Pandemic Planning Update

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Current Status of H5N1

- 383 human cases (5/29/08)
  - 62% fatality rate
  - Median age 18-20 previously healthy persons
    - Range 3mos to 75 years
    - 89% of cases persons <40 yrs
  - Two countries have represented 63% of the cases and 66% of deaths
    - Indonesia
    - Vietnam
  - Add Egypt, Thailand and China – 80% cases
  - Laos, Pakistan, Burma, Nigeria – reporting cases for the first time in 2007
  - Bangladesh – first case 2008
Areas reporting confirmed occurrence of H5N1 avian influenza in poultry and wild birds since 2003

- **Areas reporting occurrence in poultry**
- **Areas reporting occurrence only in wild birds**

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

**Data Source:** World Organisation for Animal Health (OIE) and national governments

Map Production: Public Health Mapping and GIS

World Health Organization
Current Status

• Most cases are poultry-to-human
• Limited, non-sustained human-to-human transmission (5 countries reporting)
  – Close, prolonged contact with severely ill
  – Mostly blood relatives
  – Few patient to HCW
• 25% of human-to-human occurred in clusters
  – 2 clusters – probable 3rd generation transmission
  – Largest cluster – 8 cases
Current Status: seroconversion, mild cases??

- Little evidence for clinically mild disease and asymptomatic seroconversion
  - Study of poultry workers in Hong Kong (1997)
    - 10% were positive for H5N1 antibody
  - Two known cases of HCW who seroconverted
  - Rural villages in Cambodia and China 2004-2006
    - Very few antibody +
Surveillance Efforts

• Focused on hospitalized patient with severe acute respiratory disease, unexplained pneumonia, hx of poultry/human contact
• Influenza surveillance networks are forming and expanding
  – Global Influenza Surveillance Network
    • Currently 94 countries participate
• Educating HCWs/hospitals/clinics
Surveillance Challenges

• Countries not sending isolates to WHO during seasonal influenza
• No accurate point-of-care diagnostics
• E and SE Asia – year round influenza with peaks
• Sub-Saharan Africa
  – Life expectancy 50 yrs
  – Poorest countries in the world
  – HIV/AIDS, malaria – competing challenges
Fig. 5. Schematic of the dominant seeding hierarchy of seasonal influenza A (H3N2) viruses

Questions

• Why are some countries reporting human cases while others are not?
  – Differences in risk/exposure factors?
  – Differences in case mortality?
  – Differences in clinical management?
  – Differences in surveillance?
  – Differences in strains – clades and subclades?
Red Flags

• Increase in the number of H5N1 clusters
• Increase in the size of the clusters
• Increase in cases not blood related
• Increase in cases of clinically mild disease
Clinical Picture

• Incubation ≤ 7 days
  – 2-5 days after exposure to sick poultry
  – 3-6 days after exposure to sick human
• Death about day 9
• Usually hospitalized with pneumonia
• Non-specific signs and symptoms
  • Fever, cough, sometimes diarrhea
  • Progression - shortness of breath, dyspnea
Treatment

- Oseltamivir remains the drug of choice (WHO)
- Do not use amantadine, rimantadine
- Consider double the dose of antiviral
- Do not use steroids or antibiotics prophylactically
- Isolation – negative pressure not essential
- Ventilator care
- PPEs
  - Disposable gowns, gloves, goggles, surgical masks and respirators (N95 or equivalent)
Strategies For Use of Antivirals During a Pandemic

• Containment of the first outbreak
• Containment of the first imported cases
• Targeted prophylaxis for professionals at high risk of being exposed
• Targeted post-exposure prophylaxis for persons following contact with a clinically-diagnosed case within family or workplace
Antivirals
Development and Concerns

• Several new drugs in the pipeline (Peramivir, CS 8958, T-705, DAS 181)
• Combination therapy appears to suppress resistance in vitro (oseltamivir + amantadine)
• Oseltamivir resistance in 2007-2008
  – H1N1
    • N. America-11%
    • Canada – 26%
    • Europe – 26%
  – H3N2 and B
    • 0%
• Neuraminidase inhibitors and neuropsychiatric complications??
Vaccine Development

- Pre-pandemic vaccine stockpile – enough for 13 mil – target is 20 mil
- Adjuvants are critical – can increase supply 10 fold
  - Alum and oil-in-water
- Expansion of production capacity - 2013 aggressive development production capacity would exceed demand
  - Securing a year round egg supply for flu season
  - Building cell-based vaccine production plants
- Five methods employed at present
  - Egg-based inactivated
  - Egg-based live
  - Cell-based inactivated
  - Cell-based live
  - Recombinant
Interactions between influenza viruses and bacterial pathogens

• Historic evidence for increased prevalence of pneumonia during influenza outbreaks
• Many influenza-related deaths due to secondary invaders such as Streptococcus pneumonia and Staph aureus
• Infection with virus primes the host for secondary bacterial pneumonia that is related to the inflammatory response
• PB1-F2 protein has both antimicrobial and immunostimulatory activities
• Contributes to virulence of the virus and induction and severity of bacterial pneumonia
  • Dr. Jon McCullers, Dept of Infectious Diseases, St Jude Children’s Research Hospital
Implications for Pandemic

• Antiviral choice - Oseltamivir delays onset and reduces severity of secondary bacterial pneumonia (not effect from Rimantadine)

• Hypothesis
  – Antibiotic choice – Use one that decreases inflammatory response (clindamycin vs ampicillin)

• If true, we do not have manufacturing capacity for appropriate antibiotics

• Future directions – potential role for adjunctive therapy with agents that decrease inflammatory response (e.g. statins, fibrates)
Resources and Guidelines

• Pandemic toolkit – Take the Lead
  – www.pandemicflu.gov/takehelead

• Proposed guidance on stockpiling respiratory protection-OSHA
  – www.osha.gov

• ReadyMoms Toolkit (exhibit #422)
  – www.newfluwiki2.com/showDiary.do?diaryId=2226

• Coming up:
  – Guidance on use of antivirals for prophylaxis
  – Vaccine prioritization tiers and targets
  – WHO phases are being revised
The Status of Pandemic Preparedness on College and University Campuses

• Survey distributed to 920 member institutions of the American College Health Association in fall 2007

• 87 schools responded:
  • 46 Public 4 year institutions
  • 38 Private 4 year institutions
  • 1 Public 2 year, 1 Private 2 year
PARTICIPANTS BY REGION

REGION I – 23
REGION II – 11
REGION III – 14
REGION IV – 13
REGION V – 12
REGION VI – 12
8) LOCALE:

- Urban >1,000,000: 13.8%
- Urban 100,000-1,000,000: 33.3%
- Urban <100,000: 13.8%
- Suburban: 16.1%
- Rural: 23.0%
9) CAMPUS SIZE:

- No undergraduate students: 0.0%
- Under 1,000: 5.7%
- 1,000 to 1,999: 14.9%
- 2,000 to 4,999: 20.7%
- 5,000 to 9,999: 21.8%
- 10,000 to 14,999: 5.7%
- 15,000 to 19,999: 11.5%
- 20,000 to 24,999: 12.6%
- 25,000 to 29,999: 3.4%
- 30,000 to 39,999: 3.4%
- 40,000+: 0.0%
12) Has your institution developed a pandemic emergency response plan?

- Yes: 87.4%
- No: 12.6%
14) How would you gauge your institution's progress:

- Just started: 12.0%
- 50% completed: 33.3%
- 75% completed: 44.0%
- Completed: 10.7%
18) How significant of a role has Student Health Services played in the planning effort?

- Has taken a leadership role: 64.0%
- Is a member of the planning team: 30.7%
- Acts as a consultant to the planning team: 4.0%
- Has not been involved: 1.3%
- Don't know: 0.0%

Legend:
- 0: Don't know
- 1: Has not been involved
- 2: Acts as a consultant to the planning team
- 3: Is a member of the planning team
- 48: Has taken a leadership role
15) What campus department has the primary responsibility for planning and coordinating a pandemic response?

- Risk management: 5.4%
- Environmental health and safety: 20.3%
- Student Health Services: 36.5%
- Public safety: 6.8%
- Don't know: 0.0%
- Other: 31.1%

Other: 23
Don't know: 0
Public safety: 5
Student Health Services: 27
Environmental health and safety: 15
16) Has an Incident Commander been identified for a pandemic emergency?

- Yes: 64.0%
- No: 36.0%
19) What has been the greatest challenge to planning?

- Lack of clear guidelines: 27.6%
- Lack of resources: 32.2%
- Too many uncertainties: 48.3%
- Difficulty convincing leadership: 21.8%
- Too difficult to get all the planning done: 28.7%
- Other: 23.0%
22) Has your institution been invited to participate in local or regional planning efforts?

- Yes: 83.9%
- No: 10.3%
- Don't know: 5.7%
23) If yes, check all planning groups that you have been invited to participate in:

- Planning with local hospitals and ...: 48.3%
- Planning with the local public health departments: 75.9%
- Regional planning groups: 33.3%
- State wide planning groups: 25.3%
24) Has your institution conducted drills or exercises to practice the response plan?

- Yes: 32.2%
- No: 67.8%
- Don’t know: 0.0%
20) Does your Student Health Service plan to remain open during a pandemic?

- Yes: 50.0%
- No: 9.3%
- Don't know: 23.3%
- Other: 17.4%
21) What expectations does your college/university have regarding the student health service's role during

- Provide primary care to all illness: 60.9%
- Assist local hospitals and communities: 33.3%
- Manage only non-flu related cases: 13.8%
- Act as a vaccine distribution site: 49.4%
- Not defined or unknown: 26.4%
- Other: 17.2%
25) Has your institution or the student health service stockpiled supplies?

- Yes: 62.1%
- No: 37.9%
26) If yes, please check all that apply:

- Respiratory protection (N95s, surgical masks) - 58.6%
- Gloves - 52.9%
- Water and food - 14.9%
- Anti-viral medications - 13.8%
- General medical supplies - 34.5%
- Other - 10.3%
29) Do you administer flu shots to:

- **Spouses**: 59.7% Yes, 40.3% No
- **Staff**: 89.4% Yes, 10.6% No
- **Faculty**: 89.3% Yes, 10.7% No
- **Students**: 96.6% Yes, 3.4% No
30) What percentage of the population(s) you serve take advantage of this service?

- Less than 10%: 48.2%
- 10%-24%: 35.3%
- 25%-49%: 10.6%
- Over 50%: 2.4%
- Don't know: 3.5%
31) Are you trying to find ways to increase the number of flu shot recipients?

- Yes: 87.2%
- No: 12.8%
32) Have you conducted or are you planning to conduct a campus education campaign on any of the following?

- Importance of flu vaccination: 86.2%
- Proper handwashing: 88.5%
- Cover your cough: 89.7%
- Personal emergency planning: 43.7%
- Other: 2.3%
27) What resources/information do you believe would be helpful to you in assisting in and implementing a plan?

- Training on emergency planning: 62.1%
- Training on incident command protocol: 54.0%
- Guidelines and update reports in ...: 82.8%
- Educational materials: 62.1%
- Other: 20.7%
Conclusions

• H5N1 is still very much with us
• The national and international strategy remains focused on early detection of a pandemic outbreak with the implementation of pharmaceutical and non-pharmaceutical means to slow the spread and mitigate the severity of the disease.
• College Health Services appear to be providing leadership on campuses in pandemic preparedness
• More training on emergency response is needed
• Continued leadership from ACHA in assisting schools to prepare is necessary