Editorial

The H1N1 2009 Pandemic: Who is afraid of the big bad wolf?

For years experts have been warning of an imminent influenza pandemic. The question was when and not if. Many felt that keeping in mind the record of past pandemics, and the behaviour of the virus, an influenza pandemic was overdue. Yet, we have been relatively complacent in India. Not because we did not believe them, but because decision-makers are difficult to convince. The reasons cited were varied, which included: 'influenza is a mild illness', 'it does not occur in India', 'no one dies of influenza', 'it is self-limiting', 'times have changed and we have better drugs', etc.

However, preparations in terms of manpower training among physicians and coordination between different sectors for an influenza pandemic have been going on both globally and, to some extent, nationally. The major boost to these preparations was the emergence of a new virus in 1997—the avian influenza virus (H5N1) infection.[1] This highly pathogenic avian influenza virus (HPAI H5N1) was first reported in humans in 1997 in Hong Kong. Through migratory birds, the H5N1 virus has been causing widespread death in poultry in Southeast Asia. In 1997, when the first outbreak in humans occurred, 6 of 18 persons died with severe lower respiratory tract infection and acute respiratory distress syndrome (ARDS). This outbreak was epidemiologically linked to an outbreak of HPAI H5N1 infection in a live bird market in Hong Kong. At that time, 1.4 million poultry was culled in Hong Kong, the market was disinfected and import of poultry from mainland China was halted. The outbreak was successfully controlled with these measures.

The HPAI H5N1 virus re-emerged in 2003 in Hong Kong when 2 members of a family of 5 presented with a lower respiratory tract illness and were tested positive for the virus.[2] An 8-year-old girl from the same family died in China but was not tested. The family had visited the Fujian province in China and possibly got infected there. Since then a number of countries have reported human cases of HPAI H5N1 and the outbreak in poultry continues in many countries including India. The risk of humans getting infected with this lethal viral infection currently seems limited to persons having close contact with live infected poultry, or surfaces or objects heavily contaminated with their droppings. The virus affects the lower respiratory tract and causes severe pneumonia and ARDS with a high case fatality rate of up to 60%.[3] Of the 492 confirmed cases so far, there have been 262 deaths.[4] Although this virus did not acquire the ability for sustained human-to-human spread and therefore did not cause a pandemic, it raised the level of alertness among health planners and international organizations about the real threat of a pandemic. Many experts felt that the H5N1 virus would mutate and develop the ability for sustained human-to-human spread. It was considered the most likely strain to cause an influenza pandemic. It was also believed that this influenza pandemic would start from and have its epicentre in Asia and Southeast Asia.

For any pandemic to start 3 conditions need to be met:

1. A new influenza virus subtype should emerge, which has not been seen in humans for at least a generation.

2. The new virus should have the ability to infect and replicate efficiently in humans.
3. The new virus should have developed the ability for easy and sustained human-to-human spread.

The H5N1 virus met only 2 of the above 3 criteria and, considering the high case fatality rate with the H5N1 virus, the world was spared of much suffering.

Since the influenza virus itself behaves in an unpredictable manner, the pandemics caused by it are known to have a variable course; which is exactly what happened in the case of the pandemic H1N1 virus. In the Federal District of Mexico, authorities began detecting an increasing number of cases with an influenza-like illness starting 18 March 2009.[5] The number of patients rose steadily; many of them developed pneumonia and there were a number of deaths. This led to a panic-like situation in Mexico in April 2009. The infection was identified to be due to a novel swine-origin influenza A H1N1 virus. This virus fulfilled all the 3 conditions needed to start a pandemic, and it spread quickly.[6] On 25 April 2009, the WHO declared a public health emergency of international concern and, on 26 April 2009, the USA declared a public health emergency. On 26 April 2009, the WHO raised the pandemic influenza from phase 4 to 5 indicating that human-to-human transmission of the virus was occurring in at least 2 countries in one WHO region. By June 2009, the infection had spread to multiple WHO regions and, on 11 June 2009, the WHO raised the pandemic alert to the highest level of phase 6.[7] By 11 October 2009, there were 399 232 confirmed cases infected with the pandemic H1N1 2009 virus, 4735 people had died and the virus had spread to 191 countries.[8] The number of people infected by the virus is likely to be higher as many individuals who had a mild infection may not have reported for testing and also many countries have now stopped routine testing. This virus has therefore emerged as a true pandemic virus of this century.

Physicians regard influenza as a mild, self-limiting infection, not very serious in tropical countries and wonder what all the fuss is about. However, influenza can be a serious respiratory illness which can be debilitating and also associated with hospitalization and mortality, especially in the elderly. The annual seasonal influenza is believed to cause 3–5 million cases of severe illness and 300 000–500 000 deaths. The risk of a serious illness and death is more among the elderly (>65 years), young children (<2 years) and those with chronic co-morbid conditions such as chronic obstructive pulmonary disease (COPD), diabetes, chronic heart disease, etc. Thus, it is a misconception that influenza is always a mild illness; influenza infection can be serious and fatal depending upon the virulence of the virus and the immunity of the host.

When a pandemic virus emerges it can be associated with a more serious illness. As this is a new virus to which no immunity is present, it affects all age groups. Pandemics occur due to a major change in the virus—the antigenic shift. In contrast, seasonal epidemics occur due to a minor change—the antigenic drift. When pandemics occur, they spread rapidly around the world and in successive waves causing morbidity and mortality. Influenza pandemics are uncommon events occurring every 10 to 50 years and have been documented since the sixteenth century. In the past 400 years there have been at least 31 pandemics.[9] Three influenza pandemics occurred during the past century with variable rates of mortality. The 1918 pandemic, regarded as the 'mother of all pandemics', was caused by an H1N1 strain of avian origin.[10] It occurred in 3 distinct waves in 1918 and 1919. The first wave started in the spring of 1918 and was not associated with a high rate of mortality although the virus was highly contagious and spread quickly (considering that travel was only by sea). The second wave that began in September of 1918 was not only severe, it inflicted a high mortality; about 50 million people died—more than the deaths in World War I.[10] Individuals died of primary viral pneumonia and secondary bacterial pneumonia. The next pandemic occurred in 1957 and was caused by the H2N2 strain. This new strain emerged due to re-assortment of 3 genes from avian viruses.[11] This pandemic was milder and the mortality much lower. The deaths occurred mainly in infants and older people. The global mortality due to this pandemic was estimated to be about 1–2 million.[12] The last

pandemic of the twentieth century occurred in 1968 and was also a mild one. This pandemic occurred due to the emergence of an H3N2 strain.[11] The mortality due to this pandemic was estimated to be about 1 million.[12,13]

The last 2 pandemics have been milder and we are better prepared than ever before. Does this mean that the current pandemic will also be a mild one and we will be able to control it quickly. This question is difficult to answer. The WHO acknowledges that H1N1 has been the fastest spreading pandemic ever and we will not be able to contain it. This new pandemic virus will spread around the globe in waves and will eventually reach everyone. It will infect almost every human being within a few years. The pandemic is unstoppable. We need to understand that we cannot contain the pandemic and any effort in this direction will be futile. The focus should be on decreasing morbidity and mortality by identifying high risk groups so that they can be treated as early as possible. As in the Walt Disney animation *Three little pigs* (not swines) we need not shout that we are not afraid of the big bad wolf, but, like the hard-working practical pig, be resourceful and use our means to be prepared in case subsequent waves of the current H1N1 influenza pandemic become more lethal.

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