdc.gov/flu/avianflu/inhumans.htm.

5330646-B

Infections have led to the death and slaughter of more than 633 million poultry birds worldwide between 2005 and 2024, according to the World Animal Health Information System, which tracks official data on epidemiologically important diseases.

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One year after hitting dairy herds, bird flu continues to devastate poultry flocks

By Coral Beach on March 27, 2025

FSN Editors +

FSN Writers & Contributors

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Events Calendar

By Coral Beach on March 27, 2025

A year into the outbreak of avian flu, there is a continuing threat from the virus to poultry flocks and dairy herds, and to a lesser degree humans.

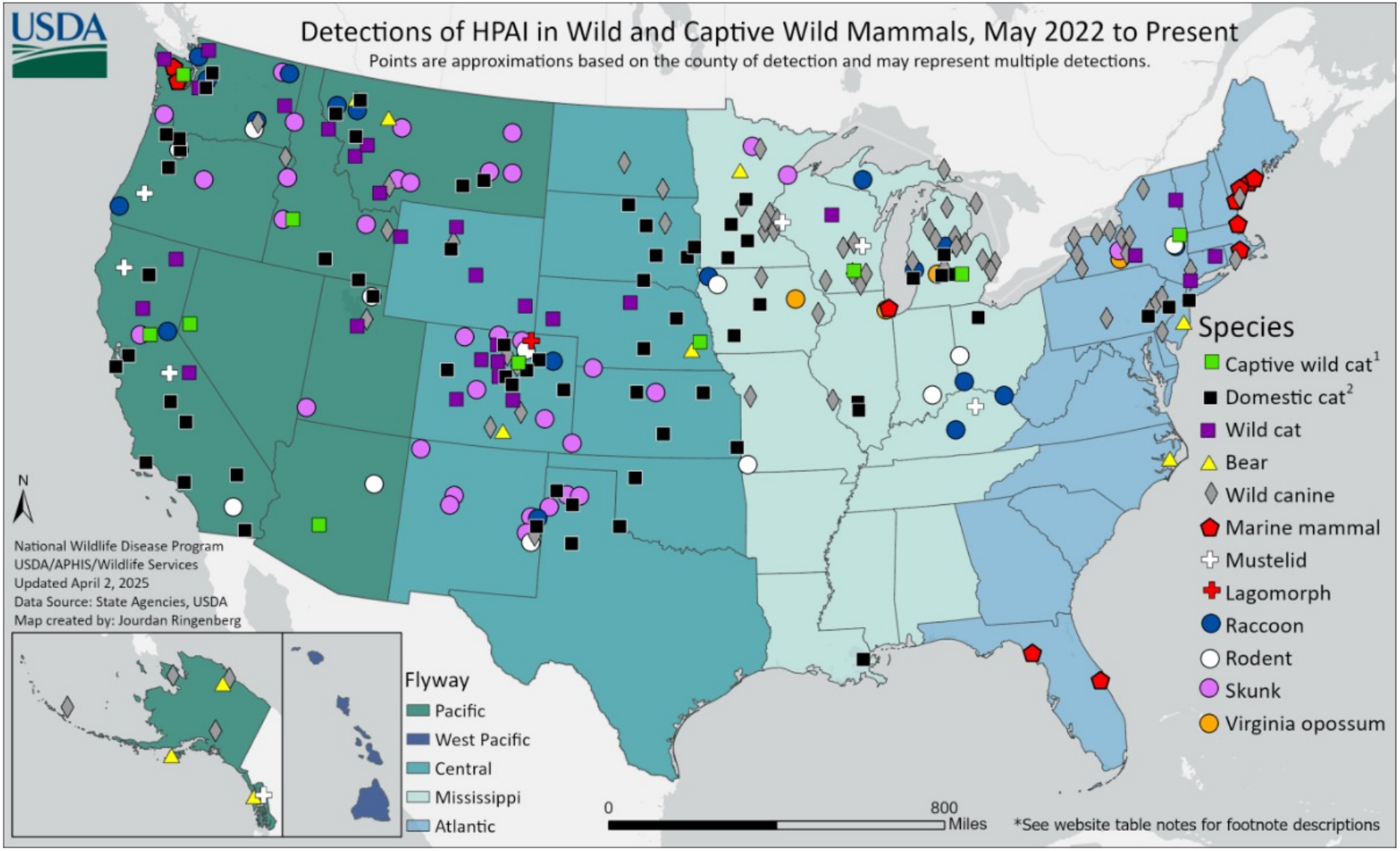
Since March 2024, the avian flu — also called bird flu or H5N1 — has infected almost 1,000 dairy herds across 17 states and necessitated the destruction of more than 165 million commercial chickens, according to the U.S. Department of Agriculture. The flu is blamed for soaring egg prices, which have reached $6 or more per dozen.

The virus has infected more than 70 people in the United States, mostly workers at dairy farms and poultry operations, according to the Centers for Disease Control and Prevention. One person who did not have either of those exposures died in Louisiana. The virus is present worldwide, with deaths having been reported in several countries.

Since its discovery in dairy cows and poultry, the virus has mutated and infected a variety of mammals, including house cats, ferrets, minks, swine and sea lions. Some of the house cats have been exclusively indoor pets and have died.

The virus has been detected in raw, unpasteurized milk and raw milk cheese, prompting warnings from public health officials.

The USDA has confirmed a new strain of the flu in dairy herds in Nevada and Utah, suggesting that it is continuing to mutate. There is concern that further mutation could lead to a strain that can be passed from person-to-person. One person in Nevada has already been infected by the new strain.


USDA
Detections of HPAI in Wild and Captive Wild Mammals, May 2022 to Present
Points are approximations based on the county of detection and may represent multiple detections.
Species
Captive wild cat[1]
Domestic cat[2]
Wild cat
Bear
Wild canine
Marine mammal
Mustelid
Lagomorph
Raccoon
Rodent
Skunk
Virginia opossum
N
National Wildlife Disease Program
USDA/APHIS/Wildlife Services
Updated April 2, 2025
Data Source: State Agencies, USDA
Map created by: Jourdan Ringenberg
Flyway
Pacific
West Pacific
Central
Mississippi
Atlantic
0
800
Miles
*See website table notes for footnote descriptions

CURRENT SITUATION

Comment

https://doi.org/10.1038/s44358-024-00008-7

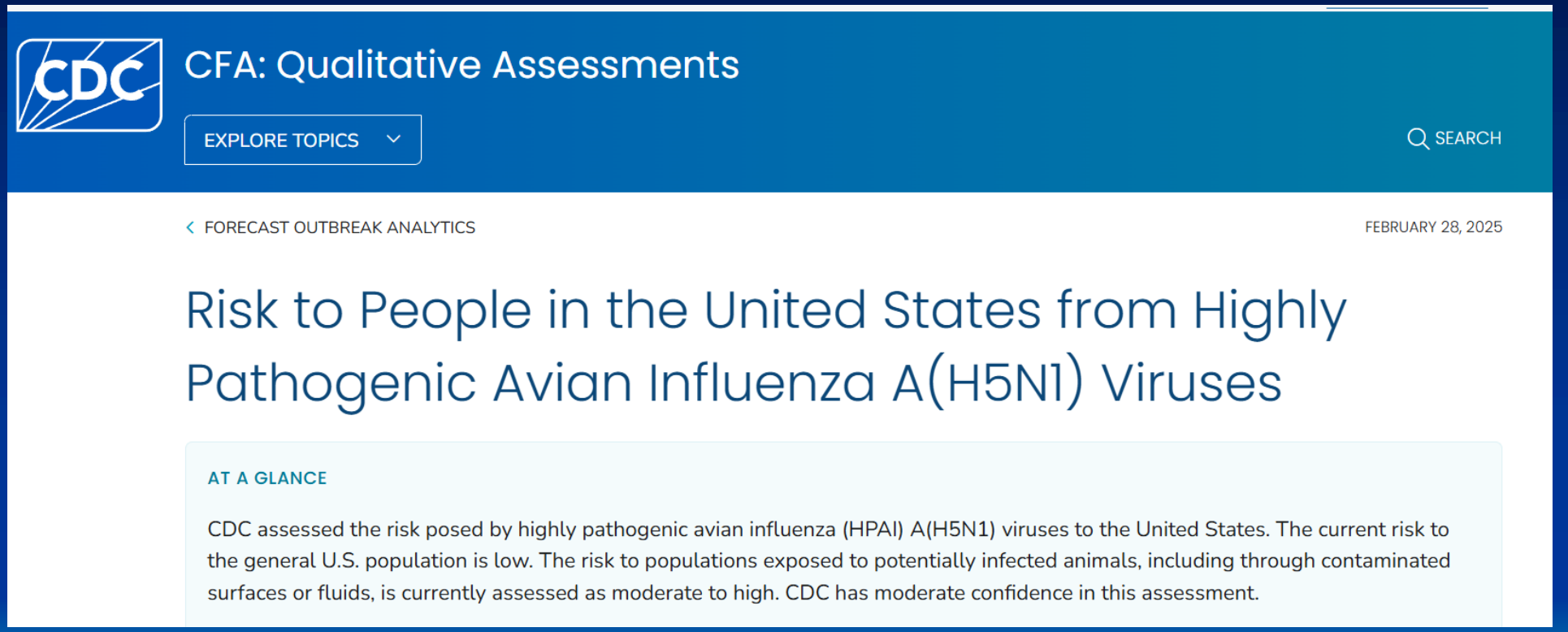
The threat of avian influenza H5N1 looms over global biodiversity

Sergio A. Lambertucci, Andrea Santangeli & Pablo I. Plaza

The highly pathogenic avian influenza H5N1 is an emerging and unexpected threat to many wild animal species, which has implications for ecological processes, ecosystem services and conservation of threatened species. International collaboration and information-sharing is essential for surveillance, early diagnosis and the provision of financial and technical instruments to enable worldwide actions.

Nature (IUCN) as either near threatened, vulnerable, endangered or critically endangered) owing to other anthropogenic threats (Fig. 1c) (data from WAHIS). In some species, a substantial fraction of global or regional populations was lost to H5N1. For example, over 20% of the Chilean population of Humboldt penguins (listed as vulnerable) presumably died of H5N1 in 2023 (ref. 11). Extremely concerning is the 2024 arrival of the virus in islands surrounding Antarctica, where a large fraction of the population of threatened species live, such as the vulnerable wandering albatross (as recorded by the Scientific Committee on Antarctic Research (SCAR)). Influenza viruses are listed by the IUCN as a threat for only 12% of the threatened species that already been infected, which is something that must be reevaluated now that spatial spread and mortality are increasing.

The unexpected threat of pathogens such as H5N1 can compromise many years of in situ and ex situ conservation efforts. One para-


CDC
CFA: Qualitative Assessments
EXPLORE TOPICS
SEARCH
FORECAST OUTBREAK ANALYTICS
FEBRUARY 28, 2025
Risk to People in the United States from Highly Pathogenic Avian Influenza A(H5N1) Viruses
AT A GLANCE
CDC assessed the risk posed by highly pathogenic avian influenza (HPAI) A(H5N1) viruses to the United States. The current risk to the general U.S. population is low. The risk to populations exposed to potentially infected animals, including through contaminated surfaces or fluids, is currently assessed as moderate to high. CDC has moderate confidence in this assessment.

As of February 28, 2025

CDC assessed the risk from H5N1 viruses to the U.S. general population and to populations in the United States with contact with potentially infected animals, including through contaminated surfaces or fluids. Risk describes the potential public health implications and significance of an outbreak for populations assessed. See definitions below for more detail.

Download

Population	Risk
General U.S. population	Low
Populations in the United States in contact with potentially infected animals or contaminated surfaces or fluids	Moderate to High
Confidence level in assessment	Moderate

Situation summary of confirmed and probable human cases since 2024

Confirmed Cases | Probable Cases

State or territory

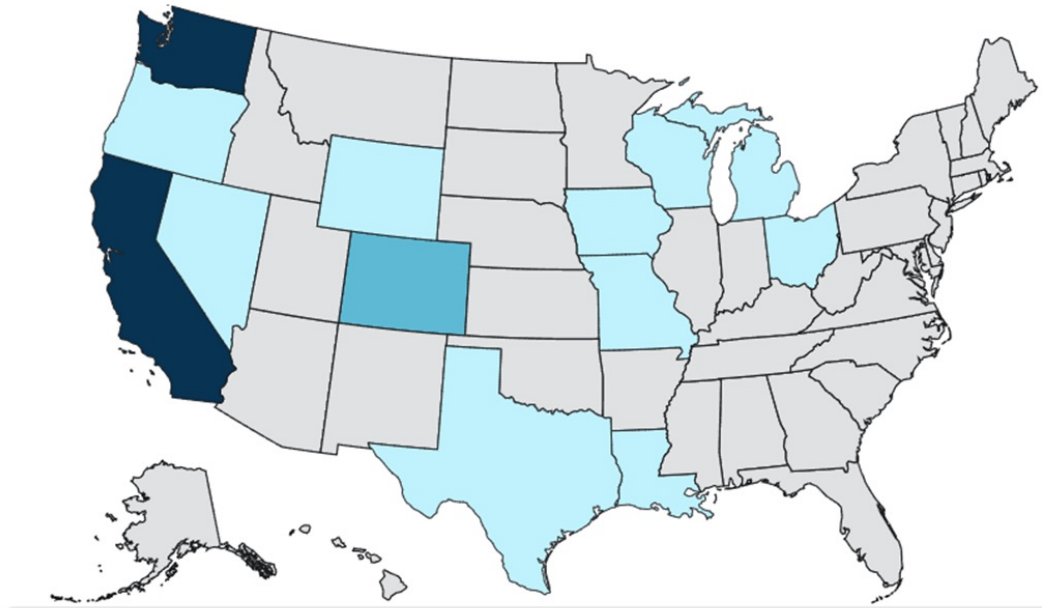
National

National Total Cases: 70

Cases	Exposure Source
41	Dairy Herds (Cattle)*
24	Poultry Farms and Culling Operations*
2	Other Animal Exposure†
3	Exposure Source Unknown‡

NOTE: One additional case was previously detected in a poultry worker in Colorado in 2022. Louisiana reported the first H5 bird flu death in the U.S.

*Exposure Associated with Commercial Agriculture and Related Operations
†Exposure was related to other animals such as backyard flocks, wild birds, or other mammals
‡Exposure source was not able to be identified



Total cases

0 | 1-5 | 6-10 | >10

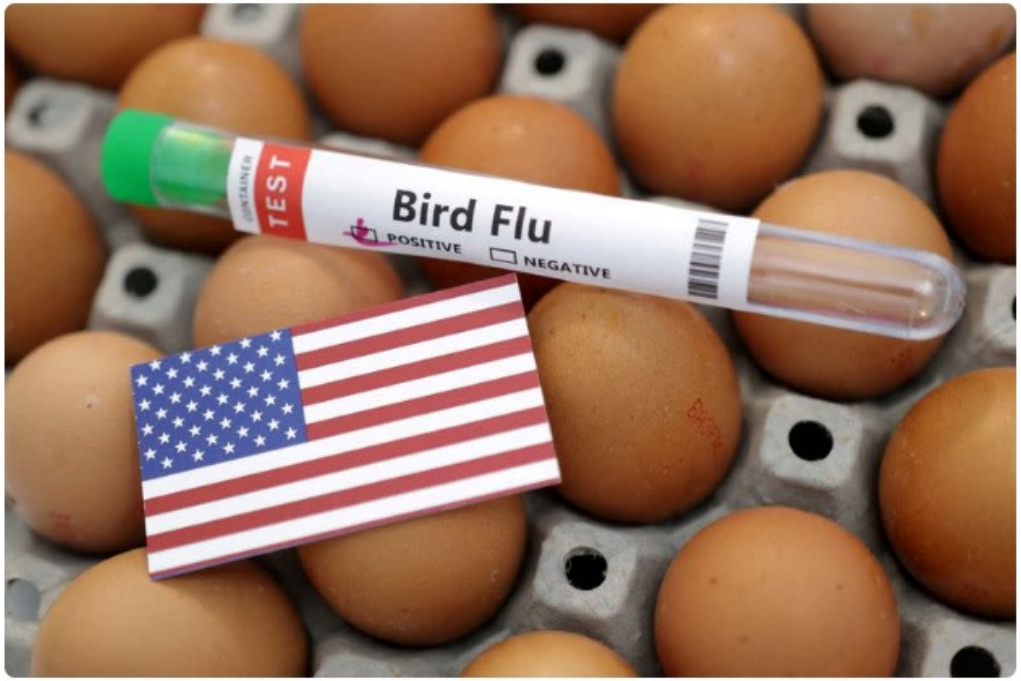
REUTERS

FDA suspends program to improve bird flu testing due to staff cuts

Leah Douglas

Thu, April 3, 2025 at 5:52 PM EDT · 2 min read

2



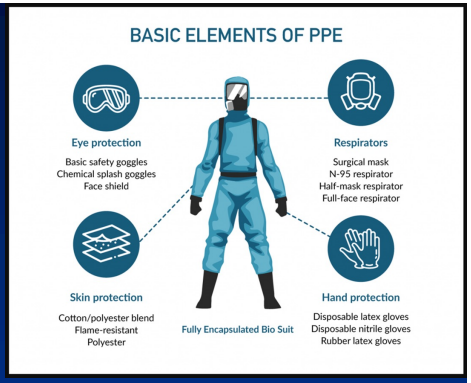
FUTURE?

- Pandemics tend to get worse before they get better…
- More global public health concerns and worse economics
- Increased danger for wild populations
- Further mutations likely
- **If human-to-human transmission occurs, BEWARE**

SUMMARY

- Influenza is one of the most dangerous zoonotic diseases
- Frequent outbreaks and epidemics globally
- Current Avian Influenza pandemic continues and is gathering momentum (Note: freezing doesn't kill the virus)
- **Animal care and wildlife professionals have HIGH RISK**

RECOMMENDATIONS



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WILDLIFE HANDLING RISKS

While this list is not necessarily complete, exposure or incidents involving contact with the following are all dangerous and potentially life-threatening:

Wildlife bites

Scratches

Fresh, dry, or aerosolized carcasses, excrement, and all body fluids (blood, urine, semen, tissue fluid, saliva, mucous, respiratory secretions, birthing waste, etc…)

Internal parasites (GI worms and their eggs, encysted life stages in body fluids, muscle or other tissues, etc…)

External parasites and vectors (fleas, ticks, mites, other vectors such as mosquitoes, flies, etc…

Wildlife bed, nest, and latrine sites

Any surface or object that is contaminated by any of the above

PROFESSIONALISM AND PROTECTION:

WILDLIFE HANDLING TO MINIMIZE RISK OF INFLUENZA

AND OTHER DANGEROUS PATHOGENS

Jay Tischendorf DVM

American Ecological Research Institute (--AERIE)

and

PetOne Animal Medical Consultation Group

PO Box 1422

Bennington, VT 05201

Cell: 406-799-4405 / Email: WildlifeVetUSA@gmail.com

4 April 2025

BASIC ELEMENTS OF PPE

Eye protection

Basic safety goggles
Chemical splash goggles
Face shield

Respirators

Surgical mask
N-95 respirator
Half-mask respirator
Full-face respirator

Skin protection

Cotton/polyester blend
Flame-resistant
Polyester

Hand protection

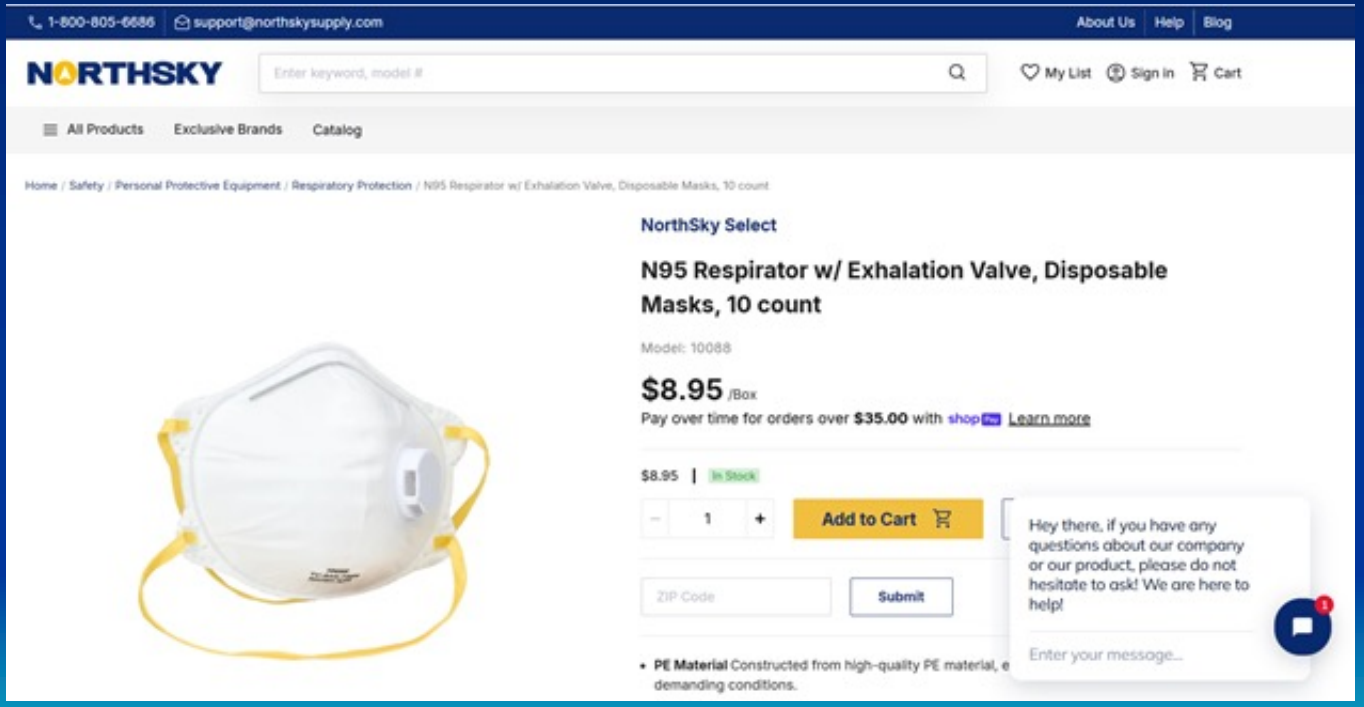
Disposable latex gloves
Disposable nitrile gloves
Rubber latex gloves

Fully Encapsulated Bio Suit

BIOSAFETY RECOMMENDATIONS

- Fluid-resistant coveralls, gown, or other suit – w/ hood
- Nitrile gloves, eye protection, strategic footgear or covers
- N95 respirator – FITTED!
- Insect/vector repellent

N95 RESPIRATOR



BIOSAFETY RECOMMENDATIONS

- How you remove PPE is as important as putting it on
- So is its disposal…
- Also note ATCC, ANSI, ISO, etc… standards for PPE
  (See the actual document)

OTHER PRECAUTIONS

- Clean and sanitize/disinfect appropriate gear
- Wash hands
- Report sick wildlife to local public health & natl resource agencies
- Don’t feed raw food to pets

“SMART” BIOSAFETY PROTOCOL

- Specific
- Measurable
- Agreed upon ad Attainable
- Relevant
- Time-Bound, Trained, Tested, re-Trained

PROFESSIONALISM AND PROTECTION:

WILDLIFE HANDLING TO MINIMIZE RISK OF INFLUENZA

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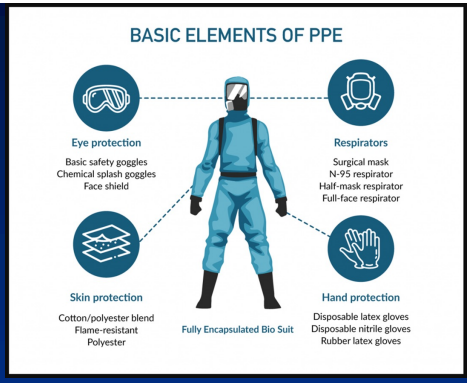
RECOMMENDATIONS



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REFERENCE AND READING

Centers for Disease Control and Prevention (CDC.gov)

Including the CDC National Personal Protective Technology Laboratory: (www.cdc.gov/niosh/npptl/topics/protectiveclothing/default)

National Association of State Public Health Veterinarians (NASPHV.org)

US Department of Agriculture (USDA.gov)

World Health Organization (WHO.int)

Companion Animal Parasite Council (capcvet.org)

AVIAN INFLUENZA UPDATE AND BIOSAFETY PRECAUTIONS

Bird Strike Committee Meeting – 8 April 2025

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