

# The Private Practitioner as a Public Health Veterinarian

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National Association of Federal Veterinarians



NYC Veterinary Medical Association Meeting  
October 9, 2024

# Outline of talk -

- ▶ Who am I? And why am I here?
- ▶ Private Practice vs Public Practice
  - ▶ Expanding your vision and horizon
  - ▶ Expanding your career opportunities
- ▶ Challenges for the small animal veterinarian: zoonotic diseases - Horses vs Zebras
  - ▶ Rabies (antidote on my experience)
  - ▶ Leptospirosis (expansion in dogs)
  - ▶ Internal and external parasites (Lyme disease, hookworm)
- ▶ Avian Influenza H5N2
  - ▶ 1984 outbreak in Pennsylvania
  - ▶ NYC Live Bird Markets
- ▶ Monkey Pox - 2003 to today
- ▶ Swine influenza H3N2 -
- ▶ West Nile Virus -
- ▶ Avian Influenza H5N1 -
  - ▶ 1997 Hong Kong
  - ▶ 2006 Worldwide
  - ▶ 2023 United States



# Who am I and why am I here?

- ▶ Born and raised in Brooklyn, NY.
- ▶ Attended OLC, Brooklyn Tech, St. Francis College and LIU C.W. Post Campus
- ▶ Araneta University, Philippines then University of Tennessee, CVM, Knoxville, TN
- ▶ University of Minnesota, CVM, Graduate School and School of Public Health
- ▶ Private small animal practice in Fountain City, TN and Brooklyn, NY (2 years)
- ▶ USDA, APHIS, Veterinary Services (32 years):
  - ▶ Section Veterinary Medical Officer, NYC and Long Island
  - ▶ Graduate Student, University of Minnesota
  - ▶ National Swine Epidemiologist
  - ▶ Director of Swine Health Staff
  - ▶ Director of National Animal Health Programs Staff
  - ▶ Director of Emergency Programs
  - ▶ USDA Liaison to the White House
  - ▶ Director of the One Health Coordination Center
- ▶ Executive Vice President, National Association of Federal Veterinarians (5 years)

# Private Practice vs Public Practice

**By Valerie E. Ragan, DVM, and W. Ron DeHaven, DVM, MBA**

Future employers of veterinarians working in the public health sector see fast-growing demand for additional veterinarians working in areas such as emerging zoonotic diseases, biosecurity threats, and food safety, with a focus on complex global problems that span both human and animal health.

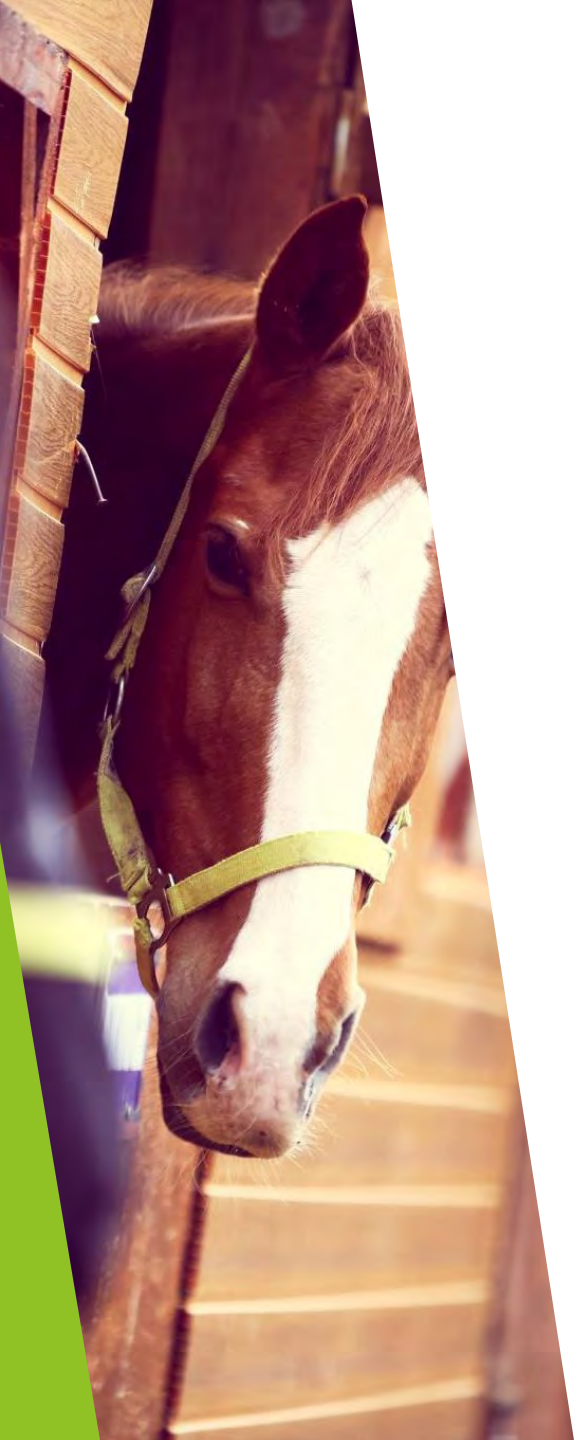
The global society is evolving, and those changes are significantly impacting the profession. In addition, the global population is growing rapidly, new pathogens are emerging (75 percent of which are zoonotic), environmental and climate changes are occurring, and antimicrobial resistance is on the rise.

<https://www.veterinarypracticenews.com/beyond-private-practice-serving-in-the-public-domain/#:~:text=Future%20employers%20of%20%E%80%80veterinarians%E%80%81>

## Public practice incorporates the following:

- ▶ regulatory veterinary medicine;
- ▶ zoo and wildlife medicine;
- ▶ public health;
- ▶ animal health at the national and state level;
- ▶ food safety and security;
- ▶ emerging infectious diseases;
- ▶ prevention and control of foreign animal diseases;
- ▶ epidemiology;
- ▶ risk analysis;
- ▶ risk management;
- ▶ prevention and control of emergency and infectious diseases;
- ▶ administration;
- ▶ management; and
- ▶ research.
  - ▶ More about all of this later...





## Challenges for the small animal veterinarian: Zoonotic diseases - Horses vs Zebras

- ▶ Rabies - **No rabid dogs** have been found in New York City in over 60 years, which coincides with compulsory rabies vaccinations in dogs.
- ▶ My experience of thinking horses
- ▶ World Rabies Day was September 28<sup>th</sup>. Canine rabies was a major topic for veterinarians in 2021 due to a canine travel ban issued by the Centers for Disease Control (CDC) after they discovered rabies in dogs imported with fraudulent rabies certificates. The restrictions have been somewhat loosened, but they still require scrolling through several pages on the CDC's website to understand how to travel with a dog.

<https://www.amcny.org/blog/2022/09/21/cautionary-tales-of-rabies-encounters-in-new-york-city/>

# Leptospirosis

- ▶ “In the 70s, the thought was that the risk [for leptospirosis infection] was mainly for **hunting dogs in wet areas**,” said John Ellis, DVM, PhD, DACVP, DACVM, professor of microbiology at the University of Saskatchewan and a member of the AAHA Canine Vaccine Guidelines task force. **“That has definitely changed over the years.”**
- ▶ “Because of the **increasing prevalence** of leptospirosis, this vaccine may be considered core for areas where the disease is present,” explained Ingrid Taylor, DVM, director of guidelines at AAHA. “According to the Guidelines, dogs should receive leptospirosis vaccinations if they spend any time outdoors (**including in rural, urban, and suburban environments**), spend time in kennels and/or dog daycares, and/or have potential exposure to wildlife reservoirs.”

[Leptospirosis vaccination recommended to be core for most dogs](#)

Published Jun 21, 2024

By [Emily Singler](#)

# Lyme Disease -

## ► Overview

- Lyme disease is caused by the *Borrelia* bacteria.
- The bacteria are transmitted to dogs by the Ixodes tick—also known as the black-legged tick or deer tick.
- Some dogs with Lyme disease never show symptoms.
- When symptoms are noticeable, they include joint pain, lameness, fever, and more.
- Early detection and treatment is key. Untreated or severe forms of Lyme can cause serious kidney problems.



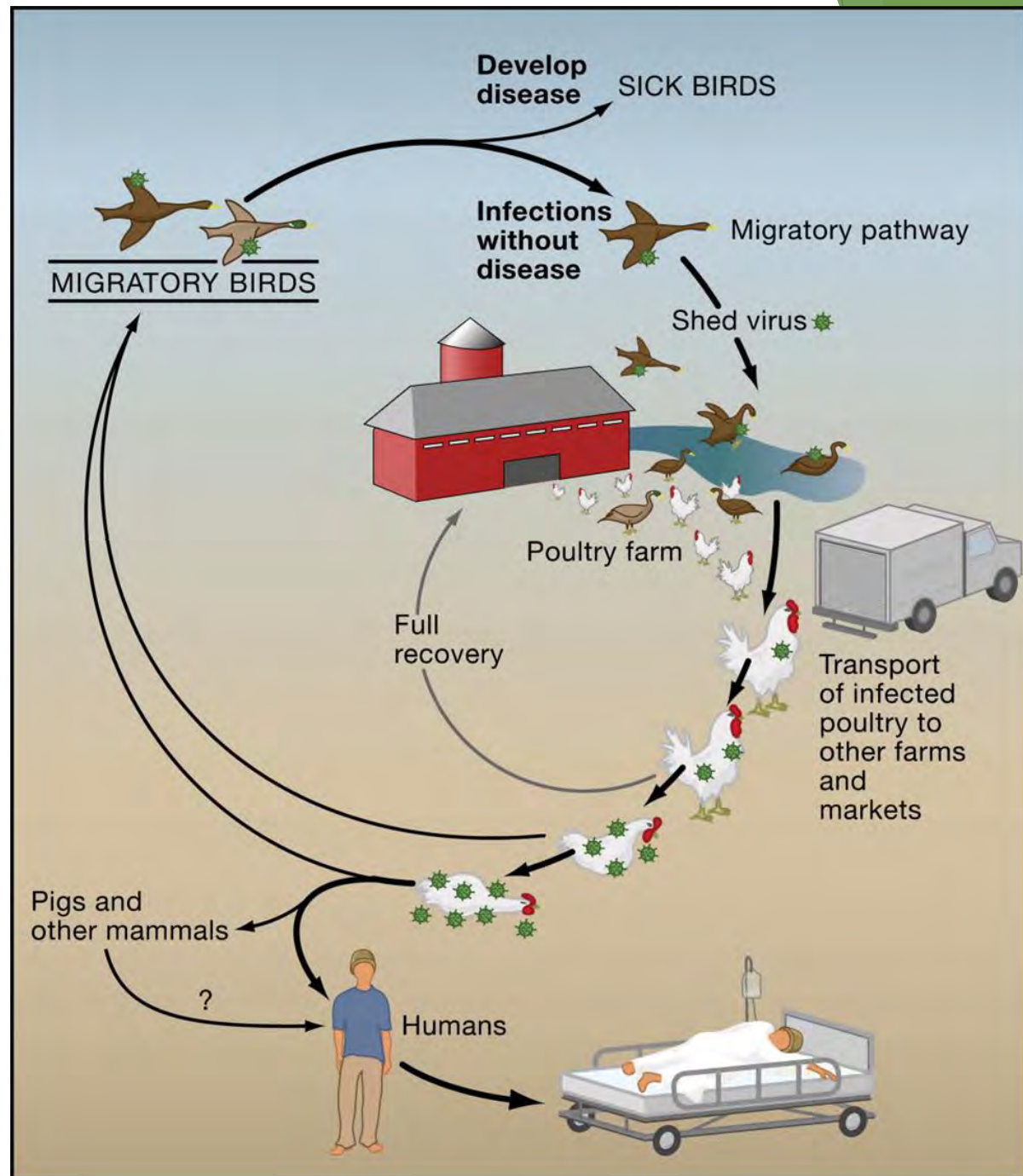
# Avian Influenza H5N2 in Pennsylvania 1983

- ▶ Low-pathogenic AI (LPAI) - A reportedly mild form of AI (**H5N2**) was introduced into chickens and diagnosed in 25 flocks between April and October 1983. Limited State regulatory flock quarantine actions were initiated. Although it was assumed that this wild disease would disappear, it is estimated to have spread to 80 - 100 undiagnosed flocks.



# Traditional thinking of avian influenza transmission

- ▶ Waterfowl to
- ▶ Poultry to
- ▶ Pigs to
- ▶ People becoming a
- ▶ Pandemic



# H5N2 Link to New York City





## Emergency Programs—AI To Prevent the Spread

- **Stop all movements of poultry, poultry products and equipment**
- **Follow disease-control recommendations for disposal of carcasses, litter, and contaminated water, feed, eggs or other products.**
- **Lock poultry houses and entry gates**
- **Permit *only* essential personnel access to your farm; *do not allow visitors***

## Emergency Programs—AI To Prevent the Spread (con't)

- **Establish proper cleaning and disinfection facilities and procedures**
- **Implement a vector-control program**
- **Encourage full participation of your poultry industry in the eradication program**
- **Report any sickness observed *immediately***

# Monkeypox

## VISUAL EXAMPLES OF MONKEYPOX RASH



Photo Credit - row 1: NHS England High consequence Infectious Disease  
Photo Credit - row 2: UK Health Sec

- ▶ Monkeypox was considered to be a rare but serious zoonotic disease
- ▶ The name monkeypox originates from the initial discovery of the virus in 1958, during an outbreak among monkeys in a Danish laboratory.
- ▶ Twelve years later, the first documented case in a human was identified in a 9-month-old infant in the Democratic Republic of the Congo (DRC).
- ▶ Following this discovery, monkeypox was sporadically found in the tropical rain forests of Central and Western Africa (10), with the DRC reporting the majority of the cases each year.
- ▶ The first outbreak outside of Africa occurred in 2003 (United States of America-USA).

# Monkey Pox and you!



- ▶ The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is assisting the Centers for Disease Control (CDC) and the Food and Drug Administration (FDA) with their investigation into an outbreak of monkeypox.



# Monkey Pox and you!



APHIS enforces the Animal Welfare Act (AWA) which, among other things, requires individuals or facilities selling exotic animals, such as prairie dogs, to have a USDA license. APHIS is working with CDC to provide information to these licensed entities about monkeypox, as well as assisting State departments of agriculture and departments of public health with trace-back and trace-forward investigations as needed. CDC is collecting this epidemiological information in its effort to stop the spread and eradicate monkeypox.

# Mpox virus

- ▶ The most recent outbreak, in 2022, surprised global public health authorities who were just starting to recover from the COVID-19 pandemic (13).
- ▶ The present outbreak is the largest in history, with the number of cases reported since the 7th of May 2022 having already surpassed the total number of monkeypox cases reported prior to this outbreak (14, 15).
- ▶ On the 23rd of July 2022 the World Health Organization (WHO) declared the monkeypox outbreak to be a public health emergency (16).

The Honorable Kathleen Sebelius  
Secretary  
U.S. Department of Health and Human Services  
Hubert H. Humphrey Building  
200 Independence Avenue, SW  
Washington, DC 20201

Dear Madam Secretary,

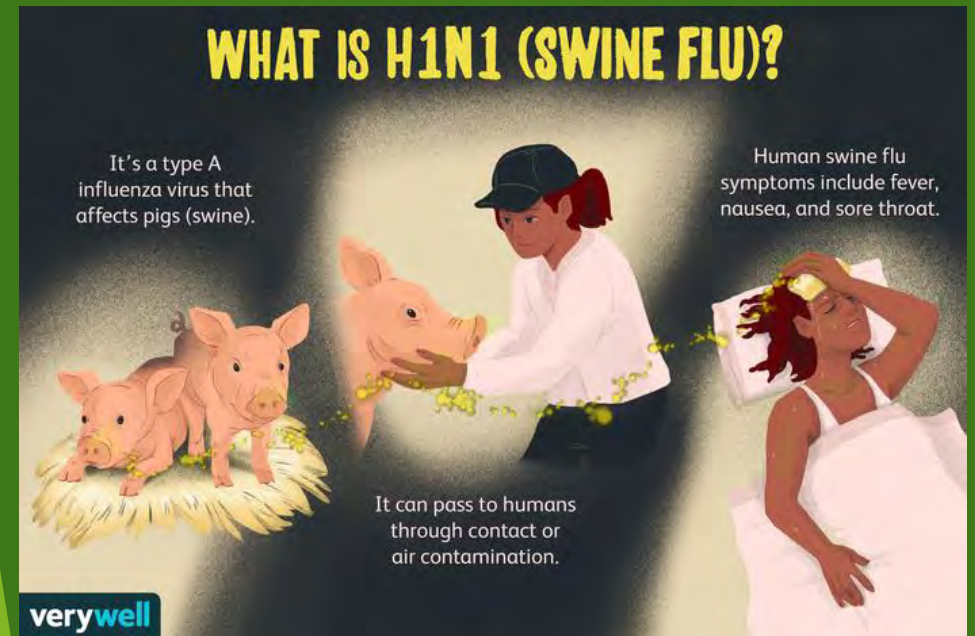
First, I commend the Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) for its commitment and continued partnership with USDA to counter possible pandemic threats posed by novel influenza viruses. This includes our close collaboration during domestic joint investigations of human infections with animal influenza viruses.

However, I am very concerned with the perception the use of the term “swine-origin” gives when referring to this novel H3N2 virus. This terminology, as we previously experienced with the recent pandemic, encourages media to use the term “swine flu” which could and has negatively and unnecessarily impacted trade and raised concerns about the safety of U.S. pork.

As we learned during the 2009 H1N1 pandemic, the use of the initial moniker “swine flu,” caused a major downturn in the domestic and international pork markets. Because of this terminology, as many as 27 countries imposed trade restrictions on U.S. swine and pork products. Each time the “swine flu” term was used, pork producers, their workers and their families suffered because their business was harmed by associating a 2009 pandemic influenza with an animal species that did not play a significant role in the ongoing transmission of the pandemic strain.

Especially in light of these difficult economic times, it is imperative that any further negative effects on the U.S. pork industry and related U.S. farm sectors be avoided if possible. Before the term “swine-origin” takes hold in the press, I am asking that we work together immediately with other domestic and international public and animal health agencies and organizations to determine what to call these novel influenza A viruses regardless if they are of swine or human origin. We not only must be careful about what we call these novel viruses because of the perception they give but also use a risk communication strategy that explains that these discoveries are helping us understand the natural ecology of influenza viruses and not place blame on any particular species. The agricultural community should be commended for being a part of that process and no attribution should be assigned to a particular species. At one time, these viruses once lived in each animal (pigs or birds) or humans. We cannot afford another economic downturn in the pork industry as we did during the 2009 H1N1 pandemic.

# Swine Influenza - H1N1 and H3N2







## HUMAN CASE OF SWINE FLU DETECTED IN UK FOR FIRST TIME



# Swine Influenza - H1N1 and H3N2

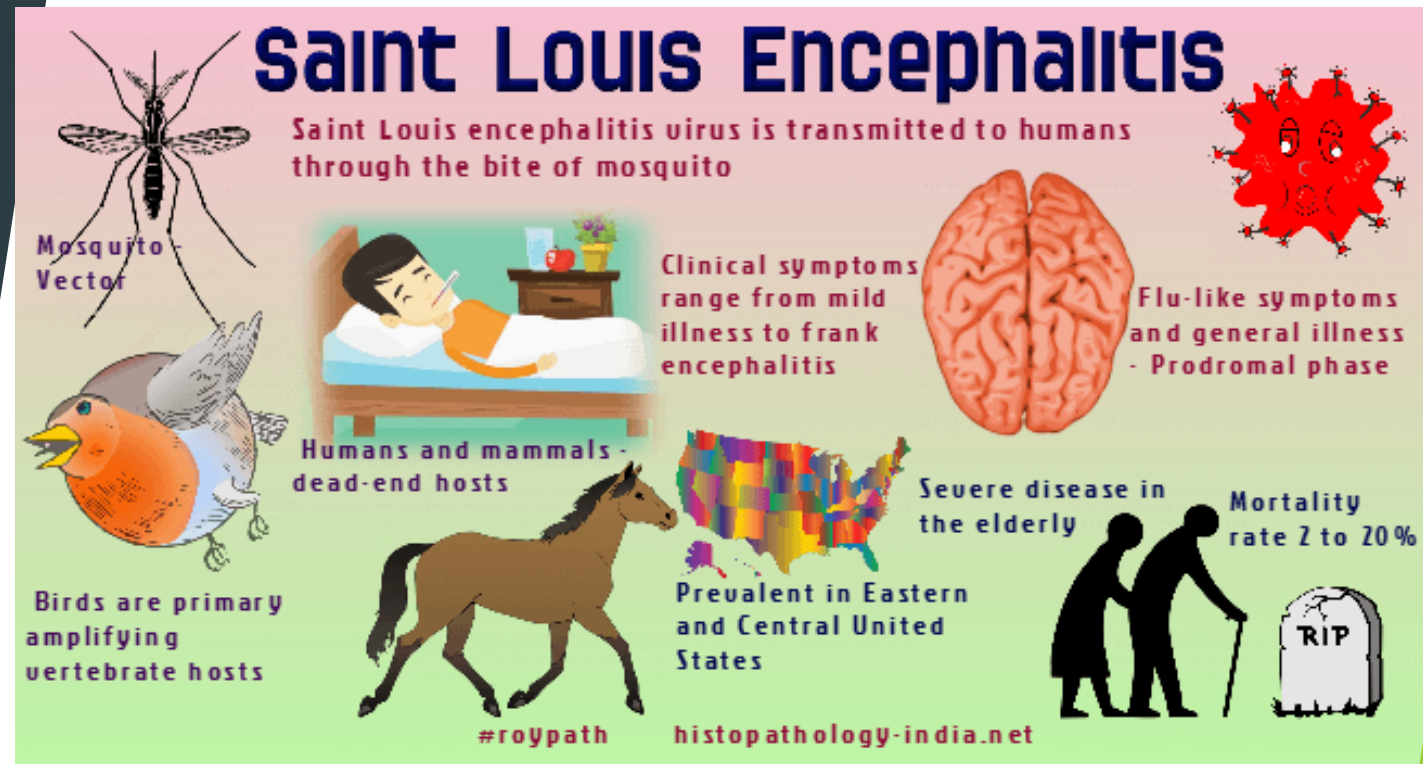
- ▶ The Cat Who Got Swine Flu
- ▶ By Tara Parker-Pope November 5, 2009 2:37 pmNovember 5, 2009 2:37 pm
- ▶ A few days after two members of an Ames, Iowa, family came down with the flu, they noticed their 13-year-old **cat wasn't feeling too well either**. The cat has since become the first documented case of a feline with the new H1N1 virus, commonly called swine flu.

# St. Louis Encephalitis or West Nile Virus?

## ► A Lesson in “One Health”

Tracey McNamara, DVM  
Diplomate ACVP  
Western University of Health  
Sciences  
Pomona, CA

► University of Zagreb  
School of Medicine  
October 5, 2011



**Saint Louis Encephalitis**

Saint Louis encephalitis virus is transmitted to humans through the bite of mosquito

**Mosquito Vector**

**Birds are primary amplifying vertebrate hosts**

**Humans and mammals - dead-end hosts**

**Birds are primary amplifying vertebrate hosts**

**Humans and mammals - dead-end hosts**

**Clinical symptoms range from mild illness to frank encephalitis**

**Flu-like symptoms and general illness - Prodromal phase**

**Severe disease in the elderly**

**Mortality rate 2 to 20%**

**Prevalent in Eastern and Central United States**

**#royopath** **histopathology-india.net**

The infographic features several illustrations: a mosquito, a bird, a person in bed with a fever, a horse, a map of the United States, a brain, a virus particle, and an elderly person with a cane next to a tombstone.

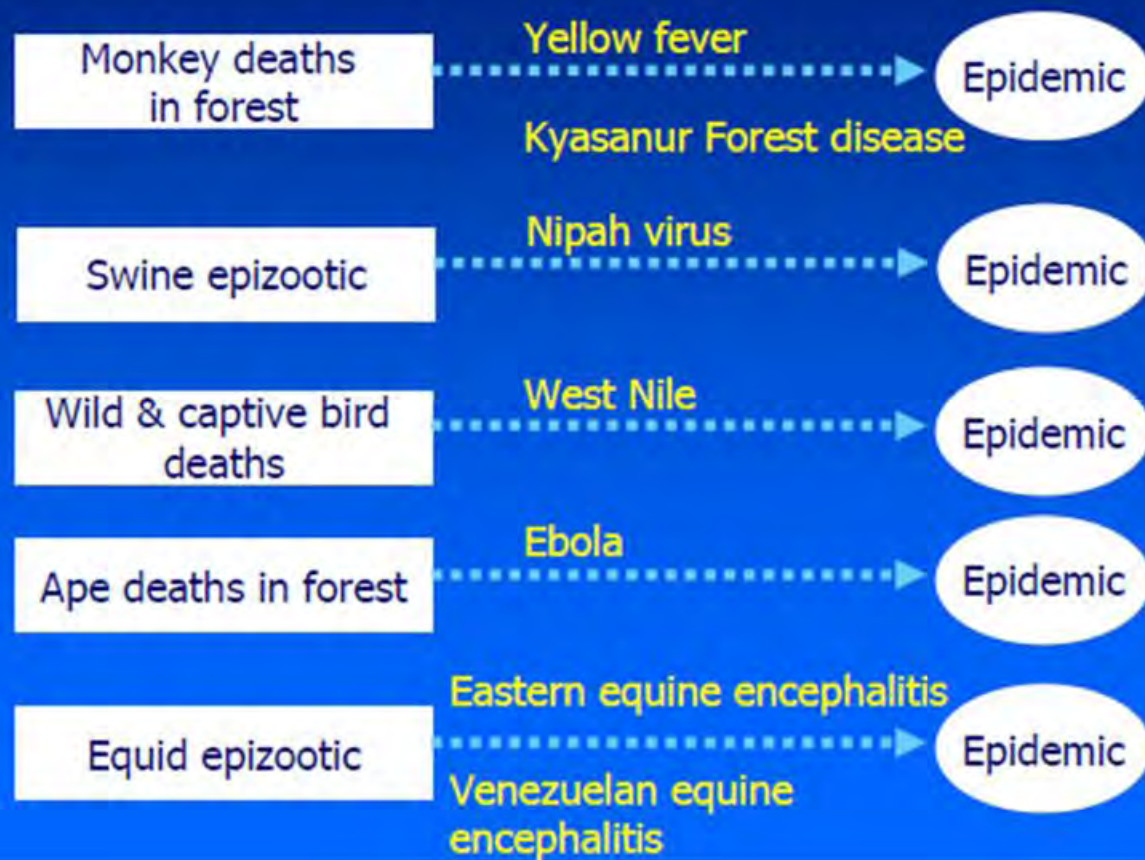
# Emerging Diseases

- **1709 known pathogens**
  - 832 (49%) are zoonotic
- **156 considered emerging**
  - 114 (73%) are zoonotic
- **Zoonoses are 3x more likely to be emerging than non zoonoses**

Source: SCIENCE, Vol289, 28July2000, p5



## Examples of diseases that regularly emerge as animal pathogens in advance of human outbreaks



## West Nile Virus Outbreak 1999

“...this case demonstrates the near absence of interagency and contingency planning for zoonotic diseases.”

*Report to the Minority Staff, Senate  
Governmental Affairs Committee to  
Senator Lieberman, Ranking Member*

## “One Health” - Revisiting an old idea



Rudolf Ludwig Karl Virchow (13 October 1821 – 5 September 1902)

**“between animal and human medicine there are no dividing lines—nor should there be”**

## 1967 – the turning point in the USA

- In an oft-quoted statement, the *Surgeon General* of the *United States* of America, William Stewart, said in 1967: “The time has come to *close the book on infectious diseases. We have* basically wiped out infection in the *United States. ...*”





**Zoos have  
been  
practicing  
“One Health”  
for 100 years  
or more**

# What happened in the summer of 1999 ...





# Epizootic

- Reports of dead birds (crows)
- Veterinarian (Bayside) finds crows with signs of nervous system disorders, treats and releases survivors.

<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>
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# Epidemic

Crows were sent to NYS DEC "Wildlife pathologist"

## Mystery Uncovered As Birds Are Found Dead In Parks & Ft. Totten

by *Liz Rhoades*

Has a plague hit the Bayside area? That's what area residents are asking following an infestation by alien destructive insects earlier this year and now the report of many dead birds, especially crows, in local parks and Fort Totten.

"I haven't seen a crow at Fort Totten since I buried a dead one last week," said Geraldine Spinella, president of the Bayside Historical Society which has its headquarters at the decommissioned Bayside fort.

"They used to be all over the place but now there are just the geese and a few small songbirds."

She also reported seeing a dead pigeon last week on the grounds.

At Kissena Park in Flushing, Parks officials report five dead crows were found last weekend.

At the Queens Wildlife Center, zoo Executive Director Robin Dalton reports eight dead crows and a few other birds.

At Alley Pond Environmental Center in Douglaston, Aline Euler, education director, said APEC has received several calls about dead sparrows, redwing blackbirds and crows in the Bayside area.

"I had an experience myself," Euler said. "I was in Douglaston where I saw a dead pigeon. You never see dead pigeons."

She said one man called saying he saw a sparrow try to take off and fly and then drop to the ground dead.

Meanwhile, Bayside residents have brought three dead crows, sparrows and



# Free Ranging Wildlife and ability to detect index cases

- More than 400 crows had been submitted for testing since early June 1999
- Illustrates fact that wildlife disease surveillance is ***insensitive to individual*** losses
- “Mother Nature” mentality – high threshold
- Qualifications of those doing wildlife necropsies?

## Epizootic

- Queens Zoo, Wildlife Conservation Society, Nassau County – send birds to NYS-DEC.
- Bronx Zoo starts own investigation

June	July	Aug	Sept	Oct
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- 8/2 – First human infection (retrospective).
- 8/12 – First case admitted to Flushing hospital.
- 8/23 – 5<sup>th</sup> case admitted, Hospital contacts NYC-DOH.
- 8/31 – Samples arrive at NYS-DOH lab.

## Epidemic



## His “Diagnosis”

### Death Of Crows In Queens May Be From Pesticides, Pneumonia

by *Liz Rhoades*

A preliminary state finding shows that a large number of crows found dead in the Bayside-Flushing area may have succumbed to a fungal pneumonia and/or long-living pesticides in the ground.

Ward Stone, a pathologist with the state Department of Environmental Conservation's Wildlife Pathology Unit at Delmar, told the Chronicle on Tuesday that preliminary results show the culprit is a fungal pneumonia and may also be related to pesticides from years ago that are still in the ground.

“Fungal pneumonia is very common in the environment,” he said. “Birds can inhale the moldy spores and become ill, especially if they are stressed or weakened.”

Bronx.

“There are many more dead ones out there,” Stone added. “This is the tip of the iceberg and I think it will continue because of the dry weather.

“We’ve had a little rain but not enough to make a difference when it comes to the birds.”

Queens, he noted, has a lot of open ground and grass and the crows may be victim to all the pesticides used years ago before the banning of DDT.

“This is a tougher season for the crows because of the weather and their deaths may be as a result of where they are feeding this year,” he said.

Last week’s Chronicle reported the deaths of numerous crows at Fort Totten in Bayside

“Just because you are working on a duck,  
there is no excuse for being a “quack”

Started our own investigation





# Captive Wildlife in Zoological Institutions

- “Valuable” individual animals – endangered species
- ***Sensitive to individual losses*** due to concern about disease spread to other collection animals
- Zoos do ***active*** disease surveillance

# Zoological Institutions

- Always on “high alert” against the threat of *introduced disease by local wildlife* found on zoo grounds
- Veterinary staff *expert in recognition* of the unusual in the unusual – much more so than local “poodle practitioners”
- Emphasis is on *real-time etiologic diagnoses* and epidemiological approach to disease outbreaks

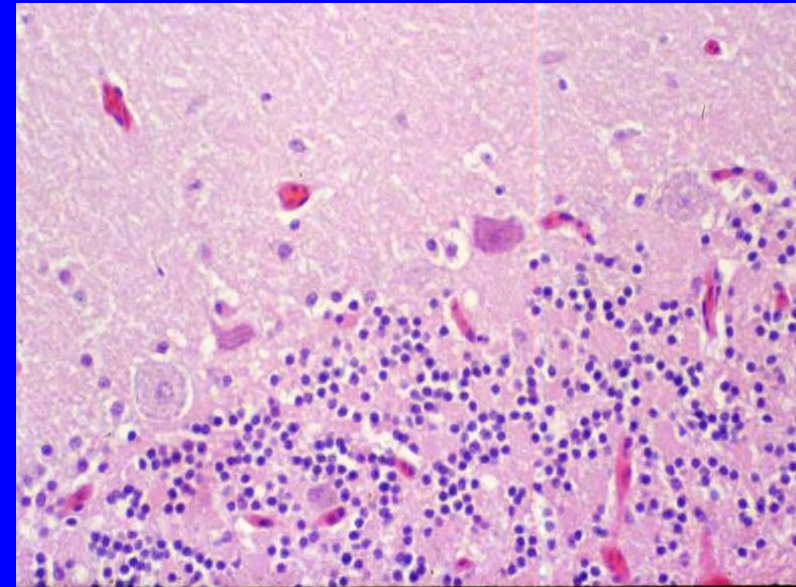
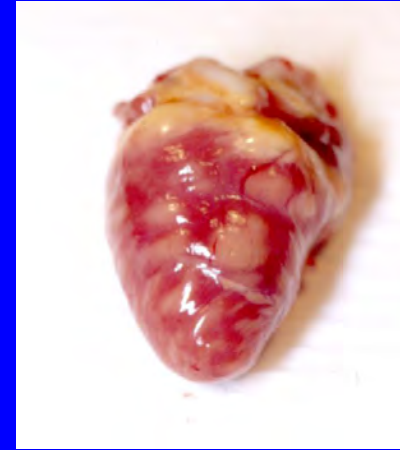
## The gross lesions seen in the first crows:

Calvarial hemorrhage localized to the region over the cerebellum



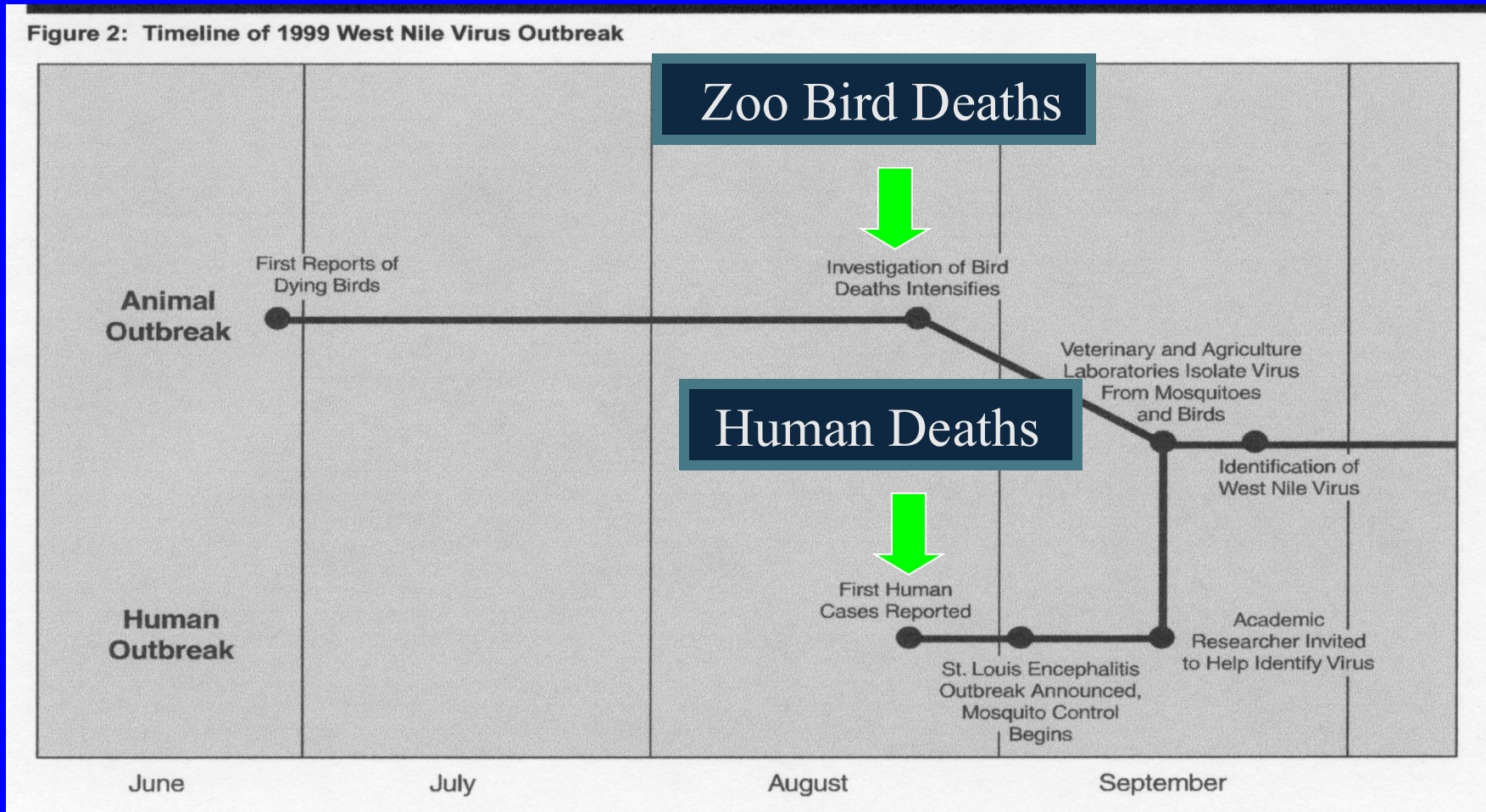
^  
Caudal aspect of skull

## Myocarditis



Hyperchromatic/Drop out of Purkinje cells of cerebellum

Synchronicity ?                      Yes  
Situational Awareness ?        No



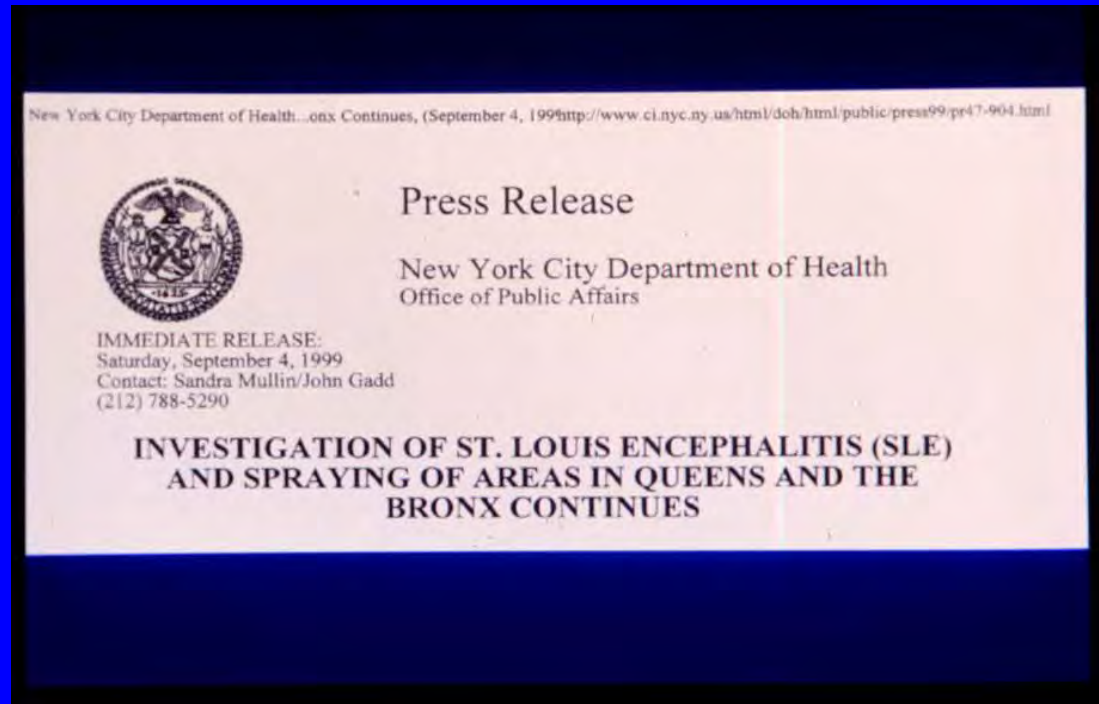


# Epidemic

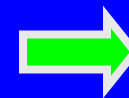
June	July	Aug	Sept	Oct
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- 9/1 NYS-DOH lab reports Flavivirus positive serology– SLE?
- 9/3 CDC lab confirms SLE, NYC starts vector control.
- Late September- Autopsy samples to UC Irvine – encephalitis project.

# “Situational Awareness” – the “Aha!” moment



**NYC DOH announces SLE  
Labor Day Weekend**



**Encephalitic people,  
Encephalitic birds?  
Hmmmmm...**








Labor Day weekend – spent in the library

I studied flaviviruses in medical textbooks!

What were the ultrastructural features  
of a flavivirus?

Could I do EM at  
Einstein Medical School?

# September 1999

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7 	8 	9 	10 	11
				<b>NVSL CDC</b>	<b>NVSL SEROLOGY</b>	
12	13 	14 	15 	16 <b>NVSL EM RESULTS</b> ↓ <b>NOTIFIED CDC</b>	17 <b>EINSTEIN EM</b>  <b>CALLED AFIP/NYSDH</b>	18
19	20 <b>NVSL SHIPS CULTURES CDC</b>	21 <b>WASH DC CONTACTED</b>  <b>SAMPLES SHIPPED</b>	22 <b>IHC Neg. EEE WEE VEE</b>	23 <b>IHC Pos. FLAVI</b>  <b>CDC Conf. Call</b>	24 <b>VIRUS Sequenced CDC Crows/Zoo</b>	25 <b>PRESS</b>  <b>CDC Conf. Call</b>
<b>PRESS</b> 26	<b>PRESS</b> 27 <b>CROWS ZOO HUMANS IDENTICAL</b>	<b>PRESS</b> 28	<b>PRESS</b> 29	<b>PRESS</b> 30		
<b>CDC Conf. Call</b>		<b>CDC Conf. Call</b>	<b>CDC Conf. Call</b>	<b>CDC Conf. Call</b>		





Tuesday Sept 7

Neurologic  
flamingoes  
held necks low  
in pronounced  
S-shaped  
curves

Wednesday Sept 8



North American Bald Eagle

Zoo mascot

Ate breakfast – dead by noon

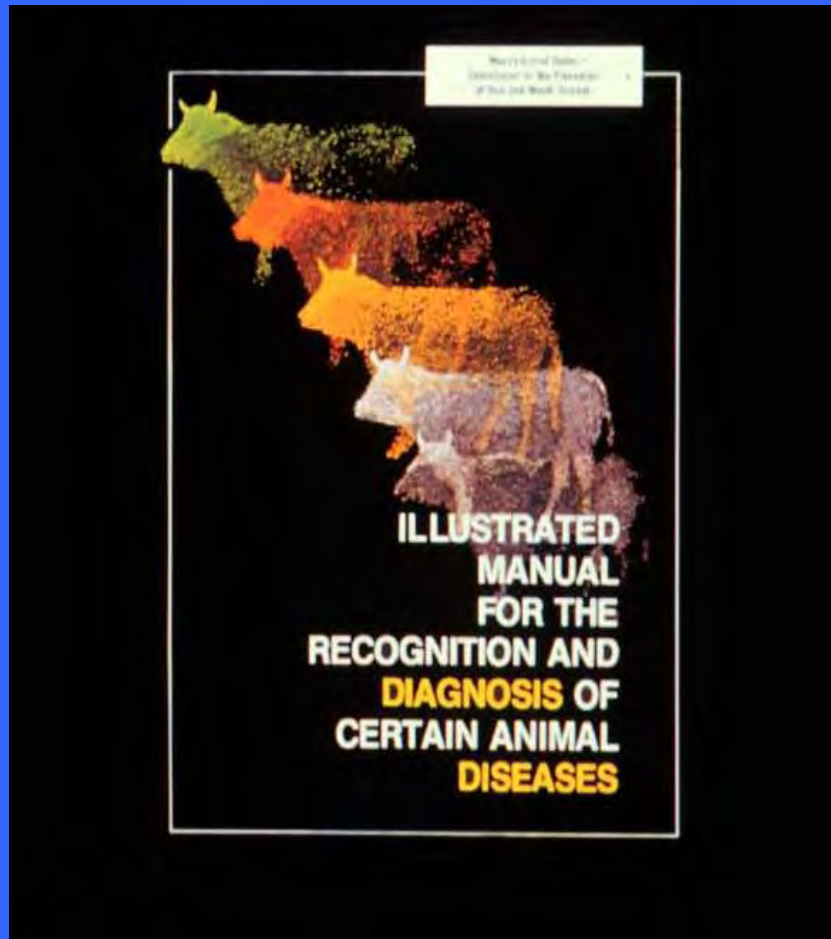
Cut in STAT slides for review

Shifted work to biological safety hood



And...When I went home that night,  
I wrote my will

# The Logic



Avian Encephalidites

HPAI

Exotic Newcastle disease



BUT, the chickens in the petting zoo were healthy



**The only thing these North and South American species  
had in common was the fact that they were  
all in outdoor exhibits**



**Could this be mosquito borne?**



## The viruses vets are used to ... EEE, WEE, VEE

- I. Group A arboviruses, now classified as Alpha-viruses of the family *Togaviridae*<sup>6</sup>:
  - 1) Western equine encephalitis (WEE) virus
  - 2) Eastern equine encephalitis (EEE) virus
  - 3) Venezuelan equine encephalitis (VEE) virus
- II. Group B arboviruses, now classified as Flavi-viruses of the family *Flaviviridae*<sup>7</sup>:
  - 1) St. Louis encephalitis (St. LE) virus
  - 2) Japanese B encephalitis (JBE) virus
  - 3) Murray Valley encephalitis (MVE) virus
  - 4) West Nile virus
  - 5) Ilheus virus

“On September 9, Dr. McNamara, concerned about the zoo’s animals, but also suspecting that there could be a link with the ongoing human epidemic of encephalitis, sought help.”

*Report to the Minority Staff, Senate  
Governmental Affairs Committee to  
Senator Lieberman, Ranking Member*



National Veterinary Services Laboratory,  
Ames, Iowa

Friday Sept 10 – negative for HPAI

Saturday Sept 11 – negative for VVND

Sunday Sept 12 – negative for EEE and  
“something was growing”; would have to wait  
for EM on isolated virus

We were out of known veterinary differentials

# “You are just dealing with some veterinary thing”

- Called Ft. Collins Vector Borne Disease Laboratory on Sept 9<sup>th</sup>
- Was told there was no possible relationship btw the bird deaths and the people dying in NYC. Period.
- When asked what I should tell a colleague, who had suffered a needle-stick exposure, the
- answer was “No treatment, no cure. Say a prayer and hope for the best”. Click.

“The Bronx Zoo pathologist tried many different channels in order to find laboratories willing to prioritize performing additional tests on the bird samples and to provide advice on needed safety precautions for zoo laboratory personnel working with the bird samples.”

*GAO/HEHS-00-180*

## Epidemic

June	July	Aug	Sept	Oct
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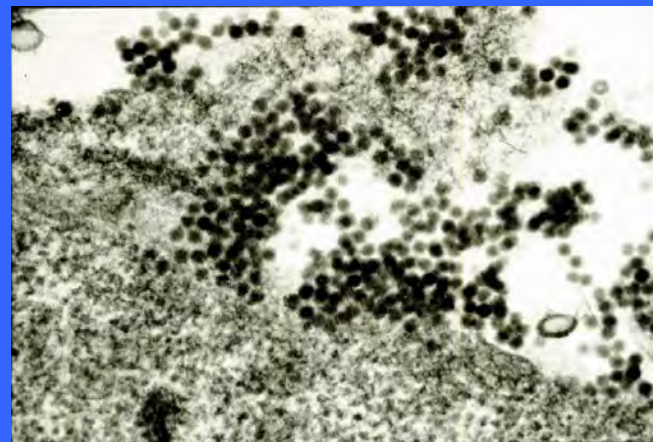
- Late September- NYSDOH questions SLE diagnosis due to profound muscle weakness in patients; meet Dr Ian Lipkin at the Encephalitis Project conference → NYSDOH sends Autopsy samples to UC Irvine for deep sequencing



# Thursday Sept 17

## USDA EM of Flamingo Isolate

- 35-45 nm Diameter
- Dense Core Surrounded by diffuse Outer Layer
- Typical Flaviviral Morphology



Called the CDC again...  
different guy/same results

“We’re not sure of the quality of work done  
in veterinary labs”

“We think you just have a contaminant”

CDC Fort Collins Epidemiologist



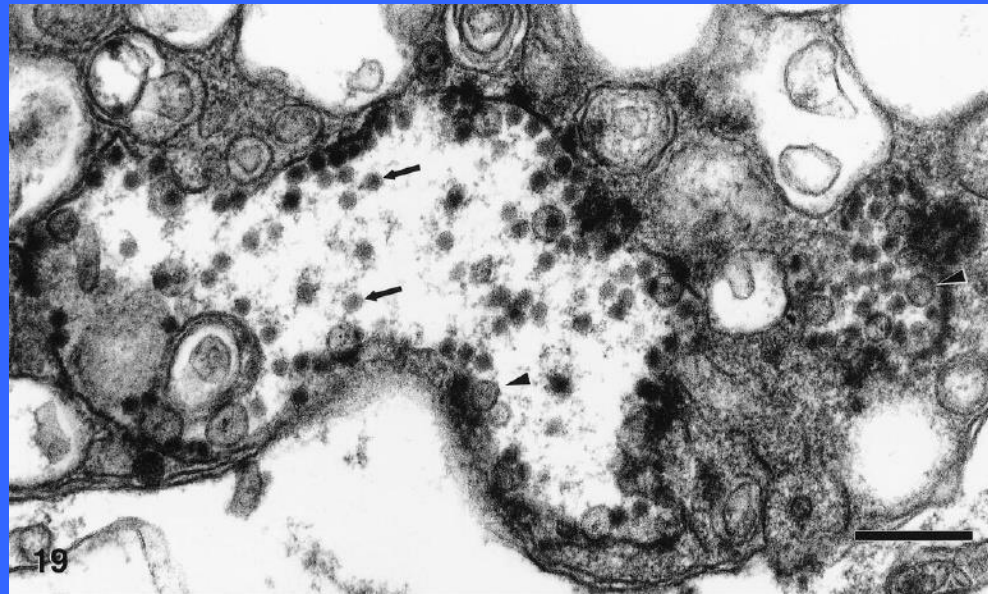
USAMRIID

Needed:

- BSL3 biocontainment
  - Many reagents; Ability to do diagnostics on unknowns
  - Can do attitude
- “I’ll call the Army!”

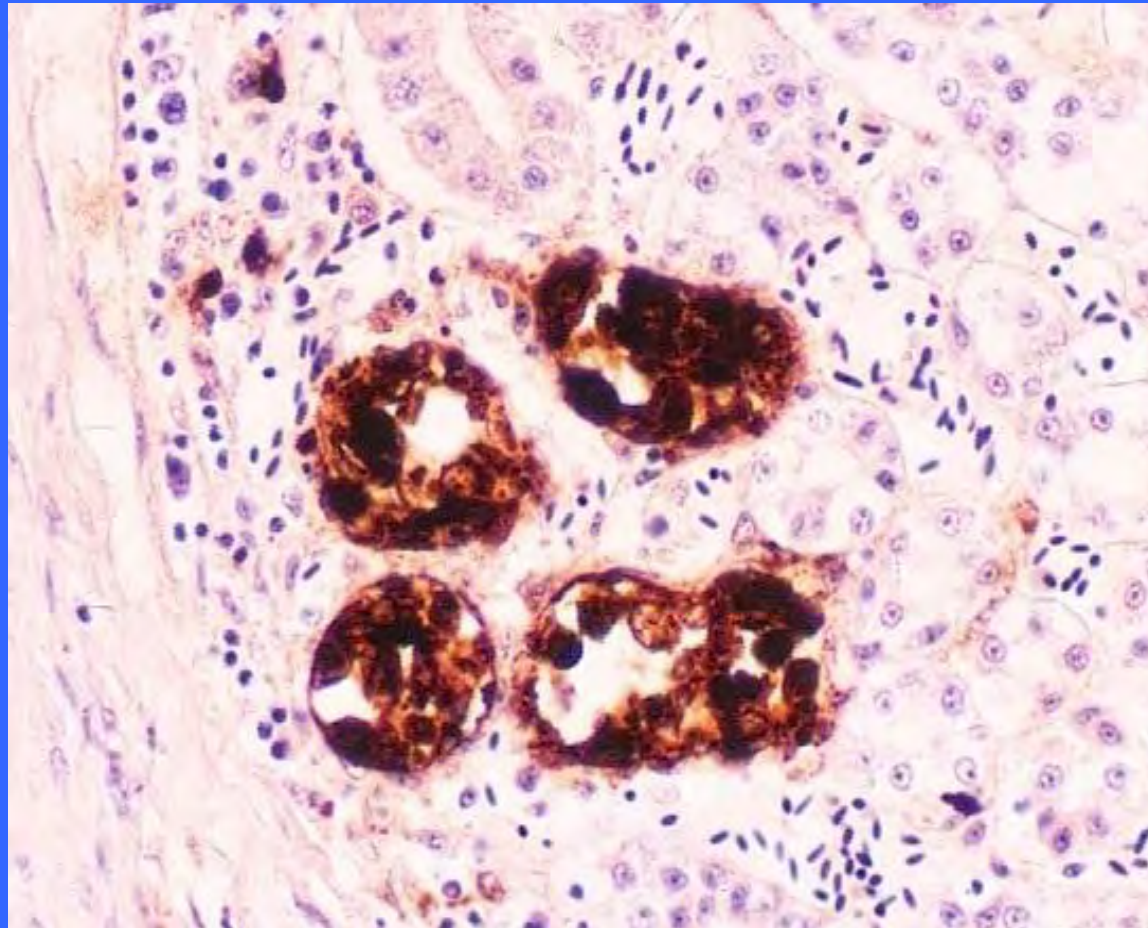
# WNV EM Features

- 35-45 nm Diameter
- Typical Flaviviral Morphology
- Dense Core Surrounded by Diffuse Outer Layer





USAMRIID had the necessary reagents  
Ruled out SLE and  
developed an IHC stain + for WNV



Epizootic

Epidemic

June	July	Aug	Sept	Oct
------	------	-----	------	-----

- Isolates identified as Flavivirus by CDC, UC Irvine.
- Partial sequence analysis interpreted as “WNV-like”, Kunjin.
- Repeat serology on humans indicates antibody against WNV.
- Complete sequence identifies West Nile virus from birds/humans.
- WNV identified from mosquitoes collected in NYC.

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# New York Outbreak Gets New Diagnosis

*West Nile Fever Has Made Its U.S. Debut*

By LYNNE DUKE  
*Washington Post Staff Writer*

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NEW YORK, Sept. 27—The mosquito-borne viral outbreak that has killed four people and sickened at least 33 others in the New York City area has been reclassified as a rare African and Asian virus that never before has been diagnosed in the Western Hemisphere,

have turned up in Connecticut, no human cases have been reported there.

The New York metropolitan area, and parts of Connecticut where dead crows were diagnosed, now have become laboratories for scientists tracking the course of a virus that first surfaced in Africa 60 years ago, became endemic to Asia and surfaced in Europe three years ago but never had



# MOSQUITO SPRAY



# Outbreak

Encephalitis, Rare in City, Kills at Least 1,  
Infects Dozens in Queens / Page A5

A helicopter releases spray intended to kill disease-carrying mosquitoes over Powell's Cove Park in College Point.

COPYRIGHT 1999, NEWSDAY INC., QUEENS, VOL. 66, NO. 2

## Lab tests too general to ID virus

By **MARTY ROSEN**  
DAILY NEWS STAFF WRITER

The country's top microbiologists misdiagnosed the mosquito-borne disease infecting New Yorkers because the lab tests they used were too general, experts said yesterday.

The tests — on spinal fluid and blood from victims in Queens — were capable of detecting mutant strains of St. Louis encephalitis, the disease initially diagnosed. But they never tested for the genetically similar West Nile, a virus never before reported in North America.

"That's one thing we've

learned from this. The world is even smaller than we thought, and we have to be prepared for that," said Dr. Philip Tierno, director of microbiology at New York University Medical Center.

West Nile and St. Louis encephalitis are flaviviruses, mosquito-borne viruses with almost identical genetic structures.

"These are first cousins. Nobody did anything wrong by not including West Nile in the test," said Dr. Thomas Monath, a medical virologist and former director of the Centers for Disease Control and Prevention's Fort Collins, Colo., laboratory.

According to Monath, scientists put samples of patients' spinal fluid on a plate holding a sample of the St. Louis encephalitis antigen, and the fluid tested positive. He said they would have realized it was a West Nile virus only if they had tested for both, then compared results. The antibodies in the spinal fluid would have reacted more strongly to West Nile virus.

The scientists also performed more detailed genetic testing on the fluids, but that was confusing because the viruses have almost identical RNA, or genetic building blocks, Monath said.

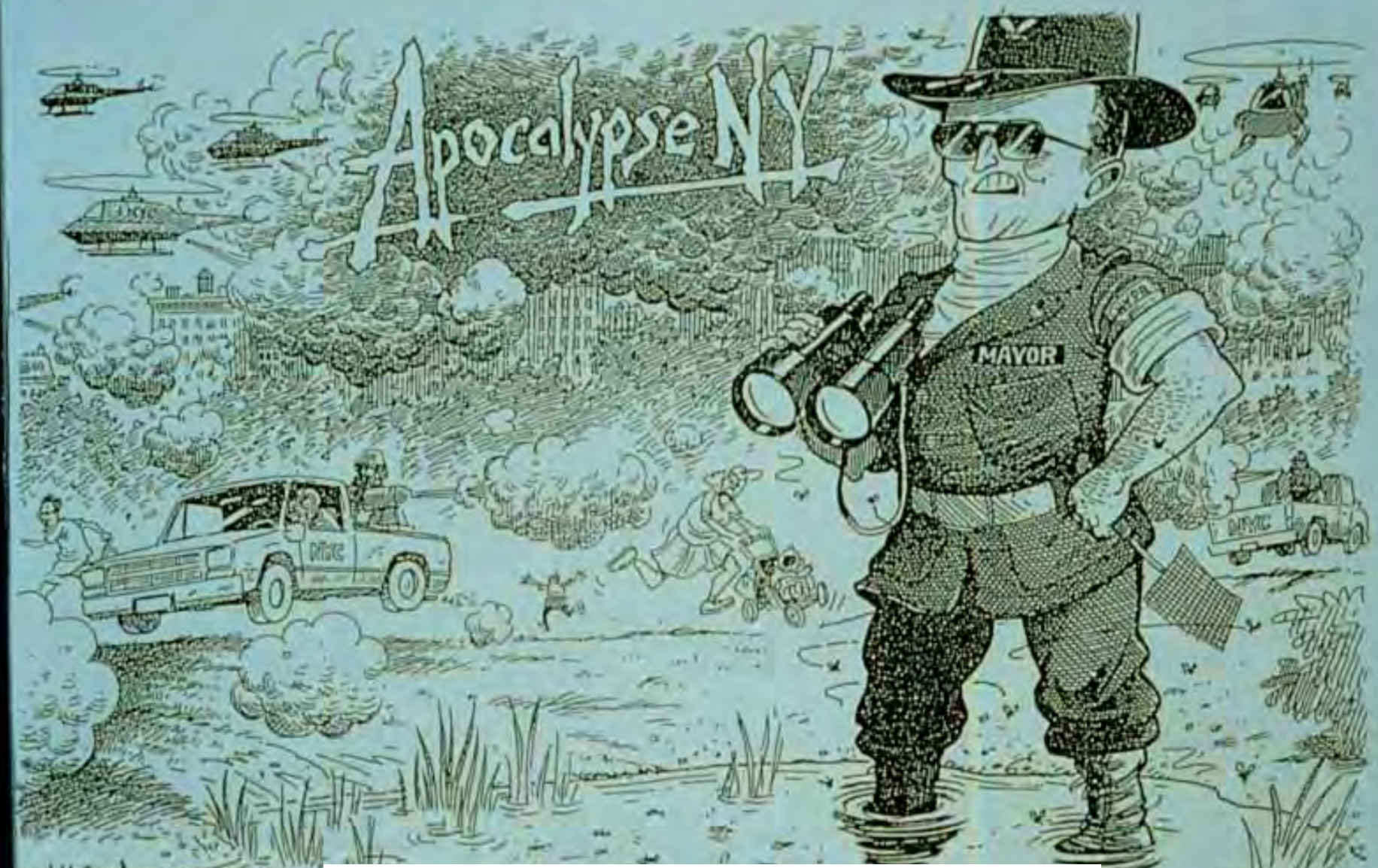
They used a more general genetic test to check for St. Louis encephalitis because the virus spawns many mutations that could evade a more specific test.

"You know it's a flavivirus, but you could wrongly conclude it's St. Louis," Monath said, explaining the error. "They were using a nonspecific probe."

Even though the Centers for Disease Control and Prevention continues to investigate, the state also shipped tissue samples to the Emerging Diseases Laboratory at the University of California-Irvine for a separate analysis.







"I love the smell of malathion in the morning" like Robert Duvall in "Apocalypse Now" movie

"I LOVE THE SMELL OF MALATHION IN THE MORNING!"

Posting on ProMed Mail  
“Oh my God, it’s killing cows!!!!”



The world’s best typo...  
Someone left the “r” out of “crows”



# West Nile Virus In New York - 1999



NYC - 1795  
Yellow Fever Outbreak  
730 Deaths



# Health & Fitness

TUESDAY, SEPTEMBER 28, 1999

The New York Times

THE DOCTOR'S WORLD

## Encephalitis Outbreak Teaches an Old Lesson

By LAWRENCE K. ALTMAN, M.D.

When you hear hoofbeats, don't think of zebras.

To doctors, the axiom is a call to focus on common ailments and not waste time on the exotic. But on those rare occasions when they do detect a zebra, doctors say they need

Virchow had it right

“between animal and human medicine there are no dividing lines—nor should there be”





# Avian Influenza H5N1 Hong Kong



Influenza H5N1 “Bird Flu” - Hong Kong, 1997  
“Slaughter of the Innocents”  
Time Magazine





# 12.7: Other Outbreaks

## “Hong Kong” 1997

H5 influenza common in birds-“bird flu” or “avian flu”

1985 Lancaster PA outbreak-highly pathogenic

1997 H5N1 “jumps” into humans: 6/18 fatal













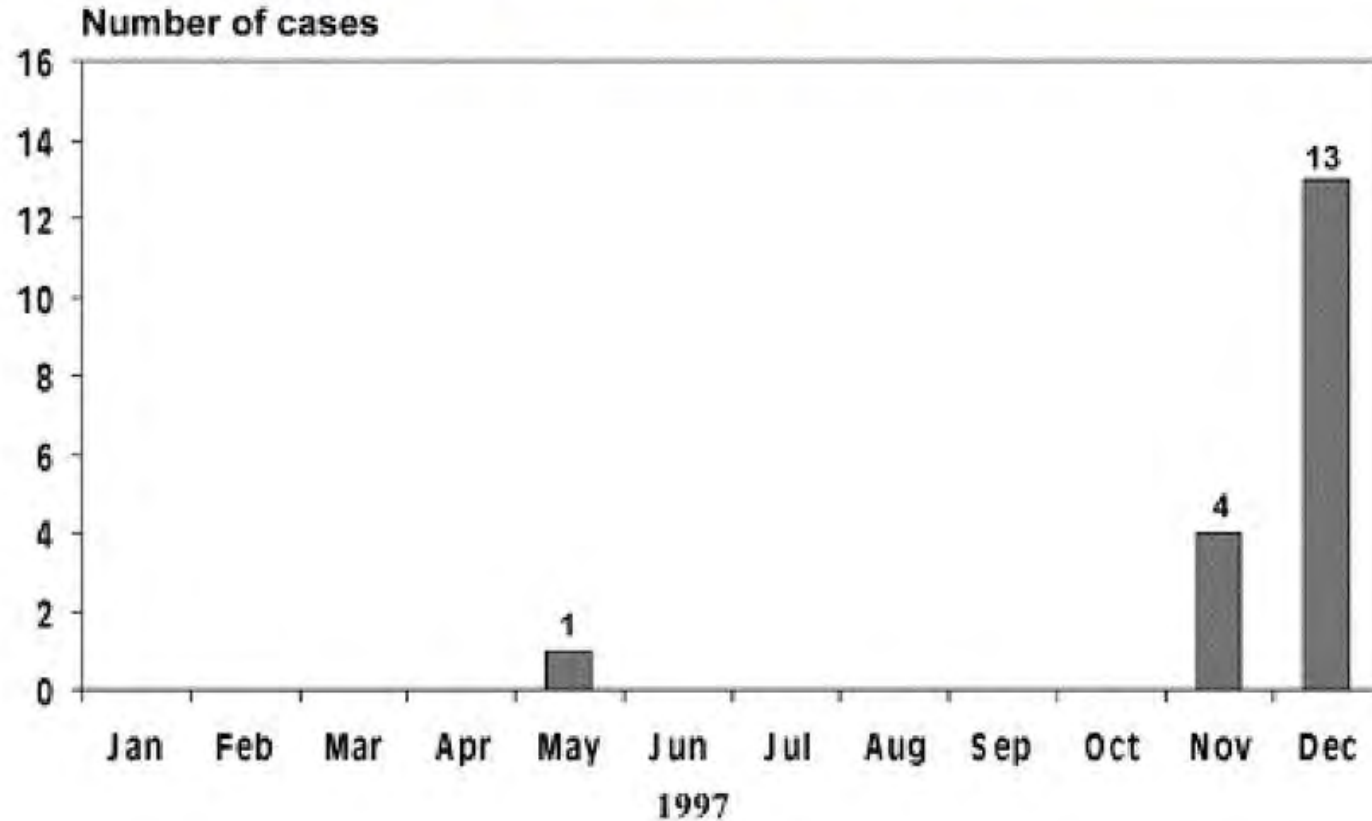








# Outbreak of influenza A (H5N1) in Hong Kong in 1997



# H5N1 Avian Influenza

- Hong Kong 1997
  - 18 human cases, 6 deaths
  - 1.4 million birds destroyed
- Dec. 2003: Asia
  - Ongoing extensive outbreak in poultry
  - Limited human to human transmission
  - 125 human cases, 64 fatal
- July-Aug 2005 Kazakhstan, Russia
- October 2005 Turkey, Romania, Russia

# Avian Influenza H5N1 2006

## and the evolution to a One Health Global Initiative



Joseph F. Anelli, DVM, MS  
Scientific and Technical Advisor for Emergency Management  
Animal and Plant Health Inspection Service (APHIS)  
Office of the Administrator  
USDA Marketing and Regulatory Programs  
1400 Independence Ave. SW



- 1968-69: Hong Kong flu **H3N2** kills 34,000 in the U.S.
- 1997: Avian flu **H5N1**, the first virus found to be transmitted directly from birds to people, emerges.
- 2003: Another avian strain, **H7N7**, appears for first time in humans.
- 2005: First known human-to-human transmission of **H5N1** occurs in Cambodia but is not sustained in people.

As of February 18th 2009: 408 human cases with 254 deaths from 15 countries

*SOURCES: National Institute of Allergy and Infectious Diseases; World Health Organization*

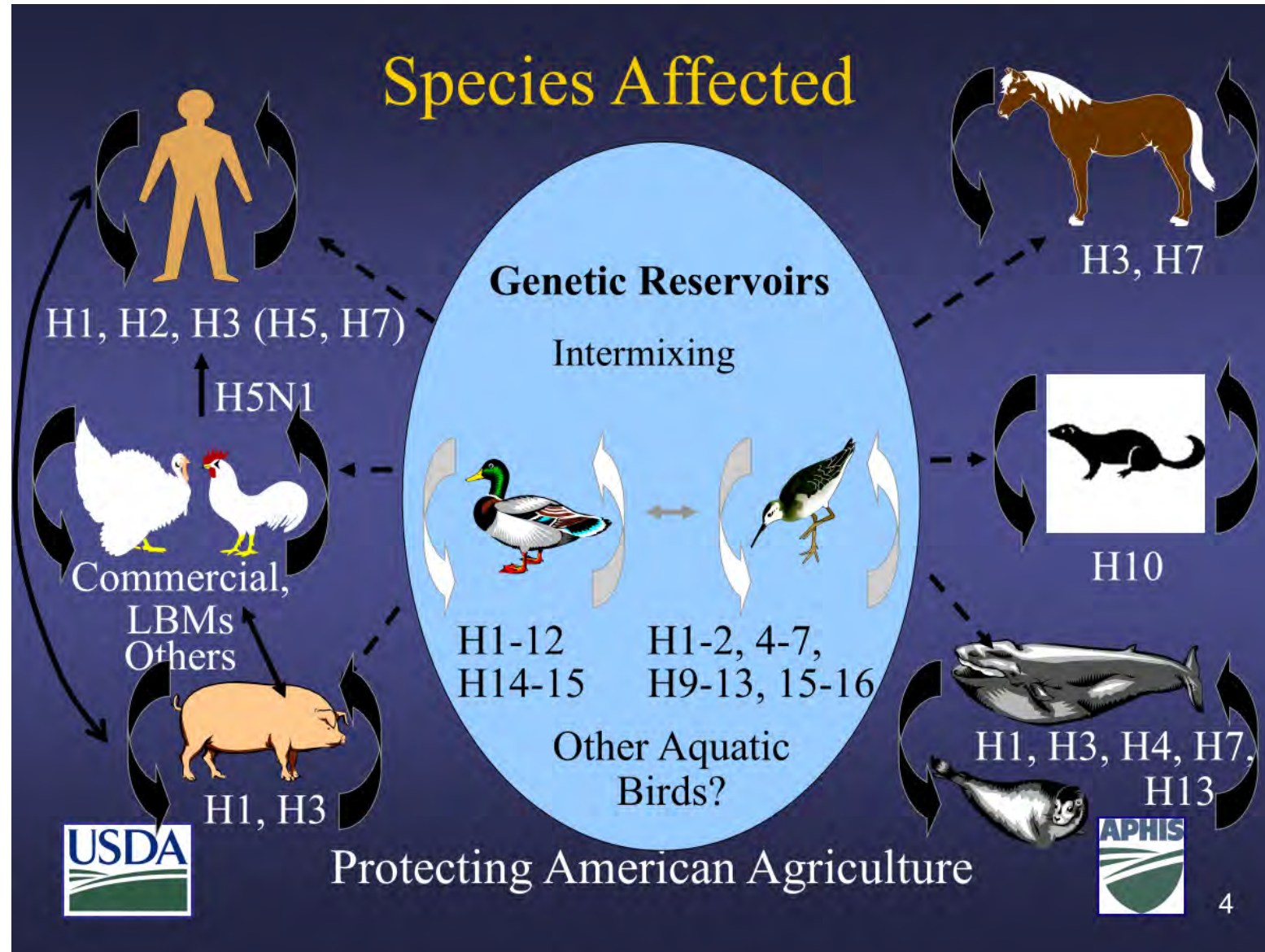


Protecting American Agriculture



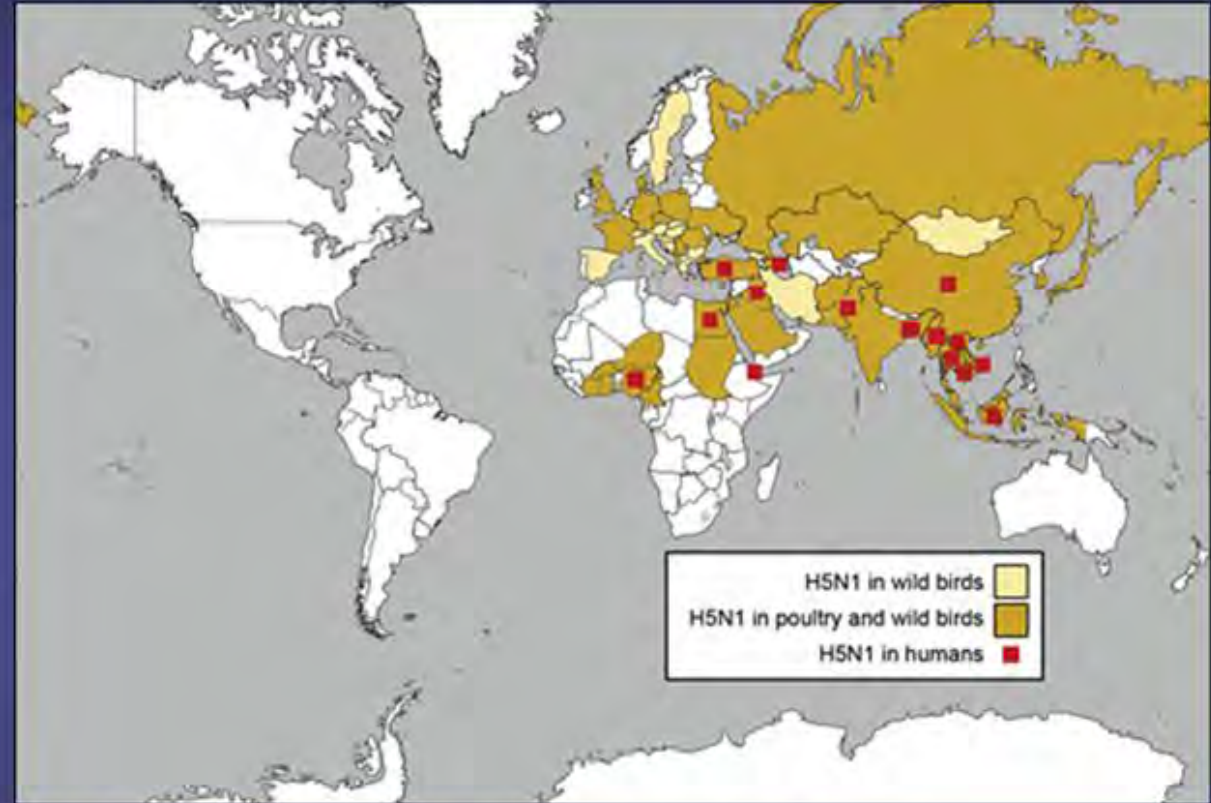


# Species Affected



- Highly pathogenic avian influenza (HPAI) – causes serious illness and significant death losses in birds

- Low pathogenic Avian Influenza (LPAI) causes no to mild illness in birds but H5 and H7 can mutate to Highly Pathogenic Avian Influenza



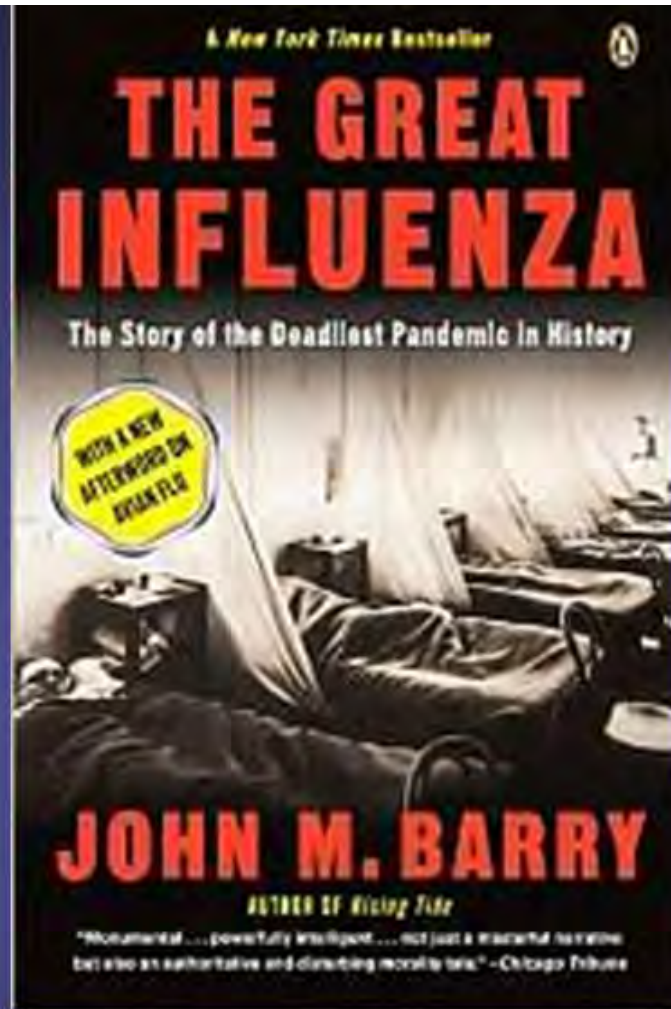
- Multiple serotypes (16 H's and 9 N's), no cross protection



*The Great  
Influenza:*

*The Epic Story of  
the Deadliest Plague  
in History*

*by John M. Barry*



*It began in 1918 and ended just two years later and is a fleeting memory now, but it was the most devastating bout with disease the world has known.*

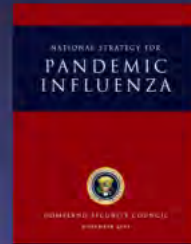
*More people died of flu in 24 weeks than have died of AIDS in 24 years.*

*The outbreak caused more casualties than did 100 years of plagues during the Middle Ages.*

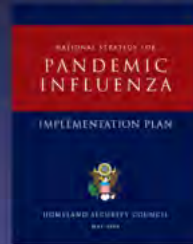
Publication Date: 2004



# Planning Against A Pandemic



2005



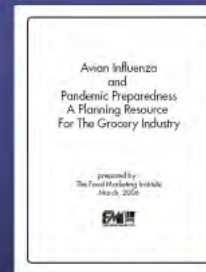
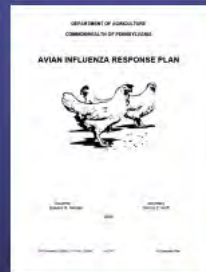
2006

## National Strategic Planning

sub-Interagency Policy Committee  
IPC, Deputies, Principals, President



## National Guidance/ Legislation/ Policies



## Federal, State, Tribal, Industry, Family and Individual Plans



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# The National Implementation Plan

- Contained 324 specific actions items
- Each of the actions included a measure of performance and a timeline for implementation of that action.
- Given the urgency:
  - approximately two-thirds were targeted for completion within 1 year of the Plan's release.
  - And all but four were to be completed after 2-years.
- USDA was lead or support for 97 of the 324 actions.



Protecting American Agriculture





## In response, USDA has:

- Increased surveillance of both domestic and wild birds, with no discoveries of highly pathogenic H5N1 avian influenza in the United States.
- Worked internationally to expand at-risk countries capabilities to identify new cases of highly pathogenic H5N1 avian influenza in order to attempt rapid eradication of the virus.
- Has extensive policies and guidelines in place to effectively control and eradicate an outbreak of highly pathogenic H5N1 avian influenza if found in the United States.



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- Prepared contingency plans to maintain essential functions during a time of work force reductions (which could be up to 40% absenteeism) due to a severe influenza pandemic.
- The *National Strategy for Pandemic Influenza Implementation Plan* required Federal departments and agencies to develop operational plans addressing:
  - (1) protection of employees,
  - (2) maintenance of essential functions and services,
  - (3) support for the Federal response, and
  - (4) communication with stakeholders on pandemic planning and response.
- A checklist consisting of 90 items to be addressed can be found at:

<http://www.pandemicflu.gov/plan/federal/operationalplans.html>



Protecting American Agriculture



NEW DELHI INTERNATIONAL  
MINISTERIAL CONFERENCE  
ON AVIAN AND  
PANDEMIC INFLUENZA  
4 - 6 DECEMBER 2007

## Evolution to a One Health Initiative...

### The Vision of New Delhi

The vision emerging from the New Delhi Conference is both broad and ambitious: to take forward the concept of "One World and One Health" as a contribution to pandemic preparedness and human security. Rising demands for animal products (associated with poverty reduction) and changes in ecosystems (due to population growth and climate change) are increasing human susceptibility to infection with animal diseases. Each Government should, therefore, encourage functional links between human and animal health systems, while investing in sustainable capacity for preventing and controlling high risk infectious diseases in animals (and thus contributing to better animal health), both within country and in conjunction with neighboring nations (through cross-border

***Each Government  
should, therefore, encourage functional links between human  
and animal health systems***

the "One world - One health" vision, the conference hosts have developed a Road Map.



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## CDC's Most Significant Global Epidemics Over the Last 15 Years

1993 – Hanta Virus

1994 – Plague (India)

1996 – New Variant CJD

1996 – H5N1 (Hong Kong)

1998 – Nipha Virus (Malaysia)

Ebola Zaire – annually

Ebola Reston in Pigs (Philippines)

1999 – West Nile

2000 – Rift Valley Fever

2001 – Anthrax

2002 – Norwalk-like viruses

2003 – SARS

2004 – Marburg Virus

2005 – H5N1 (Global)

2006 – E. coli

**70% of emerging diseases are zoonotic**

**Genetic and biological factors**

- Microbial adaptation and change
- Human susceptibility to Infection

**Physical environmental factors**

- Climate and weather
- Economic development and land use

**Ecological factors**

- Changing ecosystems
- Human demographics and behavior

**Social, political, and economic factors**

- International Travel and commerce
- Poverty and Social inequity
- War and Famine
- Lack of political will
- Intent to harm



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## List of diseases of common interest to human and animal health

Annex to the Specific Agreement of the OIE with FAO and WHO: The Global Early Warning and Response System for Major Animal Diseases, including Zoonoses (GLEWS)

### *Non-zoonotic*

- ☐ African swine fever (ASF)
- ☐ Classical swine fever (CSF)
- ☐ Contagious bovine pleuropneumonia (CBPP)
- ☐ Foot and mouth disease (FMD)
- ☐ *Peste des petits ruminants* (PPR)
- ☐ Rinderpest

### *Zoonotic*

- ☐ Anthrax
- ☐ Bovine spongiform encephalopathy (BSE)
- ☐ Brucellosis (*B. melitensis*)
- ☐ Crimean Congo haemorrhagic fever
- ☐ Ebola virus
- ☐ Food-borne diseases
- ☐ Highly pathogenic avian influenza (HPAI)
- ☐ Japanese encephalitis
- ☐ Marburg haemorrhagic fever
- ☐ New World screwworm
- ☐ Nipah virus
- ☐ Old World screwworm
- ☐ Q Fever
- ☐ Rabies
- ☐ Rift Valley fever (RVF)
- ☐ Sheep pox/goat pox
- ☐ Tularemia
- ☐ Venezuelan equine encephalomyelitis
- ☐ West Nile virus (WNV)



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## Next Steps:

The Homeland Security Council is undergoing a review but the issues of bio-defense, avian influenza and pandemic preparedness will continue regardless of the organizational structure they fall under. Therefore, USDA should:

- Continue to participate in and monitor the actions of the sub-IPCs on Bio-defense and Pandemic Preparedness
- Endorse the transition of the Avian Influenza Joint Working Group to the One Health Joint Working Group
- Coordinative a comprehensive exercise program across the Department and begin to conduct orientation exercises for:
  - Pandemic Preparedness (for maintenance of essential functions)
  - Major zoonotic disease outbreak (i.e. Rift Valley Fever)
  - Foodborne terrorist attacks (modeled after melamine contamination)



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Basic hygienic measures, such as frequent hand-washing, covering a mouth and nose during cough or sneeze, should be reinforced to minimize potential influenza transmission.



*The  
End*

*The  
Beginning*



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# What do the following slides have in common?



Medical staff take a blood sample from a man suspected of carrying the Ebola virus

## Uganda free from Ebola: ministry

Feb 20, 2008

KAMPALA (AFP) — Uganda said on Wednesday that the country was free of the Ebola virus, which has killed 37 people since September when the virulent strain first appeared in the impoverished east African nation.

Health Minister Stephen Malinga said it was the 42nd day since the last patient was discharged after the disease, obscured by ailments with near-similar symptoms, emerged mainly in western Uganda killing 37 out of 149 confirmed cases.

"There has been no further transmission of the virus since the 8th of January 2008," Malinga told a press conference here.



## Medical officials confirm Nipah virus returns to Bangladesh

4 days ago

DHAKA (AFP) — The deadly Nipah virus has returned to Bangladesh, killing at least eight people since the latest outbreak was confirmed, officials said Sunday.

Nipah induces flu-like symptoms that often lead to encephalitis and coma, with at least a 70 percent mortality rate in Bangladesh. The latest outbreak was confirmed on Friday.

"So far eight people including four children have died in the latest outbreak of the Nipah virus in (central) Manikganj and Rajbari districts," said Mahmudur Rahman, a senior health official.

"Several others are in critical condition. We told people not to be panicked. We have also increased surveillance in the affected area," he said.

## New Infectious Diseases On The Rise

More Than 300 Infectious Diseases Discovered Since 1940, Including SARS, MRSA And HIV

Feb. 21, 2008

Comments 1

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A girl in Hong Kong wears a mask to protect against SARS infection. Researchers recommend bolstering infectious disease surveillance in "hotspots" such as tropical Africa, Latin America and Asia. (AP)

### RELATED



#### PHOTO ESSAY

##### World AIDS Day

Ceremonies mark day of remembrance, push prevention and treatment.

[Doodle-Click any word](#) (What's this?)  
[AnswerTime™](#) enabled

(WebMD) Infectious diseases have been discovered at a blistering pace in recent years, and global health experts worry that we're looking in the wrong places for them.

A new study shows that since 1940, scientists have identified 335 emerging infectious diseases in people.

Those diseases include severe acute respiratory syndrome (SARS), Ebola, HIV (the virus that causes AIDS), West Nile virus, and methicillin-resistant staph (MRSA).

Many of the newfound diseases - 71% - started in wildlife and are becoming more common. Drug-resistant strains of infectious diseases are also on the rise, note the researchers, who included Kate Jones, PhD, of the Zoological Society of London.

Most of the infectious disease discoveries were made in Western countries, and those discoveries peaked in the 1980s.



### New warning over monkeypox threat



**The US could face further outbreaks of dangerous monkeypox if the virus has gained a foothold among native animals, say experts.**

The illness, from the same family as smallpox, is endemic in parts of Africa, but 81 cases were reported last year in six US states.

Writing in *The Lancet Infectious Diseases*, researchers from Stanford University say that it could return.

Some scientists say that, in theory, it could be used as a bioweapon.

It is thought that monkeypox was carried into the US by rodents imported as exotic pets.

It is extremely contagious among rodents, and fears now centre on whether or not the virus has managed to spread into native rat and mouse populations.

If so, say Drs Daniel Di Giulio and Paul Eckburg, it could form a "reservoir" of the virus which could provide the source of further outbreaks.

## Bird flu leading suspect in southern man's death

16:04' 21/02/2008 (GMT+7)

*VietNamNet Bridge* - A man in the coastal province of Bac Lieu died on Tuesday allegedly of bird flu's influenza virus H5N1 type-A.

43-year-old Lai Van Tan was hospitalized at the General Hospital of Bac Lieu Province with varicella, cough and dyspnea. Later, he was suspected to contract the influenza virus H5N1 type A after a chest X-Ray.



## Bird flu virus sends Bangladesh on high alert



**The Ministry of Health in Bangladesh after a bird flu case was confirmed in Karachi.**

*By: Mary Couchman  
Feb 3, 2008, 1:51 PM EST*

Bird flu, also known as the H5N1 virus, has spread to three more districts of Bangladesh sending the populated country into high alert. According to the Health Ministry, all the hospitals have been directed to set up isolation wards beforehand.

The latest outbreaks were reported in southwestern Gopalganj, northeastern Sylhet and northern Mymensingh district, officials said.

**They are all zoonotic diseases.**



## One medicine concept

<http://www.bmj.com/cgi/content/full/331/7527/0-f>

- Deaths of millions of birds around the world brings the link between human and animal health sharply into focus
- Time to consider the wider connections between animal and human health
- Think about how the medical and veterinary professions might work more closely together for the benefit of patients of all species

# Public Policy Formulation



Problem  
Identification

Ripped from the headlines April 29, 2022

Where are we today?

A man in Colorado is the first human in the U.S. to test positive for bird flu, the Centers for Disease Control and Prevention announced Thursday. The case comes as the H5N1 bird influenza tears through the U.S., posing a low risk to humans while leading to the deaths of millions of birds.



**NBC NEWS**

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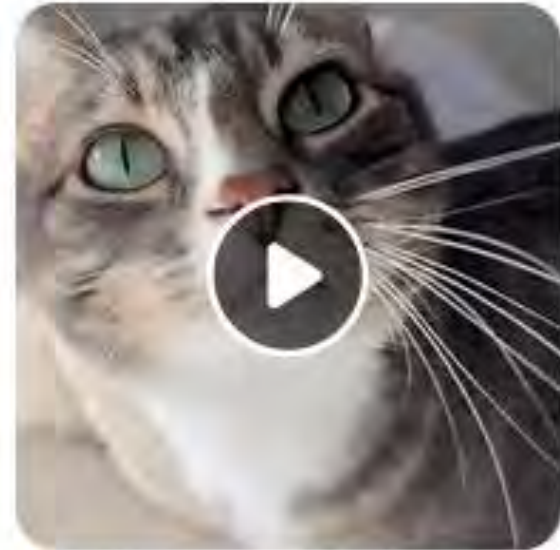
# U.S. records first case of highly contagious bird flu in human, health officials say

Although the H5N1 flu is highly infectious among birds, public health officials said the risk it poses to humans remains low.



**yahoo!** · 1d

Pet owners warned: 6 bird  
flu cases found in cats,  
including indoor-only





So what does this mean for you?

Considerations for Veterinarians: Evaluating and Handling of Cats  
Potentially Exposed to Highly Pathogenic Avian Influenza A(H5N1) Virus

# WHAT TO KNOW

- ▶ Veterinarians and veterinary staff, in field and clinical settings, who are working in close contact with cats who are suspected or confirmed-positive for HPAI A(H5N1) virus infection should take precautions to prevent potential unprotected exposures.
- ▶ Sick animals may be able to transmit influenza virus to people in their saliva, feces or droppings, and other body fluids.
- ▶ Human infections can occur when the virus is inhaled or gets into a person's eyes, nose, or mouth.







Can it get any worse?

# News about Avian Influenza 2024

bing.com/news



yahoo! · 16h

Avian flu has infected dairy cows in more than a dozen states – a microbiologist explains how the...

The H5N1 virus has infected about 900 people since 2003, and more than half of...

 **NBC NEWS**

CDC says close contact of Missouri b

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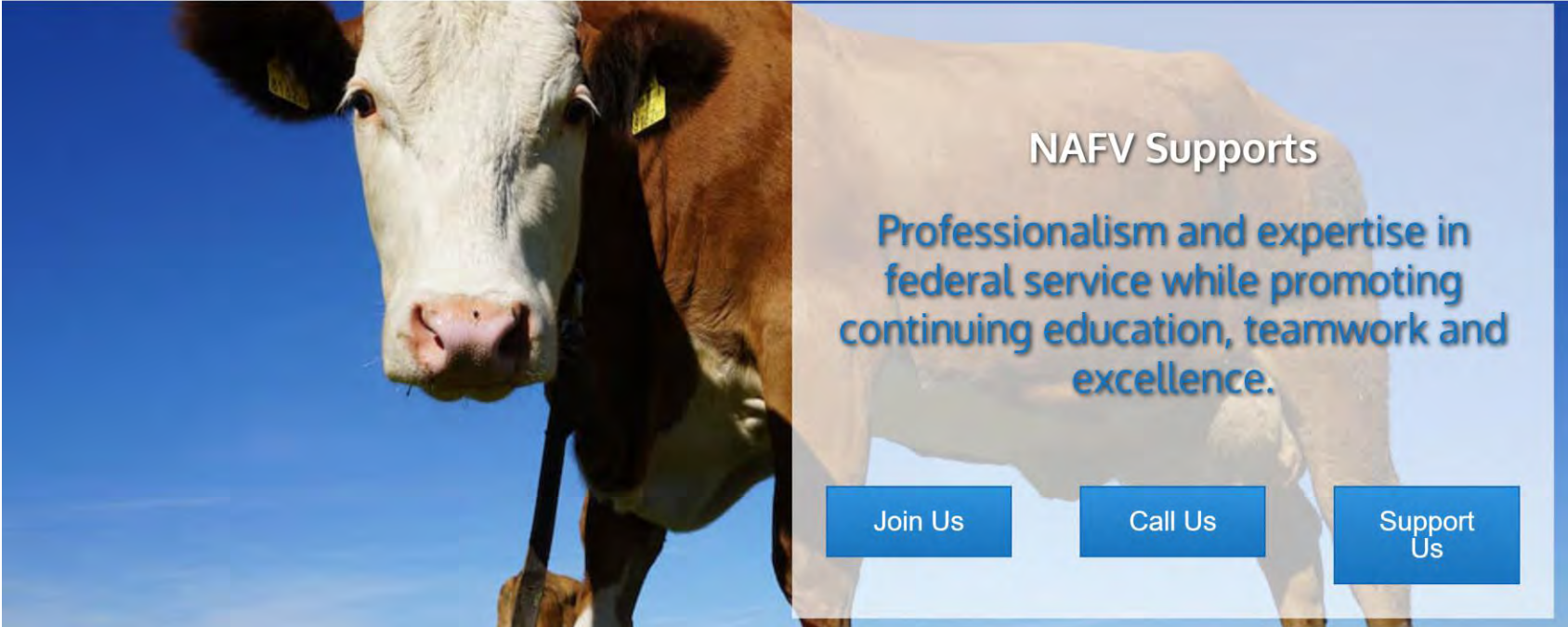


## CDC says close contact of Missouri bird flu patient showed symptoms

In a report Friday, the agency said the second person was not tested and has recovered.



National Association of  
Federal Veterinarians



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