

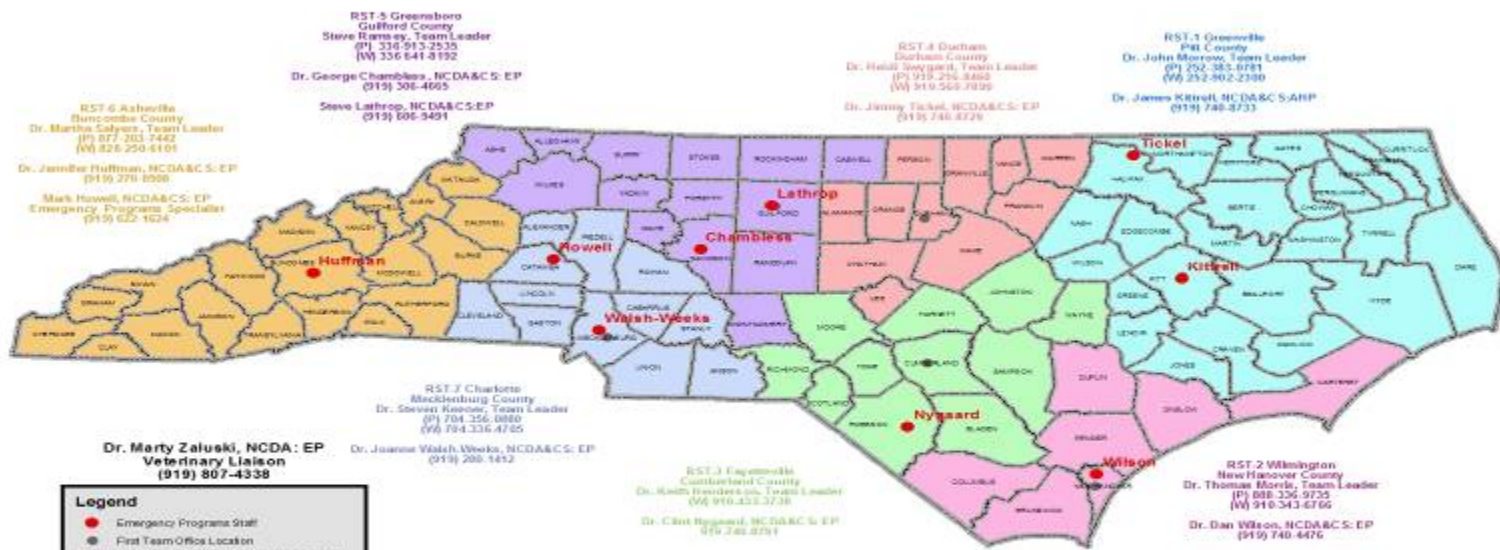
Pandemic Influenza Preparedness

NC Division of Public Health



Public Health Regional Surveillance Team, Region 4

NCDA & CS: EMERGENCY PROGRAMS DIVISION AND NC PUBLIC HEALTH REGIONAL SURVEILLANCE TEAM (PHRST)



Legend

- Emergency Programs Staff
- First Team Office Location

Public Health Regional Surveillance Team

- PHRST-1 Greenville
- PHRST-2 Wilmington
- PHRST-3 Fayetteville
- PHRST-4 Durham
- PHRST-5 Greensboro
- PHRST-6 Asheville
- PHRST-7 Charlotte

Source: Dept. of Health and Human Services:
Division of Public Health and NCDA & CS
Emergency Programs Division



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NOVEMBER 19, 2004



The team



Objectives

- Review the fundamentals of influenza
 - seasonal
 - avian
 - pandemic
- Assess the current threat of pandemic influenza
- Discuss pandemic influenza preparedness in North Carolina



Influenza Overview

■ Types of influenza

- A
- B
- C

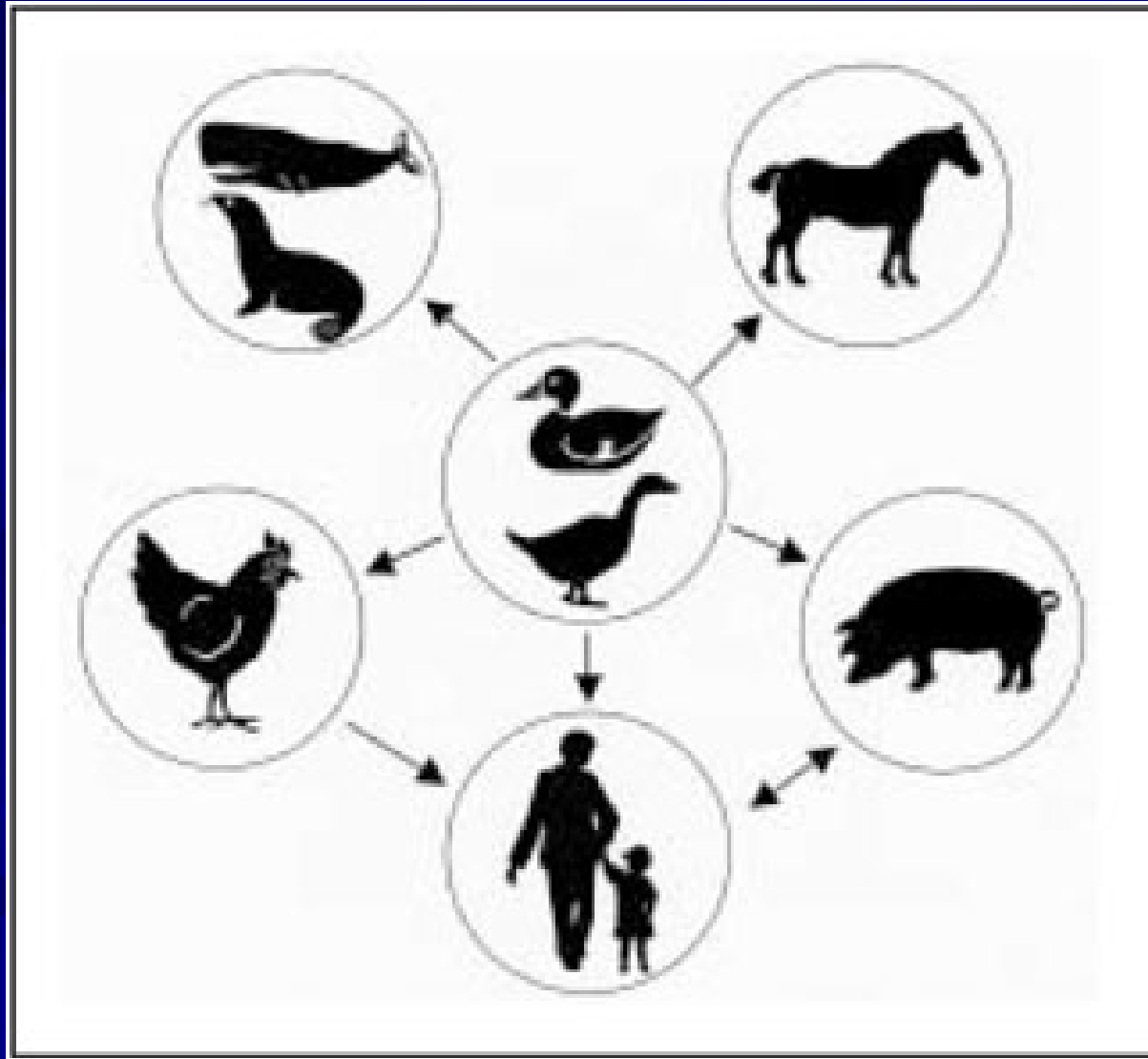
■ Subtypes of influenza

- H
- N



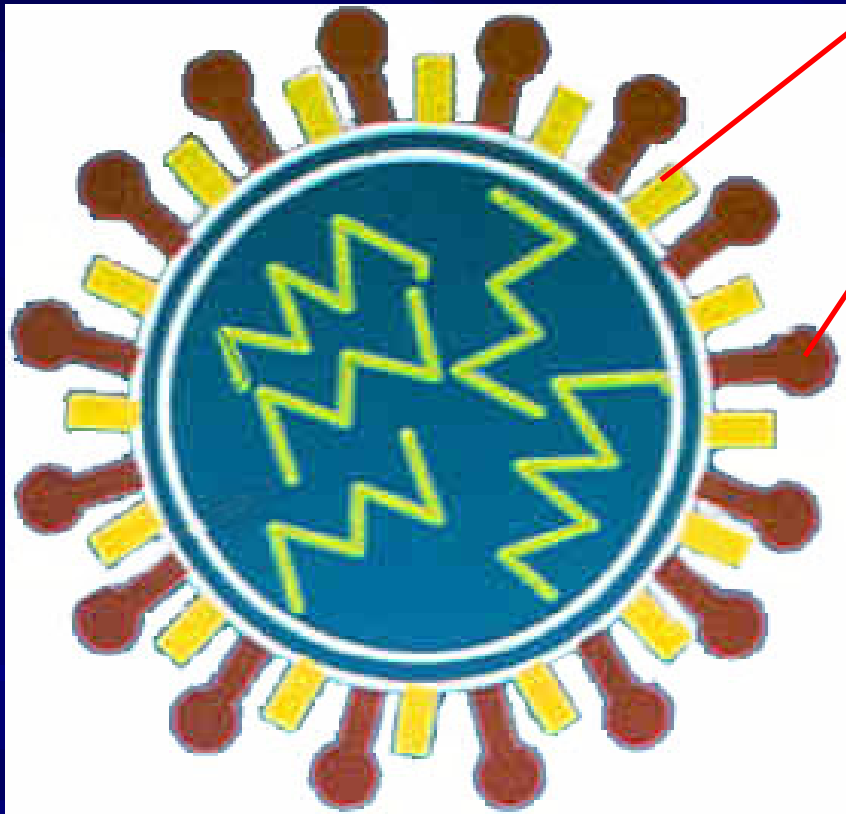
Corbis.com

Influenza A Virus in Animals



<http://www.mayoclinicproceedings.com/images/7904/7904crc-fig1.jpg>

Surface Proteins of Influenza A



- Hemagglutinin (H)
- Neuraminidase (N)
- Combination of surface proteins determines subtype; H__ N__

Different categories of influenza

- Seasonal influenza
- Avian influenza
- Pandemic influenza

Seasonal Influenza

- Viral respiratory disease
- Highly contagious
- Seasonal epidemics
- Annual impact (U.S.)
 - 36,000 deaths
 - 200,000 hospitalizations



Seasonal Influenza A

■ Hemagglutinin

- H1
- H2
- H3

■ Neuraminidase

- N1
- N2

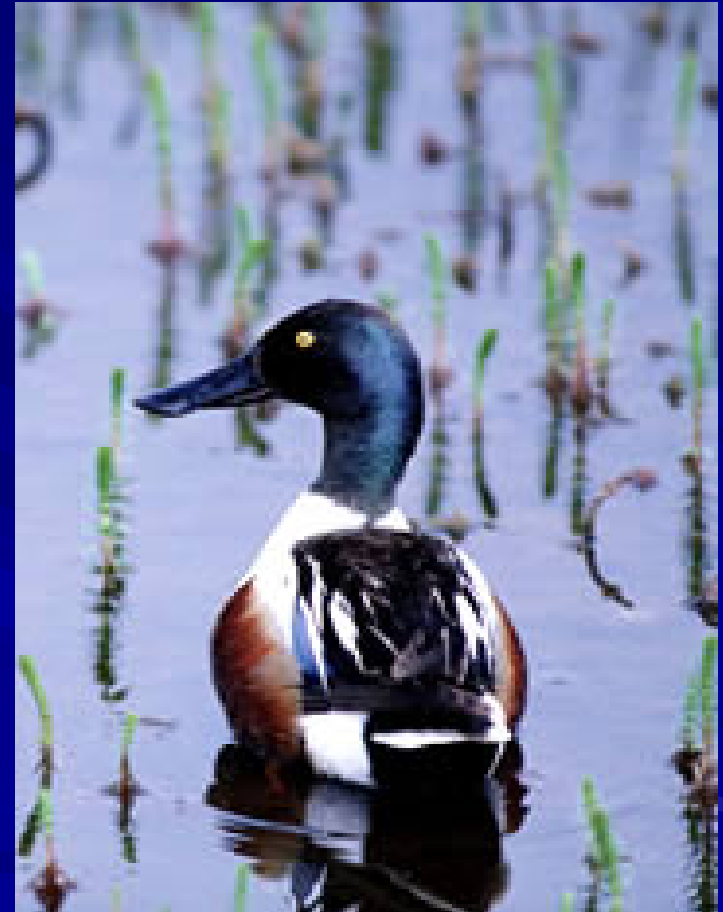
■ Subtypes

- H1N1
- H3N2



Avian Influenza

- Migratory waterfowl are the natural reservoir
 - Carry virus in intestines
 - Virus shed in feces and respiratory secretions
 - Usually do not get sick





WATERFOWL FLYWAYS OF NORTH AMERICA



Avian Influenza

■ Hemagglutinin

- H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12, H13, H14, H15, H16

■ Neuraminidase

- N1, N2, N3, N4, N5, N6, N7, N8, N9

■ Subtypes

- H5N1
- H7N7
- H9N2



Avian Influenza in Poultry



- Very contagious within flocks
- Can lead to severe illness and death
- Can spread to other animals

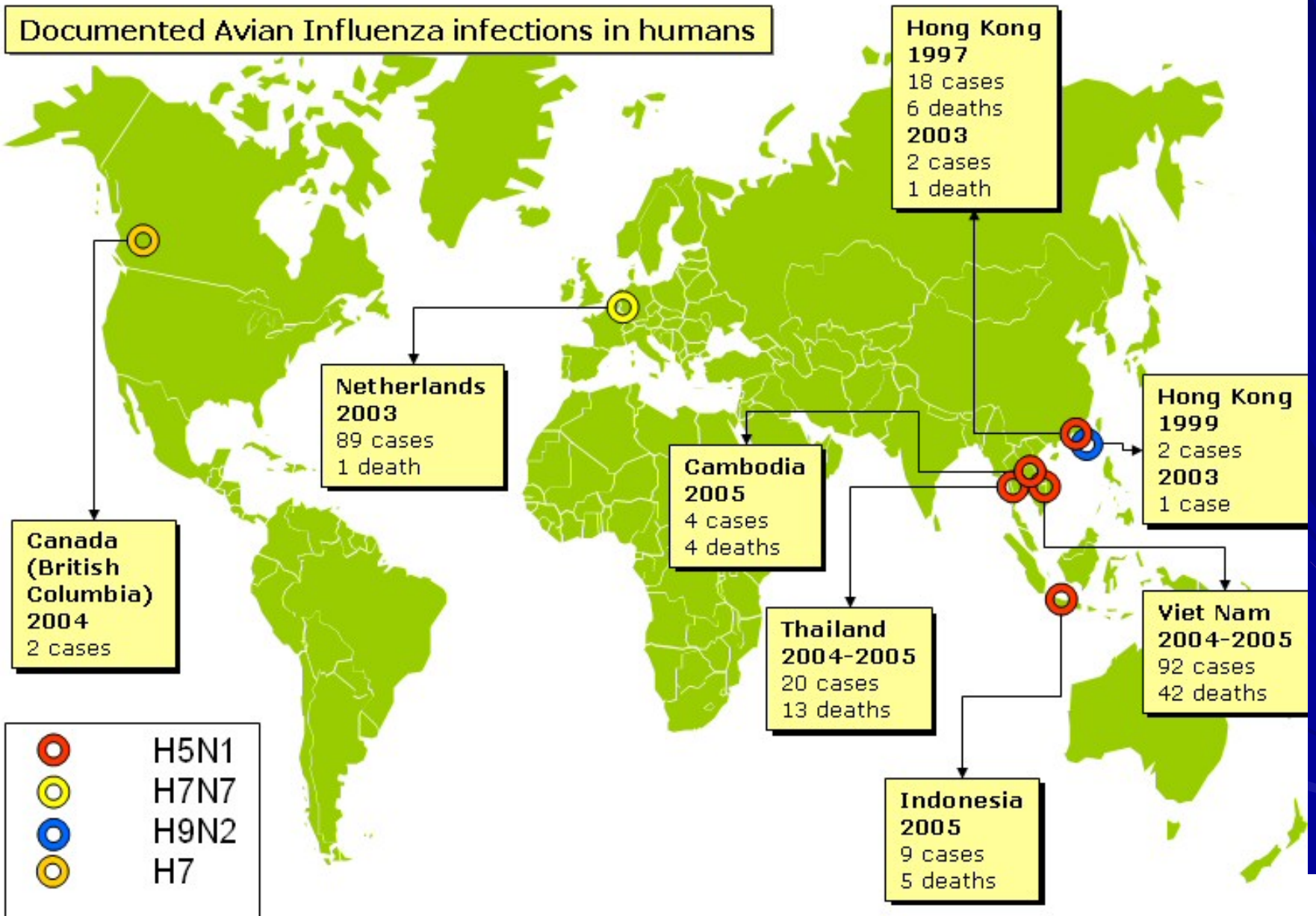


Avian Influenza in Humans

- Avian flu viruses *typically* do not infect humans
- Avian flu viruses can cause a variety of illnesses in humans
 - Conjunctivitis
 - Influenza-like illness
 - Pneumonia
 - Death
- Avian influenza infections in humans does not mean a pandemic is certain



Documented Avian Influenza infections in humans



Data as of: 11.11.2005

Pandemic Influenza

- Major mutation occurs
 - Genetic reassortment of human and avian influenza viruses
 - Direct animal (poultry) to human transmission
- Results in new subtype of influenza A
 - Avian origin
 - Adapted to humans
 - No immunity in the human population
- Results in multiple **simultaneous epidemics worldwide** with enormous numbers of deaths and illness
 - Six to eight weeks
 - Multiple waves

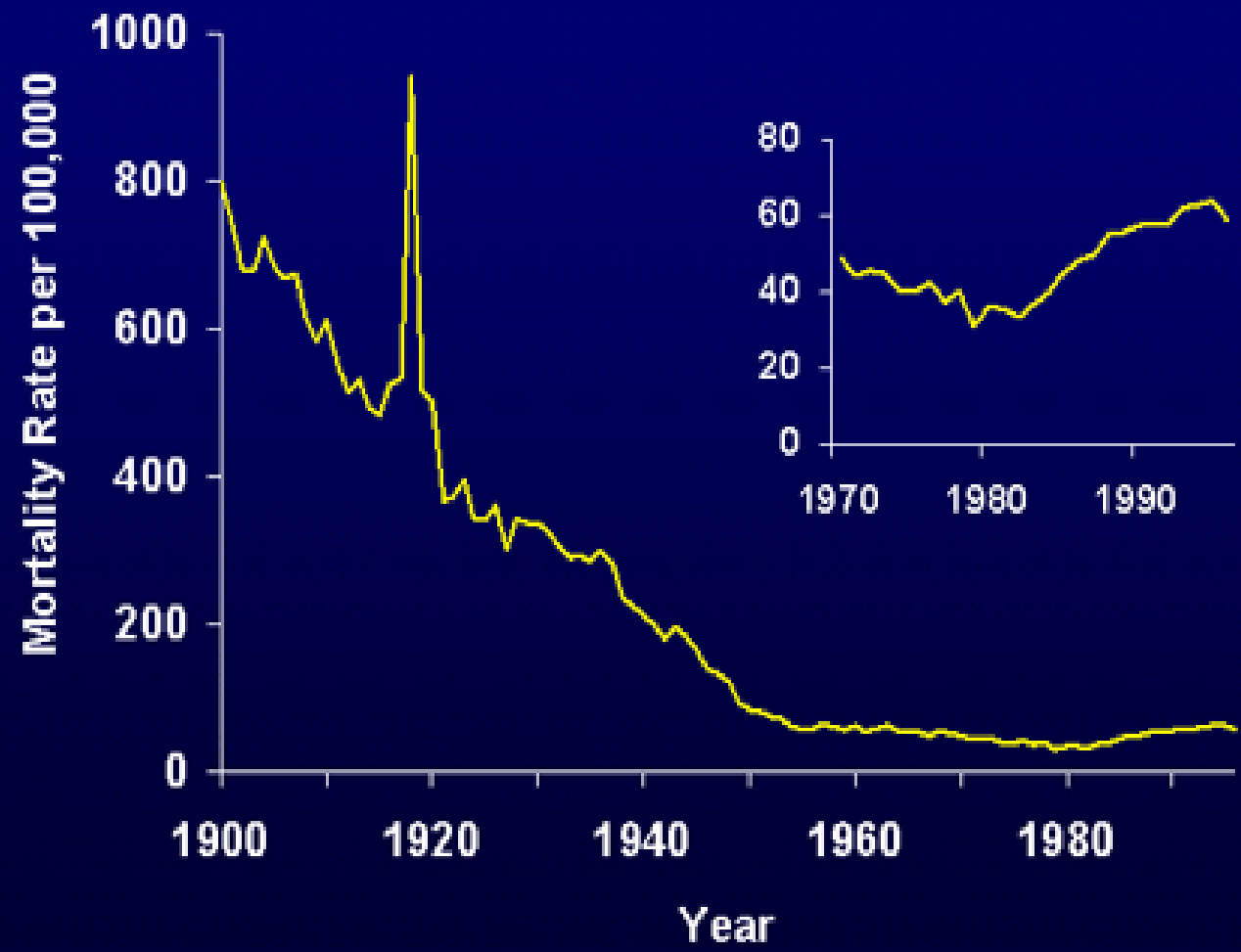


Pandemics of the 20th Century

Year	Subtype	Impact in the United States
1918-19 Spanish flu	H1N1	550,000 deaths
1957-58 Asian flu	H2N2	69,800 deaths
1968-69 Hong Kong flu	H3N2	33,800 deaths



Infectious Disease Mortality in the United States, 1900 to 1996

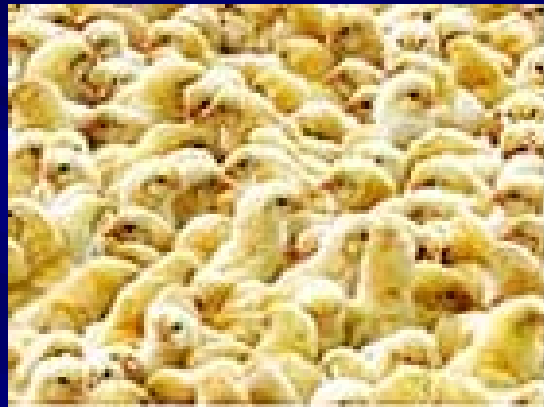


Impact of an Influenza Pandemic United States

- 18 - 45 million outpatient visits
- 300,000 - 800,000 hospitalizations
- 88,000 - 300,000 deaths



“Pandemic Watch”



Pandemic “Prerequisites”

- ✓ ■ Novel virus emerges
- ✓ ■ Novel virus causes disease in humans
 - Novel virus can be efficiently transmitted person to person

WHO Pandemic Phases

Inter-pandemic phase New virus in animals, no human cases	Low risk of human cases	1
	Higher risk of human cases	2
Pandemic alert New virus causes human cases	No or very limited human-to-human transmission	3
	Evidence of increased human-to-human transmission	4
	Evidence of significant human-to-human transmission	5
Pandemic	Efficient and sustained human-to-human transmission	6

H5N1 in Humans

- Current outbreak began December 2003
- Initially cases were limited to Southeast Asia
- Geographic distribution continuing to expand in 2006
 - Human cases are now being reported in Europe and Africa



Direct Contact with Poultry

Primary Risk Factor



- Plucking and preparing diseased poultry
- Handling fighting cocks
- Playing with poultry
- Consumption of duck's blood or possibly undercooked poultry

“Pandemic Watch”

Global Perspective

■ Good news

- No evidence of sustained person-to-person transmission

■ Bad news

- H5N1 virus continues to circulate widely in Asia, Europe and Africa
- Eradication of H5N1 in birds is difficult



“Pandemic Watch”

United States

- No reported cases of H5N1
 - Migratory birds
 - Poultry
 - Humans
- Other avian influenza viruses detected in poultry in 2004
 - **H5N2** in Texas
 - **H7N2** in Maryland



Pandemic Influenza Preparedness in North Carolina



Impact of an Influenza Pandemic North Carolina

- 1.4 million outpatient visits
- 29,000 hospitalizations
- 6,700 deaths

- Assuming 30% attack rate and NC population of 8.5 million people
- Based on CDC software FluAid 2.0



Pandemic Influenza Planning

■ Goals

- *Reduce* morbidity
- *Reduce* mortality
- *Reduce* social disruption



Pandemic Influenza Planning

■ Challenges

- Widespread
- Long duration
- Health services overwhelmed
- Shortages may occur
 - Medications
 - Equipment
 - Hospital beds
 - Personnel



Pandemic Preparedness Activities

- NC Pandemic Influenza Response Plan
- Exercises
 - Eight tabletop exercises Jan-Feb 2006
 - for hospitals and local partners
 - Statewide full scale exercise May 2006
- Pandemic Influenza Ethics Task Force



North Carolina Pandemic Influenza Response Plan

- Collaboration among many different groups
- First version posted to website October 2004
- Modeled after other plans
 - National Planning Guide (CDC)
 - NC SARS Response Plan
- Revised version completed January 2006



Core Components

NC Pandemic Plan

- Command and Control
- Surveillance
- Vaccine Preparedness and Response
- Antiviral Preparedness and Response
- Medical Surge
- Preparedness in Healthcare Facilities
- Communication



Appendices

NC Pandemic Plan

- Supplements to core parts of plan
- “Stand alone” appendices
 - Laboratory diagnosis
 - Community containment
 - International travel guidelines
 - Mass fatality plan
 - Legal issues
 - Mental health



Local Health Department Toolkit

NC Pandemic Plan

- Roles by pandemic phase
- Determination of county-level impact
- Influenza vaccine estimation
- Designation of alternate sites



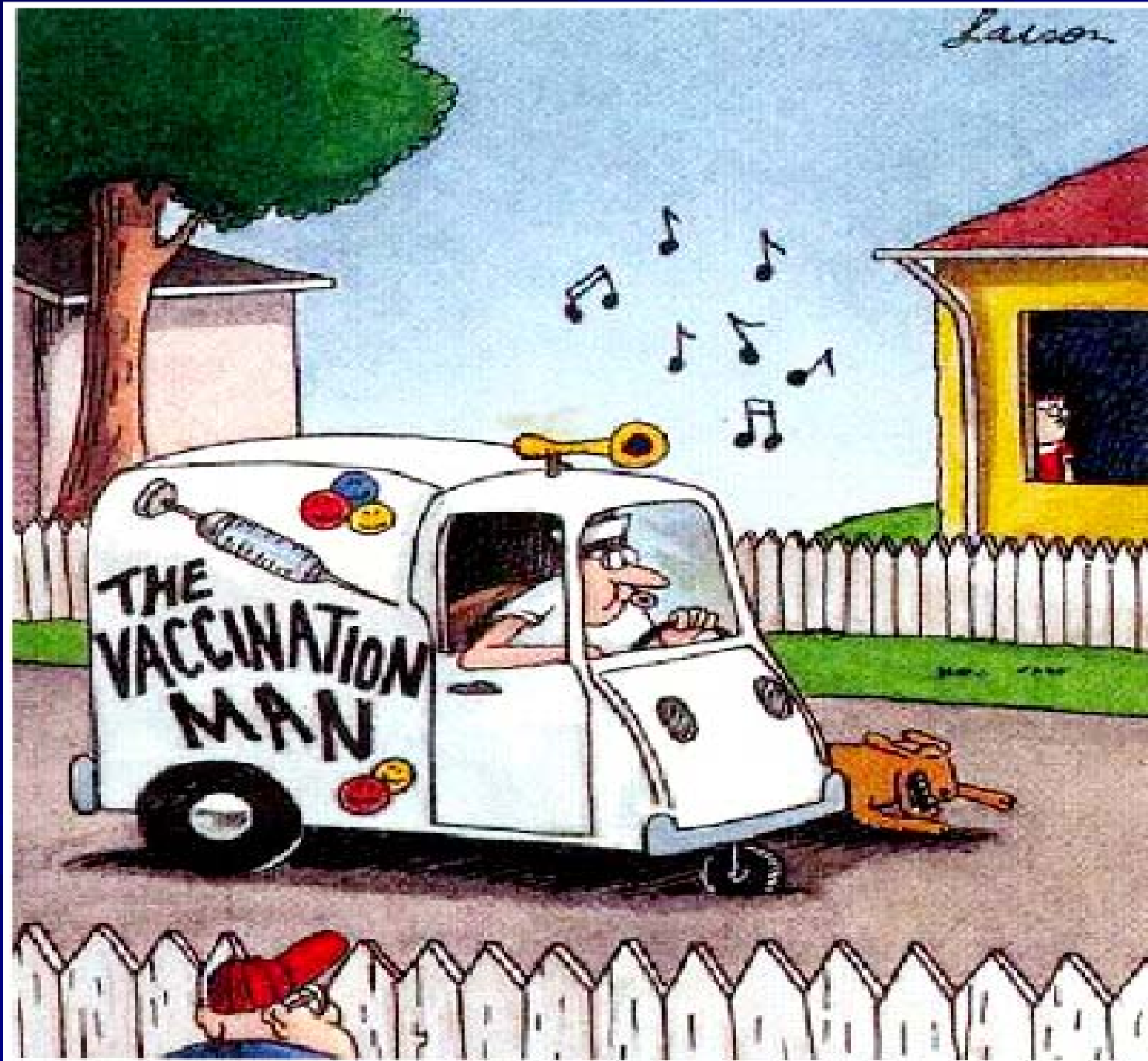


Pandemic Influenza Planning

Ongoing Issues

- Strengthen local health department plans
- Exercise pandemic influenza plans
- Increase situational awareness outside of public health
- Encourage planning among other entities
 - Businesses
 - Schools
 - Volunteer organizations







An Influenza Pandemic and the Clinician

- Know clinical and epidemiological features
- Teach your colleagues
 - Have a pandemic plan
 - Have antivirals and protective equipment
- Be prepared to lead
 - Confirm the diagnosis
 - Get the virus
 - Get a lot of help, fast



Investigating Person-to-Person Spread



Containing Pandemic Influenza With Antiviral Agents

- Theoretical models using Thailand data
- Contacts of suspected cases take antiviral agents
- Pandemic contained if R_0 low
- Prophylaxis with quarantine more effective
- Critical is speed of detecting cases and response

Longini IM et al. Science 2005

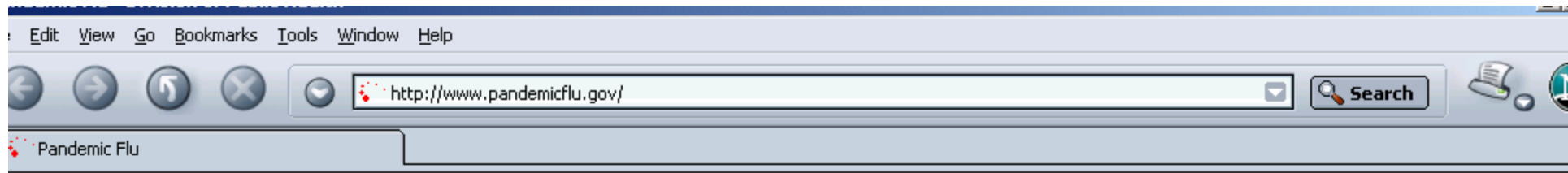
Ferguson et al. Nature 2005



Conclusions

- Forecasting the next pandemic is difficult
- Current outbreaks of H5N1 pose an ongoing threat
- Pandemic influenza presents unique challenges for planners
- Many different entities need to plan





PandemicFlu.gov AvianFlu.gov

Get Informed. Be Prepared.

The official U.S. government Web site for information on pandemic flu and avian influenza. Information is organized by topic on the left sidebar.

- Pandemic Flu Home**
- General Information
- Planning & Response
- Monitoring Outbreaks
- Health & Safety
- Tests, Vaccines & Medications
- Bird & Animal Issues
- Global Activities
- Travel
- Research Activities

What Can Be Done Now

- Federal Government
- State & Local Governments
- Individuals & Families
- Business
- Schools
- Health Care Providers
- Community Organizations

New Information & Activities



Massachusetts State Summit
Feb. 7 — Governor Mitt Romney and HHS Secretary Leavitt address a wide range of community and business leaders from across the state. [More >>](#)

HHS and Institut Pasteur Partner on Pandemic Influenza Preparedness
Feb. 6 — Memorandum of Understanding signed establishing a Joint HHS-IP Working Group to work on projects to build global capacity to detect flu viruses that could have the potential to trigger a human pandemic. [More >>](#)

New Rapid H5 Flu Test Approved
Feb. 3 — The U.S. Food and Drug Administration approves rapid test for H5 flu in humans. [More >>](#)

Iowa State Summit
Feb. 3 — Meeting in Des Moines, Governor Tom Vilsack and HHS Secretary Leavitt discuss pandemic flu planning with state and local officials and private sector partners. [More >>](#)

Connecticut State Summit

H5N1 Flu Watch

Human Cases of H5N1 in Europe

- Statement by HHS Secretary Leavitt Regarding Human Cases of H5N1 in Europe. [More >>](#)

Meetings & Conferences

State Summits

- Feb. 16 Tallahassee, FL
- Feb. 17 Columbus, OH
- Feb. 17 Las Vegas, NV

Business Summits

North Carolina Influenza Sentinel Surveillance Program - Division of Public Health

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http://www.epi.state.nc.us/epi/gcdc/pandemic.html

Communicable Disease Control

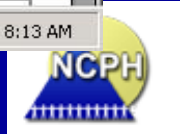
Pandemic Influenza (Flu)

N.C. PANDEMIC INFLUENZA PLAN

Title	PDF
Title Page	View (14kb)
Table of Contents	View (27kb)
Cover Letter	View (65kb)
Introduction	View (47kb)
World Health Organization Phases of an Influenza Pandemic	View (24kb)
List of Commonly Used Acronyms	View (22kb)
Core Parts of Plan:	
Part A: Command, Control and Management Procedures	View (112kb)
Part B: Surveillance	View (80kb)
Part C: Vaccine Preparedness and Response	View (51kb)
Part D: Antiviral Preparedness and Response	View (65kb)
Part E: Mass Care	View (67kb)
Part F: Preparedness in Healthcare Facilities	View (123kb)
Part G: Communications	View (163kb)
Appendices: *	
<i>Command, Control and Management Procedures</i>	
A-1: Appendix 7 to Annex B of the NC Emergency Operations Plan	View (762kb)

Start | North Carolina Influenza ... | 8:13 AM

www.ncpublichealth.com



Online Resources

- www.who.org
- www.cdc.gov
- www.pandemicflu.gov

- www.ncpublichealth.com

- pandemicflu.plan@ncmail.net



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