The 2009 H1N1 influenza, initially known as swine flu, originated in North America in early 2009. This new strain of influenza A virus (H1N1) came to the attention of the international public health community when several foci of influenza-like illness were identified in Mexico, which had more than 850 cases of pneumonia, of whom 59 had died. Mild cases of influenza-like illness were also reported from Texas and California. Virus isolates were obtained from the cases in California and from samples of cases sent from Mexico to the Canadian National Public Health Laboratory in Winnipeg. Molecular analysis of these virus isolates showed that they were virtually identical and indicated that they represented a completely new, rapidly spreading strain of H1N1 virus, which appeared to have originated in swine. This was the first reassorted influenza virus to emerge since the 1968-1969 pandemic caused by the Hong Kong influenza virus.

Under the new International Health Regulations (2005), this rapidly spreading, novel virus was quickly recognised by the World Health Organization as constituting a Public Health Emergency of International Concern, the first such emergency since the new International Health Regulations were introduced in mid-2007.

Further analyses by the US Centers for Disease Prevention and Control (CDC) and other laboratories have indicated that this new virus is a quadruple reassortment. It appears that there are elements in common with a 1998 North American virus from swine and a Eurasian swine virus. The 1998 North American swine H1N1 virus contains genetic elements from swine, avian and human influenza viruses.

The early analysis indicates that there is little or no protection provided by prior infection with seasonal flu. However, there may be some protection in people over 60 years old. In addition, there appears to be little or no protection from current vaccines as determined by antibody cross-reactivity.

Fortunately, this virus appears to cause a relatively mild disease, somewhat similar to seasonal influenza. However, the virus is significantly different from seasonal influenza in several distinct ways: most cases of the new virus occur in school-age children between 6 and 18, whereas seasonal influenza occurs in all ages; and the new virus can cause serious illness particularly in young adults between the ages of 20 and 45 and especially those with underlying health conditions such as diabetes, asthma, chronic obstructive airways disease, cardiovascular disease, morbid obesity, those undergoing immunosuppressive therapies and pregnant women. There is also an indication from Canadian experience that indigenous populations may be at greater risk.

The virus is also sensitive to the antiviral drugs, Tamiflu and Relenza. However, the potential emergence of anti-viral drug-resistant 2009 H1N1 virus is a concern. Anti-viral, resistant H5N1 avian influenza and H1N1 seasonal influenza appeared to develop relatively quickly.

The major concerns over what is now developing into a global pandemic is that a much higher proportion of the population will
be infected by this virus when compared with seasonal influenza. This is due to the lack of underlying immunity. It is possible that 30% of people in some countries may be infected with this virus. Significant mortality will ensue if the case fatality rate is similar to seasonal influenza. The initial estimates of the case fatality rate for this new influenza virus are in the order of 0.4%. At the moment the case fatality rate may be an overestimate, because the analysis does not take into account the unidentified and undiagnosed cases.

Possible reassortment between 2009 H1N1 virus and H5N1 avian influenza or drug-resistant seasonal influenza is also a consideration. Given that H5N1 avian influenza has a case fatality rate in the order of 60%, this is a serious concern. At this early stage in the pandemic there are many uncertainties.

Despite the unfortunate common name of the virus initially (swine flu), there is no evidence at this stage of infected swine herds in USA or Mexico, or indeed anywhere so far investigated. Only one swine herd has been shown to be infected, this being a herd in Alberta, Canada. It is not clear at this stage how the herd was infected, but it would appear that a farm worker brought the virus back after travelling to Mexico. Thus the origin of the virus remains unknown, with the earliest case estimated to have been in late February.

The development of vaccines against this new virus is under way in several countries around the world, including at CSL in Australia. Novartis has announced that the first batch of vaccine has been produced and is likely to be available in the Northern Hemisphere autumn, 2009. CSL is also close to initiating clinical trials, with the first trials expected to occur in July. Vaccination remains the most effective way in which this pandemic can be controlled.

At the time of proofing this article (07 August 2009) the virus continues to spread with over 200,000 laboratory confirmed cases reported to the World Health Organization in 160 countries, causing over 1480 deaths. Most of the confirmed cases and deaths have been from the Americas. However, this is just the tip of the iceberg, and very many more unconfirmed and undiagnosed cases have undoubtedly occurred. It is also possible that the spread of the disease has been slower in the northern hemisphere as the influenza season is coming to an end with the advent of the warmer summer months, compared with the rapid spread in the southern hemisphere, especially in Australia, Chile and Argentina, where the winter influenza season is just starting. In Australia, as at the time of proofing, there have been 24,500 confirmed cases reported with 77 deaths, although laboratory testing is now only done for moderate or severe cases in vulnerable patients. There have been over 4,900 cases in Argentina, with 243 deaths and 11,700 cases in Chile, with 80 deaths. The majority of severe cases and deaths in Australia have had underlying causes, and nearly 3000 cases have required hospitalisation, with many needing ventilatory support in intensive care units.

On 11 June 2009, the World Health Organization announced that the pandemic phase of the H1N1 09 outbreak had been raised to pandemic phase-6, the highest phase level. However, it is important to recognise that this was on geographic grounds only and did not indicate severity, which was stated as being of moderate severity. In Australia, a new phase of response to be known as PROTECT was announced 17 June 2009. It is a measured, reasonable and proportionate health response to the risk that the virus poses to the Australian community and recognises that the disease is mild in most cases, severe in some and moderate overall and that the overwhelming majority of patients are making a rapid and full recovery. It provides a clear, medical response, based on best medical evidence, especially targeted to those we now know are most likely to have poor outcomes. It focuses on early treatment of people who may be vulnerable to severe outcomes. It also moves towards a voluntary home quarantine as the preferred measure for both adults and children with suspected H1N1 09 influenza infections.

Australia and South American countries are very much in the limelight as the Northern Hemisphere gears up for the next northern winter. There is considerable concern that the virus could mutate to a more serious infection or could gain resistance to oseltamivir. On the other hand, experience from previous pandemics would tend to suggest that a second wave of infection may be more serious than the first. Whatever happens over the next few months, there is little doubt that with influenza one has to expect the unexpected!

References