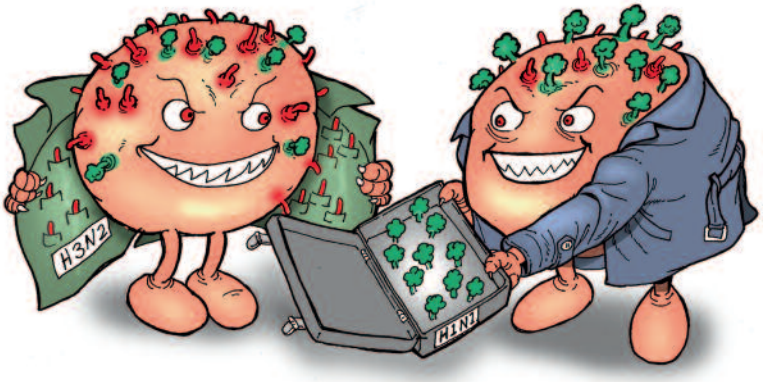
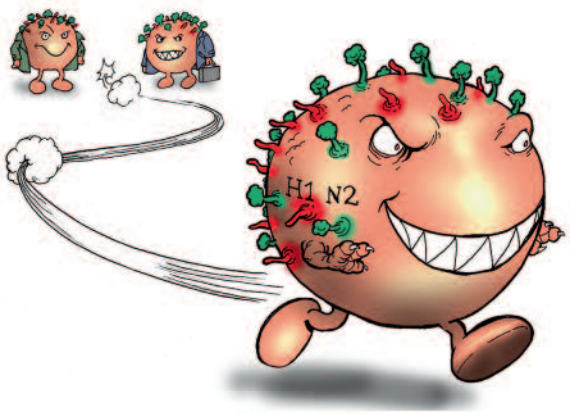
INFLUENZA: What Lies Ahead?

This disease knows no international boundaries and kills more people than war or terrorism. There were more than 2.8 million new cases of it in Japan in the first week of February 2018. The Centre for Disease Control (CDC) reported 4000 deaths weekly due to it and its complications in the USA. In Hong Kong, schools were shut early for the Chinese New Year [16 Feb 2018] after an outbreak claimed over 120 lives. This year it is reported to be the worst outbreak since 2010 with mostly children and the elderly affected. No, we are not talking of a frightening new disease. In fact we are talking of the wily foe which annually somehow manages to outfox and outwit us by being able to undergo subtle changes that counters medical science's best attempt to curb its rampant spread. We are talking of the influenza virus.

Despite all our technological advancements and surveillance abilities, mankind has not been able to accurately predict a single severe pandemic. This year is a stark reminder that 100 years ago the devastation of the 1918 Spanish Flu was evident worldwide. It is conservatively estimated that more than 50





TRAVEL MEDICINE

By Dr Salim Parker
SASTM Past President

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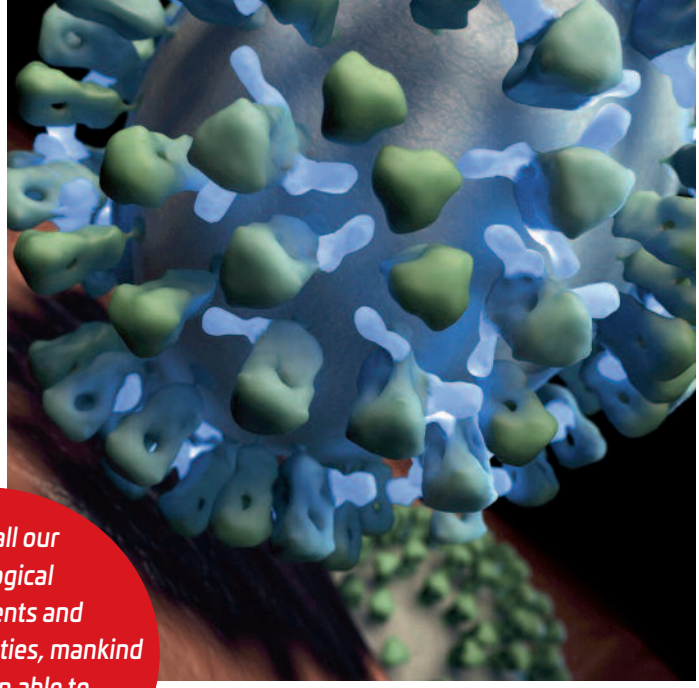

million humans lost their lives due to the disease with about 10 million fatalities in India. South Africa was the fifth most severely affected country with close to 500 000 deaths. Two waves were recorded in our country starting from Cape Town and Durban. The well-developed rail and sea transport system at that time facilitated the spread of the pandemic. Since the disease primarily affected young adults aged between 18 and 40, a staggering 900 000 children were orphaned in our country.

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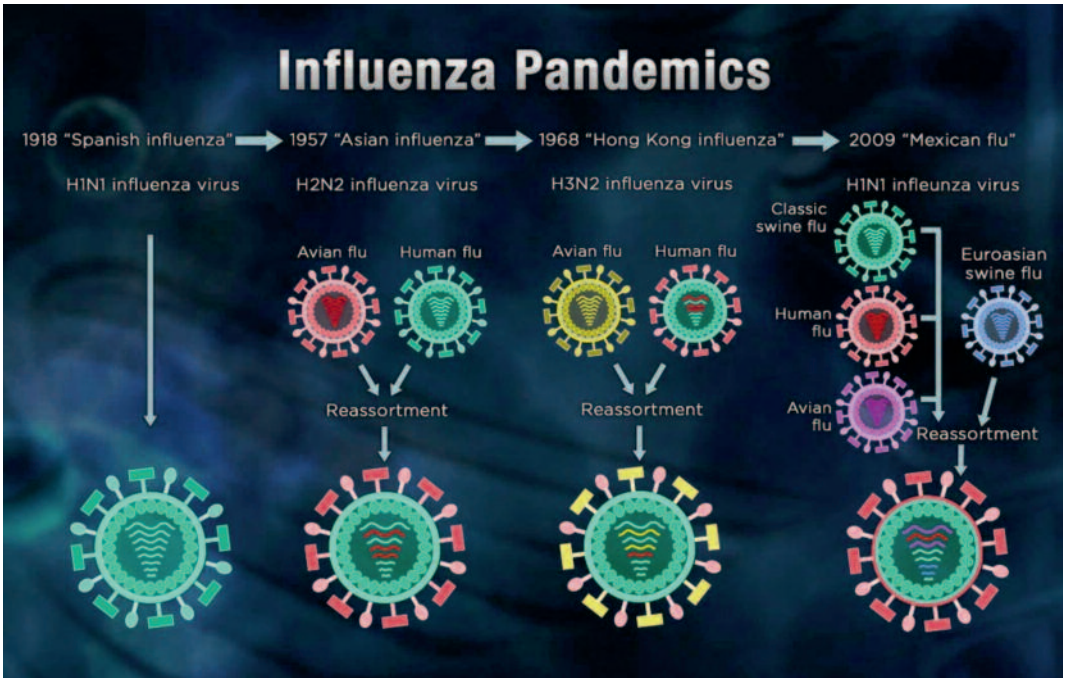
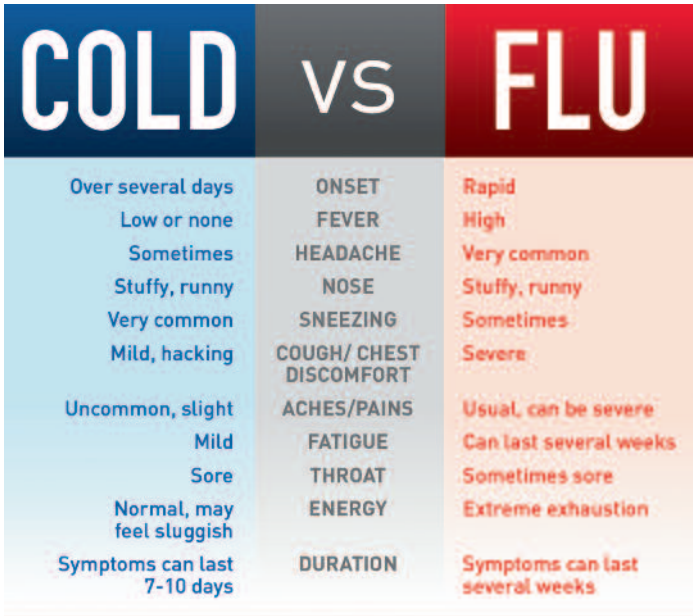
It was always considered that most pandemics would originate from Asia. Most of the earth's land mass and population is found there and close interaction between humans and animals most commonly occurs there. The 1957 pandemic spread from mainland China and spread wordwide within 6 months. The 1968 one started in Hong Kong and rapidly spread. Avian influenza, more commonly known as bird flu, has been known to affect wild birds and poultry on the Chinese mainland. These viruses, such as H5N1, occasionally crossed the species barrier and infected humans. When this happened, H5N1 had a 50% mortality in humans. Because of the frequent



interactions and numbers of humans and birds in the northern hemisphere, the rationale was that one of these influenza viruses would mutate into a virulent form and start the next human influenza pandemic.

Again the virus was able to outmanoeuvre the unsuspecting human race. The H1N1 pandemic of 2009 started in Mexico in about March and very rapidly spread along the international travel routes. Since the vast majority of flights departing Mexico flew to North America and Europe, the disease, called swine flu, first manifested there before spreading to the rest of the world. By July 2009 virtually all countries had reported cases. Computer modelling has shown that stopping the spread would have been near impossible. If for example travel out of Mexico was curtailed by 40%, the rate of the spread of swine flu would have been delayed by only two days. If the traffic out of Mexico was decreased by 90%, the rate would have slowed by only two weeks!

We are discovering more and more about this fascinating virus. A type called H11N2 was discovered in Antarctica in 2014. What was fascinating about this virus was that it contained genetic material from strains found in the northern and southern hemispheres. It has been postulated that migratory birds such as the giant petral flies thousands of kilometres from Antarctica to Central America and acquires different influenza strains there and then takes it back to the frozen wastelands where the different viruses mutate and exchange genetic material. The potential exists that one of these mutated strains may be extremely infective in humans and, if it is carried somehow to large settlements, may initiate the next pandemic. Of concern is that the first human case of H7N4, which occurs in birds, was documented on 14 February 2018. In March 2018 a H1N2 specie that most likely resulted from the genetic interchange between the current circulating H1N1 and H3N2 strains was described.



Cold versus flu pic is from: httpcdtdesign.comwordpress20180126fhw-cold-flu-prevention-campaign

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The swine flu pandemic also shed some important light on animal-human virus transmission. It is now known that humans transmit far more influenza viruses to swine than swine transmit to humans. Human-to-swine transmission is actually the key to the evolution of influenza diversity in swine and in effect, humans sow the seeds of future pandemics by infecting swine.

Influenza is often considered a trivial disease but the South African death statistics tell a different horrifying story. Tuberculosis is still the number one killer in our country. Influenza and pneumonia, which is grouped as one entity for death statistics purposes, has been the second leading cause of death from 2009 till 2013. The introduction of a very effective vaccine against pneumonia had led to

influenza/pneumonia falling to the 6th leading of death by 2015. But statistics can be deceiving. Diabetes was the leading cause of natural deaths in South African ladies in 2016. We have to consider the relationship between diabetes and influenza as the effects of high blood glucose levels predisposes to infections and its complications.

Diabetes mellitus has been associated with a worsened outcome of influenza as it tripled the risk of hospitalisation following infection. It also quadrupled the risk of intensive care unit admission once hospitalized. Influenza vaccination reduced hospitalisation of working-age persons with diabetes mellitus by 79%. Influenza vaccination was associated with a significant decrease in risk for hospital admission due to stroke, heart failure, and influenza or pneumonia in one study. Patients suffering from other medical conditions such as heart failure also benefit from vaccination as deaths due to influenza related complications decreased by up to 50%. There is an association between influenza and acute myocardial infarctions. Asthma sufferers have more severe effects due to influenza infection and vaccination has been proven to be associated with better outcomes.

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The cost to the economy during the winter season can be staggering. In 2013 the direct and indirect costs was 26 billion dollars for the 8 million afflicted in the USA. For 2018 36 million cases were postulated, leading to 750 000 hospitalisations and 56 000 deaths at a cost of 87 billion dollars. Preventing an epidemic through vaccination would be about one tenth of the cost of managing an outbreak. Influenza vaccination should be high on the priority list for most citizens, especially those at high risk.