IRD Biweekly Influenza Digest for weeks ending 05/10/13 and 05/17/13

H7N9 Focus Issue

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A novel A/H7N9 influenza virus has emerged, causing multiple human cases and more than a hundred hospitalizations and deaths. The inaugural issue of the IRD Influenza Digest is devoted to this issue.

HIGHLIGHTS

- H7N9 Situation Assessment:
  - No new cases since early May: See cases/deaths/case fatality by province Map More
  - Debate-Risk factors for H7N9: It is still unclear why older men are differentially exposed (Eurosurveillance), although a new WHO-supported study sees a link between poultry farms and H7N9 infection. Previous studies conflict on the role poultry exposure has Lancet, Eurosurv or doesn’t have PLOS Currents, Lancet
  - Pandemic potential debated: (CDC Director, Lancet) Still risk remains – some changes include no new cases after bird market closures, wider geo. spread, and identification of few mild cases. WHO ECDC CDC
  - Epidemiology of H7N9: Comprehensive epi reports and advice for US clinicians, excellent graphs, maps, and an overview of the US preparedness response US Perspective-MMWR article NEJM Article

- H7N9 Vaccine Update
  - Yes, vaccine is possible
    - Novartis leads the way with vaccine virus synthesis in 1 week using only sequence data and their cell-free technique Science News
    - WHO expedites Candidate Vaccine Virus (CVV) release: Based on A/Shanghai/2/2013 and A Anhui/1/2013 Click here
    - WHO Report: Vaccine Response to the Influenza A H7N9 Outbreak – outlines process of CVV development, giving concrete steps, guidelines, and contact information.
    - WHO Updated Guidelines and bio-safety risk assessment for vaccine production for pandemics
  - No, vaccine isn’t possible
    - CIDRAP’s Director questions feasibility of effective H7N9 vaccination JAMA Article and researchers highlight H7N9 antigen’s low immunogenicity Article

Literature Highlights (see also literature section):

- Lancet:
  - Exposure to AH7N9 in farms and wet markets Comment. Takes a closer look at first 125 cases
  - Origin and diversity of A H7N9: phylogenetic, structural, coalescent analyses Click here CIDRAP News Article
  - Human AH7N9 infections from wet market poultry: clinical analysis, characterization of genome Click here

- EID:
  - Monitoring A(H7N9) through National ILI Surveillance, China: Only 6 positives found out of 50k ILI cases tested through the Chinese surveillance network. Click here CIDRAP CDC
  - Clinical Findings for Early Human Cases of Influenza A(H7N9) Virus Infection, Shanghai, China Click here 1st 4 H7N9 patients had similar symptoms, although 2 recovered, 2 died

- Sci China Life Sci: Environmental connections of H7N9 infection and virus adaptation to humans Click link

IRD GENOMIC ANALYSIS

Using IRD analysis tools, we have combined restricted-access sequences from GISAID (www.gisaid.org) with public domain sequences to clarify the origin of the HA segment and identify candidate sequence variations that might be involved in adaptation of the virus to humans. PDF
HUMAN H7N9 CASES

Human Cases: Official WHO Worldwide (as of 05-17-13): 131 Cases, 36 Deaths; CFR: 27%; 5 new cases and 12 deaths since 05-01-13 – WHO Update of Influenza around the world Click link; subtype distribution in a World Graph and By Country. (Note: Unless labeled “suspected”, all cases confirmed/accepted by WHO).

Deaths:
- 12 cases earlier reported have died WHO 1, WHO 2, WHO 3 WHO 4
  - 32nd death in 56 y/o man with generalized poor health: News
  - 33rd death in 83 y/o woman in Shanghai Click link News
  - 34th-35th deaths Reuters News
  - 36th death in a 64 y/o woman from Hunan province News

Cases:
- 5 cases confirmed: Hong Kong Health Protection, WHO 1 WHO 2 WHO 3
  - Fujian Province: 9 y/o boy and 58 y/o and 69 y/o men
  - Hunan Province: 69 y/o man
  - Jiangxi Province: 79 y/o woman

ANIMAL OUTBREAKS/UPDATES

Cases:
- 10 cases of H7N7 in 13,000 birds in Germany – all birds slaughtered Click link
- May 9 OIE Update: 1 environmental Sample tested positive in Xiaobei Market in Fujian
- May 5 OIE Update: Positive samples tested and destruction of ~90,000 birds bordering Hong Kong News
  - 1 chicken in Sanniao live bird wholesale market in Guangdong (an additional one suspected as noted in Chinese News)
  - 1 chicken in Xiangtang market in Jiangxi
  - 3 environment samples from Xinfulu live bird market in Shandong
- Animal involvement and human infections:
  - CDC's pictorial illustrates the source of H7N9 from wild and domestic birds Click link
  - OIE Expert Mission to China—confirms possible link between live bird markets and human infection
  - Global Scientific Task Force update on H7N9 and wild birds Update declares no role of wild birds
- Poultry Industry Impact:
  - Poultry industry in China accrues an estimated $6.5 billion in losses, prompting Chinese govt. to subsidize farmers Click link News
  - Poultry prices expected to rise by June or July Click link
  - Emergency measures halted in Shanghai leading to optimism in the poultry market Forbes
- African Union release on possible H7N9 impact in Africa Click link

VACCINES/DIAGNOSTICS AND ANTIVIRALS

Vaccines/Diagnostics
- Quick Diagnostic for H7N9: U. Hong Kong has new H7N9 quick diagnostic News Article

GLOBAL PANDEMIC PREPAREDNESS EFFORTS

- H7N9 Situation and CDC Response Update May 9, 2013
- WHO released two interim guidance documents Surveillance Recommendations for human infection, Lab H7N9 handling bio-risk
- Level IV Emergency response switches to heightened surveillance in two Chinese provinces News
- Ann Int Med: Influenza A(H7N9): From Anxiety to Preparedness Click here News
LITERATURE & REPORTS

- **BMJ**: Viruses from ducks and chickens dominate the family tree of H7N9 [Click here]
- **CID**: Evolutionary characteristics of A/Hangzhou/1/2013 and source of AI H7N9 subtype in China [Click link]
- **Clin Chem**: Molecular Detection of Human H7N9 Influenza A Virus Causing Outbreaks in China [Click link]
- **EID**: AI A(H7N9) Virus Infections, Shanghai, China [Click link]
- **Emerg Microb Inf**: Clinical presentation and sequence analyses of HA and NA antigens of the novel H7N9 viruses [Click link]
- **Eurosurveillance**:
  - Preliminary inferences on the age-specific seriousness of human disease caused by A(H7N9) in China, Mar-Apr 2013 [Click link]
  - Link between exposure to poultry and all A(H7N9) cases in Huzhou city, Mar-May 2013 [Click link]
  - Surveillance of A(H7N9) virus infection in humans and detection of first imported case in Taiwan, 3 Apr-10 May 2013 [Click link]
  - A(H7N9) virus in China - scenarios and triggers for assessing risks and planning responses in the EU, May 2013 [Click link]
- **J Clin Microbiol**: Evaluation of Simplexa™ for the Direct Detection of Influenza A, B and RSV in Clinical Samples [Click link]
- **J Biol Chem**: The universal epitope of influenza A neuraminidase fundamentally contributes to enzyme activity and replication [Click link]
- **Lancet**: Genesis of avian-origin H7N9 influenza A viruses [Comment]
- **Microbes Infect**: Genomic signature and protein sequence analysis of a novel influenza A (H7N9) virus … [Click here]
- **Theo Biol Med Mod**: How to interpret the transmissibility of A(H7N9): an analysis of initial human cases from China [Click here]

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