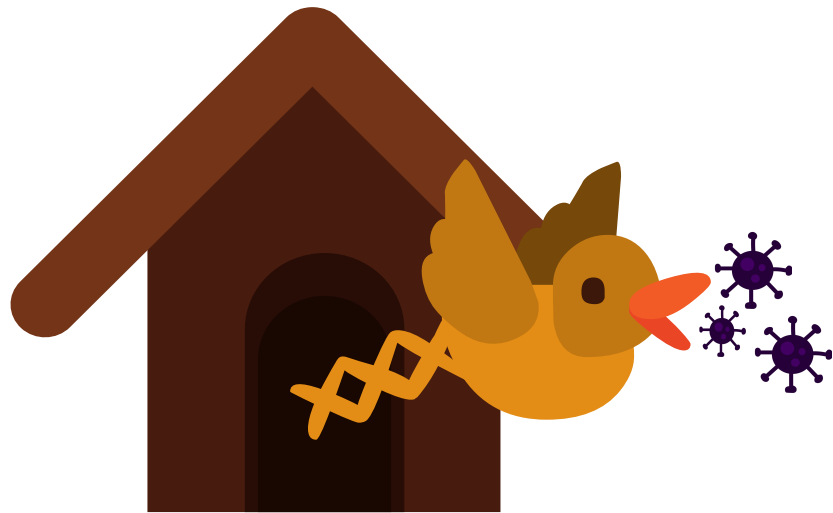


H5N1 Flu Over The Cuckoo Nest:

A brief guide to the current Bird Flu situation and recommendations to keep your community and yourself safe.

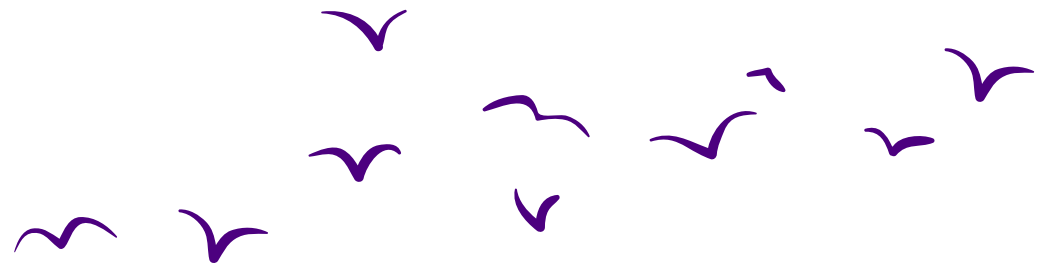


WEBSITE LINK

Bird Flu Basics

We Exist in the Context:

- This is not occurring in a vacuum. For your consideration:
 - Climate change (increased risk of pandemics)
 - New Administration
 - Legal challenges to masking, public health initiatives
 - Disinformation, misinformation, social media
 - No centralized news source anymore
 - Public health collapse
- Update your vaccines! **Consider masking again.**
- If you have outdoor cats, no you don't!



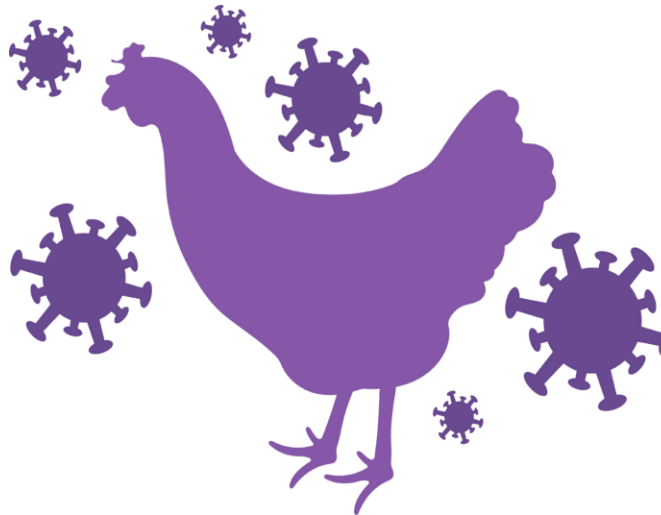
Today's Topics

Understanding Bird Flu

- Defining Disease Spread
- Introduction to Bird Flu
 - Defining H5N1
 - Flu Types, 2024 Vaccine
 - Bird flu symptoms, pathogenicity, genetics
- Timeline of outbreaks
- Current News

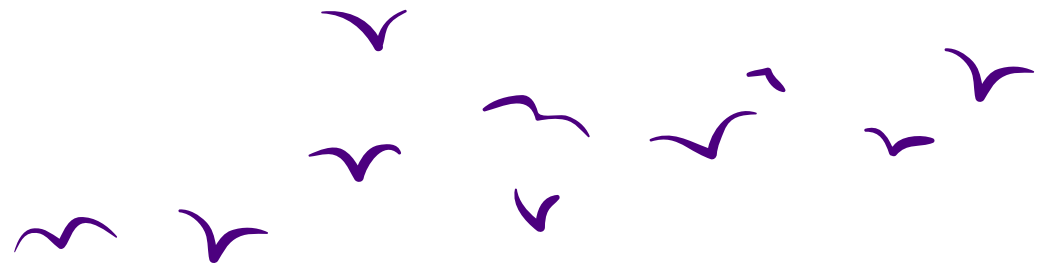
Addressing Bird Flu

- Challenges
 - Politics
 - COVID consequences
 - Education & Social Media
- Mitigation Strategies
- Resources
- Talking Points
- Discussion
- References, Further Reading



It's *just a flu*, right?

It is Flu A, but let's talk about what that means.



Defining Disease Spread

Know your -demics!

Endemic

Consistent presence of a disease limited to a particular region, with a **predictable** and balanced pattern of occurrence. Does not refer to disease severity.

- *Malaria*

Epidemic

Unexpected increase in the number of disease cases in a specific geographical area. Epidemics occur in multiple countries around the world.

- *Smallpox, measles, polio*

Pandemic

A disease's growth is exponential across a wide area in multiple countries and populations.

- *SARS-CoV-2, Bubonic Plague, AIDS, "Spanish" (Kansas) Flu*

Defining Disease Spread

Pandemic

SARS-CoV-2 is continually causing unpredictable outbreaks in multiple countries and populations.

Epidemic

Multiple ongoing **Avian Flu** outbreaks:

- 2020 wild bird/poultry epidemic
- 2024 cattle/livestock outbreaks
- Sporadic human outbreaks

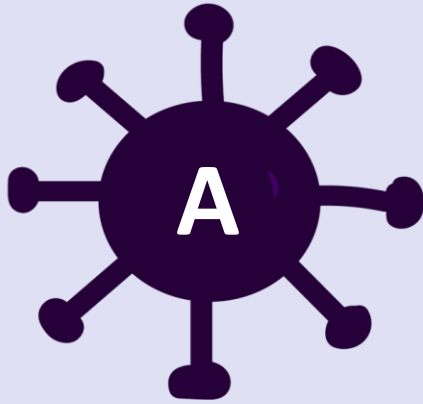
Pathogen of Pandemic Potential (PPPs) – A bacteria, **virus**, or other microorganisms that are:

- Likely highly transmissible and capable of wide, uncontrollable spread in human populations
- *And* highly virulent, making them likely to cause significant morbidity and/or mortality in humans. (NIH)

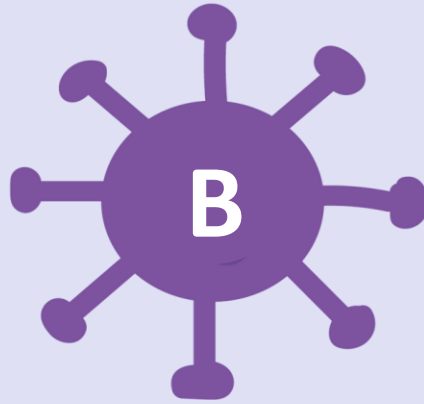
...like influenzas.

Influenza Types

PPPs



Epidemic Risk



Epidemic Risk

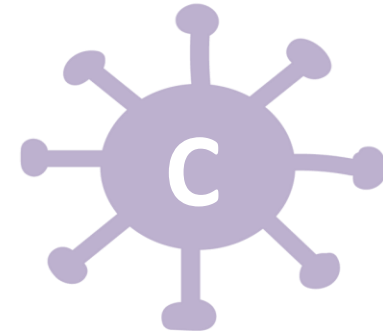
Influenza A(H1N1) was the primary strain during:

- The 1918 “Spanish” (Kansas) flu pandemic
- The 2009 swine flu pandemic

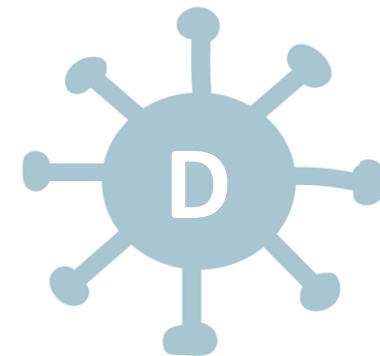
Influenza A viruses tend to evolve more rapidly than influenza B viruses.

Influenza A is typically carried by **birds**.

No Pandemic Potential



Minimal symptoms
in humans

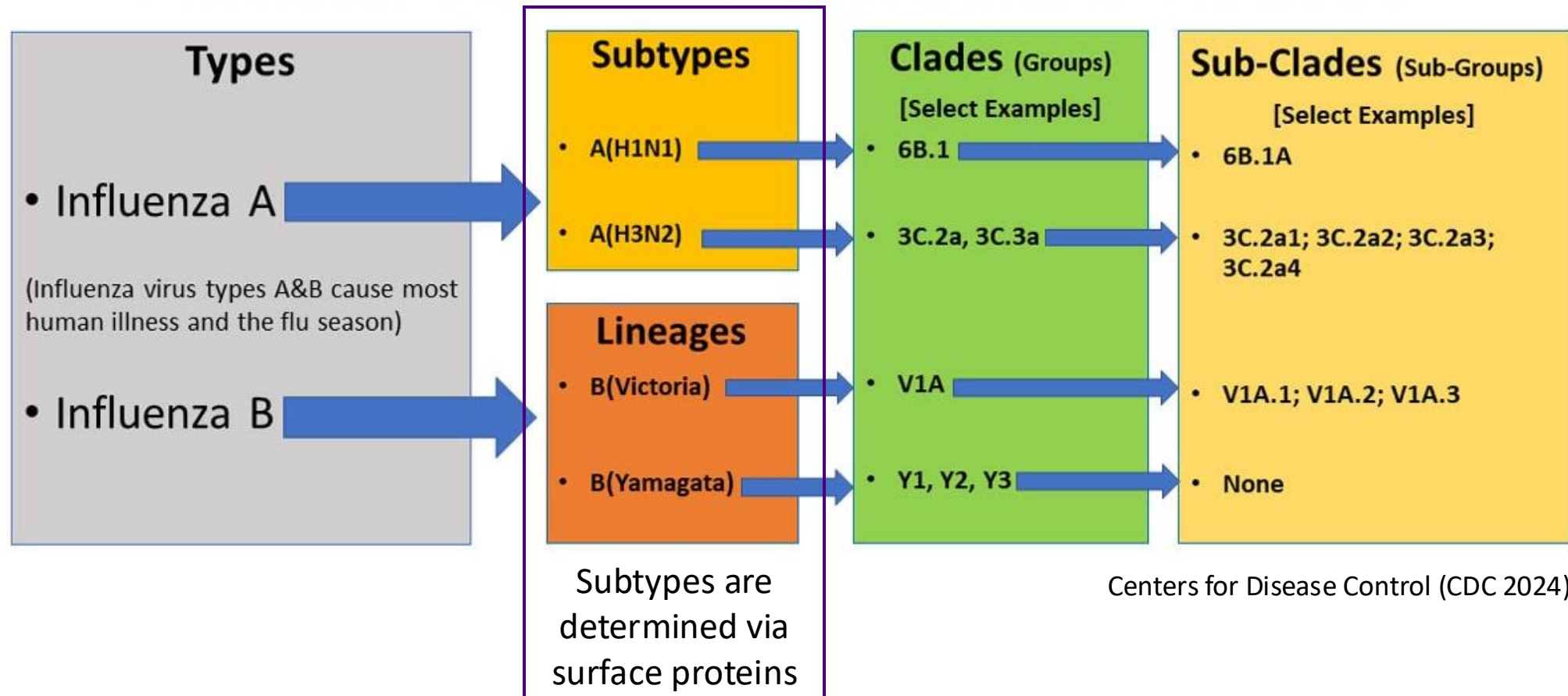


Not infectious to
humans

2024 Trivalent Vaccine Strains

2024 Flu Vaccine – A(H1N1), A(H3N2), and B(Victoria) are in this year's seasonal flu formulation.

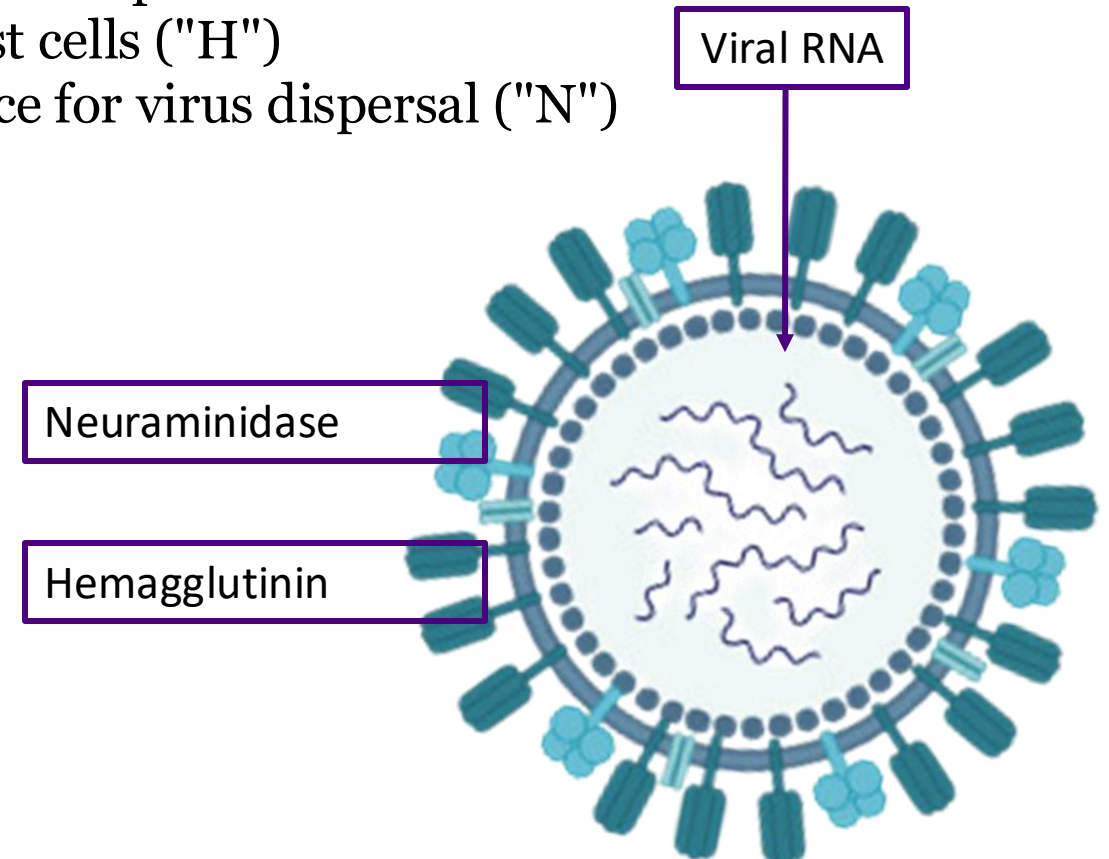
Human Seasonal Influenza Viruses



What is Bird Flu?

- Avian flus are classified by severity in poultry:
 - Highly Pathogenic Avian Influenza (HPAI)
 - Low Pathogenic Avian Influenza (LPAI)
- Nomenclature of flu strain is derived from types of two proteins:
 - Hemagglutinin (HA) – helps virus bind to host cells ("H")
 - Neuraminidase – helps break down cell surface for virus dispersal ("N")

Influenza Type **A** (**HxNy**)



What is Bird Flu?

Highly Pathogenic Avian Influenza (HPAI)



There are H5N1 vaccines in development, and there is a stockpile of vaccines for old strains. This is one of the most promising avenues to limit effects of a possible pandemic.

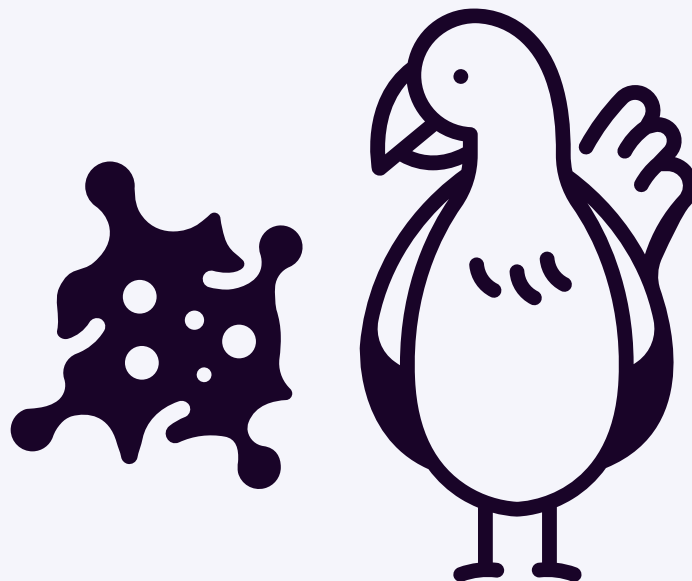
There is currently no public vaccination strategy.



Bird Flu: The Basics

What is Bird Flu?

- Influenza virus found in wild and commercial birds
- Other influenza A variants have high mortality (>50%) in reported human cases
 - Might be overinflated due to under-detection
- Currently infecting different species of mammals



How does it spread?

- **Foodborne**
 - Raw milk, dairy
- **Fomites (inanimate)**
 - Touching surfaces, contact in eyes/face
- **Airborne**
 - Inhalation

Bird Flu: CDC Symptoms and Exposure Guidance

H5N1 causes high levels of systemic inflammation.

Symptoms include:

- Eye redness (conjunctivitis)
- Mild flu-like upper respiratory symptoms
- Pneumonia requiring hospitalization
- Fever ($\geq 100\text{F}$ or 37.8C) or feeling feverish
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue
- Shortness of breath/difficulty breathing

Less commonly:

- Diarrhea
- Nausea
- Vomiting
- Seizures

If new symptoms arise after a confirmed or suspected exposure, during the **10 days after your last exposure**:



Stay home and away from others until confirmed and/or symptoms recover



Tell supervisor and medical provider, they'll contact state/local health department (HD)



HD will determine next steps



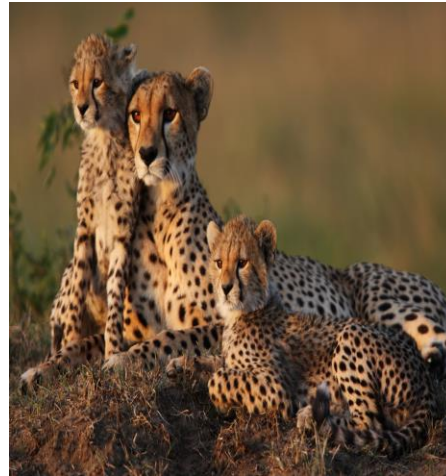
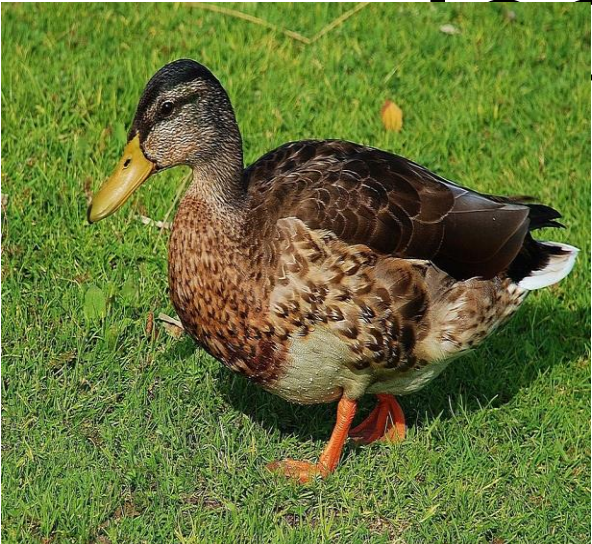
Treatment like antivirals may be prescribed

déjà vu, anyone?

Bird Flu: Key Genetics, Mutations, Transmissibility

- **Reassortment** – viruses like influenza can combine with other strains
 - Adaptions for transmissibility, pathogenicity
- Mammal-mammal (m2m) transmission vs human-human (h2h) transmission
 - H5N1 has ripped through many different avian (bird) species and mammalian species
 - Cow and seal herds indicative of m2m transmission
 - Not yet h2h; developing mutations
- **Herd Immunity:** When a population of animals or people are protected from an infectious disease because a large percentage of them are immune and do not contribute to onward spread.
- The **critical threshold** needed to achieve herd immunity (usually between ~50-90%+) depends on:
 - The **disease** — transmissibility or contagiousness, infectious period
 - The **population** — interaction/contact between individuals
 - The **degree of immunity** — from either vaccine or previous exposure/infection (threshold is *much higher* if the vaccine does not fully prevent infection, such as with **influenza** viruses and **COVID-19!**)

The more opportunities the virus has to jump to humans, the higher the chance for an h2h mutation



Non-Exhaustive Timeline of Bird Flu Outbreaks

- **1997** – First known human case of infection with H5N1.
- **2003** – Re-emergence of human infections with H5N1.
- **January 2022** – First documented case of HPAI H5N1 in U.S. wild birds since 2016 ; sea lions in Peru die en masse; UK man infected by backyard ducks
- **April 2022** – First U.S. human case in an incarcerated man after working with poultry
- **February 2023** – Sporadic human cases around the world since 2022
- **March 2023** – rumblings of preparations for bird flu vaccine
- **July 2023** – Euro Food and Safety recommend dogs/cats stay inside
- **March 2024** – First reports of H5N1 in dairy cows in US

Non-Exhaustive Timeline of Bird Flu Outbreaks

- **April 2024** – more cattle outbreaks, dairy farms refuse testing; First reported case of cow-to-human transmission in US; UK student dies, China reports cases
- **October 2024** – Confirmed cases in Canadian teen (hospitalized), child in CA (mild/recovered); sources unknown so far; Virus found in pigs
- **November 2024** – First confirmed human death in LA
- **January 2025** – Multiple ongoing outbreaks at commercial poultry farms, backyard flocks, and zoos
 - Multiple deaths in big cats, house cats, poultry, wild birds, and cattle

Current News

- Ripping through wild animal populations
- Rapidly increasing outbreaks in poultry, livestock
 - Human cases increasing
- Increasing levels of mutations
- CDC increasing PSAs, directed at gen public
- USDA/FDA/CDC has not been fast to react to these threats
 - **FINALLY mandated testing**
 - **Over 100+ million poultry have been culled**
- Raw Milk company recalled raw milk in stores due to bird flu contamination (11/24)



Current News

- Multiple outbreaks discovered in last month across commercial farms in multiple states
 - And internationally
- Executive orders issued to gag HHS departments, including FDA and CDC
- Ongoing “quademic” of seasonal flu, COVID, RSV, and norovirus
- Recommendations issued that patients with positive Flu A tests be genotyped to determine if it is H5
- Sporadic outbreaks of other HPAs, including H5N9

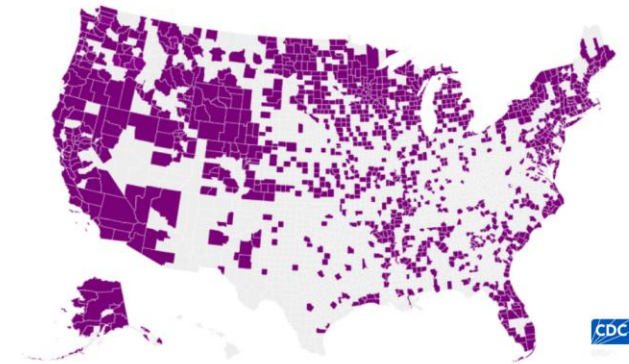


H5N1 Surveillance

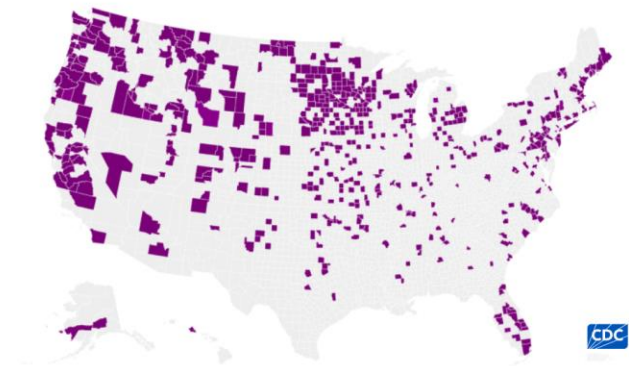
As of November 22, 2024

Detections in Animals

- **10,604** wild birds detected as of 11/19/2024 | [Full Report](#)
- **50** jurisdictions with bird flu in wild birds
- **109,668,208** poultry affected as of 11/21/2024 | [Full Report](#)
- **49** states with outbreaks in poultry
- **612** dairy herds affected as of 11/21/2024 | [Full Report](#) [↗](#)
- **15** states with outbreaks in dairy cows
- **53** human cases in U.S.
 - Canadian teenager hospitalized with strain NOT related to livestock outbreaks in US; CA child tested + - no known animal contact



Wild Birds



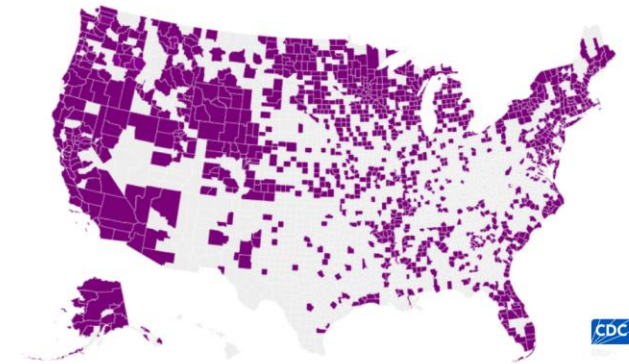
Backyard/Commercial Birds

H5N1 Surveillance

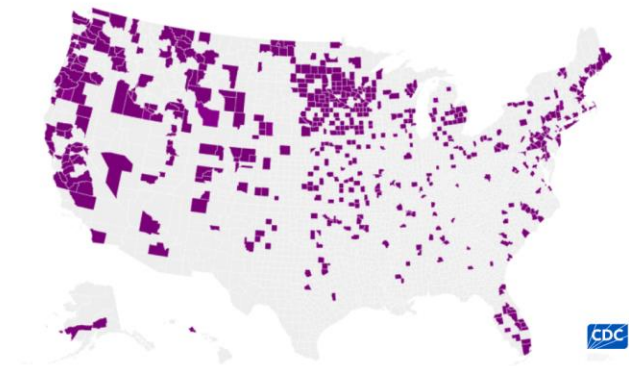
As of December 11, 2024

Detections in Animals

- **10,718** wild birds detected as of 12/10/2024 | [Full Report](#)
- **51** jurisdictions with bird flu in wild birds
- **120,572,146** poultry affected as of 12/10/2024 | [Full Report](#)
- **49** states with outbreaks in poultry
- **742** dairy herds affected as of 12/10/2024 | [Full Report](#) [↗](#)
- **16** states with outbreaks in dairy cows
- **58** human cases in U.S.
 - Cali child drank raw milk



Wild Birds



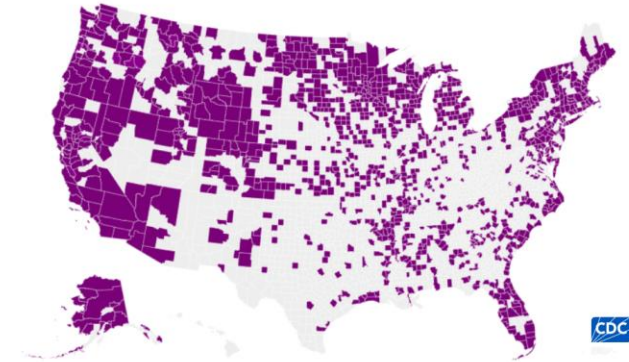
Backyard/Commercial Birds

H5N1 Surveillance

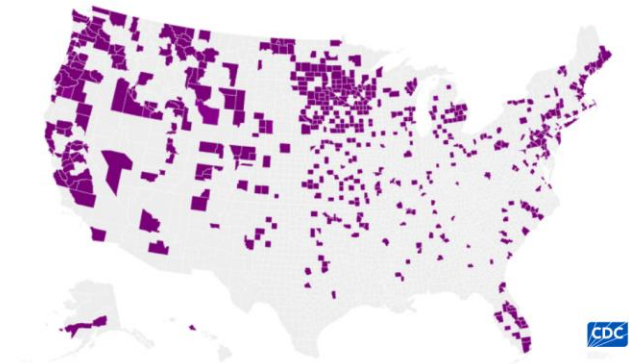
As of January 28, 2025

Detections in Animals

- **10,972** wild birds detected as of 1/27/2025 | [Full Report](#)
- **51** jurisdictions with bird flu in wild birds
- **145,077,200** poultry affected as of 1/27/2024 | [Full Report](#)
- **51** states with outbreaks in poultry
- **943** dairy herds affected as of 1/27/2024 | [Full Report](#) [↗](#)
- **16** states with outbreaks in dairy cows
- **67** human cases in U.S.
 - First human death reported in December



Wild Birds




Backyard/Commercial Birds

H5N1 Surveillance

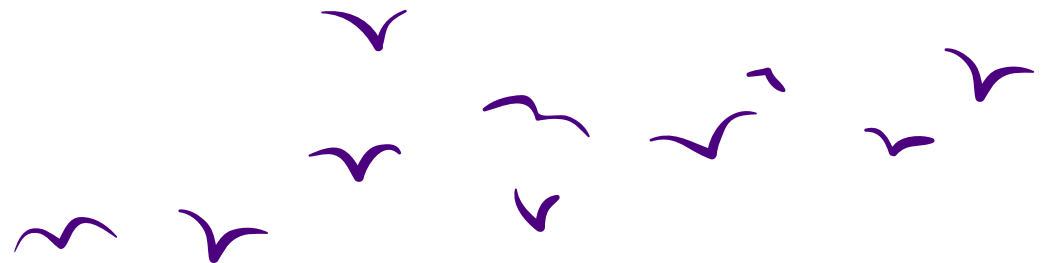
As of January 31, 2025

Detections in Animals

- **11,065** wild birds detected as of 1/28/2025 | [Full Report](#)
- **51** jurisdictions with bird flu in wild birds
- **149,964,521** poultry affected as of 1/31/2024 | [Full Report](#)
- **51** states with outbreaks in poultry
- **951** dairy herds affected as of 1/31/2024 | [Full Report](#) 
- **16** states with outbreaks in dairy cows

So...what do we do?

Great question!



Challenges

- Education gaps and social media
- Politics
 - Biden policy changes
 - Healthcare Infection Control Practices Advisory Committee (HICPAC)
 - Current Administration
- COVID consequences
 - Failed public health/misinformation/distrust
 - Collapsing healthcare infrastructure
 - APATHY
 - Systemic organ damage
 - Immune deficiencies

Education & Social Media

"The internet is a machine that devours truth" - Hank Green

- **Misinformation** – false or inaccurate information
- **Disinformation** – *purposely* false information
- Lack of science education
 - Lack of critical analysis; what makes a source good?
 - Misunderstanding of fundamentals
 - Fear and overwhelm of topics
- Disorganized, conflicting messaging
 - WHO vs CDC
 - CDC vs media pundits
- Diffuse messaging (too many platforms)

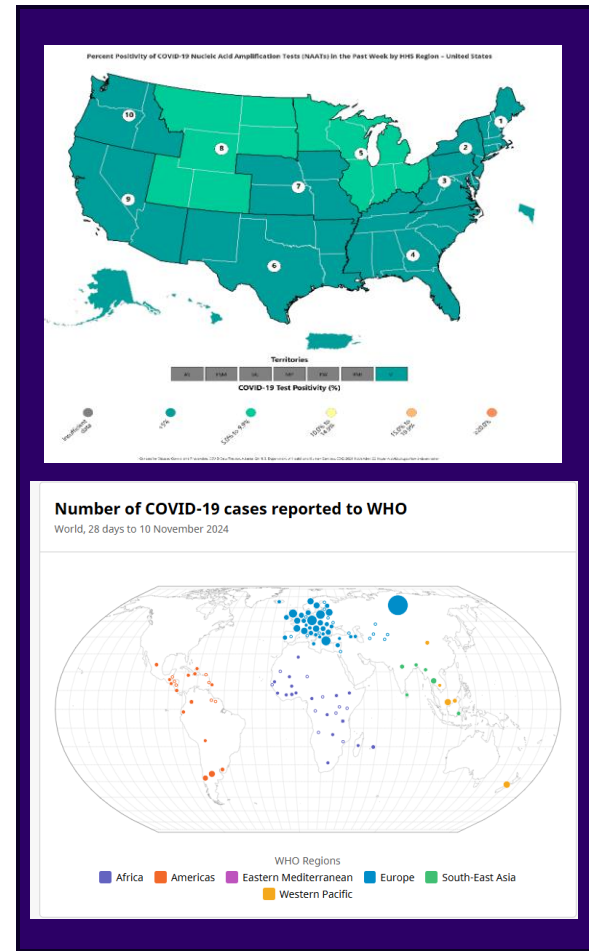


Take it as a warning!

The Last Administration

- Biden declared end to national emergency for COVID
- Mask bans have popped up around the country
- CDC's HICPAC voted against respirators
 - Use for industrial fumes and wildfire smoke also decreased
- CDC recommendations changing quietly
 - Buried important information on their website
- Vague guidance for vaccine boosters/types
- No surveillance, hospital reporting
- General civil unrest/distrust

The WHO never officially declared an end to the pandemic.
They just ended the global public health emergency.
US cases are likely underreported, and surveillance has fallen apart.



Top map: U.S. reported positive cases of COVID in last week.
Bottom map: COVID positive cases reported to WHO in last week.

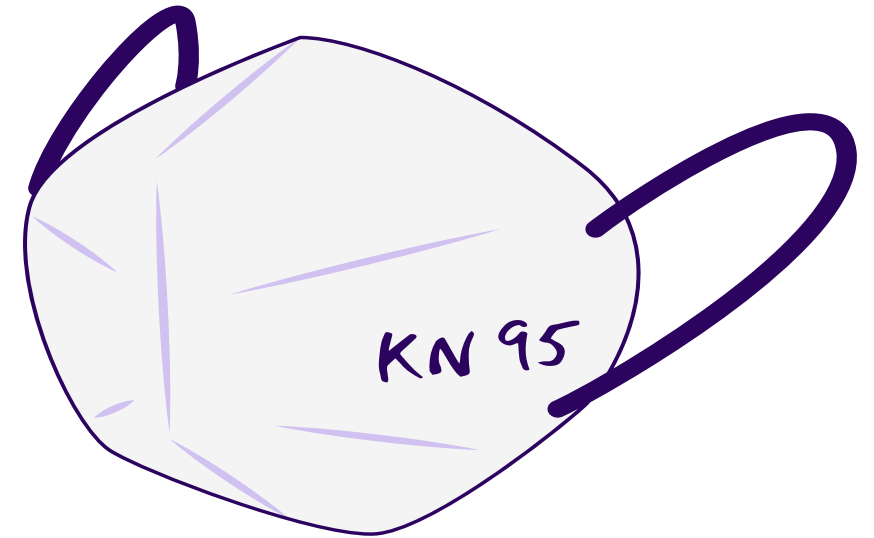
Tr*mp's 2025

- Dismantling FDA
- Dismantling CDC
- Defunding NIH
- Anti-vaccine
- Anti-mask
- Prohibitory mandates
- Inflammatory rhetoric
 - RFK currently undermining WHO
 - Encouraging raw milk consumption



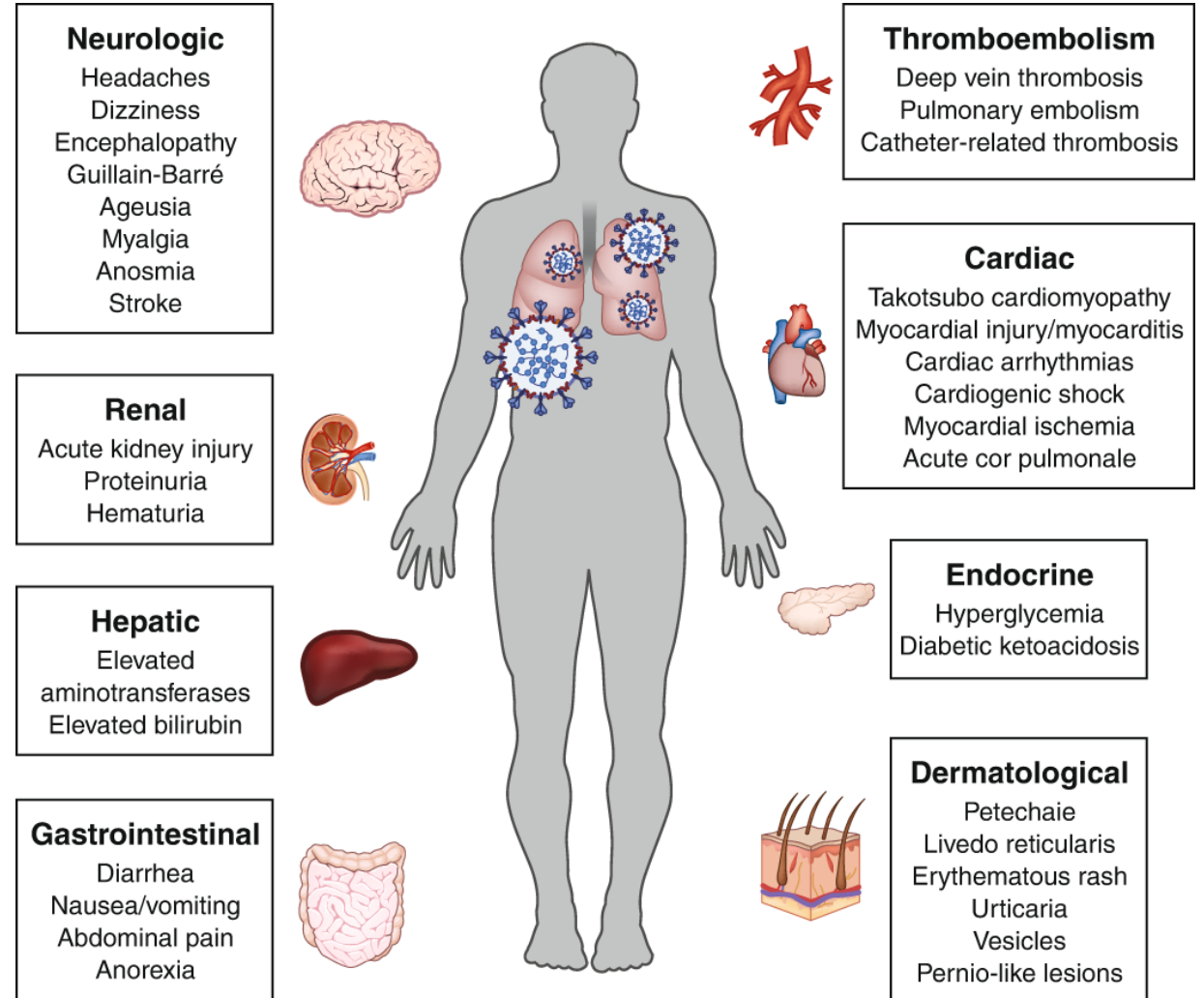
COVID Consequences: Public Health

- Failed public health/misinformation/distrust
 - CDC suspended surveillance; likely underreported
 - Tests are <80% effective, often requires triplicate test
 - Lack of guidance on test parameters, vaccine schedules/doses
 - Heavily downplayed by PH orgs, media outlets
- Collapsing healthcare infrastructure
 - Healthcare worker burnout
 - Exorbitant insurance premiums and drug prices
 - Not enough workers, beds, or resources
- APATHY
 - As a trauma response
 - Political polarization
- Trauma
 - Mass death
 - Mass disability
 - Statistics in unemployment/jobs/economy may be skewed because people either can't participate, or died.

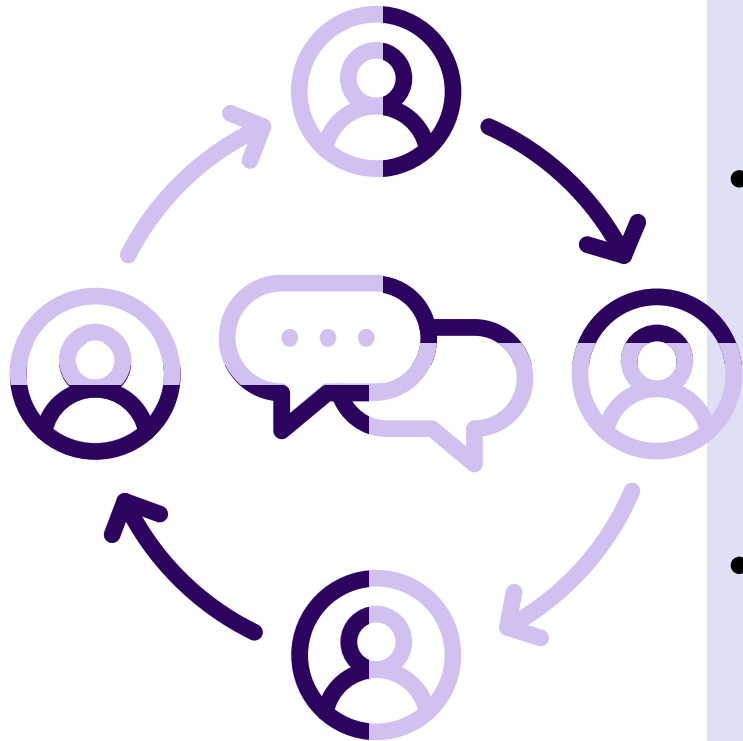


COVID Consequences: Health

- Systemic organ damage
 - Increased heart attacks, strokes
 - Increase in diabetes, alcohol intolerance
 - Brain fog, neurons literally fuse, delirium (dementia?), memory loss, personality changes, etc.
- Immune deficiencies
 - Immune cell invasion/damage
 - Increase in pneumonia, tuberculosis, whooping cough, flu, RSV, etc.
- Lots of inflammation!!



Mitigation Strategies



- **Awareness**

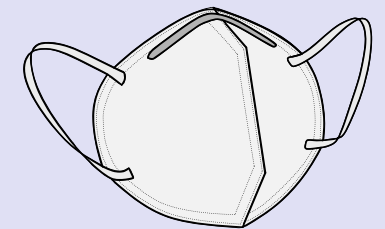
- Keep up with business journals (Insider, Forbes, Bloomberg)
- Clear messaging
- Consistent messaging
- Across platforms and IRL

- **Preparedness**

- Personal protective equipment (PPE)
 - Respirators, goggles
- Proper Hygiene
 - Air ventilation, washing hands
- Update vaccines!!!!

- **Community support**

- Mask Blocs
- Advocacy orgs
- Communication and Education
- Reach out to congressional reps





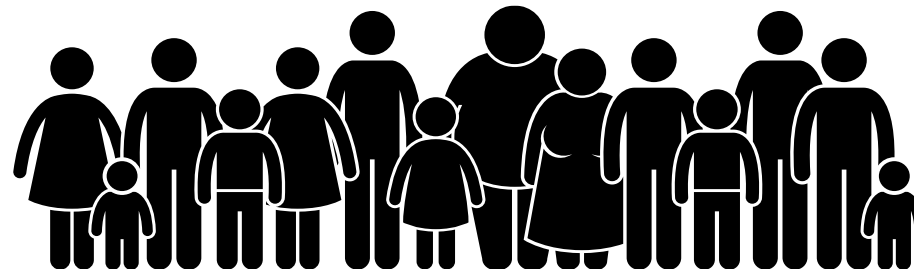
Resources

By the People

- [Find your Mask Blocs](#)
- [Long Covid Justice](#)
- [People's CDC](#)
- [Public Health Collaborative](#)
- [Urgent Action Alerts \(How to email your Reps\)](#)

By the Government

- [Center for Disease Control \(CDC\)](#)
- [Department of Agriculture \(USDA\)](#)
- [National Institutes of Health \(NIH\)](#)
- [World Health Organization \(WHO\)](#)
- [Bloomberg](#)
- [U.S. Senate contacts](#)



Talking Points

- Person-focused, direct language gets the message across.
- Use innocuous/unrelated anecdotes or analogies.
- No “I told you so”
- No condescending framing
- Not framed as taking something away

Masks are like window screens.

Don't let the bugs in!

People don't always get it right.

Don't drink raw milk!

Protecting yourself against H5N1 protects your community and your pets!

Disease is a big business. Bird flu is booming.

Your immune system is not a muscle!

Your cats can't wear a mask, but you can!

Think about your future self!

In 1918, “Just the flu” killed as many people as WWII



Immediate Action Items

- Update your vaccines – pass it on!
- Bring in your cats, keep your dogs away from birds (dead or alive)
- Mask up – protect your disabled peers
- Do some reading, watching, or listening on these topics
- Practice talking through hard conversations :)
- Talk to your loved ones!

Discussion

Questions? Comments? Concerns? Suggestions? Clarifications?

For your consideration:

- How do we encourage community-level protections, like respirators?
 - This includes dissuading a lot of the falsehoods, while acknowledging autonomy.
- How do we interact with friends/loved ones/community members that don't know or seem to care as much?
- What are the best ways to disseminate key information to different communities, and on different platforms?
- How do we mobilize against an administration rife with disinformation, denialism, and acceleratingly harmful policy?
- How do we address our own distrust of institutions, without undermining the science?
- How do you spot disinformation? Misinformation?



News Updates and References

- [Mandated raw milk testing](#) (NYT)
- [Worrying Bird Flu mutation](#) (STAT)
- [A foreseeable disaster](#) (NYT opinion)
- [South African Epidemiologist discusses bird flu in US](#) (NYT opinion)
- [The Flying Flu Updates](#) (Isabella substack)
- [Elephant seal populations](#) (Phys News)
- [NIH Pathogens of Pandemic](#) (NIH)
- [-demics language](#) (Columbia)
- [Canadian teen hospitalized](#) (CNN)
- [RFK maligning the WHO](#) (BlueSky)
- [Chicken flocks culled after outbreak - JULY 2024](#) (Reuters)
- [Bird flu vaccines in the works](#) (UofM)
- [H5N1 in pigs](#) (NPR)
- [Why flus are dangerous in pigs](#) (CDC)
- [Flu A reassortment](#). (PubMed)
- [The Flying Flu: Recent updates and discussion](#) (By Isabella C)
- [Past Immunity in H5N1](#) (Nature)
- [Hank Green Discusses History and the Internet](#)

Resources

- [CA Farmworkers Foundation \(CFF\)](#)
- [United Farmworkers Foundation \(UFW\)](#)
- [Farm Worker Family](#)
- [Farm Worker Outreach \(CA Gov\)](#)
- [Foodtank - resources for farm workers](#)
- [CDC Bird Flu Prevention \(CDC\)](#)
- [Seasonal Flu Vax to mitigate risk \(UofM\)](#)
- [WHO H5N1 Dashboard \(WHO\)](#)
- [WHO COVID Dashboard \(WHO\)](#)
- [CDC Flu FAQ \(CDC\)](#)
- [CDC Bird Flu Dashboard \(CDC\)](#)
- [USDA HPAI detection \(USDA\)](#)
- [CDC Bird flu surveillance \(CDC\)](#)
- [Bird Flu citizen updates \(Sentinel Intelligence\)](#)
- [A guide to H5N1 viruses and beyond \(UNMC\)](#)
- [Sustainable Development \(U.N.\)](#)