Report to the Boards of Health
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Mid-Michigan District Health Department, Wednesday, May 22, 2024
Central Michigan District Health Department, Wednesday, May 22, 2024
District Health Department 10, Friday, May 31, 2024

HPAI

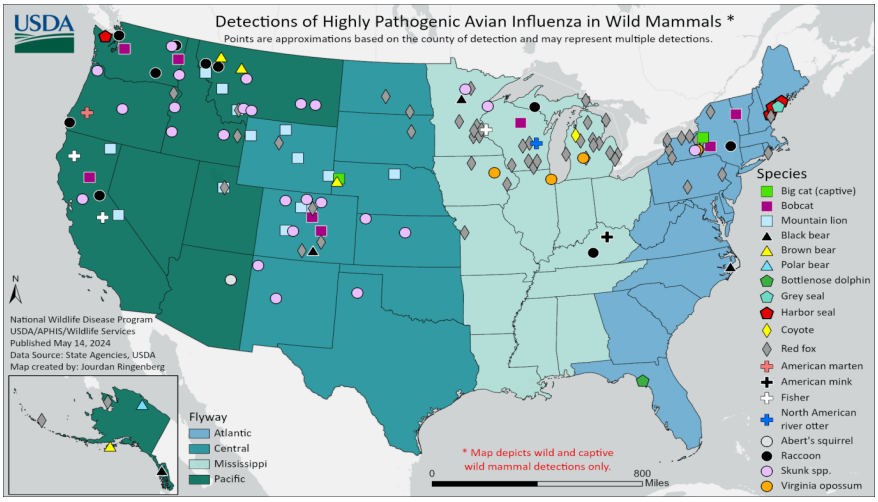
For background information about avian influenza see the report "Highly Pathogenic Avian Influenza (HPAI)" from April 2022 at https://rb.gy/fexymw.

Avian influenza, or bird flu, can be caused by different strains of influenza A virus. The first known description of avian influenza was in 1878 in northern Italy and was referred to as "fowl plague." It was described as a contagious disease of poultry which caused high amounts of bird death. There are *potentially* 144 different subtypes of influenza A that can cause avian influenza; however, some types are more common. Over the past few years, the subtype H5N1 (clade 2.3.4.4b) has been most common in the United States and in many parts of the world. There have been rising cases in birds as well as crossover into mammals that had not been effected before.

In birds, avian influenza viruses are very contagious and widespread. Most of them cause little to no disease in birds and are called low pathogenic avian influenza (LPAI) viruses. Highly pathogenic avian influenza (HPAI) viruses can develop from some LPAI viruses and cause serious illness in birds, killing up to 90% to 100% of the infected flock.

The natural host, or reservoir, for avian influenza is waterfowl and other wild aquatic birds and they can carry the virus without becoming ill. Infected birds can shed the virus in their saliva (spit), nasal secretions (mucus), and feces (poop). Other birds or mammals may get infected when they come in contact with things contaminated with the bird materials containing the virus or if they eat infected animals. Domesticated birds such as chickens, turkeys, and ducks become ill when they get infected. The virus can spread quickly and cause large numbers of death among domestic birds. Typically, depopulation or culling of infected flocks is carried out to stop the illness.

The global spread of bird flu is partly due to the migration patterns of birds, which is why there is an increase in the spring as migration is at its peak. The changes in avian influenza patterns have likely been effected by several changes over the past decades which are mainly due to human activity. These include larger demands for animal protein, particularly from poultry, increases in agriculture and animal farming, exploitation of wildlife, land use changes and deforestation driven by urbanization and industrialization, increased travel, food supply changes, climate change, and critical health and economic issues for those living in the hotspots for emerging infectious diseases.

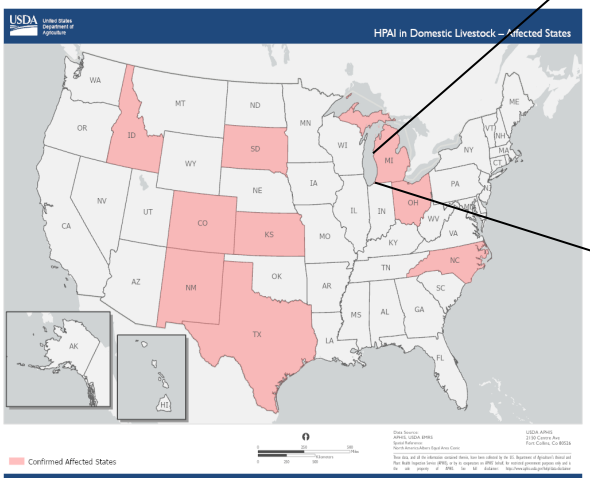


As of May 14, 2024
https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections

Since 2020, influenza A H5N1 has spread in wild birds globally and continues to evolve, causing outbreaks in poultry, and spilling over into a wide number of other animal species. It is still not well understood how the virus is passing to animals such as seals, dolphins, goats, and cows.

March 25, 2025 was the start of a multistate outbreak in dairy cows which is the first time in the world H5N1 was found in ruminant species. The virus appears in high amounts in

udders and raw (unpasteurized) milk. Signs of sick cows seem to be decreased herd level milk production, some severely impacted cows experiencing thicker, concentrated, colostrum-like milk, decrease in feed consumption, abnormal tacky or loose feces, lethargy, dehydration, and fever. As of May 15, there are 49 herds effected in 9 states. Of those, 14 (29%) are in Michigan and eight (16% of total and 57% of those in Michigan) are in one of the counties of MMDHD or CMDHD.



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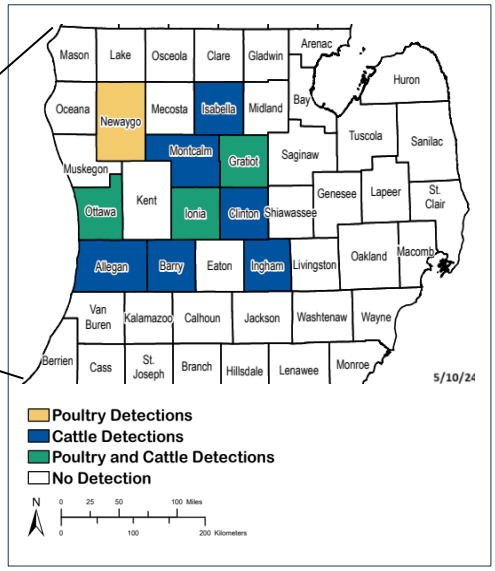


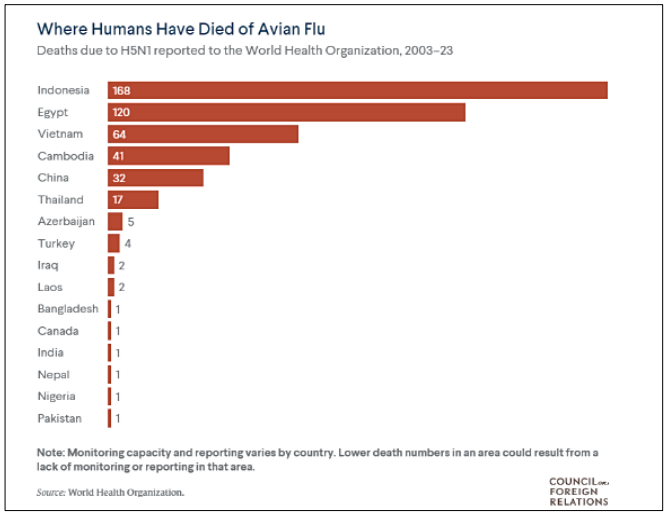
https://www.michigan.gov/mdard/animals/diseases/avian/avian-influenza

HPAI Detections in MMDHD, CMDHD, DHD10 as of May 15, 2024		
Apr 28, 2022	*Backyard poultry*	*Wexford*
Mar 29, 2024	Dairy	Montcalm
Apr 8, 2024	Dairy	Montcalm
Apr 12, 2024	Dairy	Isabella
Apr 16, 2024	Commercial poultry	Newaygo
Apr 24, 2024	Commercial poultry	Gratiot
May 2, 2024	Commercial poultry	Gratiot
May 9, 2024	Dairy	Isabella
May 9, 2024	Dairy	Gratiot
May 10, 2024	Dairy	Gratiot
May 10, 2024	Dairy	Clinton
May 15, 2024	Dairy	Gratiot

Human infection with avian influenza can occur in those exposed to infected animals. This happens rarely and most illnesses are mild and limited to conjunctivitis (pink eye) or mild respiratory disease. On April 1, 2024, a dairy worker in Texas was diagnosed with H5N1 after contact with an ill dairy cow. Their only symptom was subconjunctival hemorrhage (bleeding under the thin membrane covering the eyeball) and watery eye drainage.


Figure 1. Conjunctivitis with Subconjunctival Hemorrhage in Both Eyes.

Eyes of Texas Dairy Worker with H5N1
Source: New England Journal of Medicine



There have been 25 human infections with H5N1 in 8 countries since 2022, most cases have been very mild. However, human infections with H5N1 and other avian influenza strains can cause serious illness and death. Between 2003 and 2023, there have been 461 human deaths in 16 countries due to H5N1. So, despite the current clade of H5N1 seeming mild, there is still concern it could become more severe in humans. Another concern is that as H5N1 virus passes to more mammals, it may change in ways that allow it to pass to and between mammals more easily. This might include changing so that it can pass from one human to another.

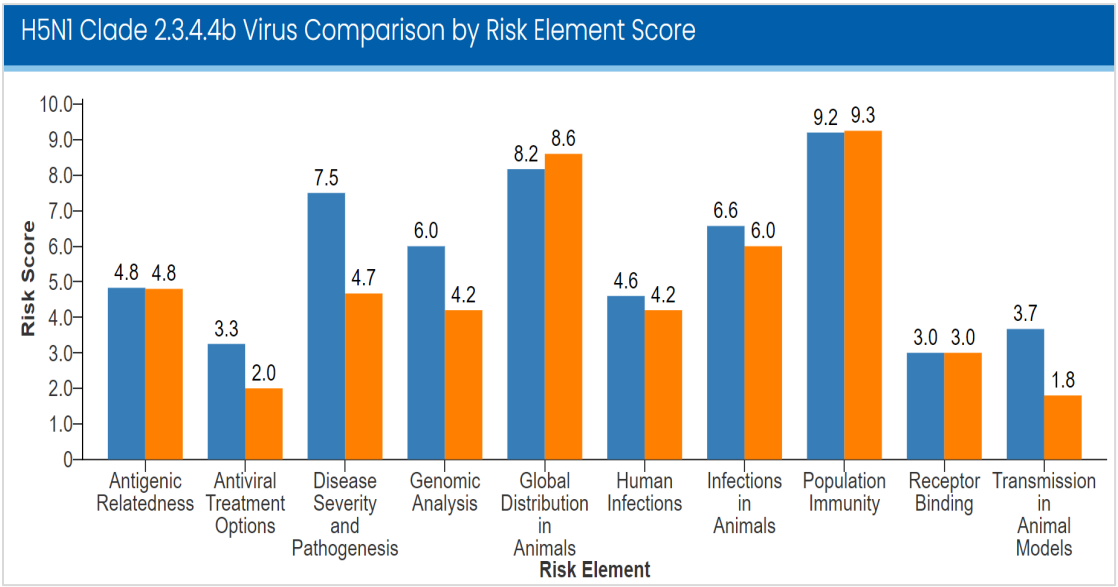
Major changes in the influenza virus are called shifts. There are different ways shifts can happen. If a non-human influenza A virus (for example an avian influenza virus) exchanges genetic information with other influenza A viruses (such as human or swine influenza) this is called genetic reassortment. The new virus could be able to infect people. If this new virus causes illness in infected people, can spread easily from person to person, and is

different enough that most people don't have any existing immunity, an influenza pandemic can occur. This has happened four times over the past 120 years, resulting in millions of deaths.

Human Influenza Pandemics of the Last 120 Years				
Year(s)	**Pandemic**	**Likely Origin of Virus**	**Estimated Global Deaths**	**Notes**
1918/1919	H1N1 (Spanish Flu)	Equine H7N7, human A(H1) subtype, and an avian N1	40 to 50 million people	Continued to circulate widely for several decades until 1957, causing a few severe epidemics.
1957	H2N2 (Asian Flu)	Composed of 3 different avian influenza genes	Exceeding 1 million	Continued to circulate for 10 years after the pandemic, producing one major epidemic before the next pandemic in 1968.
1968	H3N2 (Hong Kong Flu)	Genetic reassortment of two low pathogenicity avian influenza (LPAI) viruses (one was the new A(H3)) and human influenza A viruses. The N2 was from the 1957 Asian flu pandemic virus.	Approximately 1 million	This is one of the two human seasonal influenza A viruses still circulating today.
2009	A(H1N1)pdm09	Virus derived from North American avian influenza, Eurasian avian-like Swine influenza, A(H1N1) classical-type swine influenza, and human seasonal A(H3N2) influenza viruses	Approximately 575,000	Remains a dominant seasonal influenza virus strain today.

Source: https://nasphv.org/Documents/Zoonotic%20Influenza%20Reference%20Guide%20-%20June%202022.pdf

CDC Influenza Risk Assessment Tool (IRAT) is used to assess the potential pandemic risk posed by influenza A viruses that are not currently circulating in people. The overall pandemic risk scores for H5N1 (clade 2.3.4.4b) are "moderate."



https://www.cdc.gov/flu/pandemic-resources/monitoring/irat-virus-summaries.htm

There are avian influenza vaccines for poultry used in countries where the virus is endemic and there is little poultry trade. The US does not yet vaccinate commercial poultry for avian influenza but the USDA " is exploring the possibility of developing a poultry H5N1 vaccine to stock and use in an emergency". They say that vaccinating poultry against H5N1 bring many challenges and there are trade restrictions with some markets overseas that prohibit the sale of vaccinated poultry meat, eggs, etc. In fact, the US ***is*** one of those countries that forbids the purchase of poultry imports from flocks that have been vaccinated. The concern is that the vaccine does not protect against infection only against illness.

Meat and dairy from ill animals are not supposed to enter the food supply. Even if it did, pasteurization and cooking eggs and meat will kill the virus, making it noninfectious. Following safe cooking and eating recommendations, especially not drinking or eating any raw milk products is always recommended and will keep consumers safe from avian influenza.

Antivirals effective for seasonal influenza are effective for avian influenza infection in humans.
Seasonal flu vaccines do not provide protection against these viruses. CDC has developed a candidate vaccine viruses (CVV) that are nearly identical or, in many cases, identical to the protein of clade 2.3.4.4b A(H5N1) viruses most recently infecting birds and other mammals. The CVV could be used to produce a vaccine for people, if needed. More information about making a candidate Vaccine Virus (CVV) for a Highly Pathogenic Avian Influenza (Bird Flu) Virus is available at the CDC https://www.cdc.gov/flu/avianflu/candidate-vaccine-virus.htm.

Resources

- **DNR: Eyes in the Field. REPORT sick or dead bird and mammal observations - call 517-336-5030 or fill out form at https://www2.dnr.state.mi.us/ors/Survey/4**
- Information for waterfowl hunters https://www.ducks.org/conservation/waterfowl-research-science/waterfowl-hunters-and-the-avian-flu-what-you-need-to-know
- CDC Avian Flu https://www.cdc.gov/flu/avianflu/index.htm
- USDA Avian Influenza https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza
- USDA Defend the Flock https://www.aphis.usda.gov/livestock-poultry-disease/avian/defend-the-flock
- The Center for Food Security and Public Health Animal Health Emergency Training Tools and Resources https://www.cfsph.iastate.edu/emergency-response/
- MDARD Avian Influenza (Bird Flu) https://www.michigan.gov/mdard/animals/diseases/avian/avian-influenza
- MSU Extension Avian Influenza https://www.canr.msu.edu/avian_influenza/
- Food Safety Information
  - CDC Raw Milk https://www.cdc.gov/food-safety/foods/raw-milk.html
  - MDHHS Raw Milk Risks
  - MSU Extensions Myths and facts about raw milk https://www.canr.msu.edu/news/myths_and_facts_about_raw_milk
  - Food safety: CDC Food Safety https://www.cdc.gov/food-safety/
- CDC Healthy Pets, Healthy People https://www.cdc.gov/healthy-pets/index.html
- Agritourism Safety https://safeagritourism.org/
- Links to Information for Specific Groups (People with backyard birds/poultry, bird enthusiasts/hunters, working with infected birds): https://www.cdc.gov/flu/avianflu/groups.htm

Recommendations:

1. While the current risks to people from current avian influenza situation is low, awareness of needs to be raised including the need to identify, report, and test suspected animal and prevention of human infection as there is a moderate risk this could lead to another influenza pandemic.

2. Continue to Integrate One Health philosophies, the concept that our health is closely connected to the health of animals, plants, and our environment, into 4-H, hunting, fishing, fairs, agriculture, and other

areas of human and animal interaction to prevent the spread of avian influenza and all other zoonotic diseases.

Sources

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