6 October 2009

This supplement has been prepared to present scientific and technical news items that may be of more interest to technical personnel at RDT&E activities and the labs, or the medics rather than the broader readership of the basic CB Daily. Due to the nature of the material, the articles, if available online, are usually only available through subscription services thus making specific links generally unavailable. Thus, usually only the bibliographic citation is available for use by an activity's technical library.

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Chem-Bio News – Pandemic Influenza Edition #81

1. ASPIRIN MISUSE MAY HAVE MADE 1918 FLU PANDEMIC WORSE: *"High aspirin dosing levels used to treat patients during the 1918-1919 pandemic are now known to cause, in some cases, toxicity and a dangerous build up of fluid in the lungs, which may have contributed to the incidence and severity of symptoms, bacterial infections, and mortality. Additionally, autopsy reports from 1918 are consistent with what we know today about the dangers of aspirin toxicity, as well as the expected viral causes of death."*

2. ECONOMIC COST AND HEALTH CARE WORKFORCE EFFECTS OF SCHOOL CLOSURES IN THE U.S.: *"School closure is an important component of U.S. pandemic flu mitigation strategy, but has important costs. We give estimates of both the direct economic and health care impacts for school closure durations of 2, 4, 6, and 12 weeks under a range of assumptions. We find that closing all schools in the U.S. for four weeks could cost between $10 and $47 billion dollars (0.1-0.3% of GDP) and lead to a reduction of 6% to 19% in key health care personnel."*

3. NO NEED TO CHANGE VACCINE POLICY BASED ON CANADIAN FLU SHOT DATA: WHO: *"The consensus that emerged from a World Health Organization teleconference Friday on the controversial data seemed to be that the Canadian findings are likely due to some confounding factor or factors in the data themselves and may not reflect a real increased risk, according to a WHO official who helped pull together the meeting."*

4. THE SHIFTING DEMOGRAPHIC LANDSCAPE OF INFLUENZA: *"Our results provide a simple demographic explanation for the age bias observed for H1N1/09 attack rates, and a prediction that this bias will shift in coming months. These results also have significant implications for the allocation of public health resources including vaccine distribution policies."*

5. ESTIMATES OF THE IMPACT OF A FUTURE INFLUENZA PANDEMIC IN CHINA: *"For a 1918 scenario, we estimated that 4 center dot 95-6 center dot 95 million deaths, 20 center dot 8-22 center dot 7 million hospitalizations and 101-108 million outpatient visits could occur."*

6. STUDY: OLDER AGE GROUPS RESILIENT TO PANDEMIC FLU; EMEA

RECOMMENDS FIFTH VACCINE: *"The analyses of influenza infection patterns in the Basque Country in Spain and nationwide in France published in Eurosurveillance add to the body of evidence suggesting that people born before 1950 may have existing immunity to H1N1 strains."*

7. GROUNDING PLANES WON'T STOP SWINE FLU FROM SPREADING: *"Even a little bit of air travel goes a long way in spreading diseases like influenza," Cooper said. "So, any achievable reductions in flying are not likely to make much of a difference," he added."*

CB Daily Report

Chem-Bio News

ASPIRIN MISUSE MAY HAVE MADE 1918 FLU PANDEMIC WORSE
Infection Control Today Magazine
October 02, 2009

"The devastation of the 1918-1919 influenza pandemic is well known, but a new article suggests a surprising factor in the high death toll: the misuse of aspirin. Appearing in the Nov. 1 issue of Clinical Infectious Diseases and available online now, the article sounds a cautionary note as present day concerns about the novel H1N1 virus run high.

High aspirin dosing levels used to treat patients during the 1918-1919 pandemic are now known to cause, in some cases, toxicity and a dangerous build up of fluid in the lungs, which may have contributed to the incidence and severity of symptoms, bacterial infections, and mortality. Additionally, autopsy reports from 1918 are consistent with what we know today about the dangers of aspirin toxicity, as well as the expected viral causes of death."

The full article can be found at: http://www.infectioncontroltoday.com/hotnews/aspirin-misuse-1918-flu-pandemic.html

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ECONOMIC COST AND HEALTH CARE WORKFORCE EFFECTS OF SCHOOL CLOSURES IN THE U.S.
By Howard Lempel, Joshua M. Epstein, and Ross A. Hammond
PLoS Currents – Influenza
October 05, 2009

"School closure is an important component of U.S. pandemic flu mitigation strategy, but has important costs. We give estimates of both the direct economic and health care impacts for school closure durations of 2, 4, 6, and 12 weeks under a range of assumptions. We find that closing all schools in the U.S. for four weeks could cost between $10 and $47 billion dollars (0.1-0.3% of GDP) and lead to a reduction of 6% to 19% in key health care

personnel."

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"1) Introduction

School closures are an important and controversial part of the U.S. federal government's Community Strategy for Pandemic Influenza Mitigation in the United States [1]. Closing schools would reduce social contacts and suppress transmission. A recent literature review concludes that the direct epidemiological benefits of such a strategy are uncertain and depend on the specifics of implementation, but could include a modest (~15%) reduction in total cases and a large (~40%) reduction in peak attack rates [2].

Controlling the peak attack rate will be crucial to prevent the U.S. healthcare system's surge capacity from being overwhelmed. In its model scenario, the President's Council of Advisors on Science and Technology (PCAST) finds that flu cases may demand 50 to 100 percent of the total intensive care unit (ICU) capacity in the United States. This is a major threat to a system that operates at 80 percent of capacity during normal times [3].

Closing schools is controversial because the epidemiological benefits come with associated costs. With their children out of school, many parents will stay home from work. This absenteeism will lead to significant economic costs. Compounding the problem, some absentees will be health care workers. The most pronounced benefit of school closure is to alleviate pressure on the health care system. But if health care absenteeism is high, the system's capacity could be reduced when the virus is most prevalent and the demand for health care services is highest.

PCAST emphasizes the lack of research on the magnitude of these formidable costs: "Although evidence-based estimates of such costs are difficult to make and inherently imprecise, they can help to advance the rationality of the debates . . ." To that end, this paper includes the first detailed estimate of two of these costs in the United States. We estimate the economic cost of school closure and its impact on the health care system. In addition to providing the first detailed estimate using U.S. data, we enrich the existing international literature in three ways. First, we use a more comprehensive method to identify adults who stay home to provide care. Second, when calculating the value of work missed by caretakers, our data allows us to use the caretakers' actual wages for all caretakers who are not self-employed. Third, recent survey data enable a precise estimate of the proportion of the workforce that is able to work from home and the makeup of this segment of the workforce. We find that closing all schools in the U.S. for four weeks could cost between $10 and $47 billion dollars (0.1-0.3% of GDP) and lead to a reduction of 6% to 19% in key health care personnel."

The full article can be found at: http://knol.google.com/k/howard-lempel/economic-cost-and-health-care-workforce/2xigkp8rh6d88/3?collectionId=28qm4w0q65e4w.1&position=1#

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NO NEED TO CHANGE VACCINE POLICY BASED ON CANADIAN FLU SHOT DATA: WHO
By Helen Branswell
The Canadian Press on Google News
October 05, 2009

“International influenza vaccine experts are apparently not convinced that Canadian researchers have found a true link between getting a seasonal flu shot and catching swine flu.

The consensus that emerged from a World Health Organization teleconference Friday on the controversial data seemed to be that the Canadian findings are likely due to some confounding factor or factors in the data themselves and may not reflect a real increased risk, according to a WHO official who helped pull together the meeting.

"From a WHO point of view, the fact that the findings are not replicated in other countries I think is reassuring for us that this is an outlier, if you like, the unexpected findings that are coming out of Canada," said David Wood, co-ordinator of the quality, safety and standards team of WHO's department of immunization, vaccines and biologicals.”

The full article can be found at: http://www.google.com/hostednews/canadianpress/article/ALeqM5gPz7AwhAlmZF7pAyHmP0GWejWPHg

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THE SHIFTING DEMOGRAPHIC LANDSCAPE OF INFLUENZA
By Shweta Bansal, Babak Pourbohloul, and Nathaniel Hupert
PLoS Currents – Influenza
October 03, 2009

“Background: As Pandemic (H1N1) 2009 influenza spreads around the globe, it strikes school-age children more often than adults. Although there is some evidence of pre-existing immunity among older adults, this alone may not explain the significant gap in age-specific infection rates.

Methods & Findings: Based on a retrospective analysis of pandemic strains of influenza from the last century, we show that school-age children typically experience the highest attack rates in primarily naive populations, with the burden shifting to adults during the subsequent season. Using a parsimonious network-based mathematical model which incorporates the changing distribution of contacts in the susceptible population, we demonstrate that new pandemic strains of influenza are expected to shift the epidemiological landscape in exactly this way.

Conclusions: Our results provide a simple demographic explanation for the age bias observed for H1N1/09 attack rates, and a prediction that this bias will shift in coming months. These results also have significant implications for the allocation of public health resources including vaccine distribution policies.”

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“Introduction

In March 2009, a new A/H1N1 influenza strain (Pandemic (H1N1) 2009 influenza or H1N1/09) emerged in humans in Mexico and by early June 2009,the World Health Organization (WHO) had raised the worldwide pandemic alert level to signal a global pandemic of a novel influenza virus. Since the WHO declaration of a pandemic, the new H1N1/09 virus has continued spread across the globe, causing growing outbreaks in most countries [1]. Public health officials anticipate that there will be more H1N1/09 cases, hospitalizations and deaths throughout the fall and winter in the northern hemisphere [2]. Early epidemiological data suggest that the 2008-2009 seasonal influenza vaccines are not effective against the new strain but that older individuals who were previously infected by another H1N1 strain may be less likely to develop clinical infection [3]. Multiple manufacturers are now developing vaccines for H1N1/09, and as a best case scenario, the distribution may begin as early as October 2009, until which time the virus will continue to spread.

Influenza is a complex and continually changing disease that infects individuals of all ages. In contrast to diseases like measles and rubella, the dynamics of influenza are strongly influenced by the evolution of immunological properties of the pathogen [4]. The epidemiological landscape of flu is dynamically shaped by cycles of naturally-acquired immunity (through infection) and immune escape (through viral evolution). Based on data from prior influenza pandemics and a simple network-based mathematical model, we argue that, for a newly introduced strain of influenza, this process will cause a shift in the demographic burden of influenza from children to adults. Our analysis also has implications for optimal vaccine allocation. We echo our previous conclusions that high-risk groups should receive highest priority and direct protection when vaccine supplies are limited [5]. However, secondary efforts should focus on indirect protection of groups with greatest potential for infection, whose identities may change over time.”

The full article can be found at: http://knol.google.com/k/shweta-bansal/the-shifting-demographic-landscape-of/tkwn3sjme3vo/1?collectionId=28qm4w0q65e4w.1&position=2#

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ESTIMATES OF THE IMPACT OF A FUTURE INFLUENZA PANDEMIC IN CHINA
Preventive Medicine Week
October 11, 2009

"We estimated the effects of a future influenza pandemic in China by examining pandemic scenarios of varying severity and described the time distribution of cases during a first wave. We used a Monte-Carlo simulation model and death rates, hospitalizations and outpatient visits for 1918- and 1968-like pandemic scenarios and data from the literature or experts'

opinion to estimate four health outcomes: deaths, hospitalizations, outpatient medical visits and clinical illness for which medical care was not sought. For each of the two scenarios we estimated outcomes by week using a normal distribution. We estimated that a 1968 scenario in China would result in 460 000-700 000 deaths, 1 center dot 94-2 center dot 27 million hospitalizations, 111-117 million outpatient visits and 192-197 million illnesses for which medical care was not sought. Fifty-two percent of hospitalizations occurred during the two-peak weeks of the first wave. We estimated that patients at high-risk of influenza complications (10-17% of the population) would account for 61-75% of all deaths. For a 1918 scenario, we estimated that 4 center dot 95-6 center dot 95 million deaths, 20 center dot 8-22 center dot 7 million hospitalizations and 101-108 million outpatient visits could occur."

The full article can be found at: (H.J. Yu, et. al., "Estimates of the impact of a future influenza pandemic in China". Influenza and Other Respiratory Viruses, 2009;3(5):223-231). Link not available.

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STUDY: OLDER AGE GROUPS RESILIENT TO PANDEMIC FLU; EMEA RECOMMENDS FIFTH VACCINE
Elsevier Global Medical News
October 2, 2009

"Older people have suffered less from the pandemic virus influenza A(H1N1) in two European countries, according to articles published online Oct. 1 in an infectious diseases journal.

The analyses of influenza infection patterns in the Basque Country in Spain and nationwide in France published in Eurosurveillance add to the body of evidence suggesting that people born before 1950 may have existing immunity to H1N1 strains.

The Basque Country analysis of 1,106 laboratory-confirmed cases of influenza A since 1999 found, for example, that people age 60 or older represented just 2 of 112 (1.8%) of all cases of the pandemic strain of H1N1, compared with those younger than 30, who represented 87 (77.7%) of those cases (Euro. Surveill. 2009;14:pii= 19344).

Basque Country researchers also analyzed virologic data for 941 cases of seasonal flu dating back to 1999. Across all age groups, the ratio of infections with H3 to H1 subtypes is 3.5, and for all 15-year age groups born 1950 or later (current age: 0-14, 15-29, 30-44, or 45-59), the ratio is 3.7 or less.

But for age groups born before 1950, the ratio is higher - 7.0 for those born 1935-1949 and 13.0 for those born 1920-1934 - meaning those groups are more likely than younger groups to be infected by the H3 subtypes than by H1 subtypes. [emphasis added]

"The antigenic drift proceeds at a slower pace in the H1 hemagglutinin gene than in the H3

gene," wrote the researchers, led by Emilio Pérez-Trallero, Microbiology Service and Reference Laboratory for Influenza Infections of the Basque Country, Hospital Donostia, San Sebastián, Spain."

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"In other news, a fifth vaccine for pandemic flu has been recommended for authorization in Europe. The European Medicines Agency has recommended to the European Commission that Celvapan, a nonadjuvanted vaccine made by Baxter, be granted marketing authorization, according to an EMEA statement. The EC will make its decision "shortly," the statement said. As with other pandemic vaccines, the drug manufacturer will conduct postauthorization safety studies as soon as Celvapan is put into use across the European Union. About 9,000 subjects will be included in Baxter's studies, the statement said."

Link not available.

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GROUNDING PLANES WON'T STOP SWINE FLU FROM SPREADING
Singapore Star
October 03, 2009

"At a recent meeting in Washington, a panel of experts from the government, academia and the airlines industry, has determined that attempting to ground planes won't stop pandemics like swine flu from spreading.

One of the major conclusions from the two-day meeting was that restricting air travel during a pandemic, such as the current swine flu strain of influenza that is circulating globally, is not likely to have much of an effect.

This falls in line with recommendations that the World Health Organization made earlier this year when it declared the new swine flu strain of influenza - H1N1- to be a bona fide pandemic."

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"During April, some 2,000 flights a day to Mexico were cancelled - partly because certain countries restricted travel and partly because so many people cancelled their travel plans.

Despite the lower-than-normal travel, pandemic influenza continued to spread around the world, and that is not surprising to scientists like Ben Cooper of the Health Protection Agency in the UK, one of several panelists at the Washington meeting who said travel restrictions are not likely to work.

"Even a little bit of air travel goes a long way in spreading diseases like influenza," Cooper said. "So, any achievable reductions in flying are not likely to make much of a difference," he added."

The full article can be found at: http://story.singaporestar.com/index.php/ct/9/cid/7efe203e304dfafb/id/550142/cs/1/

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