

**WEEKLY SYNTHESIS OF SURVEILLANCE INFORMATION, LITERATURE &
GOVERNMENT UPDATES**

(WEEK ENDING JANUARY 8, 2009)

GOVERNMENT UPDATES

CENTRE FOR DISEASE CONTROL (CDC)

January 08, 2010: CDC H1N1 Flu Surveillance Update.

<http://www.cdc.gov/h1n1flu/update.htm>

Weekly Flu View Map and Surveillance Report for Week Ending January 2, 2010.

<http://www.cdc.gov/flu/weekly/>

Map includes both seasonal flu and H1N1 flu activity. During week 52 (December 27-Jan 2, 2010), influenza activity decreased slightly in the US, however the proportion of outpatient visits for ILI was above the national baseline.

PUBLIC HEALTH AGENCY OF CANADA (PHAC)

FluWatch Week 50 (December 20 - January 2, 2010)

http://www.phac-aspc.gc.ca/fluwatch/09-10/w51-52_09/index-eng.php

During weeks 51 and 52, influenza activity in Canada remained low with most of the influenza surveillance regions reporting either sporadic or no activity. Only 1.6% of the specimens tested were positive for influenza during the two-week period while the ILI consultations rate were below or within the expected range for these weeks.

Deaths Associated with Influenza A (H1N1) as of January 07, 2010

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/surveillance-eng.php>

The Public Health Agency of Canada (PHAC) is committed to sharing information about the impact of the H1N1 flu virus in Canada. Every Tuesday and Thursday at 4 p.m., the Agency will issue national updates on H1N1-associated deaths. In addition, PHAC will issue special reports on any unusual cases or clusters.

Vaccine Surveillance Report- AEFI (January 06, 2010)

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/vacc/addeve-eng.php>

Helping children cope with H1N1 flu virus (January 04, 2010)

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/hcch-aevgh-eng.php>

Helping teens cope with the H1N1 flu virus (January 04, 2010)

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/htch-aavgh-eng.php>

Helping caregivers cope with the H1N1 flu virus (January 04, 2010)

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/hcch-aivgh-eng.php>

Taking care of ourselves and our families during the H1N1 flu virus

<http://www.phac-aspc.gc.ca/alert-alerte/h1n1/tcof-pssf-eng.php>

Canada to bridge Mexico's H1N1 flu vaccine requirements

http://www.phac-aspc.gc.ca/media/nr-rp/2010/2010_0106-eng.php

ONTARIO

Ontario Influenza Bulletin 2009-2010, Surveillance Week 51-21 (December 20 - January 2, 2010)

http://www.health.gov.on.ca/english/providers/program/pubhealth/flu/flu_09/bulletins/flu_bul_01_20100108.pdf

Overall, influenza activity in Ontario is lower compared to the previous week. Overall the indicators show that influenza activity was lower in weeks 51 & 52 compared to week 50. Starting in week 45 (November 8-14), influenza activity in Ontario has declined each week.

BC CENTER FOR DISEASE CONTROL (BC CDC):

BC CDC: H1N1 flu virus update (January 05, 2010)

<http://www.bccdc.ca/resourcematerials/newsandalerts/healthalerts/2009HealthAlerts/H1N1FluVirushumanSwineFlu.htm>

Weekly BC Pandemic H1N1 Surveillance Update as of January 04, 2010:

<http://www.bccdc.ca/dis-cond/DiseaseStatsReports/influSurveillanceReports.htm>

WORLD HEALTH ORGANIZATION (WHO)

Global Situation Update 82, January 03, 2010

http://www.who.int/csr/don/2010_01_08/en/index.html

The most active areas of pandemic influenza transmission currently are in parts of central, eastern and southeastern Europe, North Africa, and South Asia. In Europe, pH1N1 transmission remains geographically widespread throughout the continent and there continues to be intense virus circulation in several countries of central, eastern, and southeastern Europe - particularly in Poland, Serbia, Ukraine, Georgia - where a high intensity of respiratory diseases activity has been recently reported. Among countries testing more than 20 clinical specimens from sentinel sites in the past week, the greatest proportions of samples testing positive for influenza were observed in Greece (72%), Georgia (54%), Switzerland (49%), Portugal (48%), Germany (48%), Luxembourg (40%), Romania (30%), Poland (25%), and Albania (23%).... (see link)

EUROPEAN CENTRE FOR DISEASE PREVENTION & CONTROL (ECDC)

January 08, 2010: ECDC Daily Update, Pandemic (H1N1) 2009

http://ecdc.europa.eu/en/healthtopics/Documents/100108_Influenza_AH1N1_Situation_Report_0900hrs.pdf

HEALTH/SURVEILLANCE BULLETINS:

CENTER FOR INFECTIOUS DISEASE RESEARCH AND POLICY (CIDRAP)

Minority groups hit hard by H1N1 (January 7, 2010)

<http://www.jsonline.com/features/health/80971802.html>

UK considering unloading surplus vaccine (January 08, 2010)

<http://news.bbc.co.uk/2/hi/health/8448080.stm>

CDC hopes to prevent repeat of 1958 flu mortality surge (January 07, 2010)

<http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/jan0710cdc.html>

Public health officials share school-based vaccination strategies (January 06, 2010)

<http://www.cidrap.umn.edu/cidrap/content/influenza/swineflu/news/jan0610schools.html>

Indian doctors request more ventilators for hard-hit city (January 05, 2010)

<http://timesofindia.indiatimes.com/city/ludhiana/H1N1-Request-for-50-ventilators/articleshow/5414044.cms>

JOURNALS SCANNED:

- American Journal of Public Health
- Antimicrobial Agents and Chemotherapy (added this week)
- BMC Medicine (added this week)
- British Medical Journal
- Clinical Infectious Diseases
- Emerging Infectious Diseases
- Eurosurveillance
- JAMA
- Journal of Clinical Microbiology (added this week)
- Journal of Clinical Virology (added this week)
- Journal of Infectious Diseases
- Lancet Infectious Diseases
- Lancet
- MMWR
- Nature
- New England Journal of Medicine
- PLoS
- PLoS One
- PLoS Currents
- PLoS Pathogens
- Science
- Vaccine (added this week)

**** Please note that the hypertext links appended to the citations below may not be available in your institution – contact your library for details on access to the journals.*

AMERICAN JOURNAL OF PUBLIC HEALTH

- Nothing new on H1N1 this week

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY (added this week)

- 1) Effects of the Combination of Favipiravir (T-705) and Oseltamivir on Influenza A Virus Infections in Mice (*Donald F. Smee, et al., December 20, 2009*);
<http://aac.asm.org/cgi/content/abstract/54/1/126>

Abstract:

Favipiravir (T-705 [6-fluoro-3-hydroxy-2-pyrazinecarboxamide]) and oseltamivir were combined to treat influenza virus A/NWS/33 (H1N1), A/Victoria/3/75 (H3N2), and A/Duck/MN/1525/81 (H5N1) infections. The combination of inhibitors (25 mg/kg/day each) increased survival to 90%. Combining ineffective doses (20 mg/kg/day of T-705 and 10 to 40 mg/kg/day of oseltamivir) afforded 60 to 80% protection and improved body weights during infection. Thus, synergistic responses were achieved with low doses of T-705 combined with oseltamivir. These compounds may be viable candidates for combination treatment of human influenza infections.

BMC MEDICINE (added this week)

- 1) Calculating the potential for within-flight transmission of influenza A (H1N1) (*Bradley G Wagner, Brian J Coburn and Sally Blower, December 24, 2009*);
<http://www.biomedcentral.com/1741-7015/7/81>

Abstract:

Clearly air travel, by transporting infectious individuals from one geographic location to another, significantly affects the rate of spread of influenza A (H1N1). However, the possibility of within-flight transmission of H1N1 has not been evaluated; although it is known that smallpox, measles, tuberculosis, SARS and seasonal influenza can be transmitted during commercial flights. Here we present the first quantitative risk assessment to assess the potential for within-flight transmission of H1N1.

BRITISH MEDICAL JOURNAL

- 1) Too early to declare H1N1 swine flu pandemic over, says WHO chief (*John Zarocostas, December 31, 2009*);
http://www.bmj.com/cgi/content/full/339/dec31_2/b5681

Abstract:

Many countries in the northern hemisphere—such as the US, Canada, the United Kingdom, and some parts of continental Europe—"have passed the peak of their second wave," Dr Margaret Chan, director general of the WHO, told reporters on Tuesday. But there is still intense pandemic influenza activity in countries such as India and Egypt, she said. "I think it is too premature and too early for us to say we have come to an end of the pandemic influenza worldwide. It would be prudent, and appropriate . . . to continue to monitor the evolution of this pandemic for the next six to 12 months," she said, adding: "One thing we need to guard against is a sense of complacency."

CLINICAL INFECTIOUS DISEASES

- 1) Correspondence: Serum Antibody Response to the Novel Influenza A (H1N1) Virus in the Elderly (*Jiang T. et al, January 15, 2010*);
http://www.journals.uchicago.edu/doi/abs/10.1086/649552?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dncbi.nlm.nih.gov

Abstract:

The elderly have been listed as a high-risk group for seasonal influenza and for this pandemic H1N1. However, people aged 65 years have the lowest incidence of infection thus far, so the elderly are not listed as an initial targeted group for the monovalent 2009 H1N1 vaccination. The antibody response to the 2009 H1N1 virus among the elderly is of particular interest. In Beijing, China, we used hemagglutination inhibition (HI) assay to detect antibody responses to the 2009 H1N1 virus. None of the subjects involved has been clinically confirmed to have the 2009 H1N1 influenza, so this substantial increase (from 9.4% to 42.5%) in antibody response to the 2009 H1N1 virus suggests that a substantial proportion of the population has been infected with the 2009 H1N1 virus but shows no clinical symptoms.

2) Preferential Lower Respiratory Tract Infection in Swine-Origin 2009 A(H1N1) Influenza (*Ellen Yeh et al., January 4, 2010*);

<http://www.journals.uchicago.edu/doi/full/10.1086/649875>

Abstract:

We report a case of 2009 influenza A(H1N1) virus infection in which virus was detected predominantly in specimens from the lower respiratory tract but was absent or at very low levels in nasopharyngeal swab samples. This presentation suggests that, in certain hosts or for particular variants of 2009 A(H1N1) virus, the lower respiratory tract may be the preferred site of infection.

EMERGING INFECTIOUS DISEASES

1) Household Responses to Pandemic (H1N1) 2009–related School Closures, Perth, Western Australia (*Paul V. Effler, et al., February 2010*);

<http://www.cdc.gov/eid/content/16/2/pdfs/09-1372.pdf>

Abstract:

School closure is often purported to reduce influenza transmission, but little is known about its effect on families. We surveyed families affected by pandemic (H1N1) 2009–related school closures in Perth, Western Australia, Australia. Surveys were returned for 233 (58%) of 402 students. School closure was deemed appropriate by 110 parents (47%); however, 91 (45%) parents of 202 asymptomatic students reported taking >1 day off work to care for their child, and 71 (35%) had to make childcare arrangements because of the class closures. During the week, 172 (74%) students participated in activities outside the home on >1 occasion, resulting in an average of 3.7 out-of-home activities for each student. In our survey, activities outside the home were commonly reported by students affected by school closure, the effect on families was substantial, and parental opinion regarding school closures as a means to mitigate the outbreak of pandemic (H1N1) 2009 was divided.

2) Employment and Compliance with Pandemic Influenza Mitigation Recommendations (*Kelly D. Blake, Robert J. Blendon, and Kasisomayajula Viswanath, February 2010*);

<http://www.cdc.gov/eid/content/16/2/pdfs/09-0638.pdf>

Abstract:

In the event of a serious pandemic influenza outbreak, businesses must play a key role in protecting employees' health and safety. With regard to pandemic influenza mitigation recommendations requiring social distancing, we examined whether some US employees would disproportionately fail to comply because of job insecurity and financial problems associated with missing work. We used the 2006 Harvard School of Public Health Pandemic Influenza Survey and multivariable logistic regression to determine whether employment characteristics such as

inability to work from home, lack of pay when absent from work, and self-employment would be associated with less ability to comply with recommendations. We found that inability to work from home, lack of paid sick leave, and income are associated with working adults' ability to comply and should be major targets for workplace interventions in the event of a serious outbreak

3) Statewide School-located Influenza Vaccination Program for Children 5–13 Years of Age, Hawaii, USA (*Effler et al., January 4, 2010*);

<http://www.cdc.gov/eid/content/16/2/pdfs/09-1375.pdf>

Abstract:

New guidance recommends annual influenza vaccination for all children 5–18 years of age in the United States. During 2007–2008, Hawaii offered inactivated and live attenuated influenza vaccine at school-located clinics for grades kindergarten through eight. Most (90%) public and private schools participated, and 622 clinics were conducted at 340 schools. Of 132,775 children 5–13 years of age, 60,760 (46%) were vaccinated. The proportion vaccinated peaked at 54% for those 6 years of age and declined for older cohorts. More than 90% of schoolchildren transited the clinic in <10 minutes. A total of 15,835 staff-hours were expended; estimated cost per dose administered was \$27 and included vaccine purchase and administration, health staffing resources, printing costs, data management, and promotion. This program demonstrates the feasibility of conducting mass school-located influenza vaccination programs in public and private schools statewide, as might be indicated to respond to pandemic influenza.

EUROSURVEILLANCE

1) A nosocomial outbreak of 2009 pandemic influenza A (H1N1) in a paediatric oncology ward in Italy, October – November 2009 (*M Chironna, et al., January 7, 2010*);

<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19454>

Abstract:

A nosocomial outbreak of 2009 pandemic influenza A(H1N1), with eight confirmed cases, occurred in a paediatric oncology ward in Italy, in October/November 2009. The fact that one case was infected despite being isolated and without contact to a symptomatic patient, hints towards potential transmission through a health care worker (HCW) and underlines the importance of vaccination of HCW who are involved in the care of critically ill patients.

2) When should we intervene to control the 2009 influenza A(H1N1) pandemic? (*H Sato et al., January 7, 2010*);

<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19455>

Abstract:

We simulated the early phase of the 2009 influenza A(H1N1) pandemic and assessed the effectiveness of public health interventions in Japan. We show that the detection rate of border quarantine was low and the timing of the intervention was the most important factor involved in the control of the pandemic, with the maximum reduction in daily cases obtained after interventions started on day 6 or 11. Early interventions were not always effective.

3) Outbreak of 2009 pandemic influenza A(H1N1), Los Lagos, Chile, April-June 2009 (*Chilean Task Force for study of Pandemic Influenza A (H1N1), January 7, 2010*);

<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19456>

Abstract:

On 6 June 2009, Chile reported 500 confirmed cases, seven severe and two fatal. Because six of the severe cases and the two deaths occurred in the region of Los Lagos in southern Chile, a retrospective study was conducted using data on emergency room visits as well as laboratory viral surveillance, during the period from 1 April to 31 May, in order to establish the date of the beginning of the outbreak. From 1 to 27 June, data were collected in real time, to establish the real magnitude of the outbreak, describe its transmission, clinical severity and secondary attack rates. Confirmed cases, their household contacts and healthcare workers were interviewed. This analysis showed that the outbreak in Los Lagos started on 28 April. By 27 June, a total of 14,559 clinical cases were identified, affecting mostly 5-19 year-olds. The effective reproduction number during the initial phase (20 days) was 1.8 (1.6–2.0). Of the 190 confirmed cases with severe acute respiratory infection, 71 (37,4%) presented a risk condition or underlying illness.

JAMA

1) Preliminary Communication: Immunogenicity of a Monovalent 2009 Influenza A(H1N1) Vaccine in Infants and Children. A Randomized Trial (*Terry Nolan, et al., January 2010*); <http://jama.ama-assn.org/cgi/content/full/2009.1911v1>

Abstract:

Following the first dose of vaccine, antibody titers of 1:40 or greater were observed in 161 of 174 infants and children in the 15- μ g group and in 168 of 172 infants and children in the 30- μ g group. Corresponding seroconversion rates were 86.8% and 94.2%, and factor increases in geometric mean titer were 13.6 and 18.3. All participants demonstrated antibody titers of 1:40 or greater after the second vaccine dose. Immune responses were robust regardless of age, baseline serostatus, or seasonal influenza vaccination status. The majority of adverse events were mild to moderate in severity. One 15- μ g dose of vaccine was immunogenic in infants and children starting at 6 months of age and vaccine-associated reactions were mild to moderate in severity.

2) 2009 Influenza A(H1N1) Monovalent Vaccines for Children (*Anthony E. Fiore, Kathleen M. Neuzil, December 21, 2009*); <http://jama.ama-assn.org/cgi/content/short/303/1/73?rss=1>

Abstract:

The report by Nolan and colleagues in this issue of JAMA indicates that a single 15- μ g dose of an unadjuvanted inactivated influenza A(H1N1) vaccine can elicit significant increases in influenza-specific antibody in more than 90% of healthy infants and young children. A second dose given 21 days later yielded significantly higher antibody levels. Data indicating that influenza A(H1N1) vaccines are immunogenic at licensed doses and schedules is excellent news for children, parents, health care professionals, and public health workers who have participated in pediatric immunization programs. Also reassuring are the findings from the safety analyses reported by Nolan et al, which indicate that this unadjuvanted vaccine is well tolerated with a safety profile similar to the seasonal influenza vaccine—an expected result given that the pandemic vaccine manufacturing process is identical to that used for seasonal vaccines.

JOURNAL OF CLINICAL MICROBIOLOGY (added this week)

1) Role of Rapid Immunochromatographic Antigen Testing in Diagnosis of Influenza A Virus 2009 H1N1 Infection (*David F. Welch and Christine C. Ginocchio, January 2010*); <http://jcm.asm.org/cgi/content/abstract/48/1/22>

Abstract:

Rapid antigen testing using immunochromatographic devices has become a diagnostic mainstay for detection of influenza virus and respiratory syncytial virus, the two major viruses infecting the respiratory tract. Recent studies have indicated that poor performance in the detection of the novel influenza A virus 2009 H1N1 should preclude their use. A survey of influenza diagnostic methods available on ClinMicroNet and Division C, the two ASM list servers, revealed that, despite this reported poor performance, a majority of the laboratories surveyed intend to continue to offer this testing during the current influenza season. Our two experts have been asked to consider the following question: what is the role of rapid immunochromatographic antigen testing in the laboratory diagnosis of influenza A virus infection during the current 2009 H1N1 pandemic?

2) Rapid and Specific Detection of Amantadine-Resistant Influenza A Viruses with a Ser31Asn Mutation by the Cycling Probe Method (*Yasushi Suzuki, et al., January 2010*);
<http://jcm.asm.org/cgi/content/abstract/48/1/57>

Abstract:

We developed a novel method to detect amantadine-resistant strains harboring the Ser31Asn mutation in the M2 gene based on the cycling probe method and real-time PCR. We also studied the rate of amantadine resistance in the 2007-2008 influenza season in Japan. Two different primer and cycling probe sets were designed for A/H1N1 and A/H3N2 each to detect a single nucleotide polymorphism corresponding to Ser/Asn at residue 31 of the M2 protein. By using nasopharyngeal swabs from patients with influenza-like and other respiratory illnesses and virus isolates, the specificity and the sensitivity of the cycling probe method were evaluated. High frequencies of amantadine resistance were detected among the A/H1N1 (411/663, 62%) and A/H3N2 (56/56, 100%) virus isolates collected from six prefectures in Japan in the 2007-2008 influenza season. We confirmed that the cycling probe method is suitable for the screening of both nasopharyngeal swabs and influenza virus isolates for amantadine-resistant strains and showed that the incidence of amantadine resistance among both A/H1N1 and A/H3N2 viruses remained high in Japan during the 2007-2008 season.

3) Comparison of a Rapid Antigen Test with Nucleic Acid Testing during Cocirculation of Pandemic Influenza A/H1N1 2009 and Seasonal Influenza A/H3N2 (*Jen Kok, et al., January 2010*);
<http://jcm.asm.org/cgi/content/abstract/48/1/290>

Abstract:

The rapid diagnosis of influenza is critical in optimizing clinical management. Rapid antigen tests have decreased sensitivity in detecting pandemic influenza A/H1N1 2009 virus compared to seasonal influenza A subtypes (53.4% versus 74.2%, $P < 0.001$). Nucleic acid tests should be used to detect pandemic influenza virus when rapid antigen tests are negative.

4) Evidence for Persistence of and Antiviral Resistance and Reassortment Events in Seasonal Influenza Virus Strains Circulating in Cambodia (*Mathieu Fourment, et al., January 2010*);
<http://jcm.asm.org/cgi/content/abstract/48/1/295>

Abstract:

The analysis of A/H1N1 and A/H3N2 influenza viruses collected between 2005 and 2008 in Cambodia detected strains resistant to oseltamivir and confirmed widespread resistance to adamantanes. Phylogenetic analyses revealed intrasubtype reassortment, probable reemergence of A/H3N2 viruses in two consecutive seasons, and cocirculation of different lineages in each subtype.

5) Comparison of Becton Dickinson Directigen EZ Flu A+B Test against the CDC Real-Time PCR Assay for Detection of 2009 Pandemic Influenza A/H1N1 Virus (*Tess Karre, et al., January 2010*); <http://jcm.asm.org/cgi/content/full/48/1/343>

Abstract:

Although performance characteristics of several commercial rapid immunodiagnostic tests (RIDT) for the detection of seasonal influenza viruses are known, only limited data have been published regarding the ability of RIDT to detect pandemic influenza A/H1N1 2009 virus. Of these comparisons, two included an evaluation of the Directigen EZ Flu A+B immunoassay (Becton Dickinson, Sparks, MD). In these two reports, the reported sensitivities were 46.7 and 49%. To date, there are no reported data comparing the Directigen EZ Flu A+B immunoassay with the real-time PCR (RT-PCR) assay developed by the Centers for Disease Control and Prevention (CDC) to detect pandemic influenza A/H1N1 2009 virus. This communication is a report of such a comparison using fresh, clinical nasopharyngeal wash (NPW) specimens.

JOURNAL OF CLINICAL VIROLOGY (added this week)

1) Performance of laboratory diagnostics for the detection of influenza A(H1N1)v virus as correlated with the time after symptom onset and viral load (*PK Cheng et al, December 16,2009*); http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VJV-4XYB47D-3&_user=7390936&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&_view=c&_acct=C000071363&_version=1&_urlVersion=0&_userid=7390936&md5=af9ad0f69b61128deed5a8e1153a8511

Abstract:

Comparison of the performance of rapid antigen test (RAT), viral culture and RT-PCR for the detection of influenza A(H1N1)v virus and to correlate their performance with the time after symptom onset and viral load. Using respiratory samples from 587 patients diagnosed with influenza A(H1N1)v infection, comparison of laboratory diagnostics showed viral culture and RT-PCR gave comparable results with overall sensitivity of 93.9% and 98.1%, respectively. For RAT, when testing a subset of 60 samples collected ≤ 3 days following symptom onset, the sensitivity was 62%. Although viral shedding is prolonged and of higher titre in influenza A(H1N1)v infection, RAT showed a low sensitivity of 62% among patients presenting ≤ 3 days after symptom onset. Viral culture showed comparable performance with RT-PCR and with sensitivity better than that documented for seasonal influenza.

JOURNAL OF INFECTIOUS DISEASES

1) A Novel Type of Influenza Vaccine: Safety and Immunogenicity of Replication-Deficient Influenza Virus Created by Deletion of the Interferon Antagonist NS1 (*Volker Wachek et al., December 29, 2009*); <http://www.journals.uchicago.edu/doi/full/10.1086/649428>

Abstract:

The nonstructural protein NS1 of influenza virus counteracts the interferon-mediated immune response of the host. By deleting the open reading frame of NS1, we have generated a novel type of influenza vaccine. We studied the safety and immunogenicity of an influenza strain lacking the NS1 gene (Δ NS1-H1N1) in healthy volunteers. We show that vaccination with an influenza virus strain lacking the viral interferon antagonist NS1 induces statistically significant levels of strain-specific and cross-neutralizing antibodies despite the highly attenuated replication-deficient phenotype. Further studies are warranted to determine whether these results translate into protection from influenza virus infection.

2) Cytokine Profiles Induced by the Novel Swine-Origin Influenza A/H1N1 Virus: Implications for Treatment Strategies (*Patrick C. Y. Woo, December 23, 2009*);
<http://www.journals.uchicago.edu/doi/full/10.1086/649785>

Abstract:

Given the apparent high mortality associated with the novel swine-origin influenza A/H1N1 virus (S-OIV) in Mexico, we aimed to study the cytokine profiles induced by S-OIV and the effect of immunomodulators. No major cytokine storm, as seen in H5N1 infection, is associated with S-OIV infection of cell lines. The mainstay of treatment for uncomplicated S-OIV infections should be antiviral agents without immunomodulators. For individual S-OIV-infected patients with severe primary viral pneumonia, severe sepsis, and multiorgan failure, immunomodulators may be considered as an adjunctive therapy in clinical trials.

LANCET INFECTIOUS DISEASES

1) [Comment] Defining the safety profile of pandemic influenza vaccines (*Dina Pfeifer, Claudia Alfonso and David Wood December 15, 2009*);
<http://download.thelancet.com/flatcontentassets/H1N1-flu/vaccination/vaccination-82.pdf>

Abstract:

Although the current pandemic is considered moderate in terms of overall severity, the influenza A H1N1 2009 virus causes an average 6–14 deaths per 1 000 000 population. Moreover, certain severe disease patterns of the influenza A H1N1 2009 virus are distinct from seasonal influenza viruses. The ongoing worldwide safety evaluation of pandemic H1N1 vaccines is unprecedented and will provide the most documented safety profile of any vaccine in history. The available data show that pandemic H1N1 vaccines are immunogenic and have an acceptable safety profile. They provide an important public health tool to minimise further harm from the virus.

2) InFACT: a global critical care research response to H1N1 (*The Global H1N1 Collaboration, January 4, 2010*);
<http://www.thelancet.com/journals/lancet/article/PIIS014067360961792X/fulltext?rss=yes>

Abstract:

The H1N1 pandemic presents acute care researchers with an extraordinary challenge and an unprecedented opportunity. By early October, 2009, there had been more than 340 000 reported cases of H1N1 infection in 191 countries, with more than 4100 deaths. WHO initially projected that up to 2 billion people could become infected with the virus over the next 2 years.

LANCET

1) H1N1 vaccination struggles against resistance and supply (*Priya Shetty, January 2010*);
<http://www.thelancet.com/journals/laninf/article/PIIS1473309909703391/fulltext?rss=yes>

Abstract:

Pandemic influenza H1N1 vaccination campaigns are at last underway across the world. Public health officials are finding, however, that a major barrier to vaccination is not the availability of the vaccine but a lack of enthusiasm from the general public and some health professionals. Meanwhile, developing countries do not even have the vaccine yet, since promises made by some rich countries to provide the vaccine to poor nations have yet to be fulfilled.

2) Mandatory influenza immunisation of health-care workers (*Gwendolyn L Gilbert, Ian Kerridge, Paul Cheung, January 2010*);
<http://www.thelancet.com/journals/laninf/article/PIIS1473309909703342/fulltext?rss=yes>

Abstract:

Seasonal influenza imposes an enormous but poorly defined burden of excess deaths, hospital admissions, and health-care costs, and often spreads within health-care facilities. Hospital patients with influenza are a potential source of infection for health-care workers that are not immunised, with attack rates among health-care workers of 18—24%. Unfortunately, health-care workers infected with influenza often continue to work, despite symptoms.

MMWR

1) Intent to Receive Influenza A (H1N1) 2009 Monovalent and Seasonal Influenza Vaccines --- Two Counties, North Carolina, August 2009 (*December 25, 2009*);
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5850a1.htm>

Abstract:

To measure intent to receive H1N1 and seasonal influenza vaccines among children and adults, during August 28--29, 2009, the North Carolina Center for Public Health Preparedness, with state and local public health officials, conducted a community assessment in two counties. This report summarizes the results of that assessment, which determined that 64% of adults reported intent to receive H1N1 vaccine. In addition, 65% of parents reported intent to have all their children (aged 6 months to <18 years) vaccinated with H1N1 vaccine, and 51% said they would have all their children vaccinated with both H1N1 and seasonal influenza vaccines. The most commonly reported reasons for not intending to receive H1N1 vaccine were belief in a low likelihood of infection (18%) and concern over vaccine side effects (14%); 85% of participants said they received their H1N1 information from television. To increase coverage with H1N1 and seasonal influenza vaccines, public health departments should use television to focus public health messages on the risks for infection and severe illness and the safety profile of the vaccine.

2) Impact of Seasonal Influenza-Related School Closures on Families --- Southeastern Kentucky, February 2008 (*December 25, 2009*);
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5850a2.htm>

Abstract:

To assess the impact of school closings on families, the Kentucky Department for Public Health (KDPH) conducted a telephone survey of randomly sampled households whose children attended schools in two adjacent school districts that had been closed because of high absenteeism during an outbreak of seasonal influenza in the community in February 2008. This report summarizes the results of that survey, which indicated that 97.0% of respondents agreed with the decision to close schools. In 29.1% of households, an adult had to miss work to provide child care, and in 15.7% of households, at least one adult lost pay because of missed work. Although the schools closed because of high absenteeism affecting school operations and funding, this was not fully communicated to families; 64.4% of respondents believed the closures would "keep people from getting ill," and 90.8% thought it was "extremely or very important" to disinfect schools while closed to reduce community spread of influenza. School districts and health departments should provide families with specific information about the reason for school closings and provide recommendations for reducing the spread of influenza while students are dismissed from school.

3) Patients Hospitalized with 2009 Pandemic Influenza A (H1N1) - New York City, May 2009 (*January 8, 2010*);
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5851a2.htm?s_cid=mm5851a2_x

Abstract:

To rapidly assess the severity of influenza illness and identify persons at highest risk for severe infection, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) reviewed the medical charts of the first 99 patients with laboratory confirmed H1N1 admitted to any NYC hospital. The purpose of the review was to characterize the demographics of the first hospitalized patients, identify associated underlying medical conditions, describe the course and severity of disease, and examine the use of antiviral medications. This report summarizes the findings of this analysis.

4) Outbreak of 2009 Pandemic Influenza A (H1N1) at a School - Hawaii, May 2009
(January 8, 2010);

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5851a3.htm?s_cid=mm5851a3_x

Abstract:

One case was in an 8th-grade student and the other in a 3rd-grade teacher. HDOH initiated an investigation to determine the extent of transmission at the school and among household contacts, and to help establish appropriate control strategies. This report summarizes the results of the investigation, which detected an outbreak of pandemic H1N1 cases at the school over the ensuing 3 weeks.

NATURE

1) Letter: Human host factors required for influenza virus replication near-final *version* (Renate König et al., December 21, 2009);

<http://www.nature.com/nature/journal/vnfv/ncurrent/abs/nature08699.html>

Abstract:

An integrative systems approach, based on genome-wide RNA interference screening, to identify 295 cellular cofactors required for early-stage influenza virus replication. Within this group, those involved in kinase-regulated signalling, ubiquitination and phosphatase activity are the most highly enriched, and 181 factors assemble into a highly significant host-pathogen interaction network. Notably, growth of swine-origin H1N1 influenza virus is also dependent on the identified host factors, and we show that small molecule inhibitors of several factors, including vATPase and CAMK2B, antagonize influenza virus replication.

2) Blog: China frets over swine flu (Daniel Cressey, January 4, 2010);

http://blogs.nature.com/news/thegreatbeyond/swine_flu/

Abstract:

China has confirmed that there have been 659 deaths from H1N1 in the country as of 2 January. In total, 120,940 cases of swine flu have been recorded.

NEW ENGLAND JOURNAL OF MEDICINE

1) Severe 2009 H1N1 Influenza in Pregnant and Postpartum Women in California (Janice K. Louie, Meileen Acosta, Denise J. Jamieson, Margaret A. Honein, January 7, 2010);

<http://content.nejm.org/cgi/content/full/362/1/27?query=TOChttp://content.nejm.org/cgi/content/full/362/1/27?query=TOC>

Abstract:

2009 H1N1 influenza can cause severe illness and death in pregnant and postpartum women; regardless of the results of rapid antigen testing, prompt evaluation and antiviral treatment of influenza-like illness should be considered in such women. The high cause-specific maternal mortality rate suggests that 2009 H1N1 influenza may increase the 2009 maternal mortality ratio in the United States.

2) Correspondence: A Community Cluster of Oseltamivir-Resistant Cases of 2009 H1N1 Influenza (*Le Quynh Mai et al., January 7, 2010*);

<http://content.nejm.org/cgi/content/full/362/1/86-a?query=TOC>

Abstract:

In this cluster, infection developed in at least 6 of the 10 people who were probably exposed to the index patient; this shows that resistant 2009 H1N1 viruses are transmissible and can replicate and cause illness in healthy people in the absence of selective drug pressure. Ongoing transmission from the cluster was not detected, but the tracing of all contacts was not possible, so ongoing transmission cannot be ruled out. However, only three other resistant cases have been detected in Vietnam as of this writing, and all were due to selection of resistant viruses during treatment rather than person-to-person transmission. Although data are limited, it is likely that the detected levels of oseltamivir resistance are clinically relevant.⁵ The loss of oseltamivir as a treatment option for severe 2009 H1N1 infection could have profound consequences. To minimize this risk, the use of oseltamivir should be restricted to prophylaxis and treatment in high-risk persons or the treatment of people with severe or deteriorating illness, antiviral stockpiles should be diversified, and optimal dosages and combination therapies should be urgently studied. Close monitoring and reporting of resistance to neuraminidase inhibitors are essential.

3) Household Transmission of 2009 Pandemic Influenza A (H1N1) Virus in the United States (*Simon Cauchemez et al., December 31, 2009*);

<http://content.nejm.org/cgi/content/full/361/27/2619?query=TOC>

Abstract:

Characterization of the risk factors and describe the transmission of the virus within households. An acute respiratory illness developed in 78 of 600 household contacts (13%). In 156 households (72% of the 216 households), an acute respiratory illness developed in none of the household contacts; in 46 households (21%), illness developed in one contact; and in 14 households (6%), illness developed in more than one contact. The proportion of household contacts in whom acute respiratory illness developed decreased with the size of the household, from 28% in two-member households to 9% in six-member households. Household contacts 18 years of age or younger were twice as susceptible as those 19 to 50 years of age (relative susceptibility, 1.96; Bayesian 95% credible interval, 1.05 to 3.78; $P=0.005$), and household contacts older than 50 years of age were less susceptible than those who were 19 to 50 years of age (relative susceptibility, 0.17; 95% credible interval, 0.02 to 0.92; $P=0.03$). Infectivity did not vary with age. The mean time between the onset of symptoms in a case patient and the onset of symptoms in the household contacts infected by that patient was 2.6 days (95% credible interval, 2.2 to 3.5). The transmissibility of the 2009 H1N1 influenza virus in households is lower than that seen in past pandemics. Most transmissions occur soon before or after the onset of symptoms in a case patient.

4) Outbreak of 2009 pandemic influenza A(H1N1) at a New York City school (*J. Lessler et al., December 31, 2009*);

<http://content.nejm.org/cgi/content/full/361/27/2628?query=TOC>

Abstract:

The findings from this investigation suggest that 2009 H1N1 influenza in the high school was widespread but did not cause severe illness. The reasons for the rapid and extensive spread of influenza-like illnesses are unknown. The natural history and transmission of the 2009 H1N1 influenza virus appear to be similar to those of previously observed circulating pandemic and interpandemic influenza viruses.

5) [Correspondence] Responses to 2009 H1N1 vaccine in children 3 to 17 years of age (*Adriano Arguedas, Carolina Soley, and Kelly Lindert, December 31, 2009*);
<http://content.nejm.org/cgi/content/full/NEJMc0909988?query=TOC>

Abstract:

These preliminary data support the use of one 15- μ g dose of 2009 H1N1 vaccine without adjuvant in children between the ages of 9 and 17 years. However, in children 3 to 8 years of age, only the 7.5- μ g dose of 2009 H1N1 vaccine with adjuvant met both the immunogenicity criteria after one dose, and the criterion for the HI antibody titer was not met by either one or two 15- μ g doses without adjuvant. The use of adjuvant may provide a rapid immune response at a lower hemagglutinin dose than that required in vaccine without adjuvant. This may increase the availability of vaccine for rapid immunization in young children, an age group that is at substantial risk for hospitalization associated with influenza.

6) Correspondence: Bacterial pathogens and death during the 1918 Influenza Pandemic (*Yu-Wen Chien, Keith P. Klugman and David M. Morens, December 24, 2009*);
<http://content.nejm.org/cgi/content/full/361/26/2582?query=TOC>

Abstract:

Although viral pneumonitis alone has caused deaths, a recent report from the Centers for Disease Control and Prevention showed that 29% of the patients who died from infection with the 2009 pandemic influenza A (H1N1) virus had evidence of bacterial infection with pneumococci predominantly of types not present in the conjugate vaccine. The currently increased incidence of staphylococcal infections may reflect the resistance of staphylococci to community antibiotic use and a higher probability of culture being performed, either after death or after the initiation of antibiotic therapy. The burden of death from pneumonia-related infection with the 2009 pandemic influenza A (H1N1) virus could be greater in developing countries with high rates of carriage of pneumococcal bacteria among both adults and children and limited availability of pneumococcal conjugate vaccine and antibiotics. The historical data suggest that administration of pneumococcal vaccine and antibiotic therapy may be important to reduce mortality from influenza-associated pneumonia.

7) Correspondence: Intravenous Zanamivir for Oseltamivir-resistant 2009 H1N1 influenza (*Aditya H. Gaur et al., December 23, 2009*);
<http://content.nejm.org/cgi/content/full/NEJMc0910893?query=TOC>

Abstract:

In the absence of real-time access to testing for oseltamivir resistance, clinicians who are treating immunocompromised patients with suspected or proven 2009 H1N1 influenza who have persistent respiratory symptoms should have a high index of suspicion for drug resistance and consider zanamivir for treatment. For critically ill patients, the choice is limited, since aerosolized zanamivir that is delivered through the ventilatory circuit is not recommended and the intravenous preparation is not commercially available.

8) Editorial: The Need for Science in the Practice of Public Health; (*Nicole Lurie, December 24, 2009*);

<http://content.nejm.org/cgi/content/full/361/26/2571?query=TOC>

Abstract:

We will all have the opportunity to learn lessons from the 2009 pandemic H1N1 virus. Although we would like to believe that pandemics occur rarely and that we have plenty of time until the next one, new infectious diseases, as well as other kinds of threats, can emerge at any time. One challenge will be to continue to invest in science — whether that means basic virology; surveillance; mitigation measures; vaccine development, manufacture, and distribution; operations and logistics; or communication — so that when the next pandemic or other emerging infectious disease appears, we will have the data we need to make informed decisions about how to confront it. A second challenge will be to strengthen the nation's public health infrastructure so that we can rapidly turn scientific knowledge into action.

9) Case 40-2009: A 29-year-old man with fever and respiratory failure (*Timothy M. Uyeki, M.D., M.P.H., M.P.P., Amita Sharma, M.D., and John A. Branda, December 24, 2009*);

<http://content.nejm.org/cgi/content/full/361/26/2558?query=TOC>

Abstract:

Unfortunately, worsening hypotension, hypoxemia, and acidosis developed. Antimicrobial therapy was broadened to include metronidazole and micafungin. Hypotension and acidosis persisted despite maximum doses of pressors, and the patient died on the ninth hospital day. Permission for an autopsy was denied. The majority of patients in intensive care units (ICUs) who have 2009 H1N1 influenza have been nonelderly persons with coexisting conditions, including obesity, and pregnant women. However, in case series of patients with 2009 H1N1 influenza in the United States 27 to 36% of hospitalized patients and 33 to 38% of patients admitted to ICUs have been previously healthy, nonobese children and young adults, such as this patient.

10) Images in Clinical Medicine: Coughing and Masks (*J.W.-T. Tang and G. Settles, December 24, 2009*);

<http://content.nejm.org/cgi/content/full/361/26/e62?query=TOC>

Abstract:

Includes videolinks of mask performance.

11) Pediatric Hospitalizations Associated with 2009 Pandemic Influenza A (H1N1) in Argentina (*Romina Libster, et al., January 7, 2010*);

<http://content.nejm.org/cgi/content/full/NEJMoa0907673?query=TOC>

Abstract:

Between May and July 2009, a total of 251 children were hospitalized with 2009 H1N1 influenza. Rates of hospitalization were double those for seasonal influenza in 2008. Of the children who were hospitalized, 47 (19%) were admitted to an intensive care unit, 42 (17%) required mechanical ventilation, and 13 (5%) died. The overall rate of death was 1.1 per 100,000 children, as compared with 0.1 per 100,000 children for seasonal influenza in 2007. (No pediatric deaths associated with seasonal influenza were reported in 2008.) Most deaths were caused by refractory hypoxemia in infants under 1 year of age (death rate, 7.6 per 100,000). Pandemic 2009 H1N1 influenza was associated with pediatric death rates that were 10 times the rates for seasonal influenza in previous years.

12) Clinical Features of the Initial Cases of 2009 Pandemic Influenza A (H1N1) Virus Infection in China (*B. Cao et al., December 24, 2009*);
<http://content.nejm.org/cgi/content/full/361/26/2507?query=TOC>

Abstract:

Surveillance of the 2009 H1N1 virus in China shows that the majority of those infected have a mild illness. The typical period during which the virus can be detected with the use of real-time RT-PCR is 6 days (whether or not fever is present). The duration of infection may be shortened if oseltamivir is administered.

PLoS

- Nothing new on H1N1 this week

PLoS ONE

1) Effect of the Novel Influenza A (H1N1) Virus in the Human Immune System (*Evangelos J. Giamarellos-Bourboulis et al., December 23, 2009*);
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008393>

Abstract:

Infection by the H1N1 virus is accompanied by a characteristic impairment of the innate immune responses characterized by defective cytokine responses to *S.pneumoniae*. Alterations of the adaptive immune responses are predominated by increase of Tregs. These findings signify a predisposition for pneumococcal infections after infection by H1N1 influenza.

2) Breaking the Waves: Modelling the Potential Impact of Public Health Measures to Defer the Epidemic Peak of Novel Influenza A/H1N1 (*Matthias an der Heiden et al., December 21, 2009*);
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008356>

Abstract:

Control strategies that reduce the spread of the disease during the early phase of a pandemic wave may lead to a substantial delay of the epidemic. Since prophylactic treatment is only offered to the contacts of the first 10,000 cases, the amount of antivirals needed is still very limited.

3) Evaluation of the Efficacy and Cross-Protectivity of Recent Human and Swine Vaccines against the Pandemic (H1N1) 2009 Virus Infection (*Philippe Noriel O. Pascua et al, December 23, 2009*);
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008431>

Abstract:

To investigate whether recent seasonal human or swine H1N1 vaccines could induce cross-reactive immune responses against infection with the pandemic (H1N1) 2009 virus, mice, ferrets or mini-pigs were administered with various regimens (once or twice) and antigen content (1.77, 3.5 or 7.5 µg HA) of a-Brisbane/59/07, a-CAN01/04 or RgCA/04/09xPR8 vaccine. ... These results suggest that neither recent human nor animal H1N1 vaccine could provide complete protectivity in all animal models. Thus, this study warrants the need for strain-specific vaccines that could yield the optimal protection desired for humans and/or animals.

4) Enhancement of the Influenza A Hemagglutinin (HA)-Mediated Cell-Cell Fusion and Virus Entry by the Viral Neuraminidase (NA) (*Bin Su et al, December 30, 2009*);
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008495>

Abstract:

The NA protein of influenza A virus is not only required for virion release and spread but also plays a critical role in virion infectivity and HA-mediated membrane fusion.

5) Improving the Clinical Diagnosis of Influenza—a Comparative Analysis of New Influenza A (H1N1) Cases (*Adrian K. Ong et al., December 29, 2009*);

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008453>

Abstract:

The clinical presentation of H1N1(2009) infection is largely indistinguishable from that of seasonal influenza. Among patients with acute respiratory illness, features such as a temperature greater than 38°C, rhinorrhea, a normal chest radiograph, and the absence of leukocytosis or significant gastrointestinal symptoms were all positively associated with H1N1(2009) and seasonal influenza infection. An enhanced ILI criteria that combines both a symptom complex with the absence of leukocytosis on testing can improve the accuracy of predicting both seasonal and H1N1-2009 influenza infection.

6) Intraseasonal Dynamics and Dominant Sequences in H3N2 Influenza (*Nicole Creanza, Jason S. Schwarz, Joel E. Cohen, January 1, 2010*);

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008544>

Abstract:

H3N2 influenza genomes sampled from New York State over ten years indicated intraseasonal changes in evolutionary dynamics. Using the mean Hamming distance of a set of amino acid or nucleotide sequences as an indicator of its diversity, we found that influenza sequence diversity was significantly higher during the early epidemic period than later in the influenza season.

7) Streptococcus pneumoniae Coinfection Is Correlated with the Severity of H1N1 Pandemic Influenza (*Gustavo Palacios et al., December 31, 2009*);

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008540>

Abstract:

The association of *S. pneumoniae* with morbidity and mortality is established in the current and previous influenza pandemics. However, this study is the first to demonstrate the prognostic significance of non-invasive antemortem diagnosis of *S. pneumoniae* infection and may provide insights into clinical management.

8) Predicting the Antigenic Structure of the Pandemic (H1N1) 2009 Influenza Virus Hemagglutinin (*Manabu Igarashi et al, January 1, 2010*);

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0008553>

Abstract:

The present study suggests that antibodies elicited by natural infection with the 1918 pandemic or its early descendant viruses play a role in specific immunity against 2009 H1N1, and provides an insight into future likely antigenic changes in the evolutionary process of 2009 H1N1 in the human population.

PLoS CURRENTS

1) Optimal pandemic influenza vaccine allocation strategies for the Canadian population (*Ashleigh Tuite, David N. Fisman, Jeffrey C. Kwong, Amy Greer, January 7, 2010*);

<http://knol.google.com/k/ashleigh-tuite/optimal-pandemic-influenza-vaccine/66mlsbkkz358/2?collectionId=28qm4w0q65e4w.1&position=1#>

Abstract:

Our model simulations suggest that vaccine should be allocated to high-risk groups, regardless of age, followed by age groups at increased risk of severe outcomes. Vaccination may significantly reduce influenza-attributable morbidity and mortality, but the benefits are dependent on epidemic dynamics, time for program roll-out, and vaccine uptake.

2) Seasonal influenza vaccine allocation in the Canadian population during a pandemic (*Ashleigh Tuite, David N. Fisman, Jeffrey C. Kwong, Amy Greer, January 7, 2010*);

<http://knol.google.com/k/ashleigh-tuite/seasonal-influenza-vaccine-allocation/66mlsbkkz358/1#>

Abstract:

In the presence of uncertainty surrounding enhanced risk of pH1N1 acquisition with seasonal vaccine receipt, delaying seasonal vaccine delivery or restricting vaccine to individuals aged > 65 may reduce overall influenza-attributable mortality in the Canadian population.

3) Efficient simulation of the spatial transmission dynamics of influenza (*Meng-Tsung Tsai et al. January 5, 2010*);

<http://knol.google.com/k/meng-tsung-tsai/efficient-simulation-of-the-spatial/3d7dm4m68r6wb/1#>

Abstract:

Early data from the 2009 H1N1 pandemic (H1N1pdm) suggest that previous studies over-estimated the within-country rate of spatial spread of pandemic influenza. As large spatially-resolved data sets are constructed, the need for efficient simulation code with which to investigate the spatial patterns of the pandemic becomes clear. Here, we describe a significant improvement in the efficiency of an individual-based stochastic disease simulation framework that has been used for multiple previous studies. We quantify the efficiency of the revised algorithm and present an alternative parameterization of the model in terms of the basic reproductive number. We apply the model to the population of Taiwan and demonstrate how the location of the initial seed can influence spatial incidence profiles and the overall spread of the epidemic. Differences in incidence are driven by the relative connectivity of alternate seed locations.

4) Symptomatic infections less frequent with H1N1pdm than with seasonal strains (*Antoine Flahault et al., December 28, 2009*);

<http://knol.google.com/k/antoine-flahault/symptomatic-infections-less-frequent/2nsp4xxomyqub/2#>

Abstract:

A serosurvey conducted in a sample of first quarter pregnant women in France at week 48-49 of 2009 exhibit a seroprevalence level of 10.6%. It has been extrapolated in male and female population living in France mainland, aged 20-39 yr, that 1,712,000, 95%CI (1,112,700 – 2,311,300) people were recently infected by H1N1pdm (recently vaccinated women were excluded from analysis). From week 36 to 46-47 of 2009, 336,288, 95%CI (207,303-421,299) patients visited their general practitioners with clinical influenza in France, mainland. We then extrapolated the proportion of symptomatic H1N1pdm influenza in both males and females aged 20-39 yr who visited their GP to be 19.6%.

PLoS PATHOGENS

1) Identification of Amino Acids in HA and PB2 Critical for the Transmission of H5N1 Avian Influenza Viruses in a Mammalian Host (*Yuwei Gao et al., December 24, 2009*);

<http://www.plospathogens.org/article/info%3Adoi%2F10.1371%2Fjournal.ppat.1000709>

Abstract:

H5N1 influenza viruses have caused over 400 human infections in 15 countries and continue to circulate in poultry and wild birds. Most human infections resulted from direct contact with virus-contaminated poultry or poultry products. It would be disastrous if H5N1 viruses acquired the ability to efficiently transmit among humans, because the mortality rate may exceed 60%. However, the genetic basis for transmission of H5N1 influenza viruses is largely unknown. Here, we demonstrate that the amino acid residue at 701 of PB2 is a prerequisite for transmission of H5N1 viruses in a mammalian guinea pig model. Interestingly, we found that the absence of glycosylation at residues 158–160 of the HA gene is pivotal for the H5N1 virus to bind to human-like receptors and to transmit in a mammal host. These findings are important for assessing the pandemic potential of H5N1 field isolates.

SCIENCE

-Nothing new on H1N1 this week.

VACCINE

1) Immunogenicity and safety in adults of one dose of influenza A H1N1v 2009 vaccine formulated with and without AS03A-adjuvant : preliminary report of an observer-blind randomized trial (*Francois Romand et al., December 22, 2009*);

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TD4-4Y0DF9F-2&_user=7149360&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&_view=c&_acct=C000071090&_version=1&_urlVersion=0&_userid=7149360&md5=70fc43d91bf18b1611897576426e8f49

Abstract:

We evaluated two inactivated split-virion A/California/7/2009 H1N1v pandemic vaccines formulated with/without AS03A, an oil-in-water emulsion adjuvant system containing tocopherol. These preliminary data suggest that one dose of either AS03A-adjuvanted H1N1v vaccine at a reduced HA dose or non-adjuvanted H1N1v vaccine at a fourfold higher dose is sufficient to immunize healthy adults. The strong immune response is consistent with prevalent immunological priming but as this and the ability to mount immune response after vaccination may be modulated by age, further investigations in children and in the elderly as well as on the persistence of the immune response are warranted.

2) A high dosage influenza vaccine induced significantly more neuraminidase antibody than standard vaccine among elderly subjects (*Thomas R. Cate et al., December 4, 2009*);

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TD4-4Y1VXG4-G&_user=7149360&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&_view=c&_acct=C000071090&_version=1&_urlVersion=0&_userid=7149360&md5=42dc5823156ef8b3e5dd5c96d6ddd2ff

Abstract:

Antibody to the neuraminidase (NA) antigen of influenza viruses has been shown to correlate with immunity to influenza in humans and animal models. In a previous report, we showed that an

inactivated influenza vaccine containing 60 µg of the hemagglutinin (HA) of each strain induced significantly more serum anti-HA antibody among elderly persons than did the standard vaccine containing 15 µg of the HA of each component. We developed a lectin-based assay for anti-NA antibody and used it to measure anti-NA antibody responses among subjects who had participated in that study. The high dosage vaccine contained eight times as much NA activity as the standard vaccine and induced a significantly higher frequency of antibody responses and higher mean postvaccination anti-NA titers to the N1 and N2 of the A/H1N1 and A/H3N2 viruses in the vaccines than did the standard vaccine. Ensuring an increased antibody response to the NA antigen in inactivated influenza virus vaccines should increase the protection against influenza. An increased quantity of the NA antigen in the vaccine will ensure an increased response.

3) Letter: Expected and unexpected adverse effects H1N1 vaccination for health care workers in a university hospital (*Aurelien Dinh et al., December 3, 2009*); http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TD4-4Y1VXG4-9&_user=7149360&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&_view=c&_acct=C000071090&_version=1&_urlVersion=0&_userid=7149360&md5=7c87cb546d795216f9d75c56fb77c81b

Abstract:

During the first week of vaccination, the vaccination team worked 22 h in 8 target units around 10 sessions including night shift. The Pandemrix© vaccine was used (Influenza A H1N1 2009 Monovalent AS03-Adjuvanted Vaccine, GSK). Only 129 HCW were vaccinated this first week among 1870 HCW of the target population (6.9%). A self-administered questionnaire was filled out by this population about the vaccine adverse effects. We received 95 answers (73.6%). We observed an important local reaction (redness or important pain) in 50 cases (52.6%), 25 systemic reactions without fever (muscle or joint aches, 26.3%) and 6 with fever (>38 °C, 6.3%). No severe allergic reaction has been observed. The mean and median was at 2 days. Even though we observed more often adverse effects than the usual flu vaccine especially for systemic reaction and, reactions were short and not severe. We also observed unexpected side effects among our vaccination team. Vaccination team had to face with suspicious HCW whom felt reticent about it. HCW not only feared long-term side effects of a 'new vaccine', but also expressed doubt and irrational fear of long-term effects. However, taking into account the personal accomplishment associated with the importance of task, the consequence in our team was minimal (evaluate with a Malasch Burn out Inventory, adapted for vaccination).