Pandemic Influenza Preparedness

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NC Division of Public Health

Acknowledgements

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- OPHP&R
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- SLPH
  - Myra Brinson, Peggy Brantley

Objectives

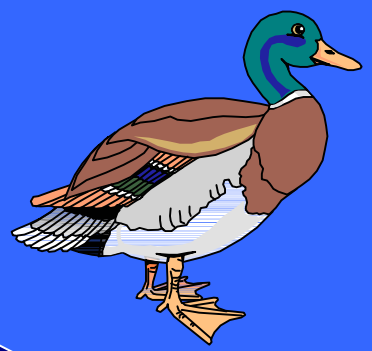
- Assess the current threat of pandemic influenza
- Planning by pandemic phase
- What we can do now (Phase 3)
- Pandemic influenza preparedness and response in North Carolina

Natural Reservoir for New Human Influenza A Virus Subtypes: Waterfowl (Aquatic Ducks, Geese)

Avian Influenza A viruses

H1 - H16

N1 - N9



Human Influenza A Viruses

H1 - H3

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

Postulated Evolution of Human Influenza Viruses

Evidence	Seroarcheology			Virus Isolation		Present
Time	1890	1900	1918	1957	1968	Present
Subtype	H2N2	H3N8	H1N1	H2N2	H3N2	Present

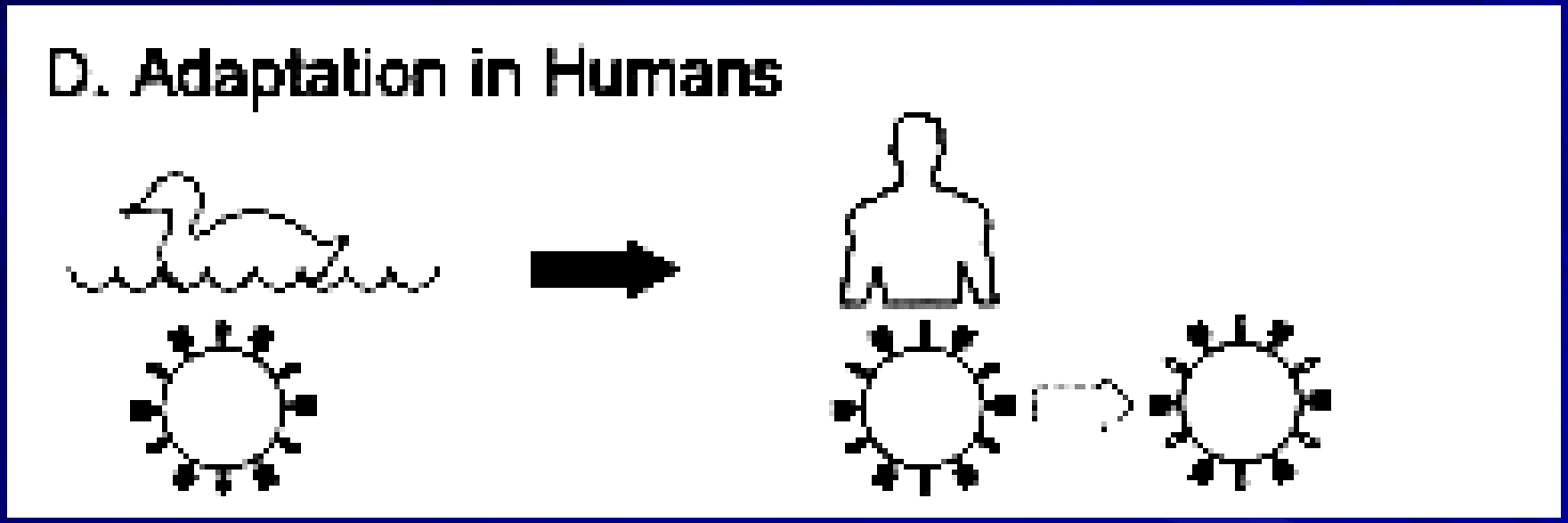
Avian genes 8 3 2

H1N1 H2N2 H3N?

H1N1 — Present (1977)

Wright and Webster. Orthomyxoviruses in Fields Virology

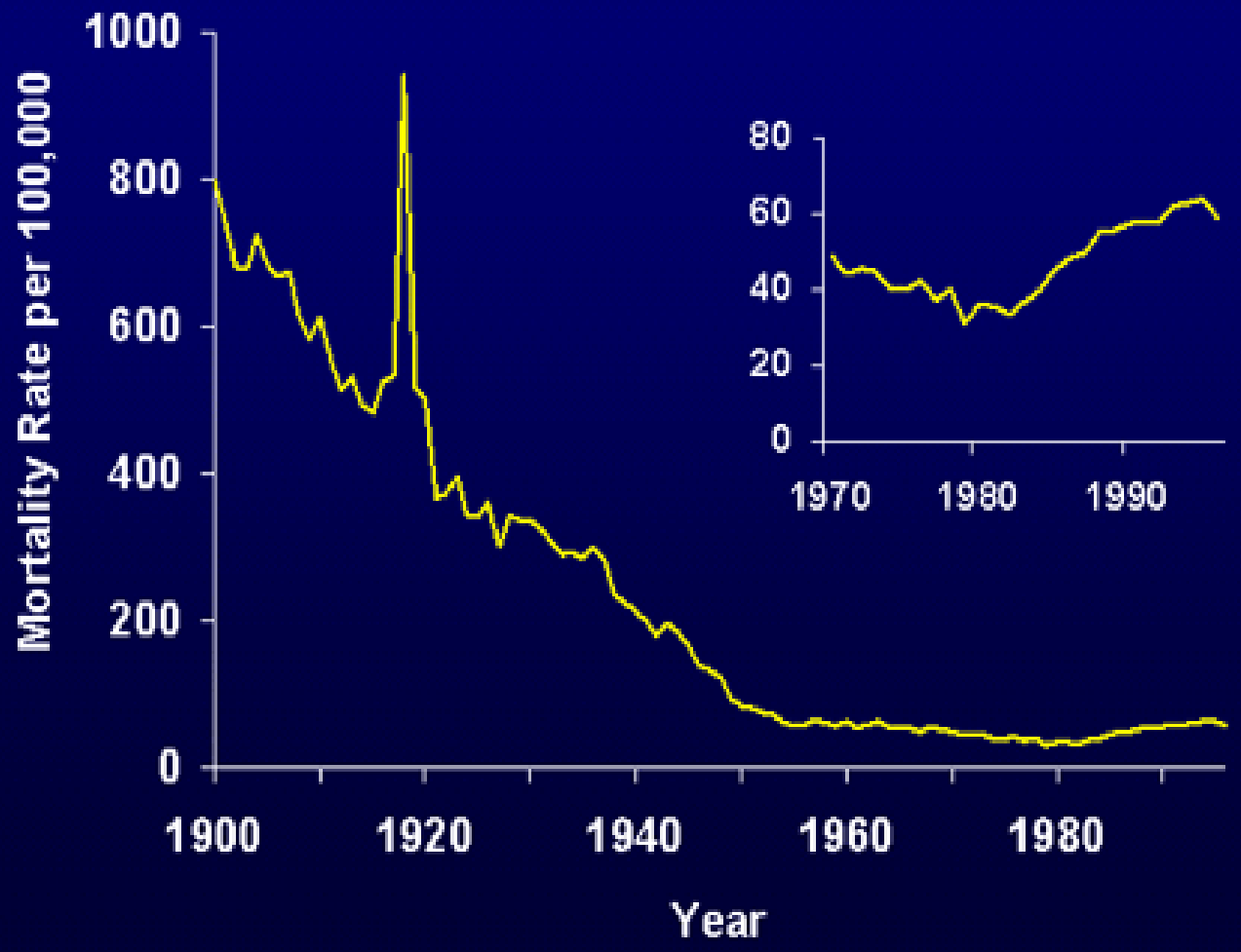
Possible mechanisms for generation of pandemic influenza viruses.



Recent studies of reconstructed Spanish flu viruses are consistent with this this theory: all genes of the 1918 virus were of avian origin.

Proc. Natl. Acad. Sci. USA, 10.1073/pnas.210382297

Infectious Disease Mortality in the United States, 1900 to 1996



CDC

“Pandemic Watch”

Pandemic "Prerequisites"

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

Dr. Asamoa-Baah, Assistant Director General,
WHO Communicable Diseases

NCPH

WHO Pandemic Phases

Inter-pandemic phase	Low risk of human cases	1
New virus in animals, no human cases	Higher risk of human cases	2
Pandemic alert	No or very limited human-to-human transmission	3
New virus causes human cases	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

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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

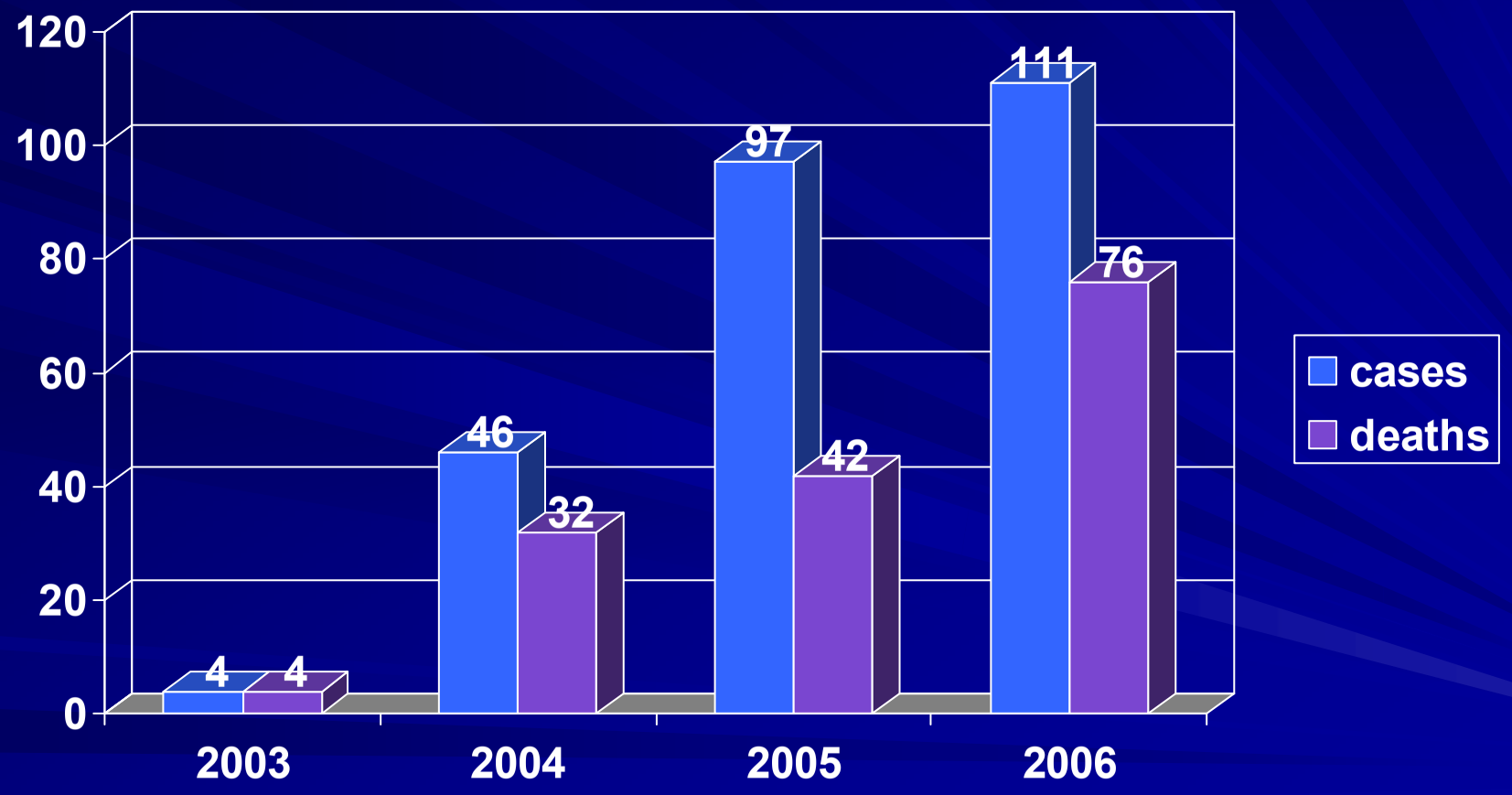
H5N1 by Country

2003	2004	2005	2006
Vietnam	Vietnam	Vietnam	Azerbaijan
China	Thailand	Thailand	Cambodia
		China	China
		Cambodia	Djibouti
		Indonesia	Egypt
			Indonesia
			Iraq
			Thailand
			Turkey

Source: http://www.who.int/csr/disease/avian_influenza/en/index.html

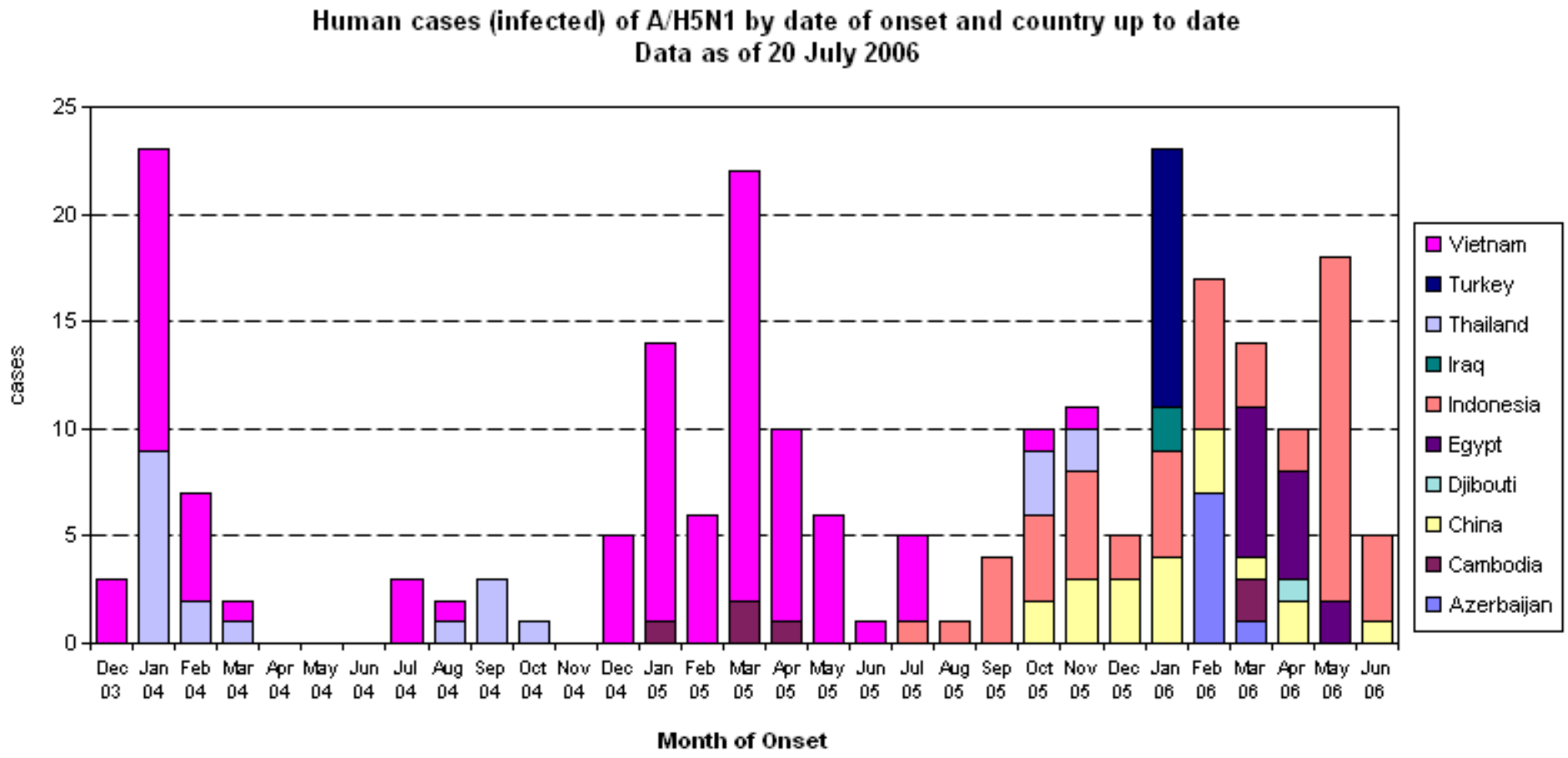
Human H5N1: 2003-6

Through November 29



Source: http://www.who.int/csr/disease/avian_influenza/en/index.html

Human Cases of H5N1



Direct Contact with Poultry
Primary Risk Factor

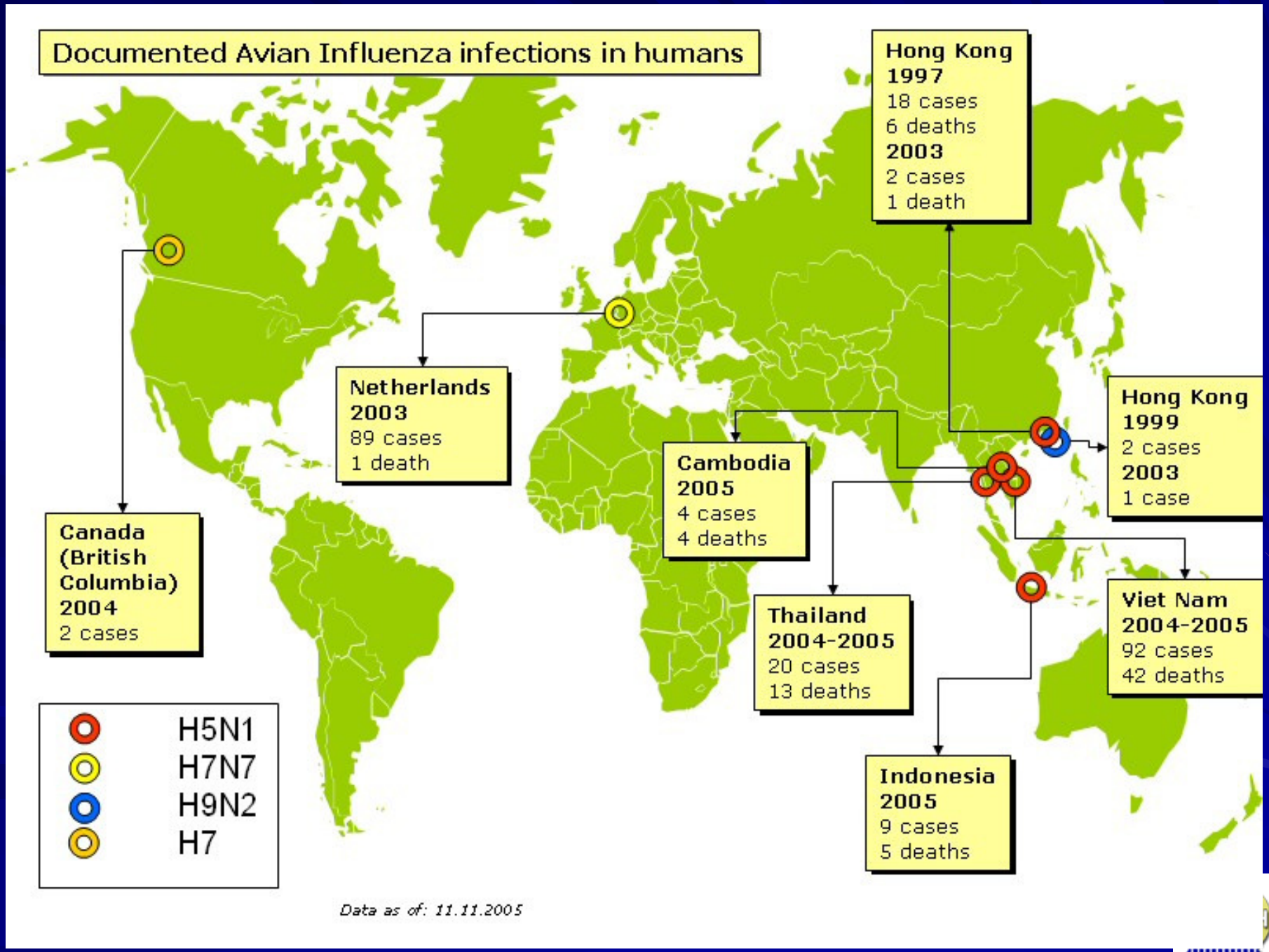
- Plucking and preparing diseased poultry
- Handling fighting cocks
- Playing with poultry
- Consumption of duck's blood or possibly undercooked poultry

"Pandemic Watch"
Global Perspective

- Good news
  - No evidence of sustained person-to-person transmission
  - Recent human cluster in Indonesia <u>not</u> a major genetic shift
- Bad news
  - H5N1 virus continues to circulate widely in Asia, Europe and Africa
  - Eradication of H5N1 in birds is difficult

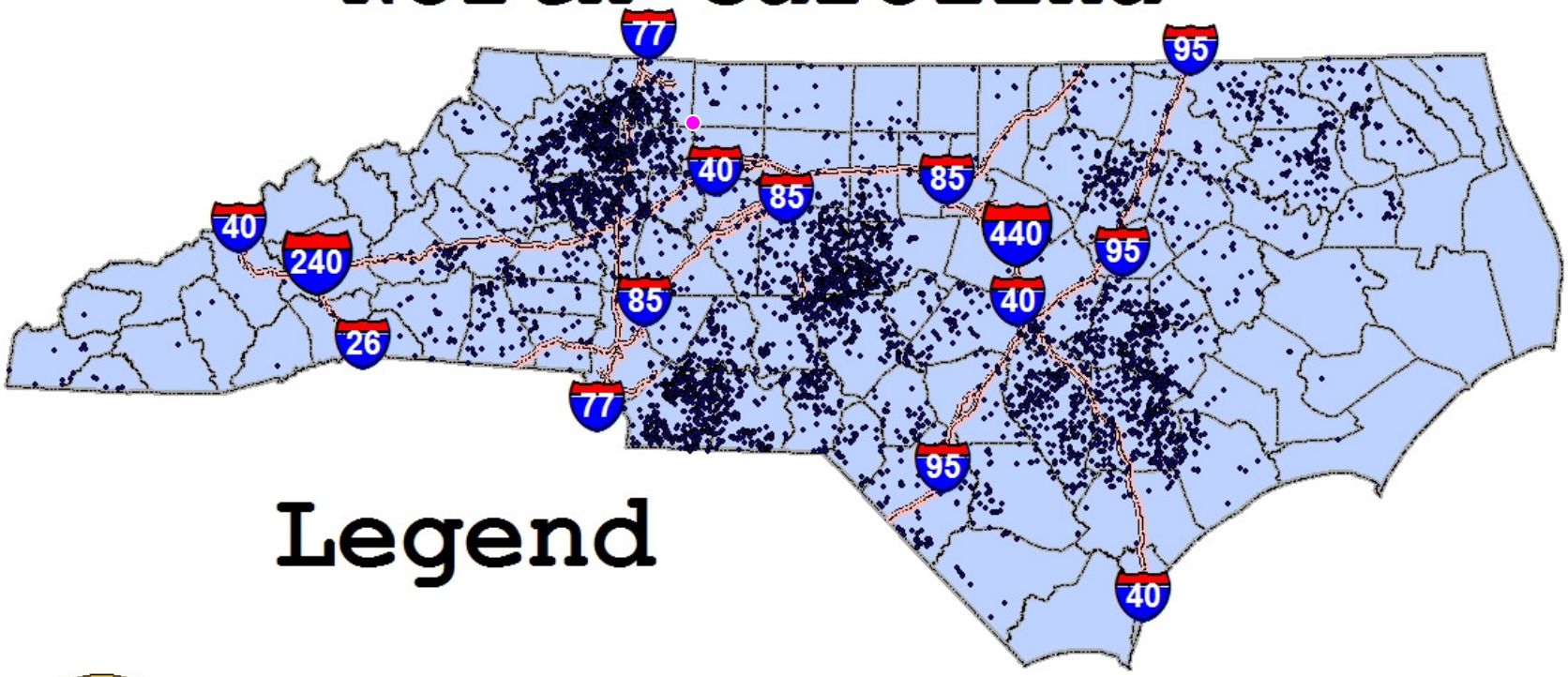
“Pandemic Watch”
United States

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


Documented Avian Influenza infections in humans
Hong Kong
1997
18 cases
6 deaths
2003
2 cases
1 death
Netherlands
2003
89 cases
1 death
Hong Kong
1999
2 cases
2003
1 case
Cambodia
2005
4 cases
4 deaths
Canada
(British
Columbia)
2004
2 cases
Thailand
2004-2005
20 cases
13 deaths
Viet Nam
2004-2005
92 cases
42 deaths
Indonesia
2005
9 cases
5 deaths
H5N1
H7N7
H9N2
H7
Data as of: 11.11.2005

First Appearance of H5N1 in NC?

Poultry Farms
North Carolina



Legend

- Poultry Farms

N

0 15 30 60 90 120 Miles

Recognition of 1st Human Cases of H5N1: Phase 3

- **Clinical**
  - Fever
  - Cough
  - Dyspnea
  - Pneumonia
- **Epidemiologic**
  - Travel to H5N1-affected country and exposure
    - Poultry
    - Wild birds
    - Patient with severe respiratory illness
  - Close contact with H5N1 patient
  - Worked with H5N1 virus in laboratory

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Suspect Novel Influenza Virus

- Report case immediately to health department
- Specimens can be sent to NC SLPH
- Consultation available
  - Testing
  - Treatment
  - Prophylaxis
  - Infection control

(919) 733-3419

Communication Plan
Phase 3: H5N1 in NC

- It's OK to eat chicken
- Spread to people is very unlikely
  - Special populations
    - Hunters, Audubon Society members, campers
    - Backyard flock keepers
    - Commercial poultry operations
  - Healthcare personnel
- If detected in wildlife or poultry, Agriculture is the lead response agency

Pandemic Influenza

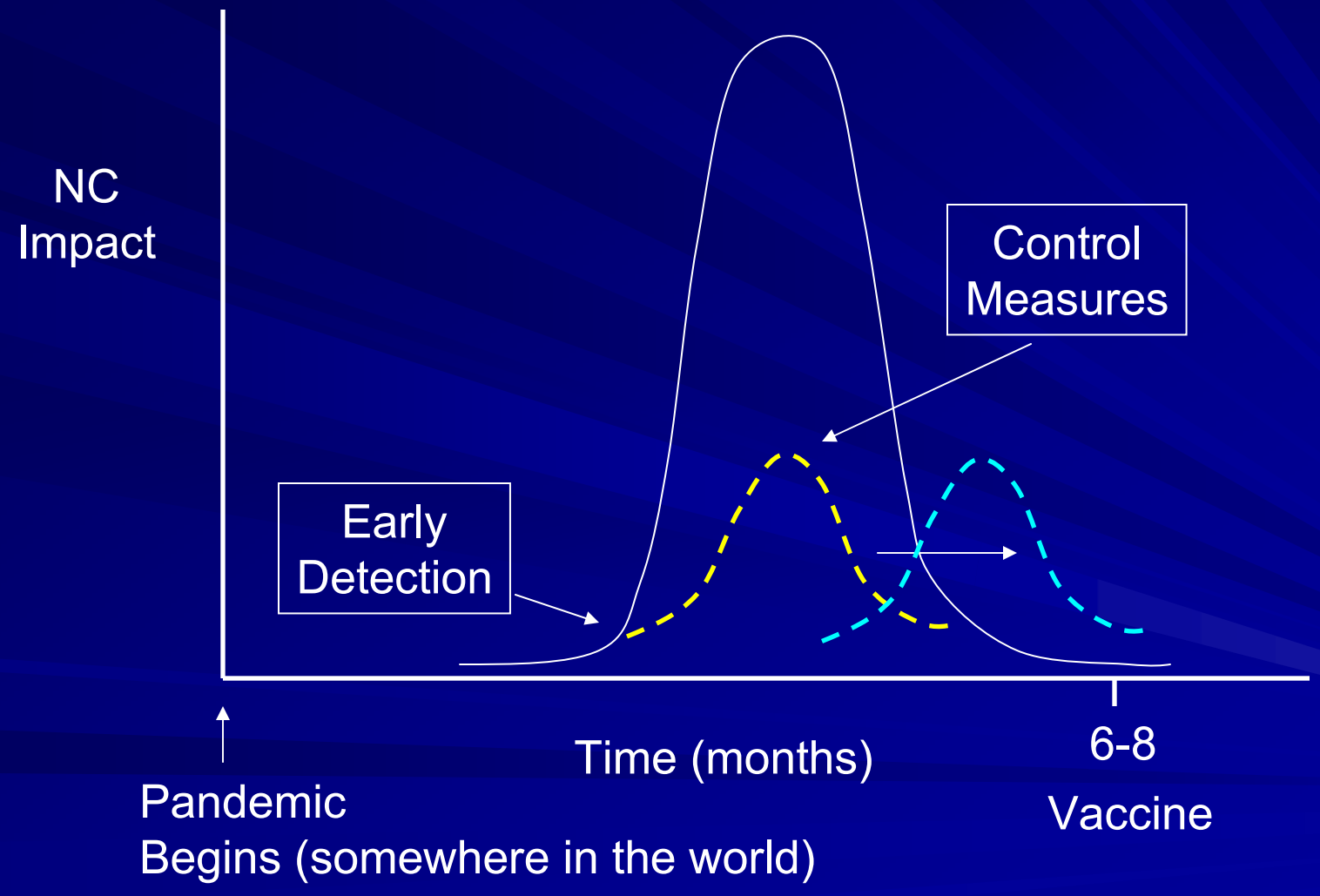
WHO Phases 4 (increased),
5 (significant), and
6 (efficient and sustained)
Human-to-Human Transmission

Impact of an Influenza Pandemic
North Carolina: Phase 6
Planning Assumptions

Characteristic	Moderate (1957-like)	Severe (1918-like)
Illness	3,000,000	3,000,000
Outpatients	1,600,000	1,600,000
Hospitalized	35,000	300,000
Deaths	8,000	65,000

- Assuming 35% attack rate and NC population of 9 million people
- Based on CDC software FluAid 2.0

Pandemic Response Goals



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
  - Quenching plan
  - Clinical algorithms

CDC - Influenza (Flu) | Pandemic Influenza: Health Professionals - Division of Public Health

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http://www.cdc.gov/flu/pandemic/healthprofessional.htm

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Department of Health and Human Services
Centers for Disease Control and Prevention

CDC en Español

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Pandemic Influenza

- Influenza (Flu)
- Avian Flu
- Pandemic Flu
  - Key Facts
  - Preparedness
  - Checklists
  - Q & A
  - References & Resources
  - Info for Specific Audiences
    - Agriculture
    - Business
    - Health Professionals
    - Governments
    - Schools
    - Traveler
- Seasonal Flu

Pandemic Influenza Information for Health Professionals

On this page:

- Overview
- Quarantine Information
- Professional Guidance
- Infection Control
- Vaccine Information
- Treatment Information
- Prevention & Health Education
- Travel Advice
- Preparedness Tools
- Other Resources

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Pandemic Influenza Toolkit

A compilation of resources and information provided to clinicians for their use in discussing Pandemic influenza with patients and providing care in case of spread of this agent to the United States.

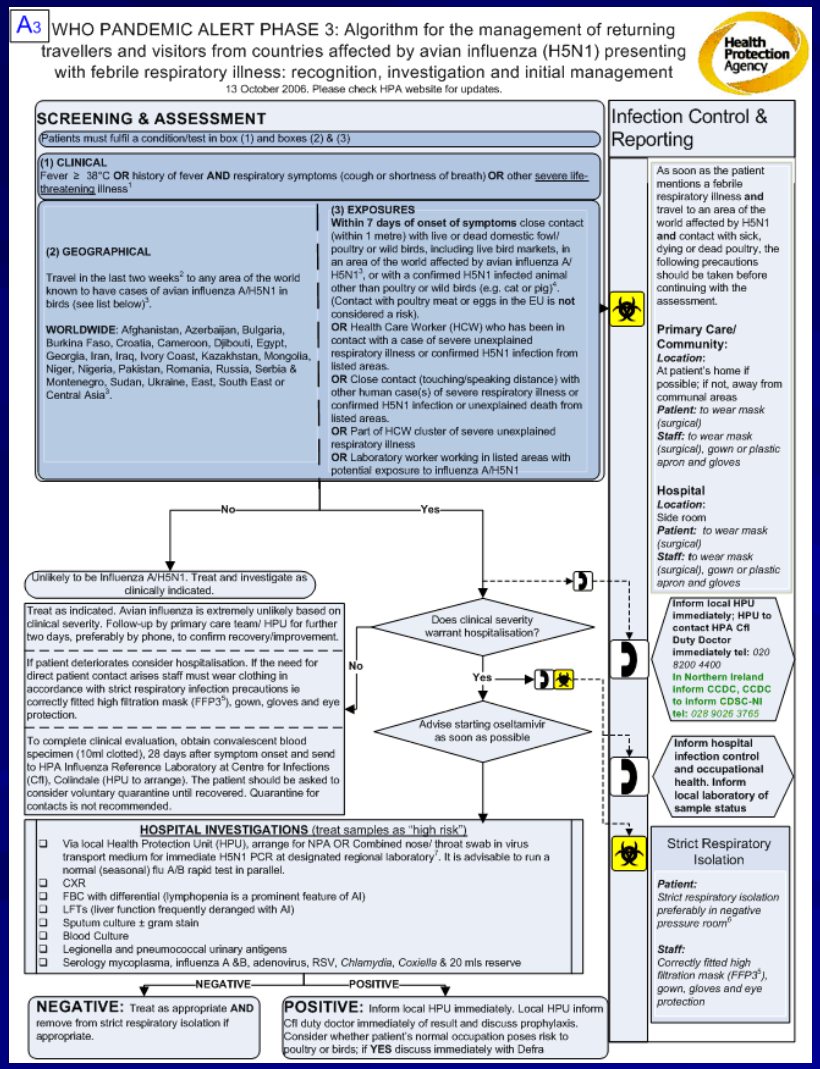
Overview

Flu Pandemics (historical)
Timeline for human flu pandemics.

Frequently Asked Questions about Pandemic influenza.

Quarantine Information

Clinical Algorithm and Toolkit



- Enhanced surveillance
- Infection control
- Diagnosis
- Treatment

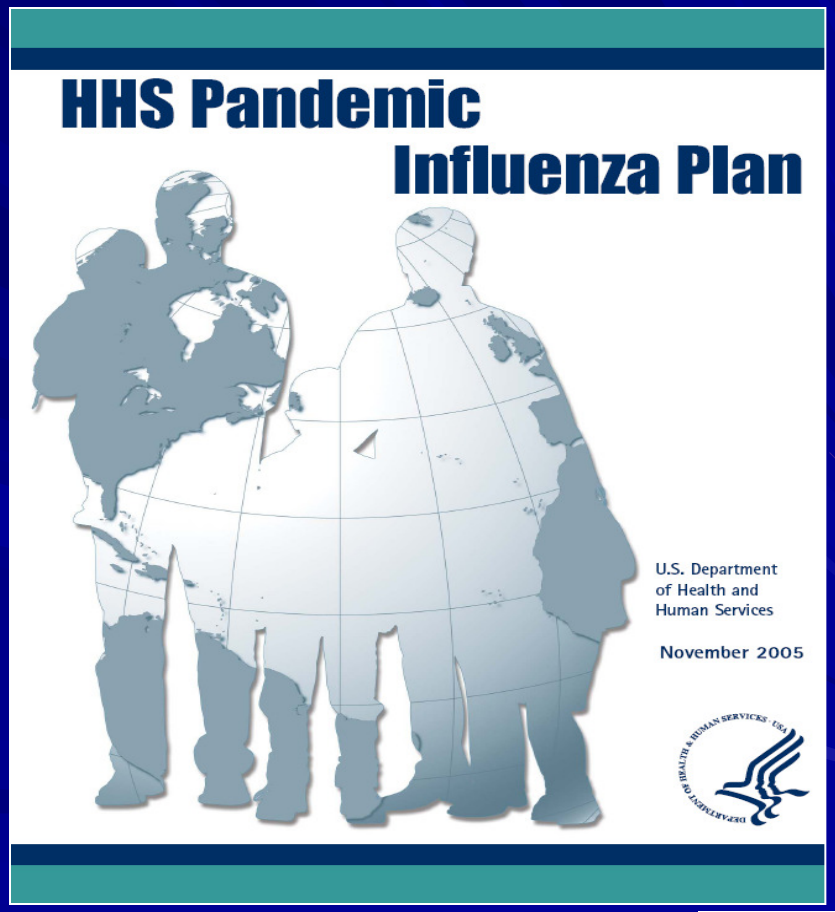
Coming February 2007

Hospital Preparedness

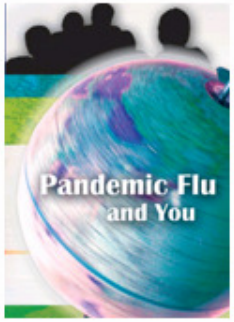
- Hospital Emergency Incident Command System (HEICS)
  - A JCAHO standard
- Disaster Committee
- Infection Control Committee
  - Workforce protection
  - Patient placement
- Continuity of Operations Planning
  - Security and safety
  - Medical surge
  - Staffing

US DHHS Pandemic Influenza Plan

- Clinical guidelines
  - Case detection
  - Clinical management
- Healthcare planning
  - Focus is hospital planning
  - Highlights some planning steps for non-hospital healthcare facilities



NC Department of Health and Human Services



Pandemic Flu and You

Pandemic Flu and You: A Primer (700 KB file)

Preparing your family (500 KB file)

First Aid Kit (1.4 MB file)

Faith-Based and Community Organizations Preparedness Checklist (550 KB file)

Business Planning Checklist (600 KB file)

Brochure (300 KB file)

- En Español (300 KB file)

Poster (300 KB file)

- En Español (300 KB file)

All files are in Acrobat format. Download the free reader.

Questions on these materials? Want to order (small quantities) of these printed materials? Want a higher resolution file so your organization can print large quantities? Contact public.affairs@ncmail.net

Business Continuity

- Critical operations
  - Minimum number of personnel needed
- Surge capacity issues
  - Staffing
  - Consumable resources
- Facility inaccessible
- Utility disruption

Division of Public Health

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http://www.ready.gov/business/_downloads/sampleplan.pdf

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Ready Business

Prepare. Plan. Stay Informed.

Sample Emergency Plan

Sample Business Continuity and Disaster Preparedness Plan

☐ PLAN TO STAY IN BUSINESS

Business Name

Address

City, State

Telephone Number

If this location is not accessible we will operate from location below:

Business Name

Address

City, State

Telephone Number

Start | Re: Blood Questions - wi... | Microsoft PowerPoint - [... | Division of Public Hea... | 12:25 PM

Essential Functions of Your Business

Shoot

Move

Essential Business Functions Public Health Epidemiology

- Medical Consultation
- Communication
- Access to information
- Plan: Work from home
  - Telecommunications
  - IT
- Business Recovery
  - Teams assigned to phased-in return to work

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“Countermeasure Response” Non-Pharmacologic Interventions

Personnel Protective Equipment

Hygiene

Social Distancing

Separation

Anthrax

AMI Building
Boca Raton, FL
October 2001

SARS

Respirator masks,
fever screening
Taiwan May 2003

MRSA

Any hospital
USA
21st century

PPE

- Influenza transmission
  - Respiratory droplets
  - Airborne (>6 feet from patient)
  - Contact
- A novel pandemic virus may have new properties
  - H5N1 and diarrhea

Masks and Respirators For Responders

- Plain surgical masks for droplet spread
  - Along with standard precautions
- N-95 or equivalent respirators for airborne spread
  - Fit testing required
  - Training required
  - Currently recommended by US DHHS
- PPE planning
  - Stockpiling (50% N-95, 50% masks)
  - Training

Masks for Well People in the Community?

- No data
- Transmission reduction if worn by sick people
- Potential harm
  - Increase risk of inoculation if not properly trained
  - SARS example
- Masks are single-use, disposable

Public gathering places were ordered closed by the leaders of many major cities.

www.pbs.org

Hygiene

- Wash hands with soap and water
- Cover mouth and nose when coughing and sneezing
  - Use a tissue or upper sleeve, but not hands
- Avoid close contact & stay home if sick

Social Distancing

- Isolation and quarantine (legal authority)
  - For use in phases 4, 5, and early 6
- Mass quarantine (voluntary or declared emergency)
  - Advanced phase 6
  - Working at home
  - School closures
  - “Snow day”

“Countermeasure Response” Pharmacologic Interventions

Antivirals and Vaccines

Number of Antiviral Drug Courses for Prophylaxis vs Treatment

By Federal Priority Group

Group	Population	Number of courses	
		Prophylaxis*	Therapy**
HCWs	11 m	61.6 m	3.9 m
"Frontline" hosp	2.5 m	14.0 m	0.9 m
Public safety	2.3 m	12.9 m	0.8 m

*Assumes 8-week prophylaxis, duration of 1st wave

**Assumes 35% attack rate

Antivirals

- HHS goal is to stockpile 81 million regimens (treat 25% of the population)
- SNS inventory
  - 50 million regimens
  - 80/20 split with Tamiflu and Relenza
- States' inventory
  - 31 million regimens
  - Federal contracts for purchase at a reduced rate

Regimens, pills, doses

- Tamiflu Regimen
  - 10 pills
  - Prophylaxis-1 pill daily x 10 days
  - Treatment-1 pill BID x 5 days
- Relenza Regimen
  - 5 ROTADISKS
  - Prophylaxis-2 inhalations daily x 10 days
  - Treatment-2 inhalations BID x 5 days

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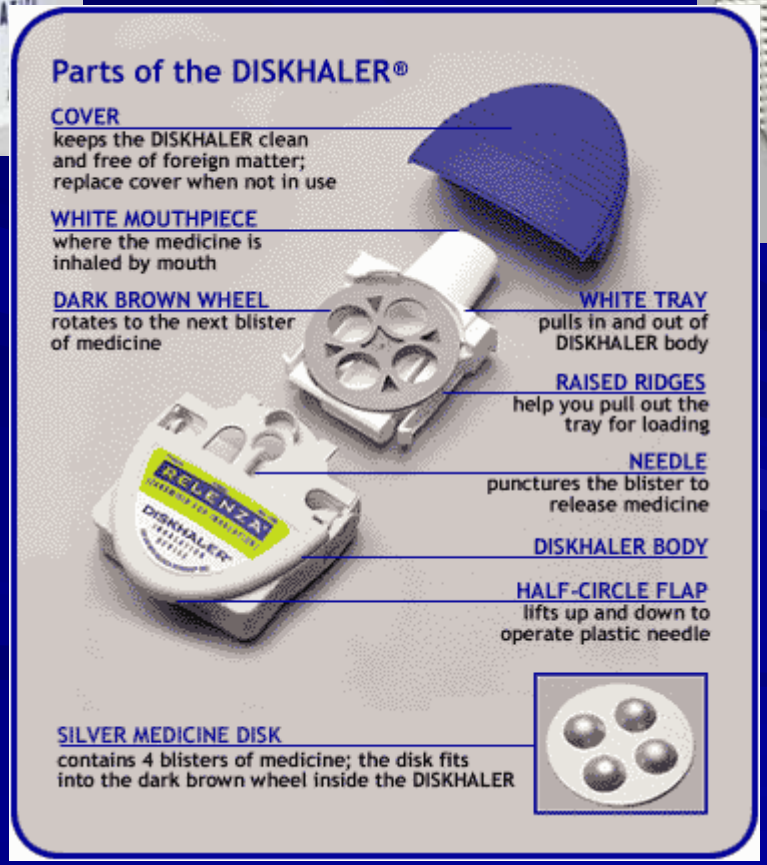
ROTADISK

RELENZA
DISKHALER
RELENZA
each containing 4 blisters


Parts of the DISKHALER®
COVER
keeps the DISKHALER clean and free of foreign matter; replace cover when not in use
WHITE MOUTHPIECE
where the medicine is inhaled by mouth
DARK BROWN WHEEL
rotates to the next blister of medicine
WHITE TRAY
pulls in and out of DISKHALER body
RAISED RIDGES
help you pull out the tray for loading
NEEDLE
punctures the blister to release medicine
DISKHALER BODY
HALF-CIRCLE FLAP
lifts up and down to operate plastic needle
SILVER MEDICINE DISK
contains 4 blisters of medicine; the disk fits into the dark brown wheel inside the DISKHALER

Tamiflu

Stockpiling in NC

- Yes
- Follow 80/20 model
- Goal: enough for 25% of the population
- Storage locations being investigated
- Used for Quenching and treatment

Shelf Life

- ~ 5 years
- Shelf Life Extension Program (SLEP)
- Allows for product in the SNS to receive extended expiration date if it meets specific conditions
- SLEP is only available for federally-owned pharmaceuticals

Tamiflu

- M2 ion channel inhibitors (amantadine) have shown HIGH resistance
- Relenza is difficult to administer; has a black box warning (wheezing)
- Relenza indicated for patients over 5
- Tamiflu is easily stored and administered; available in suspension

Antiviral Distribution Plan (Proposal/Draft)

- Until stockpile is complete, only enough for treatment regimens
- 50% to public health, 50% to hospitals
  - Hospital amount based proportionate to historical ED volume
- Public health
  - 25% kept at State
  - 25% to local health departments proportionate to population of county/district

Pandemic Vaccine

- Created at time of pandemic
- HHS allocated $1.8 billion towards vaccine production and development
- Costly and time consuming
- Goal to produce enough for entire US population

H5N1 vaccine

- Not FDA approved
- Referred to as a “prepandemic vaccine”
- Based on current strains of H5N1
  - Thailand strain
  - Vietnam strain
- Held by manufacturer in bulk form

Vaccine request and distribution

- Early press releases stated SNS
- Distribution will be through the National Center for Immunization and Respiratory Diseases (NCIRD)
  - Formerly the National Immunization Program (NIP)
- Exact process not yet established

Current Status

- SNS
  - Push-package and managed inventory are available
  - Antibiotics, PPE, ventilators
- Antivirals (as of 10/06)
  - On hand:
    - 15.7 million regimens of Tamiflu
    - 84 thousand regimens Relenza
  - Ordered
    - 13.9 million Tamiflu
    - 6 million Relenza
- Vaccine
  - 20 million doses of H5N1 vaccine

Other Pandemic Preparedness Activities

- NC Pandemic Influenza Response Plan
  - Update February 1, 2007
- Exercises
  - Eight tabletop exercises Jan-Feb 2006
    - for hospitals and local partners
  - Statewide full scale exercise “CIPHER” May 2006, led by EM
- Pandemic Influenza Ethics Task Force
- Federal Supplemental Funding (CDC)

Phase 1 Award: $2.5 Million

Contractual -Direct Aid to Counties	$2,178,292 $977,491
Laboratory	$136,034
Direct assistance	$110,000
Support/supplies	$108,919
Travel	$14,599
Total	$2,547,844

Phase 2
$6,178,689

Activity	Budget (%)
Aid to counties, EBCI	1,881,615 (30)
Office of Emergency Medical Services	1,492,000 (24)
Information Technology	977,922 (16)
Community Health Centers	700,000 (11)
Public Affairs	409,870 (7)
Public Health Preparedness & Response	288,469 (5)
Admin, equipment, supplies, travel	225,213 (4)
Disparities Prevention Team	103,600 (2)
UNC-Center for Public Health Preparedness	100,000 (2)
total	$6,178,689

Pandemic Influenza Planning Ongoing Issues

- Strengthen local health department plans
- Exercise pandemic influenza plans
  - School closure
  - Mass vaccination
- Increase situational awareness outside of public health
- Encourage planning among society other than healthcare
  - Businesses
  - Schools
  - Volunteer organizations

Conclusions

- Forecasting the next pandemic is difficult
  - When, not if
  - How severe: 1918-like or 1968-like
- Current outbreaks of H5N1 pose an ongoing threat
- Pandemic influenza presents unique challenges for planners
- Many different entities need to plan

Pandemic Flu - Division of Public Health

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http://www.pandemicflu.gov/ Search

Pandemic Flu

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
Feb. 2 — Governor Rell and HHS Secretary Leavitt address state, local and private

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

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Epidemiology is part of Public Health in North Carolina

- Topics A-Z
- Biological Agents Registry
- Communicable Disease Control
- DHHS Hurricane Information
- Environmental Contaminants
- Exposure to Chemicals
- Fish Consumption Advisories
- Harmful Algae
- HIV/STD Prevention & Care
- Indoor Air Quality
- Medical Evaluation & Risk Assessment
- Methamphetamine Labs
- Occupational Illnesses & Injuries
- Ozone
- Pfiesteria
- Public Health Preparedness & Response
- Tuberculosis
- Veterinary Public Health

- Centers for Disease Control and Prevention
- CDC Health Topics

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: *	
Command, Control and Management Procedures	
A-1: Appendix 7 to Annex B of the NC Emergency Operations Plan	View (762kb)

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www.ncpublichealth.com

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NC Department of Crime Control and Public Safety - Microsoft Internet Explorer

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Make A Plan
Build A Kit
Be Involved
ReadyNC.org

Home Make A Plan Build A Kit Be Involved

Family Preparedness | Seniors & Disabled | Pets | Utilities | Phone

Home Safety | Evacuate | Shelter-in-place | Go Bags | Food & Water

First Aid | Community | Volunteer | Contagious Diseases | Radiation

Terrorism | Earthquake | Fire | Flooding | Hurricane

Tornado | Tsunami | Winter Storm

Ready North Carolina
Prepare Now for Emergencies

We never know when an emergency might happen. They come in the form of severe weather, accidents, and unfortunately, terrorist attacks. Planning now for how you would respond will help you remain calm, think clearly and react appropriately to any disaster scenario.

Taking responsibility for your own safety by being prepared with plans and an emergency supply kit not only increases your ability to survive, but reduces the workload of first responders, emergency medical services, fire fighters and law enforcement.

No community is truly prepared for a disaster until *every* individual, family and household takes personal responsibility for his or her own safety.

The *Ready North Carolina* campaign provides North Carolinians with the information you need to prepare for all types of emergencies.

The N.C. Department of Crime Control & Public Safety, the N.C. Citizen Corps, the N.C. Emergency Management Association and the 100 county emergency management agencies across the state are ready to help you be better prepared for emergencies.

Done Internet

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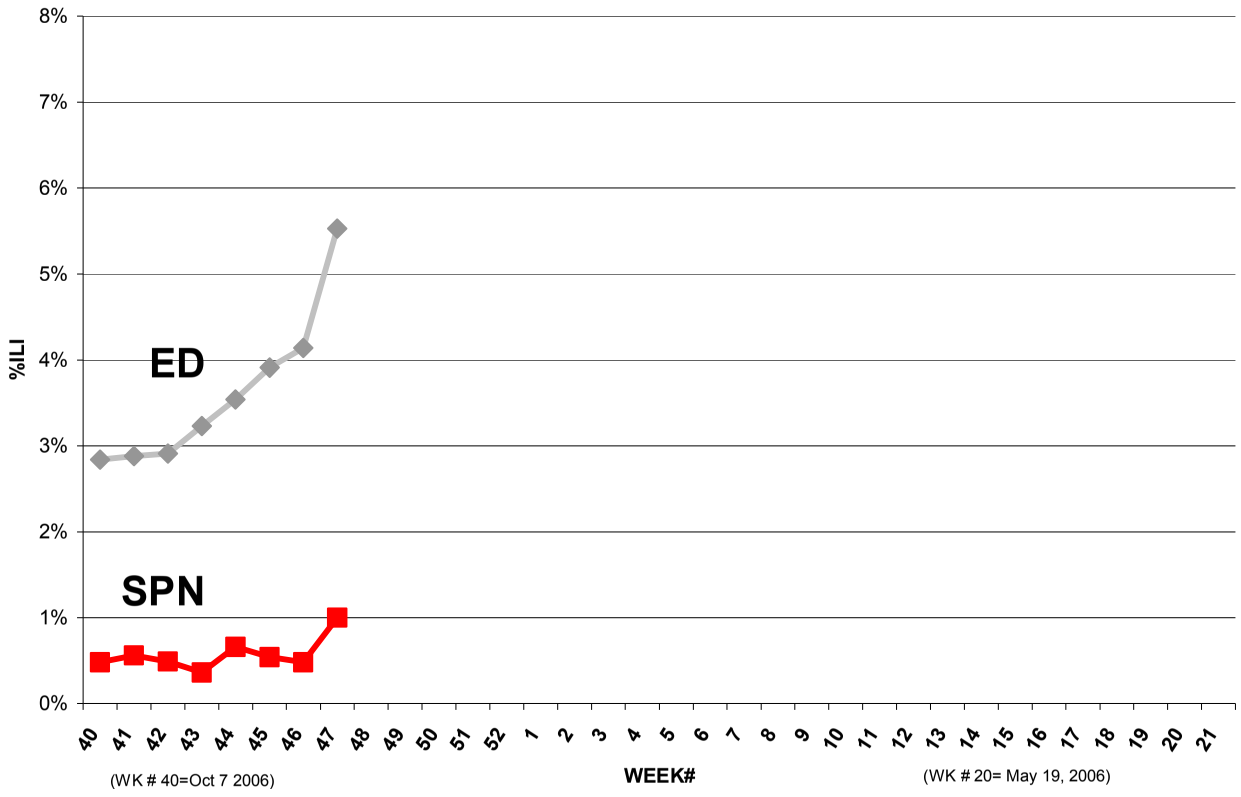
Online Resources

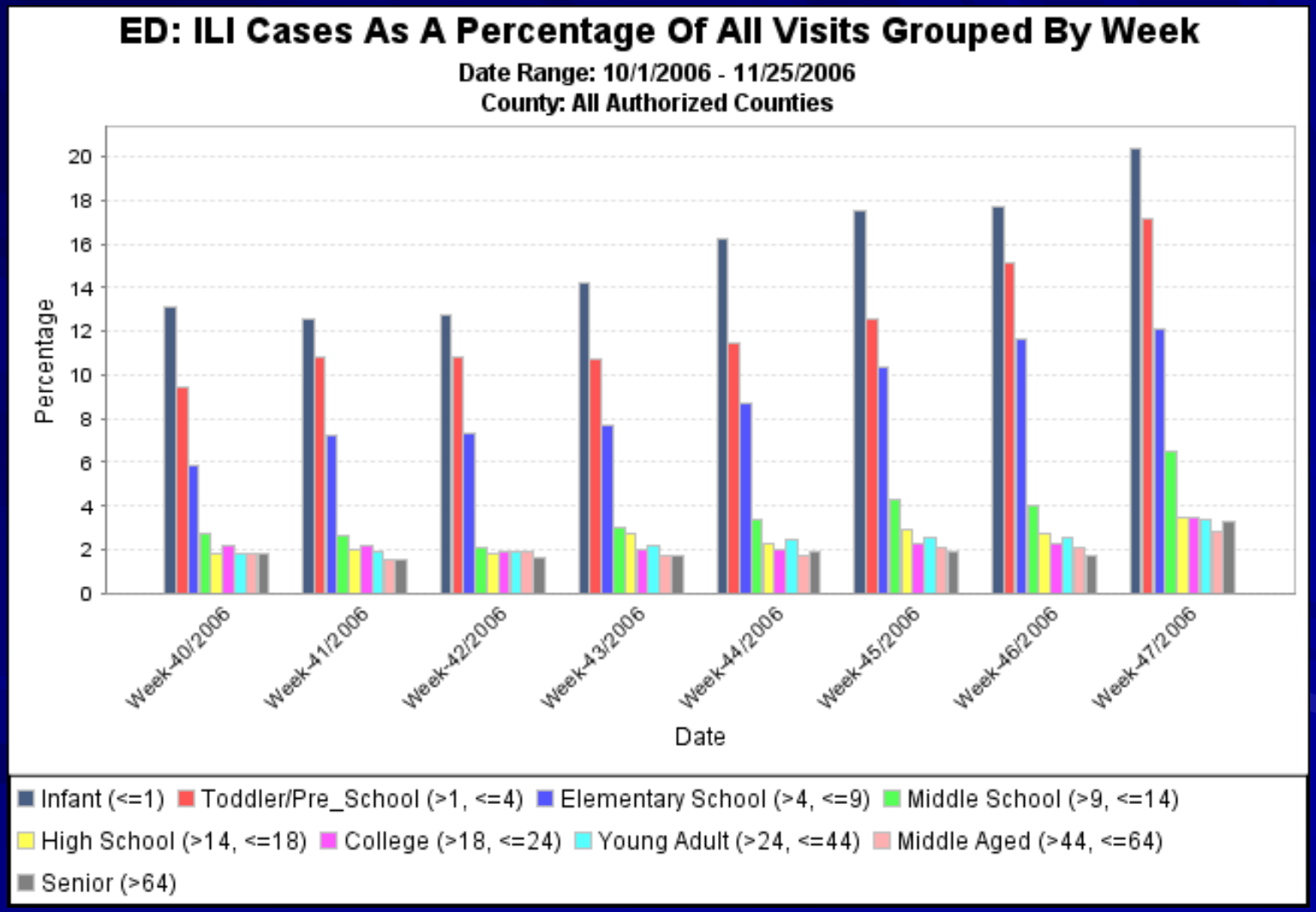
- www.who.int
- www.cdc.gov
- www.pandemicflu.gov
- www.ncpublichealth.com
- www.readync.org

- pandemicflu.plan@ncmail.net

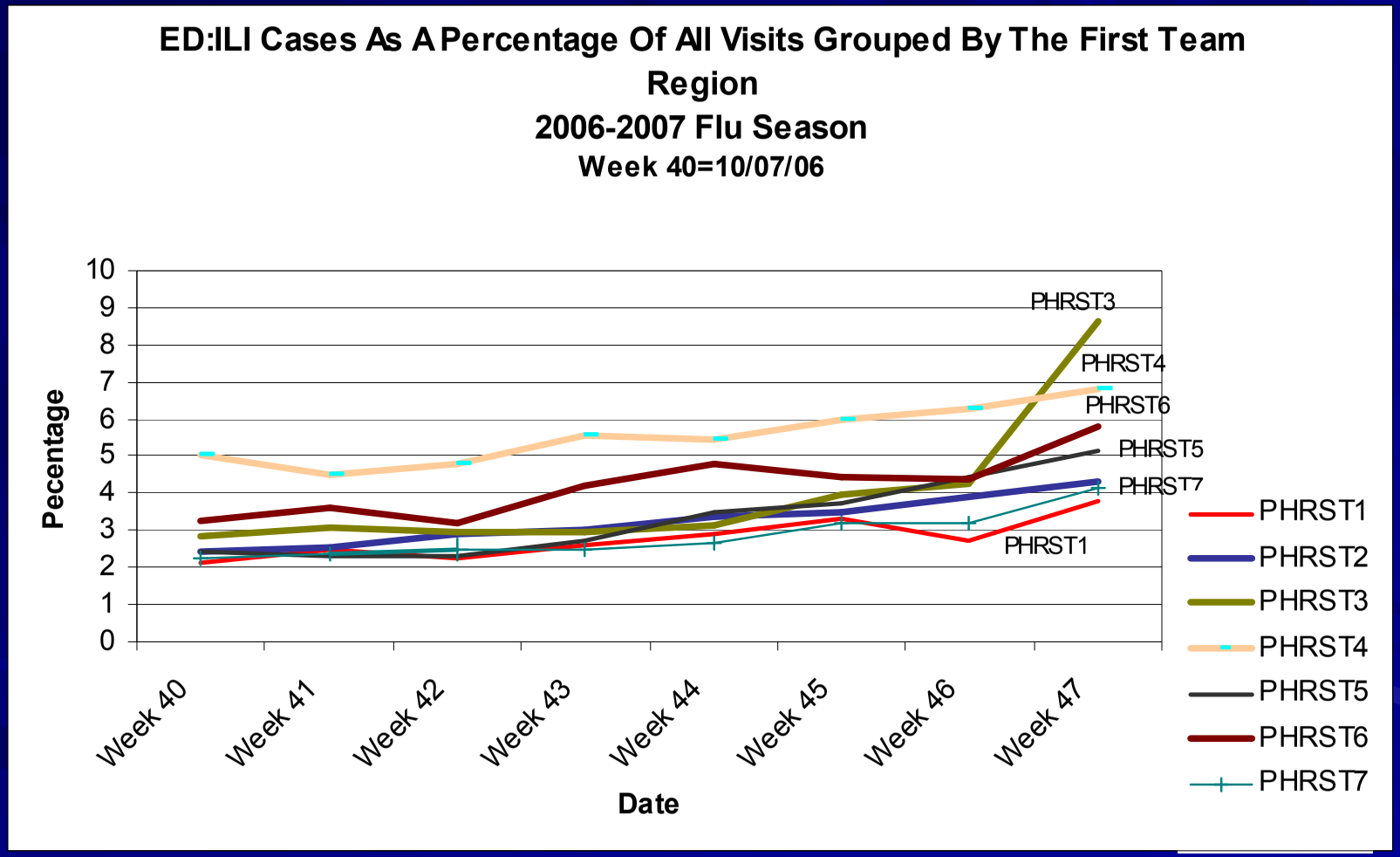
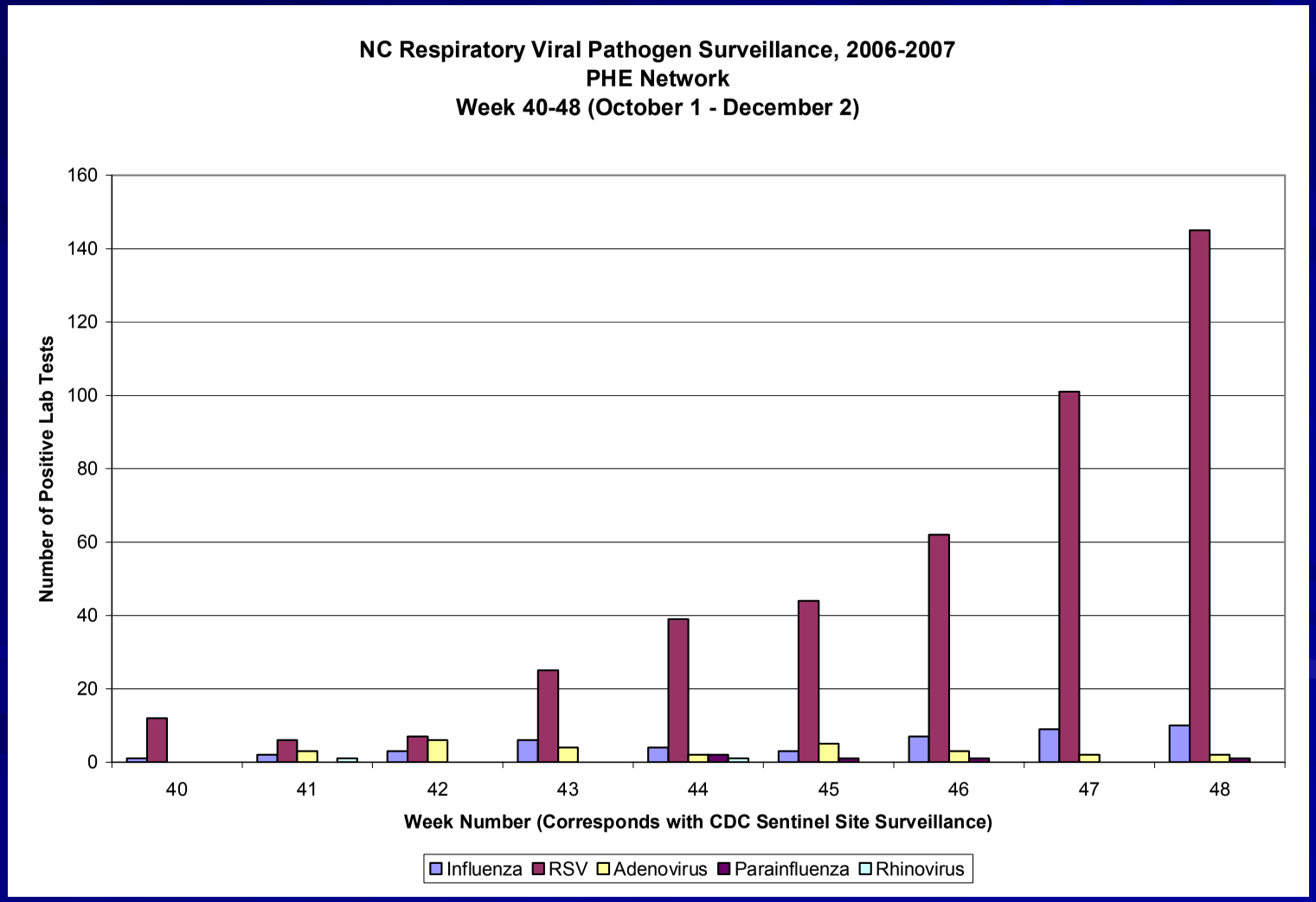
2006 Seasonal Flu Activity



NC DETECT Flu Report: 2006



NC DETECT Flu Report 2006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