National Collaborating Centre for Infectious Diseases
Centre de collaboration nationale des maladies infectieuses

Purple Paper

2009 H1N1 Influenza Pandemic Debrief Series

Province: Ontario
Public Health Setting: Rural

What would you do again in a similar public health emergency?

Vaccinate the high priority groups against H1N1.

Emphasize infection control such as handwashing, cough etiquette, staying home when sick to general public and particularly schools.

What would you NOT do again in a similar public health emergency?

Vaccinate the healthy general public against H1N1.

Provide seasonal vaccine to the healthy general public.

What was the most difficult situation your organization experienced?

The first day the public immunization clinics opened we were not prepared for the massive crowds, especially the high prevalence of very young children and very sick people.

What was the most important lesson learned?

Our staff are just wonderful, willing, multi skilled people.

What were your most important sources of information?

Provincial government directives, product monographs, influenza surveillance, especially local surveillance (hospital emergency department ILI visits and school ILI absenteeism).

Province: Not identified
Public Health Setting: Not identified

What would you do again in a similar public health emergency?

Establish an incident command structure quickly so that people know who is in charge and what jobs need to be done. This was our most valuable immediate response. Business continuity planning, with some basic facts known about the illness moved quickly and efficiently. Assess supplies and establishing stockpile. Ramp up surveillance across acute care, ERS and ICUs to daily systematic reports. Single spokesperson was extremely valuable. Mobilize antivirals early.

What would you NOT do again in a similar public health emergency?

Lots of headaches because we made assumptions about immunization sites and alternate treatment sites. Political leaders reviewing plans at the last minute changed directions as well. I'd like to engage this level earlier. We didn't plan early enough around school children, and even though they may not be at the same degree of risk as others, parents and politicians want them protected.

What was the most difficult situation your organization experienced?

Pressure on critical care beds, combined with absenteeism at the acute care end of the spectrum. Lack of nursing staff to mount immunization and care responses. Lack of flexible space for clinical and storage purposes.

What was the most important lesson learned?

Communication with the public, staff and physicians, single spokesperson, consistency of message.

What were your most important sources of information?

National/provincial teleconferences. It was really useful to be part of a national planning network looking over draft statements, knowing what was being considered, being able to compare notes with others.

Pandemic pH1N1
Bi-weekly Literature Synthesis
(Weeks of February 21 – March 6, 2010)

Epidemiology of pH1N1

The shifting demographic landscape of pandemic influenza.
Bansal S et al. *PLoS One. 2010 Feb 26;5(2):e9360.*

The investigators of this study developed a **mathematical model** to examine the effects of disease-causing interaction patterns between infected and susceptible individuals and infection-induced immunity on the demographic progression of pH1N1. This model was based on the demographic population of **Vancouver, British Columbia**. Each individual was assigned an age and age-appropriate activities (e.g. school, work, nursing home etc) based on data available from Vancouver.

In this model, a new infection took place between an infected individual and his/her naïve contact with a given probability that depended on the infectiveness of the index individual and susceptibility of the contact. Once infected, the individual could not be re-infected during the same outbreak and may develop cross-immunity against a similar influenza strain in the second season. However, because this model assumed perfect partial immunity, a proportion of individuals, who were infected in the first season and were unable to develop protective immunity, remained fully susceptible and may become re-infected by an antigenically-similar influenza strain in the second season. To study the impact of vaccination against pH1N1 on the magnitude of the first and second seasons, different age groups were prioritized. For each scenario, a vaccine coverage rate of 15% for the entire population was assumed.

As the investigators note, there is mounting evidence that contact patterns within different age groups is the primary factor determining the differential attack rates and spread of influenza in different age groups. Epidemiologically speaking, influenza disease progresses from the most connected to more moderately connected portions of the population. Since school-aged children (5-18 years) tend to have the highest numbers of contacts, they have the highest attack rates. As infection-induced immunity accumulates among children, influenza will then cascade into the adult subsets (>19 years) of the population.

The observed demographic shift of influenza spread was replicated by the current model. When the population was fully susceptible, individuals with the highest numbers of contacts were most at risk of influenza infection. When the population as a whole became partially immune, individuals with few contacts continued to enjoy a low risk of infection, while person who were moderately connected became the most vulnerable. This transition would be more pronounced if a high level of immunity was maintained among infected individuals and if the influenza strain had a high reproductive number. Moreover, the transition from school-aged children to adults would occur during the initial pandemic wave and between the initial pandemic and the post-pandemic season, whereby subsequent seasons would mostly affect the adult sub-population.

Given the above findings, the authors hypothesize that it would be prudent to optimize vaccination strategy depending on the epidemiological history of the population. Therefore, during the first pandemic wave when the population was fully susceptible, it would be more effective to prioritize school-aged children for vaccination. On the other hand, upon the return of a similar pandemic strain in the second season, adult vaccination would be more effective than school-age vaccination in reducing the total number of cases. Adult vaccination would continue to be more effective than school-aged vaccination in the second season even when pre-existing immunity acquired from prior exposure to similar influenza subtypes could be detected in adults and the elderly.

Seroprevalence following the second wave of pandemic 2009 H1N1 influenza.
Ross T et al. *PLoS Curr Influenza. 2010 Feb 24:RRN1148.*

This study was published in the open-access, internet-based journal, Public Library of Science (PLoS) Currents: Influenza*, that is aimed at rapid exchange of scientific findings and ideas regarding pH1N1. Content presented in this journal does not undergo in-depth peer-review in the interest of time, but is moderated by an expert panel of influenza researchers.*

To directly measure the incidence of pH1N1 infection in the population following the peak of the second pandemic wave in **Pittsburgh, Pennsylvania**, the investigators of this **serological survey** report the prevalence of antibodies to pH1N1 before and after the second wave of the pandemic.

Excess serum samples were collected anonymously from individuals aged 1 month to 90 years, from clinical laboratories between mid-November and early December 2009, approximately 2-4 weeks after the peak of the second wave in Pittsburgh. Blood samples, and the corresponding data, were organized by the decade of birth without other identifying information. At least 81 serum samples were collected for each decade of birth, as sample size calculations indicated that a minimum of 89 samples would be required to detect a difference in seroprevalence of ± 10% within a 95% confidence interval [CI], assuming an estimated seroprevalence of 30%. Reference sera consisted of a set of 100 serum samples collected from young healthy adults (average age 20.2± 1.3 years) in 2008. The hemagglutination inhibition assay was used to determine the antibody titer in the serum samples. This assay measures the proportion of antibodies that specifically bind to the hemagglutinin surface proteins of influenza viruses. A titer of >1:40 was considered protective.

Serum samples were collected from a total of 846 individuals. Overall, approximately 21% of serum samples from all age groups were positive for pH1N1, whereas only 6% of the reference serum samples tested positive. The proportion of samples testing positive for pH1N1 was the highest in the age group 10-19 years (45%), followed by persons aged <1-9 years (28%) and persons aged 80-89 years (26%). The latter was likely due to a cross-reactive antibody response targeting an influenza strain prior to 1957 that is antigenically similar to pH1N1. The age group with the lowest prevalence of antibodies to pH1N1 was individuals aged 70-79 years (5%). Except for the latter, all age groups had a significantly higher proportion of samples that tested positive for pH1N1 than the reference serum group.

The antibody titers to the 1918 pandemic influenza A/H1N1 and the 1957 swine influenza A/H1N1 strains were also determined as a proxy for the level of pre-existing cross-reactive antibodies to pH1N1. In general, the proportion of samples positive for 1918 influenza increased with age, beginning with 2% in the <1-9 years age group and cumulating to 59% in the 80-89 years age group. For the 1957 swine influenza, the proportion of samples that tested positive was the highest in the 50-59 years age group (58%), followed by the 20-29 years age group (54%) and the 70-79 years age group (50%). The age group with the lowest prevalence of antibodies to the 1957 swine influenza consisted of individuals aged 30-39 years (17%).

Extrapolating the overall seroprevalence of 21% in Pittsburgh to the entire population of the USA, the authors estimate that at least 63 million persons were infected with pH1N1 in 2009.

NCCID Comments:
The two major limitations of this study are the use of a single reference serum group and the detection of antibody responses to 1918 pandemic influenza A and 1957 swine influenza A viruses as a proxy for pre-existing cross-reactive antibody immunity against pH1N1. This may be due to the unavailability of age group-matched serum samples collected before the current pandemic. If these reference serum samples were available, comparisons between pre-pandemic and pandemic samples would have provided a much better estimation in the age-group specific increase in the incidence of pH1N1 following the second pandemic wave. Nevertheless, the findings of this study are in general agreement with the serological survey conducted in England, UK [1]. Results from the UK study found that the greatest increase in incidence of pH1N1 was among children aged 5-14 years, followed by children aged <5 years and individuals aged 15-24 years. Combining the <5 years and 5-14 years age groups gave an estimated pH1N1 incidence of 31.6% by September 2009, suggesting that about one in three children was infected with pH1N1 in regions with high incidence [1]. Similarly, combining the <1-9 years and 10-19 years age groups of the current study gave an estimated pH1N1 incidence of 36.9% after the second pandemic wave in Pittsburgh. Finally, the authors of this study estimated that at least 63 million persons were infected with pH1N1 in 2009 in the USA. According to the latest estimate from the CDC released on February 12, 2009, at least 57 million individual have been infected, based on

the data on pH1N1 hospitalizations between September 1, 2009 and January 16, 2010 [2].

Critically Ill Children with pH1N1

Pandemic influenza in Canadian children: a summary of hospitalized pediatric cases.
Bettinger JA et al. *Vaccine. Published online February 25, 2010.*

The Canadian Immunization Monitoring Program, Active (IMPACT) is a national surveillance initiative that has been conducting seasonal influenza surveillance among hospitalized children since 2003. IMPACT comprises 12 tertiary care children's hospitals in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia and Newfoundland, accounting for nearly 90% of Canada's tertiary care pediatric beds. These centres treat more than 75,000 children annually, serving a population base of about 50% of the nation's children referred from all provinces and territories.

Upon the emergence of pH1N1, IMPACT was extended to capture pediatric pH1N1 cases identified during the pandemic wave in spring 2009. This article reports the characteristics and clinical features of hospitalized, laboratory-confirmed pH1N1 cases aged 0-16 years identified between May 1 and August 31, 2009.

During the study period, 324 influenza cases were reported among children admitted to IMPACT hospitals, of which 319 were pH1N1 cases, accounting for 98.5% of reported cases. Because no subtype information was available for the remaining 5 cases, they were excluded from further analysis. The spring pandemic wave had a sharp peak with 74.4% of pediatric cases occurring within a 5-week period, spanning May 30 to July 4, 2009. The last reported case in this series occurred within the week of August 17, 2009. Of 324 cases, only 235 (73%) patients had complete clinical details; therefore, they were the only ones included for the final descriptive analysis.

The median age of the 235 cases was 4.8 years (range <1-16 years), with 162 (69%) children over the age of 2 years. Among 131 (56% of 235) patients whose ethnicity was known, 17 (7.2% 235) were of First Nations/Aboriginal heritage. 95 (40% of 235) children were previously healthy. Of the remaining 140 children, 121 (51% of 235) had an underlying condition that is an indication for seasonal influenza vaccination, of which chronic lung disorders (including asthma, broncho-pulmonary dysplasia and cerebral palsy with chronic aspiration) was the largest category. In general, the proportion of pediatric pH1N1 cases with at least one underlying condition increased with age.

Aside from influenza-like illness (ILI) – fever and cough – among children with pH1N1, lower respiratory tract manifestations (respiratory distress, wheezing or radiologically confirmed pneumonia) and gastrointestinal complaints (diarrhea, vomiting or dehydration) were also common ([157; 67% of 235 patients] and [129; 55% of 235 patients], respectively).

The median length of stay in hospital was 4 days (range 1-65 days). Of 39 (17% of 235) patients requiring intensive care, 15 received assisted ventilation. Anti-virals (almost exclusively oseltamivir – 99% of all anti-viral use) were administered to 107 (46% of 235) children, including 8 of 24 children under the age of 6 months. Secondary bacterial infection was reported in 8 (3.4% of 235) children, including 3 patients with invasive *Streptococcus pneumoniae*, 3 with Group A *Streptococcus*, 1 with *Haemophilus influenzae*, and 1 with *Escherichia coli*. The 3 children with invasive *Streptococcus pneumoniae* were aged >1 year and had been age-appropriately immunized with 7-valent conjugate pneumococcal vaccine. Pneumococcal serotype information was not available.

Two patients of this case series died. Both had seizure and developmental disorders. In addition to ILI, both were admitted to hospital with diarrhea, vomiting and dehydration. Both received antibiotics, although only one was administered oseltamivir. The two patients died 1 day and 3 days respectively after admission to hospital.

The *Purple Paper* will be transitioning to other current communicable disease topics in the coming months. If there are topics that you would like to know more about or that are of interest to you, please contact us at nccid@icid.com.

Household Transmissibility of pH1N1

Household transmission of 2009 influenza A (H1N1) virus after a school-based outbreak in New York City, April-May 2009.
France AM et al. *J Infect Dis. Published online on February 26, 2010.*

On April 23, 2009 (the fourth day of school after spring break), a nurse from a high school in Queens, New York, reported to the City's Department of Health and Mental Hygiene that approximately 100 students were experiencing ILI and were being sent home. Upon confirmation of pH1N1, the school was closed from April 27 to May 1, 2009. This school outbreak was the first cluster of human-to-human pH1N1 transmission in **New York City** (NYC) and the largest cluster known at the time in the USA. This outbreak also presented an unprecedented opportunity to characterize the dynamics of pH1N1 transmission in households. The investigators of this study conducted a survey among household contacts to characterize the extent of transmission within households of ill students, to identify sub-groups within the households that were at an increased risk of ILI, and to assess potentially modifiable risk factors for the prevention and mitigation of household pH1N1 transmission.

Of 568 households invited to participate in the survey, 322 (57%) responded. Of these, 100 households were excluded for further analysis due to unmet preset criteria or invalid/conflicting information provided. After exclusions, the study included 222 index case patients and 702 household contacts.

The median age of the index case patients was 16 years (ranged 14-19 years). 58 (26% of 222) patients received anti-viral treatment within a median of 2 days (range 0-10 days) after onset of symptoms. The median duration of illness was 5 days (range 1-15 days). There was no difference in the duration of illness between index case patients who received and those who did not receive anti-viral treatment.

The median household size was 4 persons (range 2-8 persons). The median number of rooms in the household – excluding bathrooms, kitchen and closets – was 6 rooms (range 2-15 rooms). The median number of rooms per person was 1.4 (range 0.33-5). The median age of household contacts was 45 years (range <1 year to 91 years, with bimodal peaks at 15 years and 51 years). 50 (7% of 702) household contacts received anti-viral prophylaxis. Among 315 (45% of 702) household contacts who reporting having cared for the index case patients, 209 (66%) were mothers; 75 (24%) were fathers; 11 (3%) were other children in the household; 13 (4%) were other related adults; and 7 (2%) were adult siblings.

Among 702 household contacts who were included for analysis, 79 reported ILI. This was equivalent to a secondary attack rate of 11.3% (95% CI 8.8%-13.7%). After adjusting for other transmission variables, older age, having received anti-viral prophylaxis and having had a household discussion about preventing pH1N1 transmission were significantly associated with a reduced risk of ILI. For each year of age, the risk of ILI decreased by 5%. Anti-viral prophylaxis reduced the risk of ILI among household contacts by 68%, and having had a household discussion about how to avoid contracting pH1N1 infection reduced the risk of ILI by 40%. The amount of time spent in the same house as the index case patient, sharing cups, eating utensils, towels and toothbrush, and eating meals together with the index case patient did not appear to be associated with an increased risk of ILI.

Groups with a higher risk of ILI included parents who provided care to the index case patients, care-givers who slept in the same room as the index case patient, and siblings who had watched television or played video games with the index patient. These risk factors present opportunities to prevent or mitigate secondary household spread of pH1N1.

Among 62 households with ≥1 secondary case, 13 (21%) households and 1 (2%) household had 2 and 3 secondary cases, respectively. The primary predictor for a household with >1 secondary case was a higher mean household size.

The median serial interval (the number of days between the onset of symptoms of the index case patient and the secondary case in the household) was 3 days (range 0-23 days). 87% of secondary household cases developed ILI within 7 days after the index case patient. Household contacts with illness onset occurring >7 days after the onset in the

index case patient were more likely to be school-aged children, compared to contacts with illness onset occurring within 2 days of the index case.

As the authors note, this study had several limitations. First, secondary household cases were not laboratory-confirmed but identified based on self-reported symptoms. Second, alternate community sources of ILI among household cases could not be ruled out. Third, differences between households who responded to the survey and those who did not respond might have inadvertently influenced the pH1N1 transmission dynamics in the household; however, these factors could not be accounted for in the study. Finally, the current study was limited to households with a single index case patient. Households with multiple index case patients from the same school may exhibit different transmission dynamics.

Oseltamivir Resistance of pH1N1

Selection for resistance to oseltamivir in seasonal and pandemic H1N1 influenza and widespread co-circulation of the lineages.
Janies DA et al. *Int J Health Geogr. Published online February 24, 2010.*

The investigators of this study performed phylogenetic statistical analyses on neuraminidase gene sequences of oseltamivir-resistant seasonal and pandemic influenza A/H1N1 isolates to determine the likelihood that these mutants might have emerged from direct selective pressure by oseltamivir or from random genetic variations. Combining these data with geographic information on reported co-circulation of oseltamivir-resistant seasonal and pandemic influenza A/H1N1, the investigators pinpointed areas in the world where potential reassortment could take place, possibly giving rise to new pandemic strains exhibiting oseltamivir resistance. 53 areas have been identified so far, including 35 regions in the USA and 7 regions in Japan.

An online application, POINTMAP, was developed for visualizing the origins of the seasonal and pandemic A/H1N1 isolates included for the current analysis. To access this tool, visit http://pointmap.osu.edu/. Results will be updated regularly as more data become available.

Personal Protective Equipment

Surgical masks for protection of health care personnel against pandemic novel swine-origin influenza A (H1N1)-2009: results from an observational study.
Ang B et al. *Clin Infect Dis. Published online February 23, 2010.*

The effectiveness of surgical masks versus N95 respirators in preventing the transmission of influenza continues to be a contentious issue. This issue has important implications in the current influenza pandemic when N95 respirators are reserved for use during aerosolizing procedures in the acute care setting. The preservation and shortage of N95 respirators mean that health care workers (HCWs) would likely only have access to surgical masks for their protection when caring for pH1N1 patients during routine procedures. In this **observational study**, investigators from **Singapore** examined the incidence of pH1N1 among HCWs who wore surgical masks while attending to patients between April 25 and August 31, 2009, during the first pandemic wave.

This study took place in a hospital that was designated for the management of SARS in 2003 and for screening and isolation of pH1N1 during the current pandemic. Learning from their experience with SARS, the study hospital has implemented enhanced surveillance among HCWs for monitoring clusters of sick staff. During the pH1N1 outbreak, all HCWs had to report their temperature at the beginning of each work day, whether they were sick or well. HCWs, who had a fever (deliberately set low at ≥37.5°C) and acute respiratory illness (ARI; cough, sore throat or rhinorrhea), were tested for pH1N1 using laboratory assays.

The first imported pH1N1 case was identified on May 26, 2009. As local transmission began and ensued, the number of pH1N1 patients being treated in the study hospital increased and then subsided as the epidemic progressed. This paralleled the trend in the number of HCWs having ARI and diagnosed with pH1N1 in the study hospital over time. However, among 2,020 HCWs reported having ARI during the entire study period, only a small proportion had confirmed pH1N1, ranging from 1.6%-3% depending on the months analyzed. Among 48 HCWs with

confirmed pH1N1 during the entire study period, none reported having direct contact with pH1N1 patients, while some HCWs reported having close contact with someone outside work who had a diagnosis of pH1N1. Furthermore, contact tracing among HCWs indicated possible secondary transmission between HCWs both inside and outside the hospital setting. There was no major spike in the number of HCWs with ARI or confirmed pH1N1 when a switch from the general use of N95 respirators to surgical masks was implemented in the emergency department and isolation facility.

NCCID Comments:
The evidence presented by the current study suggesting the equivalent effectiveness of surgical masks to N95 respirators in preventing the transmission of pH1N1 is weak. Although a randomized controlled trial would not have been possible on ethical grounds, the limited data presented by the authors are not sufficient for such a conclusion. The number of HCWs with confirmed pH1N1 was small. Furthermore, the fact that none of these HCWs reported having direct contact with pH1N1 patients, while some HCWs indicated having been exposed to alternate sources of pH1N1 in their personal environments, prompts the question about the actual risk for HCWs to contract pH1N1 in the study hospital setting. The effectiveness of surgical masks in preventing transmission of pH1N1, and influenza in general, remains elusive [3, 4]. Further research is warranted.

Effects of Oseltamivir on pH1N1

Effects of early oseltamivir therapy on viral shedding in 2009 pandemic influenza A (H1N1) virus infection.

Ling LM et al. *Clin Infect Dis. Published online February 24, 2010.*

In this **prospective case series** study, the authors described the clinical features and response to oseltamivir treatment in patients with laboratory-confirmed pH1N1 and compared the clinical illness and outcomes of treated pH1N1 patients with and without underlying comorbid conditions.

This study was conducted among pH1N1 patients admitted between April 27 and June 24, 2009 to a Singaporean national hospital that was designated for outbreak management. During the study period, **Singapore** was in the containment phase of its pandemic response, whereby pH1N1 cases were isolated in the attempt to delay community spread. Patients came from primary care clinics, border entry, or via self-referral. All patients with a laboratory-confirmed diagnosis of pH1N1 were admitted and underwent extensive baseline clinic assessment. In addition, nasal and throat specimens were collected daily for pH1N1 laboratory tests. All pH1N1 patients were administered oseltamivir (75mg) twice daily for 5 days during their hospital stay; they were discharged only when their combined daily nasal and throat specimens came back negative for pH1N1.

Clinical data were collected prospectively from each admitted pH1N1 patient. These included:

- Demographic information
- Underlying medical conditions (diabetes mellitus, heart disease, chronic lung disease, renal failure, liver disease, HIV infection, cancer, and receipt of immunosuppressive therapy including corticosteroids)
- Travel history
- Contact with pH1N1 patients or patients with acute respiratory illness
- Date of illness onset, symptoms and signs
- Timing of oseltamivir therapy
- Resolution of clinical illness
- Duration of viral shedding.

During the study period, a total of 3,490 patients were screened at the national outbreak management hospital. Among 70 patients who were admitted, 35 (50%) were Singaporeans. The remainder consisted of foreigners residing in Singapore, in transit through Singapore, or visiting as tourists. The median age of the patients was 26 years (interquartile range 21-38 years). 20 (29% of 70) patients reported having at least one underlying medical condition, of which 15 had chronic pulmonary disease or asthma. 11 (16%) patients reported having close contact with someone who had pH1N1 and 20 (29%) had exposure to someone who had acute respiratory illness. Patients presented at the hospital at a mean (± standard deviation [SD]) of 3±2 days after onset of illness.

Fever was documented in 64 (91%), cough in 62 (88%), sore throat in 46 (66%), rhinorrhea in 37 (53%), headache in 18 (26%), and myagia in 19 (27%) patients. The mean duration (±SD) of fever >37.5°C, after hospital admission, was 1.3±0.6 days. The mean duration (±SD) of hospital stay was 6±2 days. All patients had acute uncomplicated pH1N1 infection and recovered without incident.

Patients who had underlying conditions (20 of 70 patients) and those who were previously healthy (50 of 70 patients) did not differ significantly in terms of age, sex, time to presentation, duration of fever, respiratory symptoms, other symptoms and signs, inflammatory markers, viral shedding, hospital stay, and proportion of pneumonia. However, significantly more patients with comorbid conditions reported cough and had lower mean oxygen saturation, compared to those without comorbidities. There was no significant difference in the duration of fever and the duration of respiratory symptoms among patients who received oseltamivir treatment within first 2 days of illness and those who received treatment after 2 days of illness.

The mean duration (±SD) of viral shedding detected in the combined nasal and throat specimens was 6±2 days after illness onset and 4±2 days after admission to hospital. 26 (37% of 70) and 6 (9% of 70) oseltamivir-treated patients continued to shed virus 7 and 10 days after onset of illness, respectively. Duration of respiratory symptoms appeared to be positively correlated with the duration of viral shedding, albeit a weak correlation at best. By contrast, the duration of fever did not correlate with viral shedding. Finally, patients administered oseltamivir 1-3 days after the onset of illness had significantly shorter duration of viral shedding compared to counterparts who received oseltamivir treatment ≥4 days after symptom onset. In this study, oseltamivir treatment shortened the mean duration of viral shedding by 2 days (from a duration of 7 days to 5 days) when initiated within 3 days of illness onset, as opposed to initiation on day 4 after symptom onset.

NCCID Comments:
Contrary to the results from studies on seasonal influenza, the findings here call into question the clinical benefits of oseltamivir treatment against pH1N1. The investigators of this study reported a mean duration of viral shedding of 6 days among their oseltamivir-treated pH1N1 patients – a duration of viral shedding that is longer than those reported for seasonal influenza [5-7]. Moreover, the effect of oseltamivir in shortening the duration of seasonal influenza illness, as shown by other studies [5-7], could not be reproduced. While pH1N1 illness may represent a unique medical challenge that may compromise the effectiveness of oseltamivir (and zanamivir), the debate about the effectiveness of these neuraminidase inhibitors against seasonal influenza has been long-standing and to date still unresolved. In fact, a recently updated Cochrane systematic review concludes that neuraminidase inhibitors, in general, have only a modest effect against the symptoms of influenza in otherwise healthy adults [8]. Therefore further research involving better study designs is urgently needed to delineate the clinical benefits, if any, in treating influenza illness with oseltamivir and zanamivir.

Notable Publications

Safety and pharmacokinetics of oseltamivir at standard and high dosages.
Dutkowski R et al. *Int J Antimicrob Agents. Published online February 26, 2010.*

Treatment options for 2009 H1N1 influenza: evaluation of the published evidence.
Falagas ME et al. *Int J Antimicrob Agents. Published online February 23, 2010.*

H1N1 2009 pandemic flu vaccination campaign: The Homeless lesson.
Brouqui P et al. *PLoS Curr Influenza. 2010 Feb 3:RRN1146.*

YouTube as a source of information on the H1N1 influenza pandemic.
Pandey A et al. *Am J Prev Med. 2010; 38(3):e1-e3.*

Public health management of pandemic (H1N1) 2009 infection in Australia: A failure!
Waterer GW et al. *Respirology. 2010; 15(1):51-6.*

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[3] Cowling BJ et al. Face masks to prevent transmission of influenza virus: a systematic review. *Epidemiol Infect. 2010; 138:449-456.*

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