Avian Infulenza

Could it be falling from the sky? Dr. Chris Fletcher Virginia Department of Agriculture And Consumer Services





What was the deadliest month in US history? October 1918 195,000 Americans Spanish Flu

Avian Influenza---aka "Bird Flu"

• 4 types of Influenza

- A Many different spps and birds
- B Humans
- C Humans and pigs (rare)
- D Cattle and pigs
- A &B \rightarrow responsible for pandemics

• Caused by the influenza A virus



Influenza

- H number (for the type of hemagglutinin) and an N number (for the type of neuraminidase)
 - 18 different known H antigens
 - 11 different known N antigens
 - (198 different possible combinations)
- Human influenza virus H1N1, H1N2, and H3N2
 - Avian influenza that also affects humans H5N1, H7N3, H7N7, H7N9, and H9N2
 - ZOONOTIC!
 - The mortality rate for humans with H5N1 is 60%

Avian Influenza

• "Bird Flu"



- Classified as high or low pathogenicity according to its subtype
 - Low Pathogenic Avian Influenza Virus (LPAIV) mild illness in birds, often unnoticed or without any symptoms.
 - Highly Pathogenic Avian Influenza Virus (HPAIV) caused by subtypes (H5 and H7) - causes serious illness in birds that can spread rapidly, resulting in high death rates.
- Most of the influenza viruses circulating in birds are not zoonotic.
 - \rightarrow LOW Path AI



The PROBLEM.....Mutations

- Low Path \rightarrow High Path
- Both spread very quickly from one bird to another
- Can affect internal organs
- Mortality 90-100% within 48hrs



Mutations

- As a virus replicates, its genes undergo random "copying errors"
 - Genetic mutations
- Over time, these copying errors can lead to alterations in the virus
- These alterations masks the virus from our immune system
 - May not recognize and fight the virus.
- Every time a new bird is infected → increases the chance that the virus could mutate
- The "Virus" wants to keep you alive so it can replicate





Reservoirs – Influenza A

- Wild aquatic birds
 - Gulls
 - Terns
 - Shorebirds
- Wild waterfowl
 - Ducks
 - Geese
 - Swans



- Clinical Signs in these birds are usually minimal
- Will shed the virus even though they may not appear sick!
 - Saliva
 - Nasal secretions
 - Feces

Al Transmission

- Migratory wild birds introduce AI into the environment
- Birds to Human transmission
 - Cleaning cages / roosting area
 - Plucking
 - Handling infected poultry carcasses
 - Preparing poultry for consumption
 - Contact with dead wildlife







Commercial Operations

BIOSECURITY VEHICLE WASH AREA



Locked down tight!











US Flyways





Ducks and Geese

- American Black Duck
- American Wigeon
- Atlantic Brant
- Black Scoter
- Bufflehead
- <u>Canada Goose</u>
- Canvasback
- Common Eider
- Common Goldeneye
- Common Merganser
- Gadwall
- Greater Scaup
- Green-winged Teal

- Hooded Merganser
- Lesser Scaup
- Long-tailed Duck
- Mallard
- Northern (Common) Eider
- Red-breasted Merganser
- Redhead
- Ruddy Duck
- Snow Goose (Greater)
- Surf Scoter
- White-winged Scoter
- Wood Duck





• American Goldfinch

- American Tree Sparrow
- Baltimore Oriole
- Black-capped Chickadee
- Blue Grosbeak
- <u>Blue Jay</u>
- Brown Thrasher
- Chipping Sparrow
- Common Redpoll
- Dark-eyed Junco
- Eastern Bluebird
- Eastern Meadowlark
- Eastern Towhee
- Evening Grosbeak
- Field Sparrow
- Hermit Thrush
- Broad-winged hawk

- House Finch
- Northern Cardinal
- Northern Flicker
- Orchard Oriole
- Pine Grosbeak
- Pine Siskin
- Pine Warbler
- Purple Finch
- Red-breasted Nuthatch
- Red-winged Blackbird
- Ruby-crowned Kinglet
- **Ruby-Throated Hummingbird**
- Song Sparrow
- White-throated Sparrow
- Yellow-rumped Warbler
- Peregrine Falcon

Atlantic Flyway

- Bordered by an ocean
 - Entices birds to hug the coastline during migration
- Includes routes that jump to Cuba and other Caribbean islands.
- 500 bird species use the Atlantic Flyway
- Most don't travel through the entire flyway
- Dense concentration of shorebirds and waterfowl
- 10 to 20 billion birds in the United States. Every year, more than five billion will migrate





Appalachian mountains

- Safe-haven for migratory birds
 - Rich habitat
 - Streams
 - Edible insects
 - Nestable trees



- Ridgelines of the mountains provide a guide for eagles, hawks and vultures
- Remember birds play major role in agriculture.
 - Pollinators
 - Fertilize plants



How to help bird populations

Regularly clean bird baths and feeders to prevent the spread of disease



Wild Birds H5N1 as of 1/17/24



Poultry H5N1 as of 1/17/24





Mammals that have died from H5N1

- 84 Red Fox
- 37 Skunk
- 21 Mountai
- 22 Harbor S
- 14 Raccoon
- 4 Opossum
- 5 Black Bear
- 6 Bobcat



• 1 Abert's Squirrel

First penguins die in Antarctic of deadly H5N1 bird flu strain

With confirmed or suspected cases in two Antarctic penguin species, researchers fear highly contagious virus could rip through colonies



A king penguin on South Georgia. The rapid spread of bird flu is a threat to populations already endangered by the climate crisis and overfishing. Photograph: David Tipling Photo Library/Alamy

At least one king penguin is suspected to have died from bird flu in the Antarctic. If confirmed, it will be the first of the species killed by the highly contagious H5N1 virus in the wild.

Researchers have **previously raised alarm** about "one of the largest ecological disasters of modern times" if bird flu reached remote Antarctic penguin populations. The birds are currently clustering together for breeding season, meaning the disease could rip through entire colonies if it continues to spread through the region



People and H5N1

- 1 Person in CO ill but recovered
 - Assisting in Depopulation



What can I do to protect my poultry?

• Biosecurity

- Keep visitors to a minimum
- Wash your hands before and after coming in contact with live poultry
- Disposable boot covers and/or disinfectant footbaths for anyone having contact with your flock
- Change clothes before entering poultry areas and before exiting the property
- Clean and disinfect tools or equipment
- Look for signs of illness
- Report sick birds
- Try to separate poultry as far as you can from wildlife areas





Objects or materials which are likely to carry infection









Manage manure/waste

- Clean bedding in nesting boxes (Wear PPE)
- Clean and sanitize waterers/feeders



How to limit spread of disease by direct contact







Limit wildlife access to livestock





How to stop the spread of disease by fomites







Watch for signs

- Sudden death (Multiple animals)
- Lack of energy and appetite
- Decreased egg production or soft-shelled or misshapen eggs
- Swelling of head, comb, eyelid, wattles, and hocks
- Purple discoloration of wattles, comb, and legs
- Nasal discharge, coughing, and sneezing
- Incoordination
- Diarrhea



Respiratory

- Sneezing "Snicking"
- Oculo-nasal discharge
- Swollen sinuses
- Open-mouth breathing
- Harsh sounds
- Head shaking
- "Vulture" stance







Don't have poultry but want to help

- Remove standing water
- Manage ponds to decrease wild birds
 - Keep banks well mowed
- Reduce food sources
- Keep waste and feed covered
- Remove perches and plug holes around structures
- Report dead/sick birds or wild animals to state officials





Report to your veterinarian or VDACS





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Why should I care?

- Devastation to US poultry industry 40 million animals & \$3 billion
- Devastation to ecosystems Next slide
- Zoonotic risks Spanish Flu 1918





Bird flu kills 17,000 elephant seal pups in Argentina

- 95 per cent of the population
- Tested positive for the H5N1
- Pups should not be scavenging on dead birds
- Resp or Milk transmission???





Concern

• H5N1 mutates and adapts to spread in Humans



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Questions???





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