



危機

Emergency Management & Safety Solutions

Getting Ready -
Pandemic Influenza

June 2008



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Agenda

- What is the pandemic threat?
- Current pandemic Status
- Defining the pandemic threat
- Employee protection planning issues

*Disclosure: fees and travel expenses paid by
Roche Pharmaceuticals*



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Diseases are in the News...



- Train quarantined in Canada; one dead, others hospitalized - May 9, 2008
- Mumps outbreak Western Canada - May - June 2008
- Measles outbreak - downtown Toronto - Spring 2008
- SARS - 2003

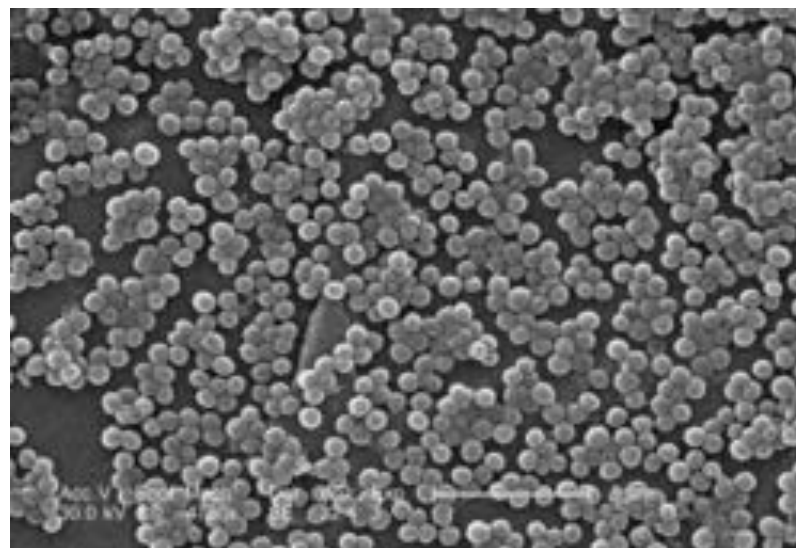


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And there are more...

- Methicillin-resistant Staphylococcus aureus - MRSA
- Drug Resistant Tuberculosis
- Spread of “unusual illnesses” such as Chikungunya previously only in Asia and Africa, now in Europe
- Malaria





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But none can top Influenza...the flu!





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Influenza Symptoms

Sudden onset of illness

Fever higher than 100.4° F (38° C)

Chills

Cough

Headache

Sore throat

Stuffy nose

Muscle aches

Feeling of weakness and/or exhaustion

Diarrhea, vomiting, abdominal pain (occur more commonly in children)





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Why is influenza so different?

- Business Continuity Planning generally has two assumptions:
 - Back to “business as usual” in 30 days or less
 - Go from the “affected” site to the “unaffected site” and resume business

Neither apply with Pandemic Influenza



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Influenza - A Primer...

- Influenza is a **highly contagious** respiratory disease. Spread by droplet nuclei (1-5 microns size within 3-6 feet).
 - Moisture particles are expelled when you breath, talk sneeze or cough.
 - Droplet nuclei can remain suspended in the air for *several hours*.
 - Remain on surfaces for 24 hours, sometimes longer.
- Every year 10-20% of the world's population gets influenza.
 - Influenza is associated with 500,000 to 1,000,000 deaths worldwide each year.
 - In the US, annual seasonal influenza results in approximately 36,000 deaths and 120,000 hospitalizations.
- Influenza has thrived over the millennia by adhering to one simple principal- **adapt or die** - it is constantly changing.

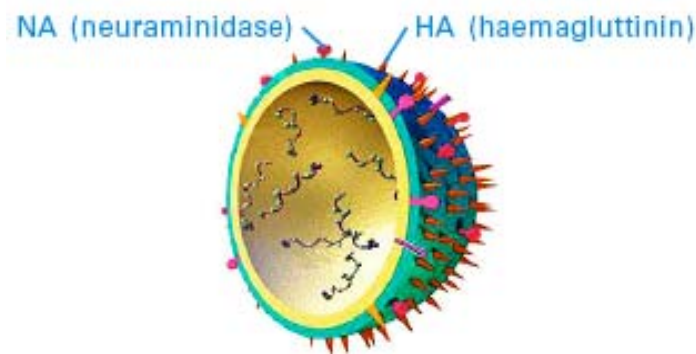


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- Influenza A has two subtypes determined by proteins on the outer surface of the virus.
 - Hemagglutinin (H) – helps virus attach to respiratory cells (H 1 - 16).
 - Neuraminidase (N) – helps virus spread throughout the body (N 1 - 10).
 - 144 different H and N combinations.
 - H3N2 is our current seasonal flu (since the last pandemic in 1968).
- Viral Changes - Drift or Shift?
 - Drift - subtle, happens annually.
 - Shift - pandemic event; caused by recombination of human and animal antigens (often swine and/or avian).

Influenza A





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Last Century - Three Pandemics

- Spanish Flu 1918-1919
- US cities experienced:
 - City quarantines
 - Required masks while on the street
 - Severe shortage of nurses (up to 75%)
 - Shortage of caskets
 - Mass burials
 - School & business closures
 - Panic and widespread fear
- 50 - 100 million+ deaths worldwide
 - 550,000 - 675,000 deaths in the US
- Asian Flu 1957
 - In May 1957 - the World Health Organization (WHO) reported a new H2N2 subtype from Singapore.
 - Infection rates were reported to range from 20% to 70%.
 - US death toll 70,000 excess mortality.
- Hong Kong Flu 1968
 - In July 1968 a new subtype - H3N2 emerged in Hong Kong.
 - Infection and mortality rates were similar to 1957, most deaths in those over 65.
 - US death toll 31,000 excess mortality.



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Differences Between The Pandemics

- 1957 and 1968
 - Less virulent viruses.
 - Caused by recombination - human flu viruses that acquired 2 or 3 key genes from bird flu virus strains.
 - Antibiotic treatment for secondary infections.
 - Improved supportive care.
- 1918
 - Scientists now believe the 1918 strain was probably **entirely** a bird flu virus that adapted to function in humans.
 - The 1918 virus was a **direct leap** from birds to humans.
 - Created a cytokine storm in its victims - overactive immune response. Just like our current threat - H5N1.



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Current Human Cases & Death Toll

- These summary of cases and deaths as of June 26, 2008
 1. Indonesia 135/110 (81%) **
 2. Vietnam 106/52 (47%) **
 3. Thailand 25/17 (63.6%) **
 4. Pakistan 1/1 (100%) **
 5. Egypt 50/22 (60%)
 6. Cambodia 7/7 (100%)
 7. China 30/20 (66.7%) **
 8. Turkey 12/4 (33.3%)
 9. Iraq 3/2 (100%)
 10. Azerbaijan 8/5 (62.5%)
 11. Djibouti 1/0 (0%)
 12. Nigeria 1/1 (100%)
 13. Laos 2/2
 14. Myanmar 1/0
 15. Bangladesh 1/0
- Total 385 cases / 243 deaths
- 63% fatality
- The total number of cases/deaths includes **only** WHO laboratory confirmed cases.



AP / Rafiq Maqbool

**** Areas that have had documented human to human transmission**



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Who has been affected?



- Who is affected?
 - 52 per cent were younger than 20 years old
 - 89 per cent were under age 40.
 - Men and women made up virtually an equal number of cases.
- Lowest death rate?
 - Over the age of 50
 - Followed by children:
 - Under age 5
 - Ages 5-9
- The total case fatality (CFR) rate was 60 per cent 2003 - 2006
 - 2007-2008 CFR has increased to 87%.





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Indonesia: Remains Ground Zero



- Indonesia
 - 17,000 islands
 - 220 million people
 - Jakarta - 12 million people
- A country of exceptions:
 - Most cases
 - Most deaths
 - Endemic and widespread
 - Numerous cases with no exposure to sick poultry
 - Cases of human-to-human transmission
 - Not sharing data OR blood samples



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Uphill Battle in Impacted Countries



AP / Said Abu el-Einein

- Convinced that her own pigeons are healthy, a poultry trader in the Nile delta in Egypt feeds corn by mouth to the birds.
 - *H5N1 avian flu has killed 22 people in Egypt.*



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Whatever happened to bird flu?

??????
?????



Did bird flu go way of the dodo?

***Good Question: Whatever Happened
To Bird Flu?***



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“It's not business as usual, but it's not like the house is on fire — it's somewhere in between.”

*Keiji Fukuda MD MPH
World Health Organization*



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H5N1 is still a problem

Egypt: 4 Women Die of Bird Flu – Jan 3
H5N1 Strikes Birds in Laos – Feb 12
Man's death raises Vietnam's fatalities to 50 – Feb 18
Pakistan reports another H5N1 outbreak – Feb 18

Bird Flu Kills Another Indonesian Boy

By ALI NOTARUMALOS
The Associated Press
Saturday, February 16, 2008, 11:46 AM

JAKARTA, Indonesia -- A 3-year-old Indonesian boy has died of bird flu, a health official said Saturday, announcing the country's second death from the illness in one day. The two cases, which were apparently unrelated, brought Indonesia's bird flu death toll to 105.

The latest victim was identified only as Haq, a 3-year-old boy from the southern part of the capital, Jakarta, radio El-Shinta reported. It said he died Friday at a hospital in the city.

Senior Health Ministry official Nyoman Kusnita confirmed the report and said laboratory tests confirmed the boy had



A worker sorts chickens to be slaughtered at a market in Jakarta, Indonesia, Wednesday, Feb. 13, 2008. The daughter of an Indonesian woman who tested positive for bird flu has also contracted the virus, the World Health Organization said Wednesday. It will look for a case of human-to-human transmission. (AP Photo/Wahid Padarsoyo) (The Associated Press)

Thousands of Miles From Home, and Possibly Carrying Avian Flu



At left is the goose designated 05.
By DONALD O. MICHELL JR.
Published January 28, 2008

SIGN UP TO EMAIL

The New York Times
Tuesday, February 19, 2008

World

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WORLD BRIEFING | EUROPE; Britain: Lethal Bird Flu at Famed Swan Reserve

By DONALD O. MICHELL JR.
Published January 11, 2008

The deadly H5N1 strain of avian flu has reached one of England's most famous swan breeding grounds, the Abbotsbury Swannery on

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Possible H5N1 Clusters

Possible H5N1 family cluster probed in Pakistan

Dec 17, 2007 (CIDRAP News) – The World Health Organization (WHO) has sent a team to Pakistan to investigate at least eight suspected cases of H5N1 avian influenza in the same general area, including cases in family clusters, according to news services.

WHO spokesman Gregory Hartl said limited human-to-human transmission is possible, according to an Associated Press (AP) report. He told *Nature* that 40 contacts of the suspected cases were being monitored.

If confirmed, the cases will mark the first human-to-human transmission of the disease from a 10-year-old boy in the Peshawar area. The cases appear to constitute the largest cluster of related cases (one confirmed, one probable) occurred among relatives of the boy. Transmission of the disease from a 10-year-old boy in the Peshawar area, where laboratory testing in that episode.

In a Dec 15 statement, the WHO said Pakistan's suspected cases in the Peshawar area, in the western part of the country, are near poultry outbreaks there. Peshawar is in the country's northwest, near the Afghan border, where most of the country's H5N1 cases have occurred.

Samples from the patients tested positive in Pakistan were being sent to a WHO reference lab for confirmation.

Doctors from the WHO in Geneva and Cairo and a team from the WHO's Unit 3 in Cairo were on their way to Pakistan yesterday to help investigate and combat the disease, according to a Dec 16 statement.

WHO: initial analysis of Pakistani H5N1 suggests no dangerous mutations

Lisa Schnirring Staff Writer

Jan 3, 2008 (CIDRAP News) – An official from the World Health Organization (WHO) today shared results of initial genetic sequencing tests on H5N1 avian influenza samples from a man who died of the disease in Pakistan that suggest the strain doesn't have the capacity for widespread transmission.

John Rainford, a WHO spokesman in Geneva, told CIDRAP News that the genetic sequencing involved two clinical samples from a 25-year-old man from the Peshawar area who was recently announced as the first confirmed human H5N1 case-patient and fatality in Pakistan.

The man was part of a family cluster of suspected H5N1 cases which sparked global concern that the virus had mutated into a form that could enable widespread human-to-human transmission. However, the WHO said in a previous statement that while the Pakistani cases suggest a rare instance of human-to-human transmission, the virus did not spread beyond the family.

Rainford said preliminary sequencing of the hemagglutinin and neuraminidase genes from the specimens was performed at the WHO collaborating center in London. Tests completed so far show the hemagglutinin amino acid sequence is identical to some of the recent clade 2.2 viruses that have been isolated from chickens in other outbreaks in the region, he said.



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What does this mean?

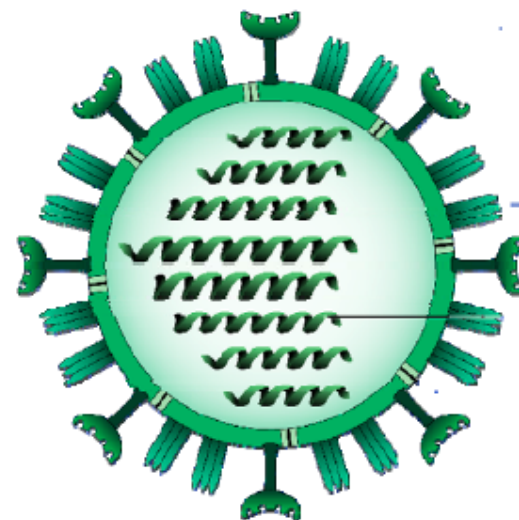
- Frankly, who knows...we have never been able to watch this so closely before.
 - Are we closer to the next pandemic?
 - Will H5N1 be the one to cause the next pandemic?
 - Will the next pandemic look like past pandemics?
- All we can do is be ready.



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H5N1...A Real Risk

- Mutates constantly
- Has a history
- Virus is adapting
- Virus is spreading
- Has completed three of the four requirements for a pandemic
 - New influenza virus ✓
 - Ability of new virus to infect humans ✓
 - Ability to cause serious illness ✓
 - Ability to spread easily among humans



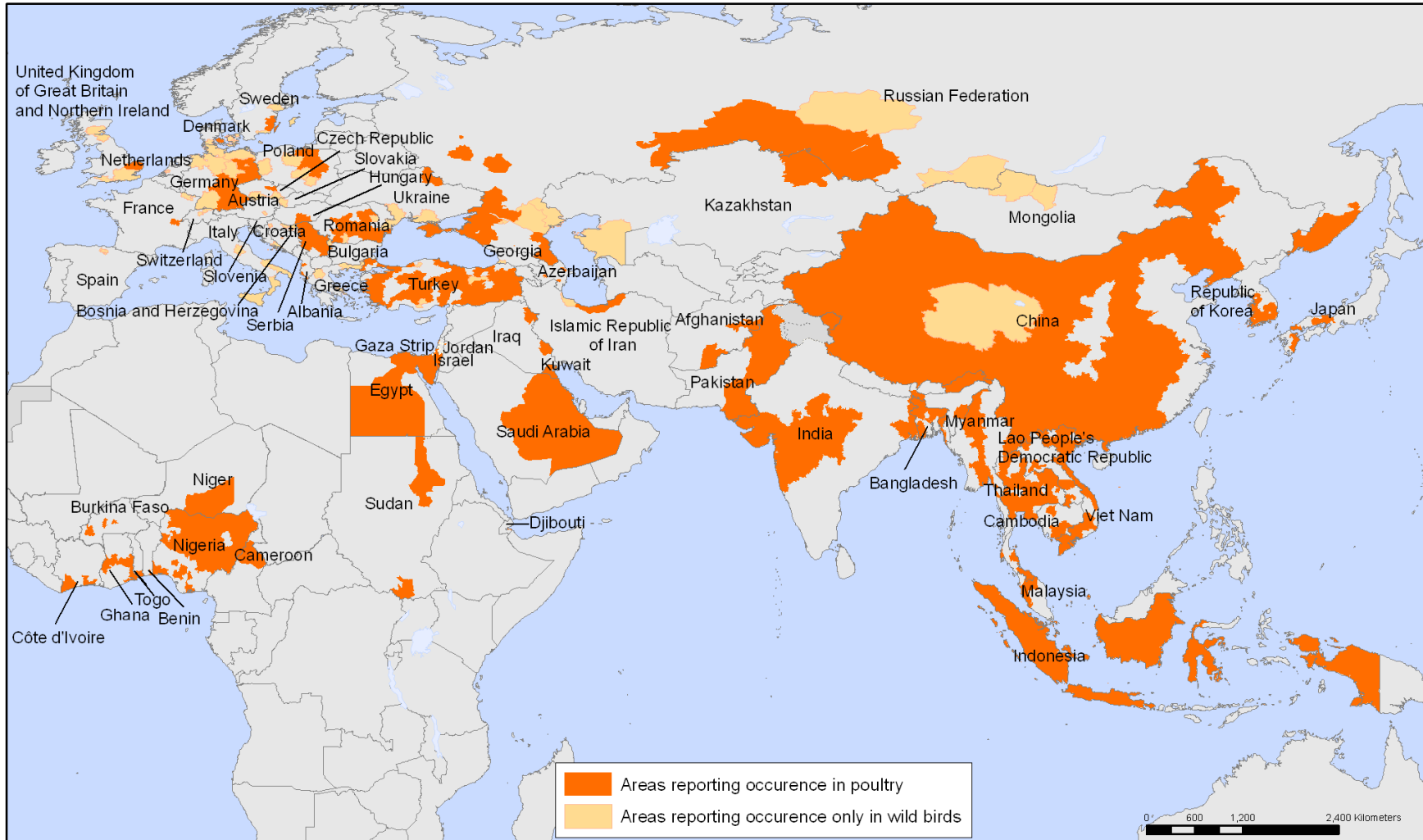


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Status as of 14 April 2008
Latest available update

Areas reporting confirmed occurrence of H5N1 avian influenza in poultry and wild birds since 2003



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Data Source: World Organisation for Animal Health (OIE) and national governments
Map Production: Public Health Mapping and GIS
World Health Organization

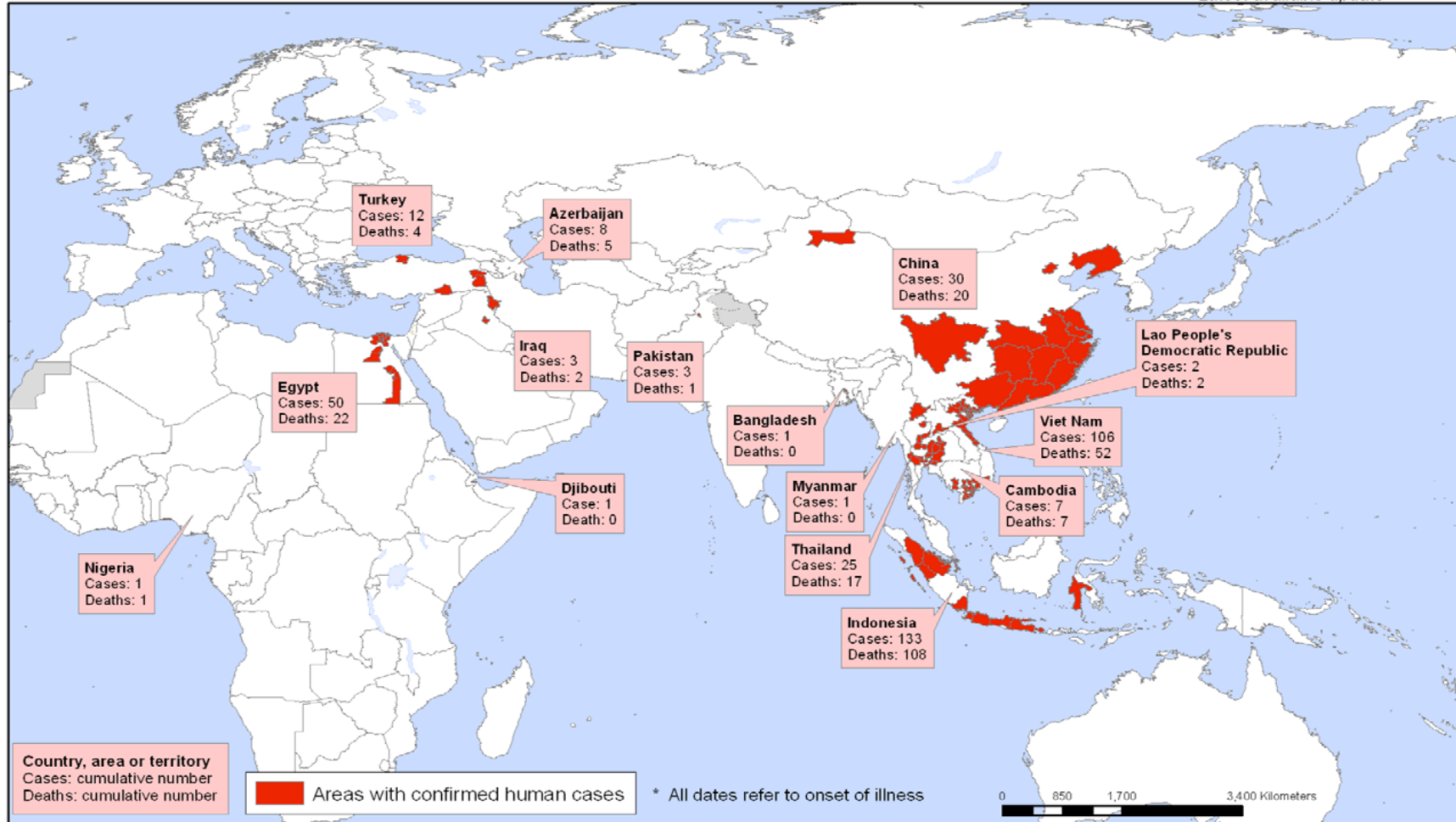


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Areas with confirmed human cases of H5N1 avian influenza since 2003 *

Status as of 28 May 2008
Latest available update



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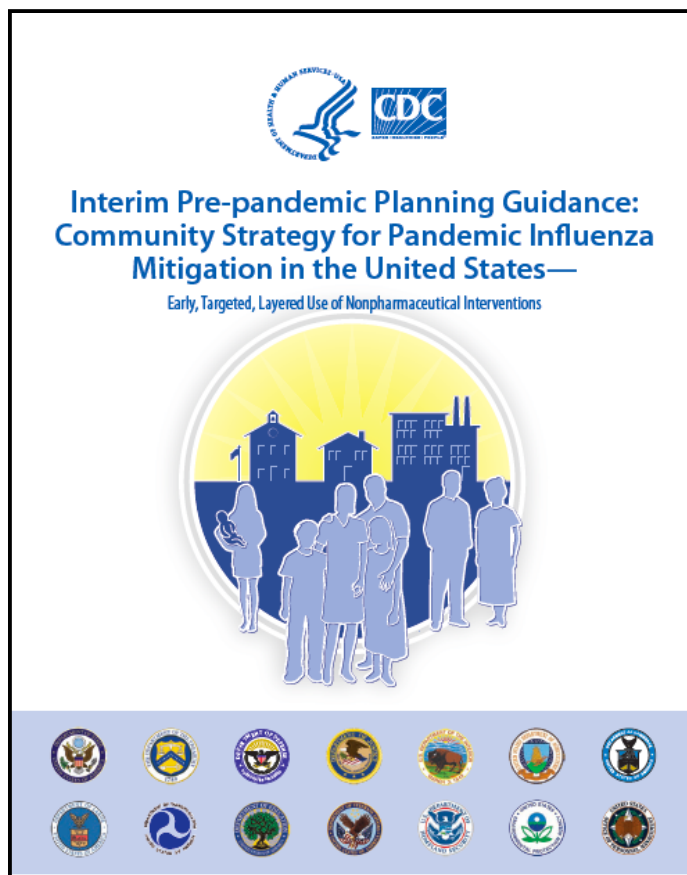
Data Source: WHO
Map Production: Public Health Mapping and GIS
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Community Strategy for Pandemics



January 2007

http://www.pandemicflu.gov/plan/community/community_mitigation.pdf

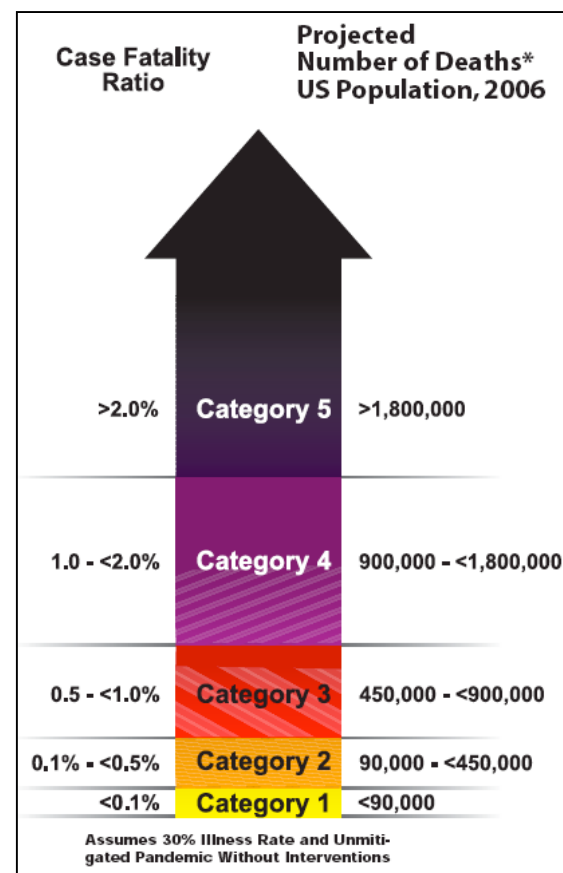


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Pandemic Categorization

- Based on Hurricane ratings but using case-fatality ratios (deaths)
 - Category One - CFR of less than 0.1%
 - Category Two - CFR 0.1% to 0.5% (1957 and 1968)
 - Category Three - CFR 0.5% to 1%
 - Category Four - 1% to 2%
 - Category Five - 2% or higher (1918)
- Estimated school closures in the first wave
 - Category 2 & 3 - Up to 4 weeks
 - Category 4 & 5- Up to 12 weeks





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Building a Resilient Organization



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Building a Resilient Organization

- The good news...
 - **All** of the pandemic planning will make your organization a much more resilient organization.

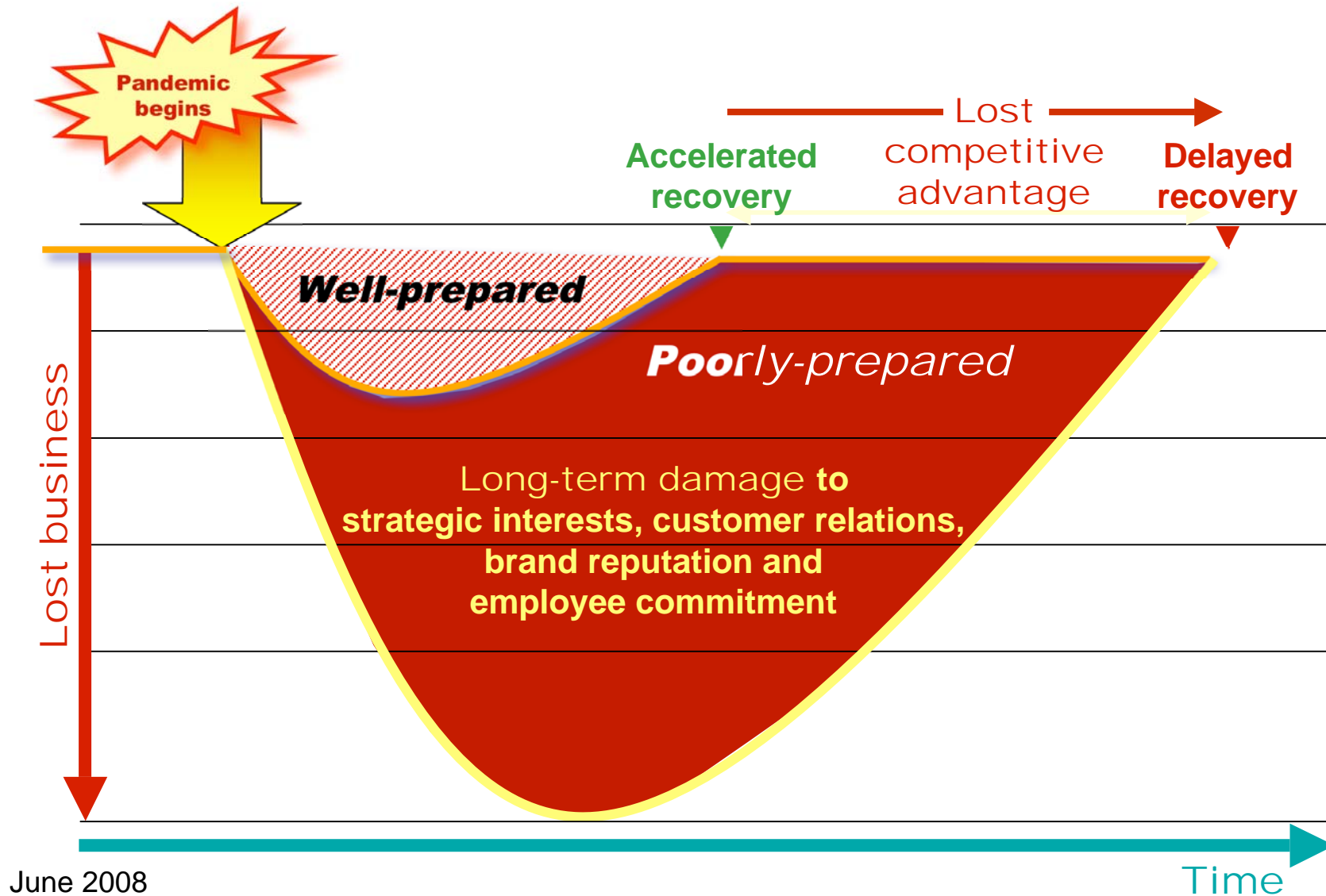




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Capture the competitive advantage by acting now





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Planning Assumptions

1. 40% absenteeism of staff, vendors, services within the community such as health care, police, fire, etc.
2. The pandemic may last as long as eighteen months in three separate waves
 - Mortality and morbidity will increase and decrease in spurts.
3. Critical functions carried out by contractors, consultants and vendors cannot be guaranteed.
4. Civil society infrastructure will be stressed, but remain functional.
5. Potential closure of gathering places in the community including schools, churches, events, malls, etc.



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Planning Assumptions

6. Will likely have less than six weeks of warning from the time the pandemic is announced before it reaches the United States.
7. No remedies will be immediately available. Tamiflu and other antivirals will be in very limited supply.
 - Vaccinations will take 9-10 months and antibiotics are only for the treatment of a secondary bacterial infection.
8. Current WHO Alert Levels do not provide any indication regarding the time interval between levels.
 - Current thinking among experts is that while it may take a significant amount of time for a virus to reach Alert Level 4 (small clusters of human to human viral spread), the time interval between Alert Levels 4, 5 and 6 may be rapid (ranging from days, to weeks, to months).
9. Phases One - Three are planning; Phases Four - Six execution.
10. Susceptibility will be universal.



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Planning Triggers



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WHO Phases

- **Phase 1 & 2** *No new influenza virus* subtypes have been detected in humans.
- **Phase 3. Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.**
- **Phase 4.** Small cluster(s) with *limited human-to-human transmission*.
- **Phase 5.** Larger cluster(s) but human-to-human spread *still localized*,
- **Phase 6. Pandemic:** increased and sustained transmission in general population.
 - Pandemics historically last approximately 18 months.



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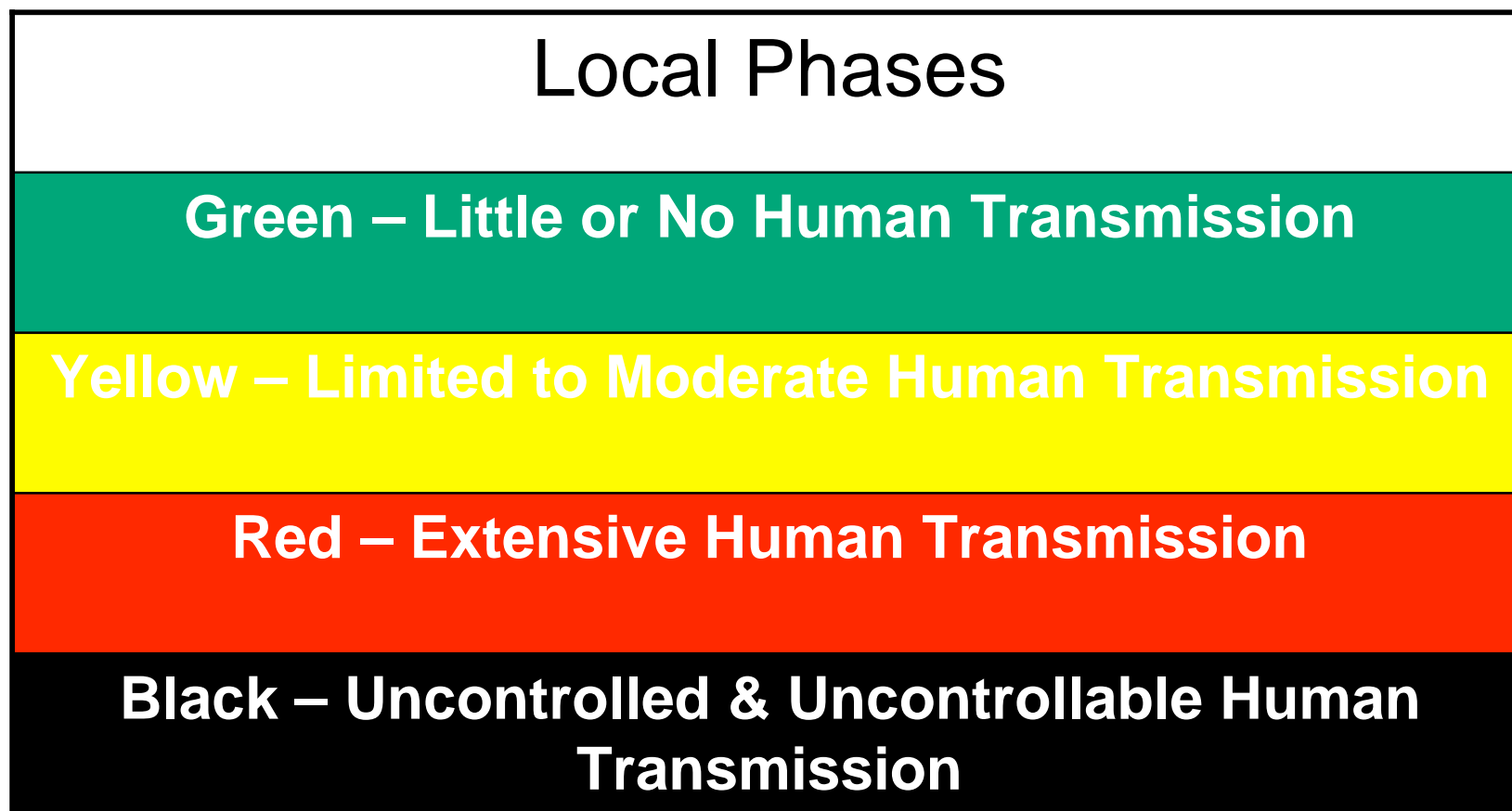
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Plan Execution Triggers



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Plan Globally Act Locally





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Pandemic Plan Strategies



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Two Strategies to Consider

- There are basically two strategies to consider:
 - Non-Pharmalogical Interventions
 - Pharmacological Interventions

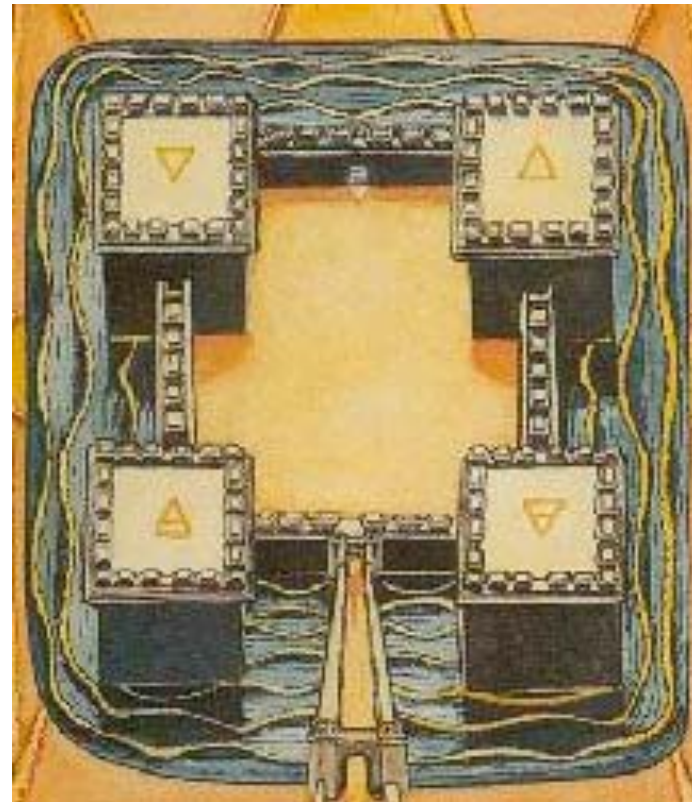


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Non-Pharmalogical Interventions

- Administrative Controls
- Environmental Controls
- Engineering Controls
- Personal Protective Equipment

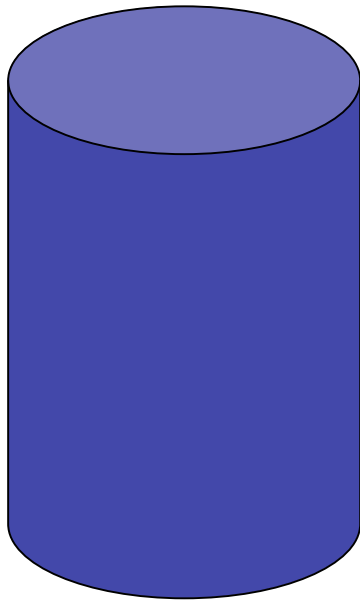




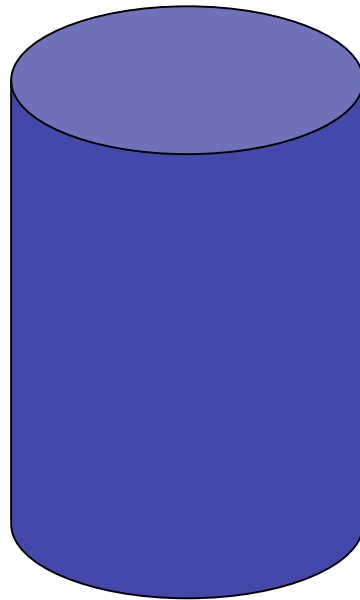
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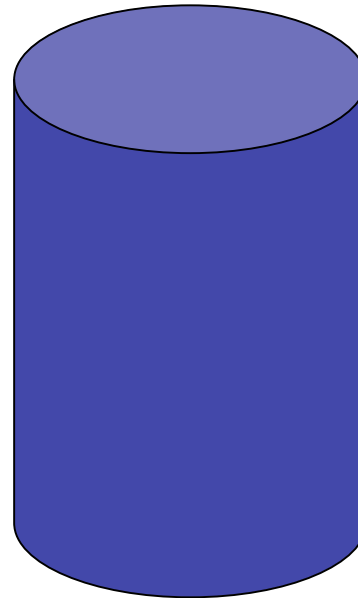
Administrative Controls Human Resources



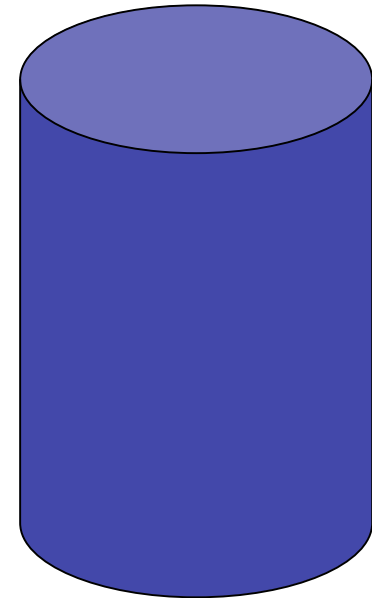
Category One
“Must” be
@ work



Category Two
“Must” work
& can work
remotely



Category Three
Can work
remotely but not
essential



Category Four
Not essential- no
need for them to
work at this time



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Human Resources

- Must be work (Category 1):
 - Social Distancing
 - Masks
 - Health education on handwashing
 - Spread people out on different shifts to spread them out
 - Employee cleans area frequently
 - Eliminate all face-to-face meetings
 - Antivirals?





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Human Resources

- Remote Staff: install a robust work from home program (Category 2):
 - High-speed connection
 - Company sponsored computer and all necessary peripherals
 - Work from home at least one day a month
 - Demonstrate in advance that can work from home
 - Desktop support for the home
 - Plan for what to do if working remotely fails



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Human Resources

- Not necessary to work (Category 3 and 4):
 - How long do you pay those who aren't working?
 - Pay partially?
 - How long do you continue benefits?
- Other HR issues
 - What if they refuse to come to work?
 - What if a family member is sick but the employee is well - do you have them come in?
 - If a person comes down with the flu after being at work it is a workers comp issue?
 - What if schools are closed?



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Expatriate Employees & Families



Chronicle / Michael Macor

- Do you bring them back?
 - When?
 - Families earlier?
- What if they want to come back and you don't think it is appropriate?



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Stricken Employees at Work



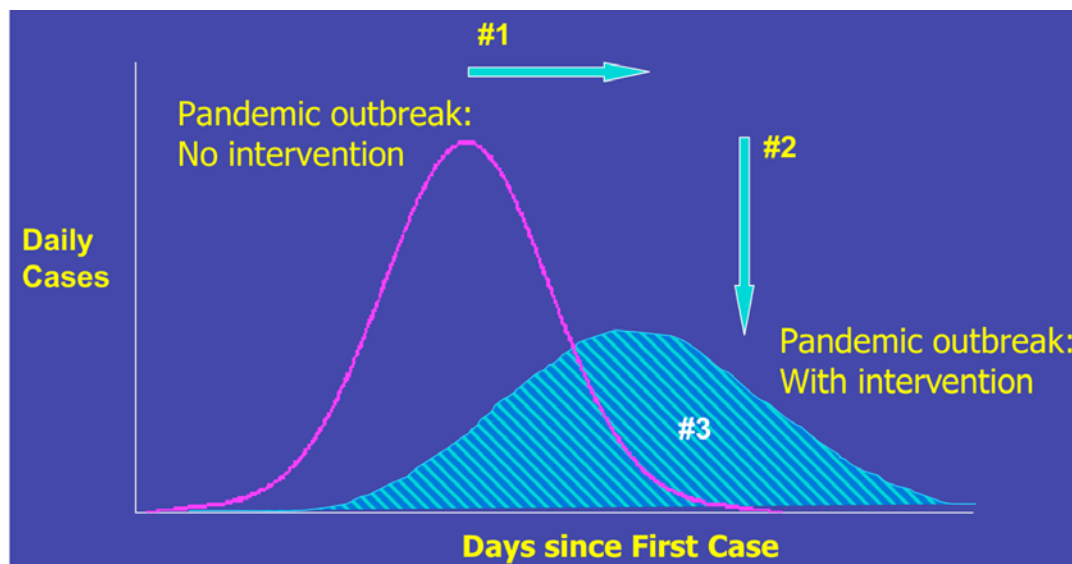
- How to handle a sick employee at work
 - Mask
 - Isolate
 - Trained responders at work
- What if 9-1-1 doesn't come?



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Community-Based Interventions - The Impact of Social Distancing

1. Delay outbreak peak
2. Decompress peak burden on hospitals & infrastructure
3. Diminish overall cases and health impacts





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Administrative Controls - Travel



- Do you restrict travel?
 - If so, when?
- Can you make travel safe?
 - PPE
- What about personal travel?
- Strategies could include:
 - Home quarantine for 10 days
 - Work from home
- What if a countries borders are closed?
- Do you have a relationship with an international medical provider?
 - Medical evacuation
 - Evacuation of remains



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Administrative Controls - Communication

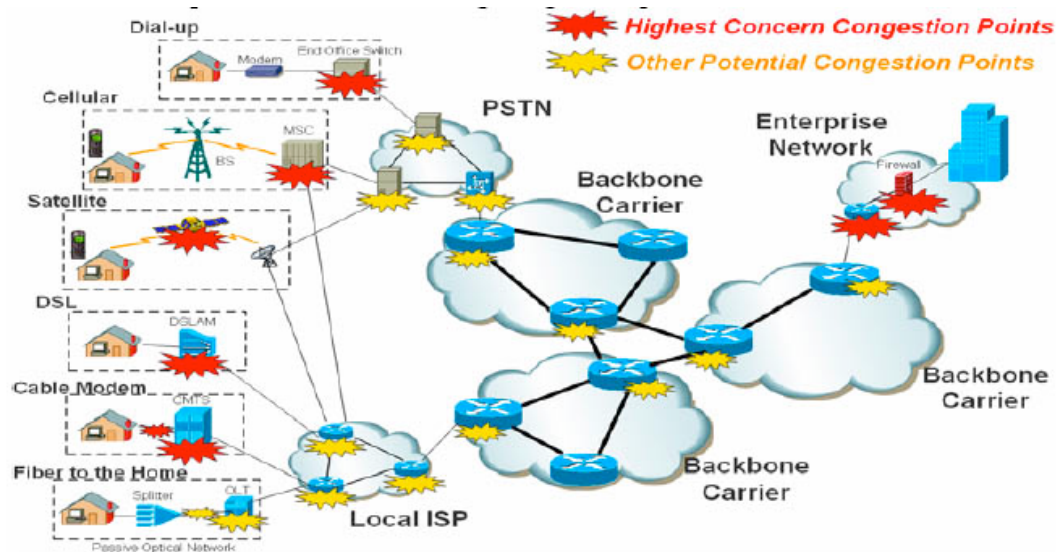
- Communication plan including template communications, strategies and tools.
- Update employee information including all forms of contact
 - Work and personal cell, office and personal email
- Develop strategies if the phones are overloaded
 - Text messaging
 - VoIP ([www.skype](http://www.skype.com))
 - Instant messaging (skype, yahoo, aol)



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DHS Study: Pandemic Influenza Impact on Communications Networks



- Page 4: Telecommuters – “Employees who plan to telecommute during a pandemic and are truly critical to business operations should not rely on best effort, residential Internet access.”
 - Released December 2007



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Administrative Controls - Security



- Visitor restrictions:
 - When?
 - How?
 - Exceptions?
 - Who can authorize?
- Visitor/vendor screening:
 - When?
 - How?
- Training
 - Personal Protective Equip.
 - Procedures



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Administrative Controls - Education

- Influenza Basics
- Workplace cleaning
- Hand washing technique
- “Cover Your Cough” campaign
- Polite social distancing
- Stay Home if you are sick policy
- Virtual meeting techniques and strategies
- Strategies to minimize face to face contact with customers





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Engineering Controls - HVAC

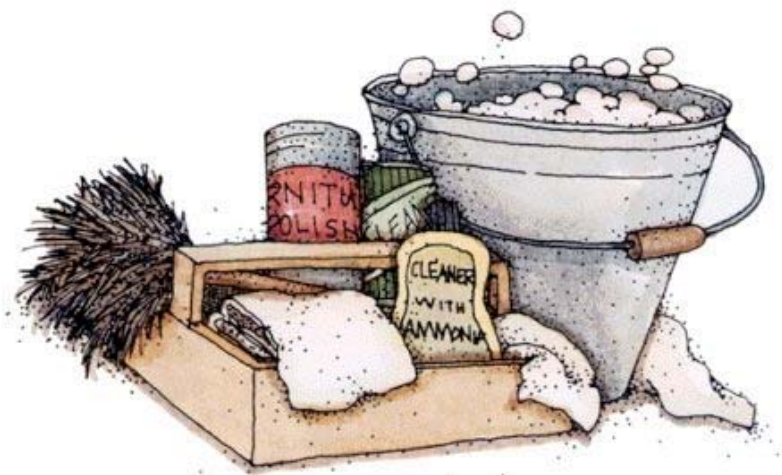
- HVAC system
 - How often to change filters
 - Changing filters
 - How much recycled air?





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Engineering Controls - Janitorial



- Janitorial
 - Cleaning procedures
 - Disinfectants that match the surface needs.
- Virus survival:
 - Virus lives on hard non-porous surfaces > 24 hours
 - On porous surfaces 24 - 48 hours
 - Swiss banknotes up to 17 days!



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Engineering Controls - Janitorial



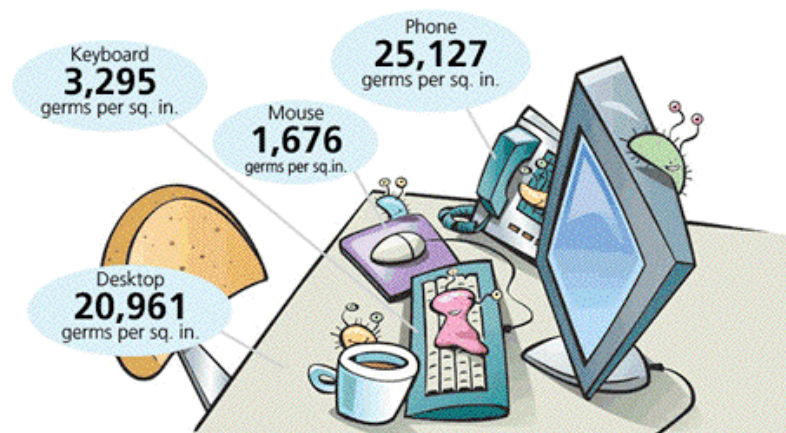
- Surface cleaning and disinfecting
- High Touch Areas require increased cleaning
 - Doorbells
 - Intercoms
 - Handrails
 - Door handles
 - Elevator buttons



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Engineering Controls - Infection Control at Work

- Cleaning work areas
 - What are the top four germiest office work areas?





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Engineering Controls - Hand Sanitizers



- Work by stripping away the outer layer of oil on the skin.
 - Must be at least 60% alcohol.
- 99.9% effective
 - Not exactly, tested on inanimate objects, not human hands.
 - Good alternative when you can't wash your hands but NO substitute for good hand washing.



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Personal Protective Equipment (PPE)



- Should you wear PPE?
 - When
 - Why?
- Masks
 - N95
 - Surgical masks
- Gloves
 - Latex
 - Nitrile



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Facemask Recommendations

- Encourages employers to stockpile respirators and facemasks so they can protect employees during a pandemic.
- Discusses various types of respirators and facemasks available for use.
- Provides estimates of the quantity of N95 respirators and/or facemasks employers should stockpile.



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Tool to Estimate Mask Use

Occupational setting	Proportion of medium or higher risk employees	Number of respirators or facemasks per employee per work shift		Number of respirators or facemasks per employee for a pandemic (120 work days)	
		N95 Respirators (high or very high risk)	Facemasks (medium risk)	N95 Respirators (high or very high risk)	Facemasks (medium risk)
Healthcare					
Hospital	67%	2	0	240	0
Outpatient office/clinic	67%	4	0	480	0
Long term care	25%	1	3	120	360
Home healthcare	90%	2	4	240	480
Emergency medical services	100%	8	0	960	0
First responders					
Law enforcement	90%	2	2	240	240
Corrections	90%	1	3	120	360
Fire department (non-EMS, career and volunteer)	90%	2	2	240	240
Medium risk employees	NA	0	2	0	240



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Estimates for High Risk Areas

Occupational setting	Facemasks needed
Healthcare	
Hospital (inpatient)	2 per patient per day
Essential visitors	3 per visitor per day
Emergency Rooms	1 per ill person
Outpatient office/clinic	2 per patient visit
Long term care	1 per patient per day
Home healthcare	1 per patient visit
Emergency medical services	1 per ill person
First responders	
Law enforcement	1 per ill person
Corrections	2 per ill inmate per day
Fire department	1 per ill person



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Pharmacological Interventions

- Vaccination
- Antiviral Prophylaxis and Therapy



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Vaccinations



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- The best method of preventing and reducing the impact of the flu on the population is the timely development, distribution, and administration of influenza vaccine
- Key target groups for **seasonal** influenza include persons at increased risk for complications:
 - Health care workers
 - People 50-64 years
 - Children 6-23 months
 - Pregnant women
- The Federal Pandemic Plan advocates pandemic vaccination for:
 - Those essential to the pandemic response and provide care for persons who are ill.
 - Those who maintain essential community services.
 - Children.
 - Workers who are at greater risk of infection due to their job.



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Pre Pandemic and Pandemic Vaccines

- Pre-pandemic vaccines (H5N1)
 - Could provide earlier protection
 - Won't match pandemic flu strain exactly
 - First shots given before a pandemic
 - Likely to require 2 doses 21 days apart
- Pandemic vaccine best option
 - Directly matches circulating flu strain
 - Up to 6 months to develop
 - May require 1 dose or 2 doses 3-4 weeks apart



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Antiviral Therapy



- Two antivirals are being used for treatment in H5N1:
 - Tamiflu (Oseltamivir) - Roche.
 - Relenza (Zanamivir) - GlaxoSmithKline
- These drugs work as a Neuraminidase (N) inhibitor
 - Prevent the virus from spreading in your body.
- Questions to consider:
 - How is it administered?
 - What is the shelf life?
 - Prophylaxis vs. Treatment?
 - How to set up a program?



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Proposed Considerations for Antiviral Drug Stockpiling by Employers In Preparation for an Influenza Pandemic

Draft Guidance for Stakeholder Discussion

The “Proposed Considerations for Antiviral Drug Stockpiling by Employers in Preparation for an Influenza Pandemic” was developed by a Federal working group to provide information to employers to inform planning and implementation decisions on antiviral drug stockpiling and, if drugs are stockpiled, to assure that they are maintained and used optimally.



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Potential Role of Antivirals in a Pandemic

- The WHO recommends antivirals for the prevention of the spread of pandemic influenza disease through household contacts.
- The CDC encourages the private sector to consider stockpiling in advance of a pandemic as part of comprehensive pandemic planning program.
- Mathematical modeling suggests that antivirals could delay the spread of a pandemic influenza virus thus gaining time to augment vaccine supplies.



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Employers and Stockpiling Antivirals

- May elect to stockpile for several reasons:
 - Assure early treatment for those who are ill.
 - Provide pre-exposure prophylaxis for employees.
 - Probably occupational exposure/risk to ill persons
 - Essential to business operations
 - Certain critical infrastructure workers and/or
 - All workforce
 - Provide post exposure prophylaxis following household or workplace exposure.
 - Protect overseas employees and operations.



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Key issues in Antiviral Stockpiling

- Plan for collaboration with state and local health departments
- Comply with State dispensing laws.
- Consider the ethical and equity concerns.
- Develop a stockpiling and dispensing model
 - Utilize existing health care providers or pharmacy's
 - Contract with a wholesale drug distributor
 - Stockpile onsite
 - Dispense pre-pandemic
- Educate employees and families



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Personal Preparedness...



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Home and Family Preparedness



- WASH your hands.
- Avoid touching your eyes, ears and mouth.
- DON'T cough into your hands!
- If sick, stay home.
- Get an annual flu shot.
- Stock up!
 - Practice personal preparedness, have enough basic supplies at home for a week.



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“How To” Hand Washing

1. Wet hands with **warm water**.
2. Apply a generous amount of **soap** & lather hands well.
3. Rub hands together for **20 seconds**, paying special attention to the areas between fingers & under nails.
4. Rinse hands thoroughly with warm water.
5. Dry hands with a disposable towel
6. Use the disposable towel to turn off the faucet & open the door.





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What is 20 seconds?

- Songs suggested by the CDC or “approved” to sing while washing for 20 seconds include...
 - Twinkle, Twinkle Little Star
 - OR**
 - Happy Birthday



- Twinkle, twinkle, little star,
- How I wonder what you are.
- Up above the world so high,
- Like a diamond in the sky.
- Twinkle, twinkle, little star,
- How I wonder what you are!



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THANK YOU!

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