

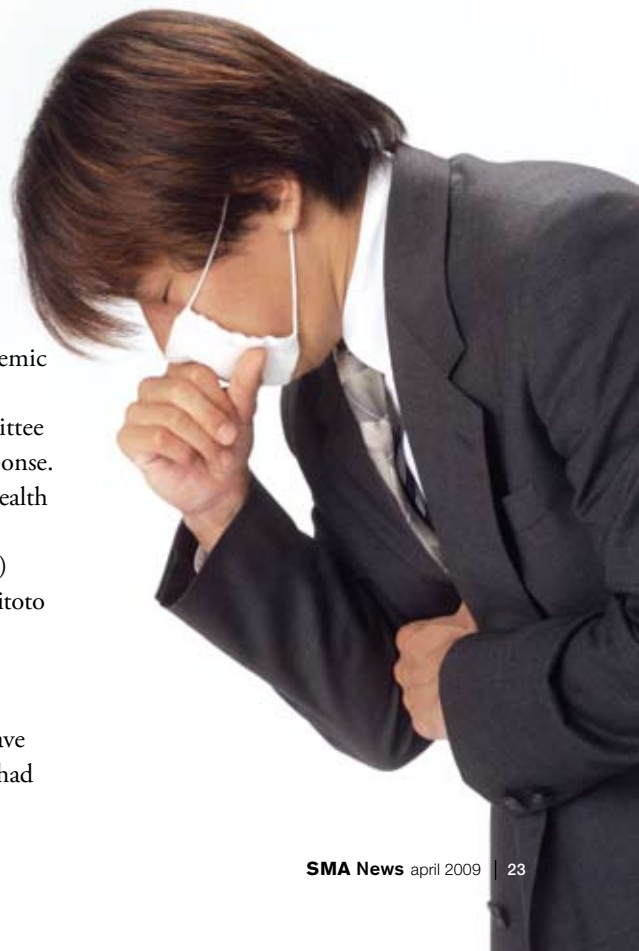
SWINE INFLUENZA: Human Pandemic?

**This article was submitted on 27 April 2009 at 10 PM.*

The rapid evolution of the H1N1 swine influenza A epidemic has caught many experts and government agencies by surprise. At the time of writing, there are 45 laboratory-confirmed cases (20 in the US; 18 in Mexico; 6 from Canada; 1 from Spain) and more than 1,800 possible cases – the majority from Mexico – from 14 countries in four continents (Figure 1). There have been 103 deaths to date, mostly in immunocompetent young adults below the age of 45 years, all from Mexico. Little clinical data is available at this point, but it is clear that most cases outside Mexico have had relatively mild disease, although the Auckland Regional Public Health Service clinical director has described four of 14 possible New Zealand cases as being “more unwell than others”.

A quick recapitulation of the highlights in the timeline of this outbreak-in-motion is in order:

- The exact start date of the epidemic is unknown, but news reports [*La Jornada, 5 April*] from Mexico suggested that health officials had registered a substantial increase in respiratory diseases from Veracruz – a state in the east-central part of Mexico – since early March 2009.
- Similar trends were soon recorded in nearby Mexican states, but recognition of the threat by health officials was delayed by the mistaken assumption that this was regular late season influenza.
- The first US laboratory-confirmed cases occurred in late March (28th and 30th) in adjacent counties in California.
- The first death is believed to have occurred on 13 April in San Luis Potosi in central Mexico – she was a 39-year-old diabetic with severe viral pneumonia and diarrhoea.
- On 22 April, a nationwide alert was issued by the Mexican Health Ministry after 20 deaths had been reported, while tests on Mexican and Californian samples had confirmed that the influenza A strains were identical.
- By 25 April, swine influenza cases had been reported from five US states, including 8 students from a high school in New York City. Dr Anne Schuchat, US Centers for Disease Control’s (USCDC’s) interim deputy director for Science and Public Health Program had told reporters that the outbreak was unlikely to be contained in just US and Mexico.
- On the same day, WHO Director-General Dr Margaret Chan had issued a press release stating that this virus had “pandemic potential”, and that WHO had convened an Emergency Committee to formulate an appropriate response.
- On 26 April, the New Zealand health minister reported that 10 of 25 (14 had influenza-like symptoms) students and teachers from Rangitoto College in Auckland, who had returned from a language trip to Mexico had tested positive for influenza A, and were likely to have swine influenza. Suspected cases had also been reported from Europe, Israel, and other South American countries.
- On the same day, Canada also confirmed six cases of H1N1 influenza among high school students who had returned from Mexico. The country has since issued a travel advisory for Mexico – the first country to do so.
- Late on 26 April, US had declared a public health emergency over H1N1.
- On 27 April, the Spanish Ministry of Health announced one confirmed case – a 23 year old man who had returned from Mexico on 22 April.
- The European Union’s health commissioner had urged Europeans to avoid non-essential travel to both US and Mexico on 27 April.



REPORT

This particular H1N1 outbreak has sparked fears of a pandemic among WHO and USCDC experts for several reasons:

1. The virus is novel to humans, comprising of a mix of genetic elements from North American swine influenza, North American avian influenza, European swine influenza, and human influenza A H1N1 virus.
2. Human-to-human transmission appears both plausible and efficient (although the degree of contagiousness is as yet unknown), unlike the H5N1 avian influenza virus or even previous swine flu viruses.
3. The virus has now spread to several countries worldwide.
4. It can cause severe disease and death. In particular, the majority of deaths in Mexico appear to be among young adults rather than the very young or elderly, a phenomenon that was characteristic of the pandemic Spanish flu in 1918.

However, considerable caution will doubtlessly be exercised by world experts convened by the WHO in deciding on an approach to this epidemic, not least because the 1976 swine flu debacle at New Jersey, US, remains fresh in their minds. Then, four severe viral pneumonias and one death attributed to a H1N1 (but of a different composition from the current virus) outbreak among healthy soldiers at Fort Dix triggered an emergency nationwide vaccination program that resulted in more than 500 cases of Guillain-Barre syndrome and 30 deaths. That particular outbreak ended as mysteriously as it appeared, leading to a public backlash against influenza vaccination.

There is no way to distinguish this H1N1 swine flu from other influenza-like illnesses (ILIs) at presentation, hence the main recommendation from WHO to date has been for countries to look out for clusters of such ILIs. Because the virus remains susceptible to the neuraminidase inhibitors oseltamivir

(Tamiflu) and zanamivir (Relenza), Roche and GlaxoSmithKline have stockpiles of their respective drugs – totaling in excess of three million doses – on standby. Baxter International has also declared that it will commence work on developing a H1N1 vaccine. The current seasonal influenza vaccines are not likely to provide protection against this new virus.

Many countries have independently taken steps towards limiting any potential outbreaks. In general, these have largely been limited to travel advisories and airport health screening. In Mexico, the government has closed down schools in the hardest-hit areas, namely Mexico City, Mexico state, San Luis Potosi and Queretaro. When it came to supporting a favorite Mexican pastime, two soccer matches were played to empty stadiums. Masks will be distributed to passengers on the capital's Metro system from Monday, 27 April, with more than six million surgical masks already having been handed out to citizens in Mexico City by government troops. Schools are similarly being closed in affected areas in Texas, New York and California in the US.

In Singapore, we remain at DORSCON Green Level 1 (corresponding to WHO Phase 3 – a detailed breakdown of the local influenza alert levels may be found at http://www.crisis.gov.sg/NR/rdonlyres/4D0F14B2-B673-4733-9513-CAA92E756034/0/AnnexADORSCONDefn_Mar07.pdf) on 27 April, although the reader can appreciate the mismatch between the actual situation and the DORSCON level. There are no local cases of swine flu currently, but MOH has stepped up surveillance measures and thermal scanners are deployed at Changi Airport (and soon at Seletar Airport) to screen all arriving passengers. No official travel advisory has been issued by Singapore with regards to US and Mexico travel as yet.

WHAT DOES IT MEAN?

The “swine flu” epidemic is still in evolution and it remains unclear at this point whether it will develop into a

full-blown pandemic. Unlike the SARS coronavirus, the transmission of this particular H1N1 virus appears far more efficient. Mortality is thankfully lower, although the exact virulence of the virus is unclear in view of inconsistent reporting from Mexico. Concerned doctors and other healthcare staff should track the progress of this epidemic in order to remain updated on the situation and for personal and patient safety. By keeping track of MOH's DORSCON level, one will be able to determine the level of personal and clinic protection required. It probably doesn't hurt to remember to ask your patients for their recent travel history in the foreseeable future! **SMA**

Some regularly update sources of information include:

- World Health Organization:
 - o <http://www.who.int/csr/disease/swineflu/en/index.html>
- CDC Atlanta:
 - o <http://www.cdc.gov/swineflu/investigation.htm>
- Wikipedia (amazingly quick updates, but accuracy may be an issue):
 - o http://en.wikipedia.org/wiki/2009_swine_flu_outbreak
- Promed Mail:
 - o <http://www.promedmail.org/>
- Ministry of Health, Singapore:
 - o <http://www.moh.gov.sg/>
- The Straits Times:
 - o <http://www.straitstimes.com/> (or get hardcopy version)
- The Singapore government's crisis website:
 - o <http://www.crisis.gov.sg/FLU/>
 - o You can also download the local pandemic guide from this website.
- Google Maps: (updated map of the outbreak – there are several available):
 - o <http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=109496610648025582911.0004686892f8fe515012&ll=35.487978,-58.414994&spn=40.577184,116.519623&source=embed>
 - o It might be easier to go to: <http://googlemapsmania.blogspot.com/> and look for the “Maps of the Swine Flu Outbreak” section.



Figure 1: Map of the current swine flu outbreak. Obtained from Google Maps on 27 April 2009.

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CURRENT SWINE FLU AND 1918 SPANISH FLU

Comparisons between the two are inevitable. The 1918 pandemic influenza A virus was thought to be a “swine flu” initially, and also belonged to the H1N1 sub-type. Both viruses had also never been detected prior to the time of the respective outbreaks. Up to 50-100 million people may have perished during the 1918 pandemic, and given the disturbing parallels between the two outbreaks (young and healthy affected, with deaths), one fear is that the current epidemic may reap a similar death toll.

However, this is where the advance of technology may play a crucial role. 91 years later, we have effective drugs and the capability to develop a vaccine rapidly. Secondary bacterial infections – the cause of death for a substantial proportion of patients in 1918 – can now be largely averted by antibiotics (note this does not suggest that antibiotics should be prescribed for all cases of influenza). The intensive care specialty has also progressed tremendously, and experience with both SARS and avian influenza has resulted in viable pandemic preparedness plans in many countries. It is probable that both transmission and mortality will be far lower this time round, even if the swine flu outbreak assumes pandemic proportions.

WHY “SWINE FLU”?

Dr Peter Cowen cogently describes in a recent ProMED-mail post [Influenza A (H1N1) virus, human – N America (04); 26 April 2009] why “swine flu” is commonly used in the current outbreak when rather few of the cases have had contact with pigs.

- The H1N1 virus is traditionally called “swine flu” because of the 1918 pandemic virus that was transmitted easily between humans and their swineherds. Although subsequent work has suggested that H1N1 probably had a wild bird origin, the original term has stuck.
- Influenza viruses commonly circulate in pigs, with H1N1 remaining one of the most common of such viruses. These “swine flu” viruses also regularly infect humans worldwide, although human-to-human transmission is not as efficient as human influenza viruses.

- The current outbreak virus has elements of human, swine and avian viruses.
- Therefore the term “swine flu” has stuck in the media and public imagination largely as a result of the history and evolution of the virus, although it should simply be referred to as H1N1 influenza virus.

