



February 2010
Issue 16

When Pigs Fly - The Season that Was

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I don't think it's fair for someone to blame Mexico for this. You can't blame any country; you can't blame a person or an institution. The recombination of genes in the virus is something that happens naturally...

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The first influenza pandemic of the 21st century was declared by the Director-General of WHO on 11th June 2009, the first in 41 years. Much has changed since the last pandemic of 1968-1969, including the high volume of air travel (up to 9.57 million people on 80987 flights per day) (9), rapid exchange of information through the media and world-wide-web, influenza surveillance and vaccination programs in developed countries, pandemic preparedness planning, and improved influenza diagnostics and treatments. Yet, the fundamentals of influenza preventive measures recommended by the New South Wales (NSW) Director-General of Public Health in 1920 following the pandemic of 1918-1919 (10) still apply today: isolation of the ill, quarantining of all arrivals, wearing well-fitting masks, and the use of vaccination to prevent disease or mitigate the severity of illness.

The declaration of the pandemic presented an unparalleled opportunity for close and careful observation of the events to unfold, and an assessment of the effectiveness of the strategies outlined in the Australian Health Management Plan for Pandemic Influenza (AHMPPI) (1) in dealing with a pandemic; it includes details on the phases of the health response, the establishment of specific influenza services (flu clinics and psychosocial



services), the provision of antivirals through the national medical stockpile and the protection of the population through vaccination. An additional PROTECT phase was introduced in June to identify and treat patients who may be at risk of more severe illness, and to control outbreaks in high-risk settings.

The pandemic also generated significant media interest, with many attention-grabbing headlines, resulting in considerable anxiety amongst the general public. This resulted in disruptions of services, quarantining of cruise-ships, closure of schools, a significant rise in patient visits to health care providers, demands for diagnostic testing, and prescription of antivirals. The northern hemisphere was also closely watching how the pandemic would unfold in the southern hemisphere, in order to best prepare for their upcoming influenza season.

Pandemic (H1N1) 2009 influenza virus is a recent reassortant of the triple-reassortant swine influenza A/H1N1 (with swine, avian and human influenza genes) and Eurasian swine influenza viruses. Unlike avian influenza A/H5N1, H1N1 09 demonstrates efficient human-to-human transmission. Early on in the pandemic, it was unclear how virulent the virus would be, further fuelling public anxiety. As of 7th February 2010, more than 212 countries had reported laboratory confirmed cases, with 15292 deaths (15). It is difficult to assess the true impact of H1N1 09 compared to seasonal influenza, as mortality rates of seasonal influenza are estimates derived from models using all-cause mortality data (14). Despite the uncertainties, some pertinent facts have emerged.

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The first case of H1N1 09 in Australia was detected on 8th May 2009 in a traveller returning from the United States (8). The 2009 Australian influenza season lasted approximately 18 weeks from mid-May to late September, with H1N1 09 the predominant influenza subtype. As of 5th February 2010, there have been 37693 cases and 191 deaths from H1N1 09 in Australia (5385 cases and 54 deaths in NSW) (2). However, this probably underestimates the true community attack rate as laboratory confirmation of suspected influenza was not universal. A three-fold increase in presentations to NSW emergency departments with influenza-like illness (ILI) was noted compared to previous years; up to 35 patients were admitted daily with laboratory confirmed cases of H1N1 09 at the peak of the season (11). Interestingly, the presentation rate of ILI to sentinel general practitioners was less compared to than in 2007, Australia's worst recent influenza season. Rates of workplace absenteeism of greater than 3 days were also similar to 2007 (2). Although H1N1 09 was a mild disease for most of the community, at the severe end of the spectrum, 722 patients (28.7 cases per million inhabitants) were admitted to Australasian intensive care units (ICU), with a case fatality rate of 14.3%. This is in contrast to the total of 228 patients that were admitted to ICU with viral pneumonitis during the four influenza seasons of 2005-2008 combined. Risk factors for severe disease included age under 65 years, obesity and pregnancy (92.7%, 28.6% and 9.1% of admissions respectively) (13). The overall crude mortality rate was 0.9/100000 population (2).

A total of 39351 influenza diagnostic tests were performed by NSW Public Laboratories from May to September 2009 (11). At ICPMR, 16312 influenza tests were performed (6909 nucleic acid tests, 3852 rapid antigen tests, 2940 direct immunofluorescent antigen tests, 1650 serological tests and 961 viral cultures) from May to August. The role and use of diagnostic testing varied during the different phases of the pandemic. Due to the decreased sensitivity of rapid antigen tests and direct immunofluorescent antigen tests in detecting H1N1 09 compared to seasonal influenza (5), nucleic acid tests were used as the definitive test for H1N1 09. In NSW, a decision was made to initially concentrate diagnostic services at two public virology laboratories (ICPMR and SEALS). Sensibly, this sensibly changed later, to include other public laboratories with nucleic acid testing expertise. Some clinicians have subsequently questioned the merits of this approach (4,6), as there were significant delays in turn-around-times between specimen collection to notification of results in some instances. There were multiple reasons for the long delays, the main one being the large number of samples collected from individuals with clinically mild disease. There were also issues including long transit times between the point of collection and receipt in the reference laboratory, inappropriate specimens, and request forms that were incorrectly filled out or missing. Diagnostic testing was also complicated by the fact that the peak of H1N1 09 activity coincided with the peak of respiratory syncytial virus activity.

The national vaccination program with monovalent H1N1 09 vaccine targeting groups at risk for developing severe infections (pregnant women, people with underlying co-morbidities, health care workers, obese and Indigenous Australians) was introduced in Australia on 30th September 2009 (2).

Provisional estimates suggest that 3 million adults (19% of the population) had received the vaccine (3). It is hoped that the vaccine will provide greater protection to the Australian public during the second wave of H1N1 09 infection. During this time, it is also essential to monitor for the potential spread of oseltamivir-resistant H1N1 09, as there have been 225 cases worldwide, and at least 2 in Australia (2,12). Thus far, all the resistant isolates have the H275Y mutation, which is responsible for the majority of oseltamivir-resistant A/H1N1 seasonal influenza strains (7).

In the meantime, more data needs to be collected and analyzed in order to truly understand the epidemiology of the pandemic, so that future public health interventions can be planned, and their efficacy assessed.

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