

Pandemic Influenza and Business Preparedness

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Outline of Talk

- What is influenza?
- Why are we so worried?
- What can we do about it?
- How can the City prepare?

Influenza 101

- Caused by a virus
- Virus shed in respiratory secretions
- Incubation period 1 - 4 days (average of 2 days)
- Contagious prior to onset to symptoms
- Abrupt onset of fever, body aches, sore throat, nonproductive cough, headache
- Circulating virus changes every year, requiring an annual flu vaccination

All that is called the “flu” is not influenza

Influenza - Complications

- Pneumonia
 - primary influenza
 - secondary bacterial
- Ear
- Heart
- Muscular
- Death

Annual Impact of Regular Influenza

- >36,000 deaths annually
- > 225,000 excess hospitalizations nationwide, and
- Highest rates of hospitalization among young children and persons ≥ 65 years of age
- 90% of these deaths among persons ≥ 65 yrs
- Annual vaccination is critical!

Why Are We So Worried Now?

Pandemic (Worldwide Epidemic) Flu

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Annual vs. Pandemic Flu

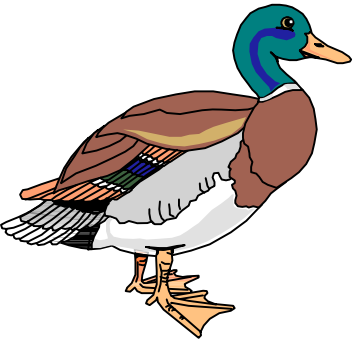
Annual

- Every winter
- 500k-1 million deaths
- Deaths in at risk populations
- Vaccination available (?) and effective
- Variant strain (drift)

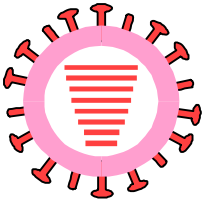
Pandemic

- 3 times/century
- 1918: 50-100 million deaths
- At risk population may enlarge (1918)
- Vaccination not available at outset
- Novel strain (shift)

Mechanisms of Influenza Virus Antigenic "Shift"

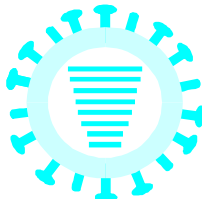


15 HAs
9 NAs

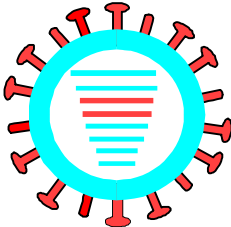
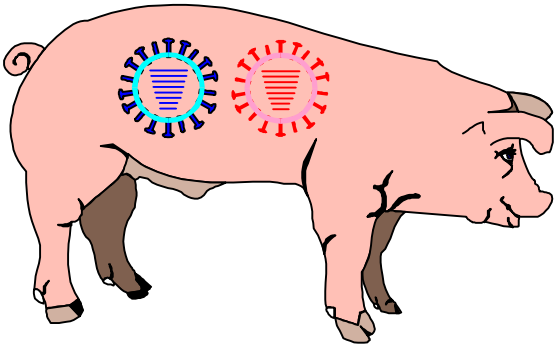
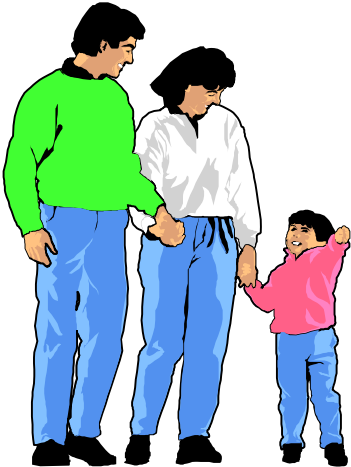


Non-human
virus

DIRECT



Human
virus



Reassortant
virus

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Influenza Pandemics 20th Century



Credit: US National Museum of Health and Medicine

1918: “Spanish Flu”

A(H1N1)

50 - 100 M deaths

>1 M US deaths

1957: “Asian Flu”

A(H2N2)

1-4 M deaths

~70,000 US deaths

1968: “Hong Kong Flu”

A(H3N2)

1-4 M deaths

~34,000 US deaths

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Mortality Comparisons

	# DEATHS
World War II	50 million
1918 Flu Epidemic	20-40 million
World War I	15 million
Ebola	1000- 2000
SARS	774

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Avian Influenza: The Next Pandemic?

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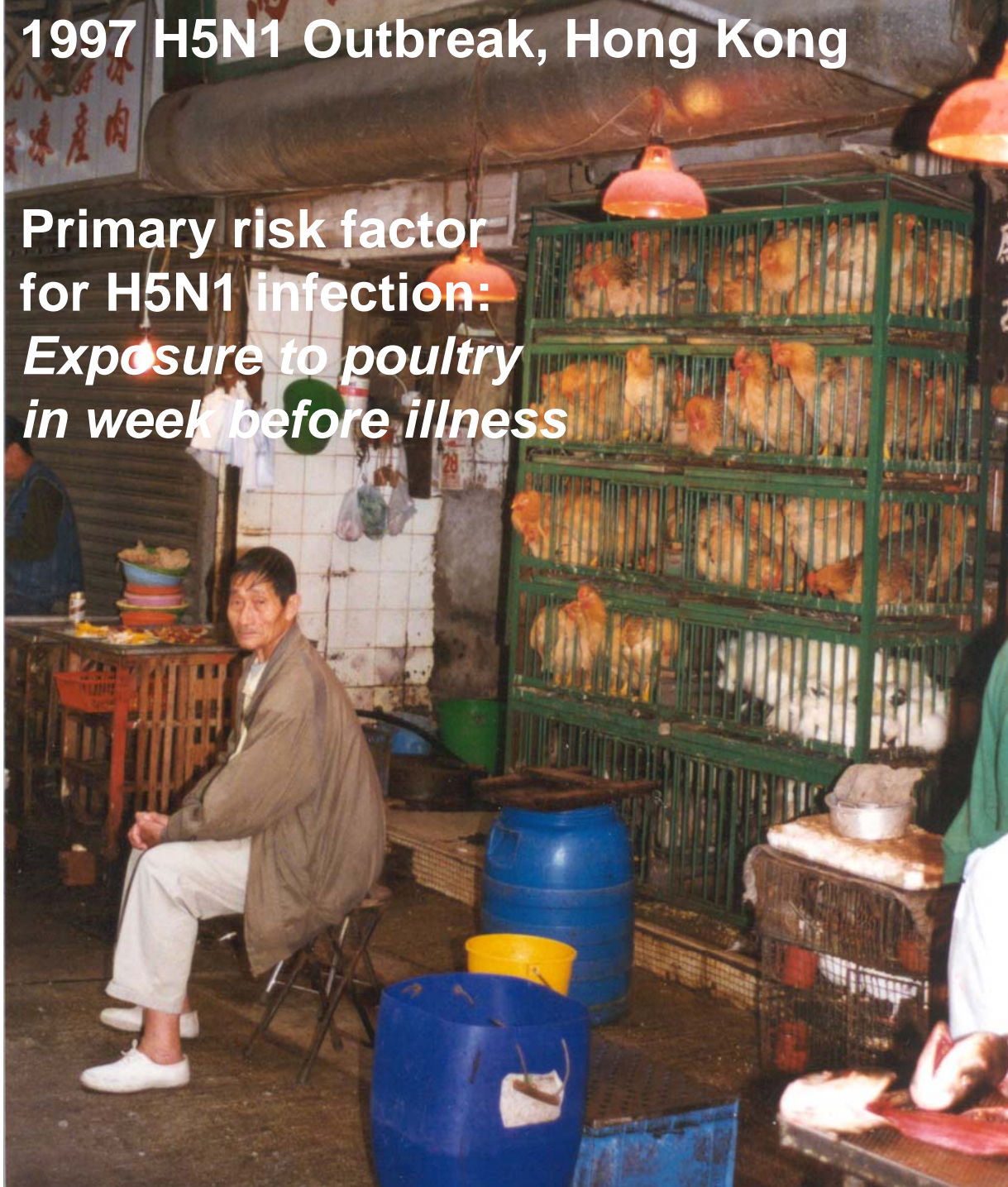
Recent Episodes of Avian Influenza in Humans

1997	<i>Hong Kong- 18 cases, 6 deaths 1.5 million chickens destroyed</i>	H5N1
1999	<i>Hong Kong, 2 cases in children, both recovered</i>	H9N2
2003	<i>Hong Kong, 2 cases in children, both recovered</i>	H5N1
2003	<i>Poultry outbreak, Netherlands, 80 human cases, mostly mild, 1 death</i>	H7N7
2003-4	<i>Poultry and human outbreak, SE Asia, high mortality</i>	H5N1

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1997 H5N1 Outbreak, Hong Kong

Primary risk factor
for H5N1 infection:
*Exposure to poultry
in week before illness*



Avian Influenza Update

As of December 7, 2005

- 135 human cases, 69 deaths (laboratory confirmed)
 - Indonesia, Viet Nam, Cambodia, Thailand, China
- Almost all cases with direct contact with poultry, rare human to human cases
- Migratory waterfowl are infected
- Area of infected birds is increasing westward (now in Europe), ? Eventually into North America

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Criteria of Pandemic Influenza Risk

- Emergence & spread of a “novel” influenza A virus
 - Virus antigens (or HA/NA) derived from animal viruses YES
 - Susceptibility among most/all of the population Yes
 - Sustained & efficient human-human transmission No

Uncertainties

- We don't know, if the next pandemic will be due to avian flu or another strain.
- We don't know when a pandemic will happen.
- We don't know if the strain will be susceptible to antivirals, what the mortality risk factors are.
- Was 1918 unique?

However: best defense against a serious pandemic is to prepare in advance

Potential Impact of the Next Influenza Pandemic in NYC

	Worst case estimate
Illnesses	2.4 Million
Hospitalizations	267, 000
Deaths	51,000

Source: adapted from DHHS data *For internal distribution only – not for public dissemination.*

What Can We do About it?

Surveillance

Respiratory and Hand Hygiene

Community Control

Anti-Virals

Vaccines

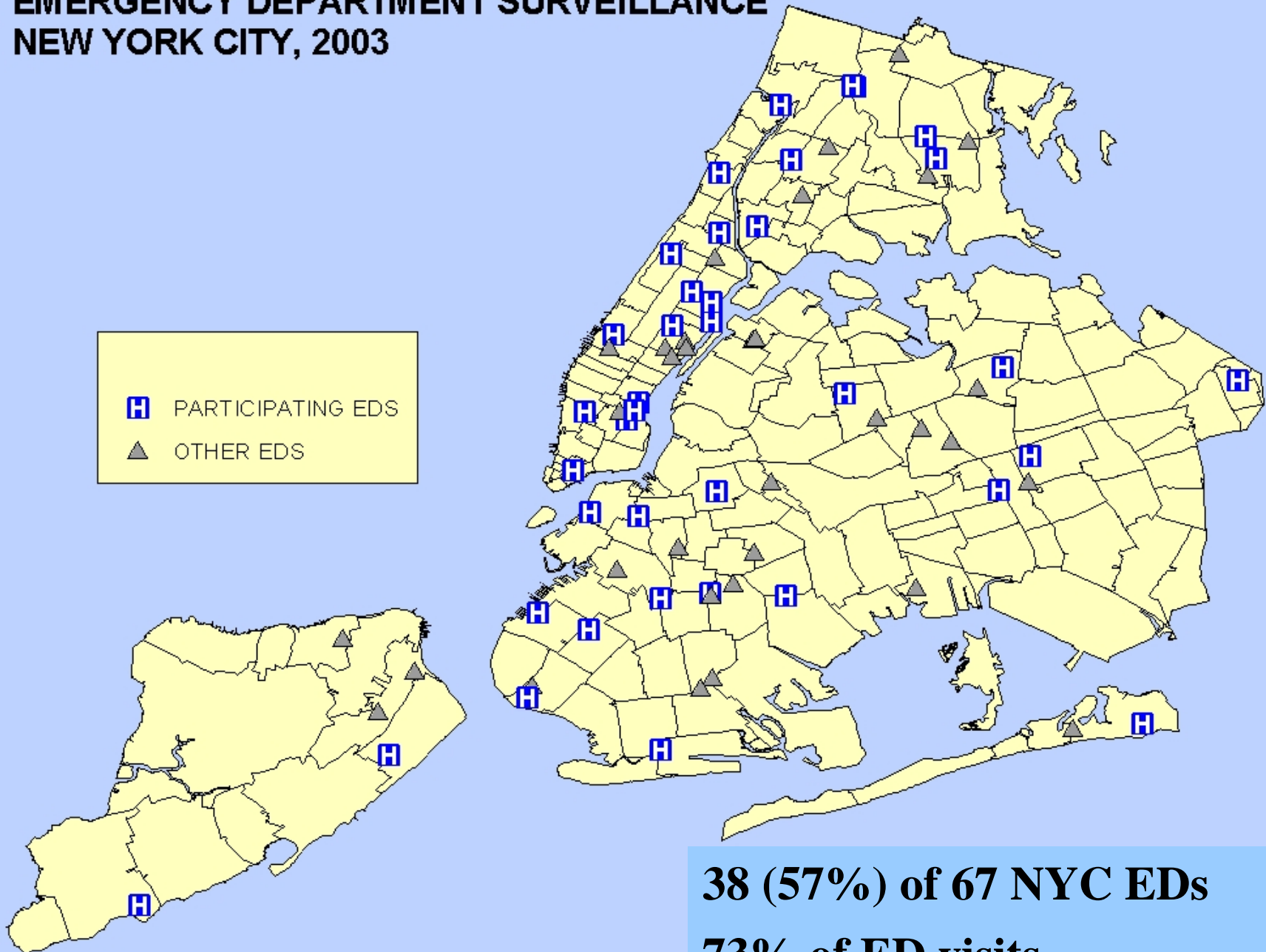
Hospital Preparedness

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Detection/Surveillance

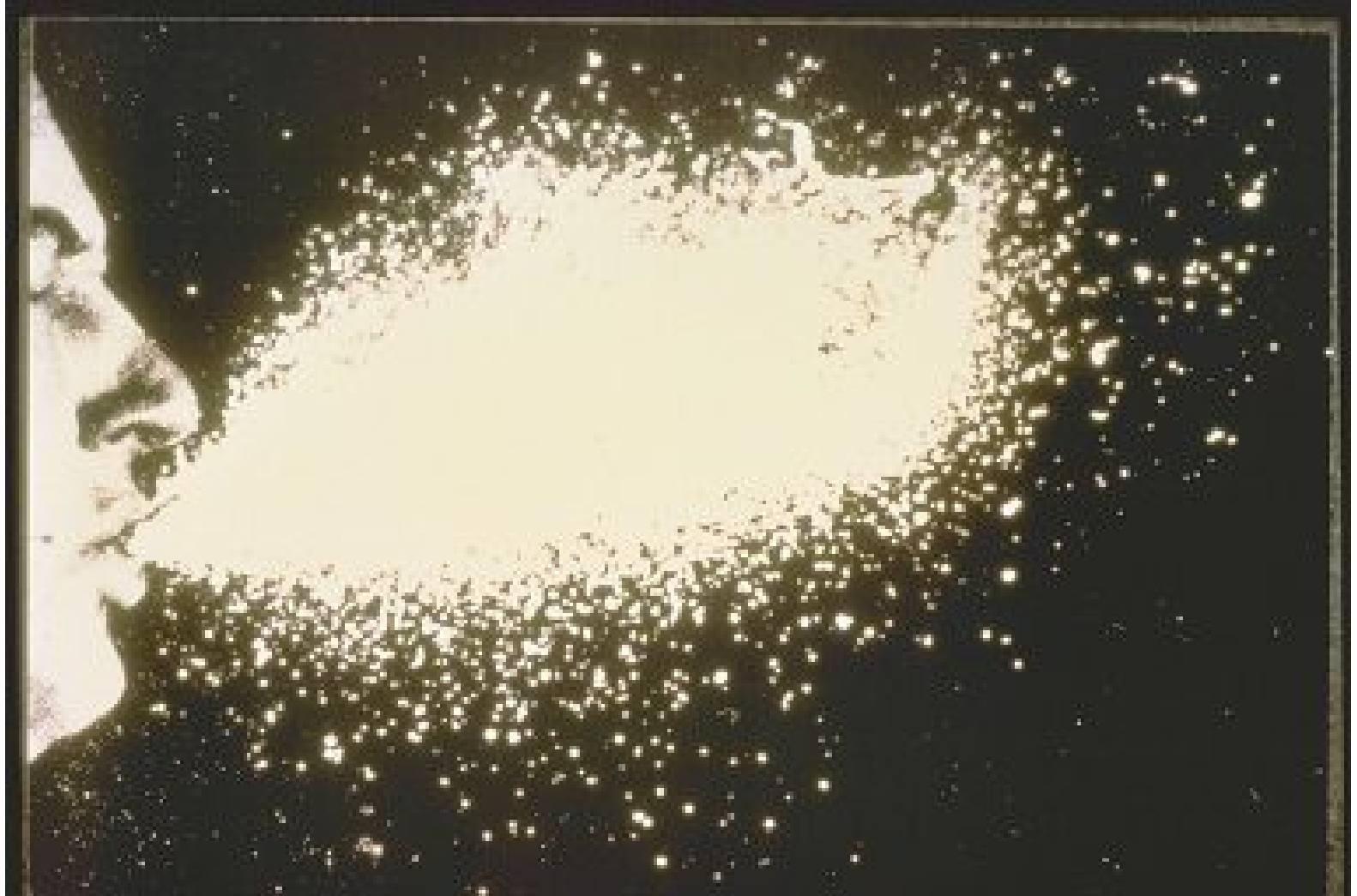
- Multiple methods of influenza surveillance
 - Track international situation
 - Syndromic Surveillance
 - Influenza Sentinel Physician Surveillance
 - Laboratory-based surveillance
 - Nosocomial investigations of Nursing Homes
 - Over the counter pharmacy sales
 - Reporting of cases among travelers to H5N1 affected countries

EMERGENCY DEPARTMENT SURVEILLANCE NEW YORK CITY, 2003



■ PARTICIPATING EDS
▲ OTHER EDS

38 (57%) of 67 NYC EDs
73% of ED visits



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Influenza Transmission

- Occurs primarily by large respiratory droplets that are expelled from the respiratory tract during coughing or sneezing.
- Close contact, within 3 feet, is usually required
- May occur when hands, or other objects, become contaminated with respiratory secretions and then contact mucous membranes.
- Environmental transmission has not been demonstrated epidemiologically

Control Measures to Limit Dissemination of Influenza

- Covering mouth/nose with a tissue when coughing
- Post signs that promote respiratory/cough hygiene in common areas
- Hand hygiene after contact with respiratory secretions
- Make hand sanitizers available to your staff
- If feasible, screen personnel for cough or fever before they come on duty
- Ill workers should be advised to stay home

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Masks

- Surgical type masks should be worn by those ill when in public.
- Masks are not foolproof: virus may go around openings. No evidence to show they decrease community transmission.
- More sophisticated respirators (N95) recommended for hospital personnel performing high risk procedures involving aerosolization of secretions.

Community Control

- Public education and communication is critical.
- Quarantine unlikely to be used or if used successful.
- Closure of schools, public events will be considered and recommendations will be based on characteristics of the outbreak.

Response: Antivirals

- Limited supplies dictate use for treatment (not prophylaxis)
- Goal: limit mortality
- Prioritization of antivirals for treatment: severely ill patients, health care workers, first responders (includes public safety).
- Current federal stockpile of 2.3 million treatment courses in SNS
- Federal plan is to stockpile to treat 25% of US population
- Distribution through DOHMH

Tamiflu – Potential Negatives

- Not a cure: decrease duration of symptoms, and viral shedding
- May not be effective against pandemic strain
- Inappropriate use may lead to resistance
- In anthrax, prophylaxis adherence 27%
- Proven efficacy only if given within 48 hrs of symptoms
- 5-year shelf life
- Not approved for pregnant women and children < 1
- Adverse effects
- Real impact uncertain

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Pandemic Vaccines

- No vaccine available currently.
- Needs to be strain specific.
- With current technology, may not be available until 6 months after the “first wave”.
- When available likely to be in small quantities requiring prioritization. Distribution through DOHMH.
- Current HHS proposal emphasizes new technologies for vaccine production, which would speed up development.

Response: Hospital Preparedness

- Monitor hospitalizations, deaths, and cases
- Attention to information exchange
- Development of surge capacity plans
- Hospital coordination on closing and rationing resources
- May have increased need for hospital security

How Can The City Prepare?

Citywide Planning Key Organizational Questions

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Citywide Planning

- 9/9 hospital tabletop, 11/30, 12/12 follow-up meetings with city hospitals
- 12/1 meeting with OEM EOC functional groups: safety, infrastructure, utilities, health care, human services, transportation, public-private partnerships
- 9/23 and 12/12 meeting with New York City Businesses