



EPHA Briefing for members

Subject	FAQ on Pandemic Influenza
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Table of Contents

1. What is Influenza?	p.2
2. What is the difference between a seasonal epidemic and a pandemic?	p.2
3. How do pandemic influenza viruses appear?	p.3
4. How many pandemic outbreaks did we experience during the 20th century?	p.3
5. Why is there so much concern about Avian Flu (H5N1)?	p.3
6. Will the next pandemic be worse than previous outbreaks?	p.4
7. Are vaccines useful in averting an influenza pandemic?	p.5
8. Are these drugs available for prevention and treatment?	p.6
9. How can we get prepared?	p.6

Many experts regard the prospect of a new influenza pandemic as the most significant global public health emergency caused by a natural pathogen. Given the current threat caused by the “Avian Flu” outbreaks in Asia, the WHO considers that the world is closer to a global an influenza pandemic than at any time since 1968.

The inescapable fact is that another influenza pandemic will occur in the foreseeable future with the potential to infect globally. The magnitude of such a pandemic is unpredictable. Estimates of the potential impact of the next influenza pandemic vary greatly. Even in the best case scenarios, 2 to 7 million people would die and hundreds of millions would require medical attention at a world-wide level.

This briefing aims at providing an a basic overview of pandemic influenza.



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1. What is influenza ?

Influenza is an acute respiratory illness (ARI), caused by a virus that attacks mainly the upper respiratory tract. It can cause mild to severe illness, sometimes leading to death. Influenza epidemics occur every year affecting 5-15% of the worldwide population. The annual death toll is difficult to assess (in particular given the lack of data from developing countries), but it is estimated to be between 250 000 and 500 000 people¹.

2. What is the difference between a seasonal epidemic and a pandemic ?

Two types of influenza are responsible for epidemic and pandemic diseases. These are classified as Influenza Virus Type A and B. Within those two types, there are many different subtypes. They differ according to the proteins on the surface of the virus (HA Haemagglutinin - 15 HA subtypes - and NA Neuraminidase - 9 NA subtypes -). This gives a possible 135 combinations of influenza strains.

This genetic instability allows frequent minor genetic changes (known as “antigenic drift”) that require bi-annual reformulation of trivalent (ie tackling three strains) influenza vaccines. So far, only influenza A has undergone major genetic changes (“antigenic shift”), which creates a new subtype to which the population has little or no immunity. It results in global pandemic (an epidemic over a wide geographic area and affecting a large proportion of the population).

Researchers have identified three essential prerequisites for the start of a pandemic. First a novel virus subtype must be transmitted to humans. Secondly, the new virus must be able to replicate in humans and cause disease and thirdly, the new virus must be efficiently transmitted from human to human.

¹ Source : [WHO fact sheet n° 211](#) – March 2003



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3. How do pandemic influenza viruses appear ?

Many experts believe that the main reservoir for Type A influenza viruses is wild birds, but influenza A viruses also infect animals such as pigs and horses. The last two pandemic viruses were combinations of bird and human influenza viruses. These novel viruses probably emerged when an intermediate host, such as a pig, was infected by both human and bird influenza A viruses at the same time.

Sometimes, an avian influenza virus can "jump the species barrier" and move directly from chickens to humans and cause disease, alike the current H5N1 avian flu. The severity of any human pandemic depends on the ability of the virus to successfully adapt and cause human to human transmission.

4. How many pandemic outbreaks did we experience during the 20th century ?

There were three occasions when human influenza pandemics occurred. Most famously the Spanish flu of 1918-19, which killed up to 40 million people. The South East Asia flu pandemic of 1957 resulted in the estimated deaths of 2 million people and 1968 saw the rise of the 'Hong Kong Flu' which led to 1 million deaths.

5. Why is there so much concern about Avian Flu (H5N1) ?

The recent emergence and subsequent widespread distribution of an avian influenza virus H5N1 which originated in Hong Kong has the potential to ignite the next 'pandemic'.

This virus H5N1, met all of the pre-requisites² for the start of a pandemic except the final one. The first instance of probable human-to-human transmission was reported in September 2004 in Thailand. Although this event appears to be isolated, experts doubt that this can be the only such case and that other cases may not have been identified and reported.

As of June 2005, 54 of the 108 individuals identified as being infected by the virus had died. The victims have been mainly young, healthy adults and this is puzzling the scientific experts. Paradoxically, experts raise the alarm bell because they have monitored fewer fatal cases. It should

² See point 3 for more precision.



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be remembered, however, that an avian influenza virus would probably lose pathogenicity when it acquires the improved transmissibility needed to ignite a pandemic, according to the WHO.

The H5N1 virus is now endemic in many south-Asian countries and the goal is no longer eradication but rather containment. Although first identified in 1997, the H5N1 avian flu virus has changed since 2004 to become more pathogenic, it survives several days longer, has been found in mammals and can be asymptomatic - 1/3 of domestic ducks in Thailand are reportedly infected without developing any obvious signs.

6. Will the next pandemic be worse than previous outbreaks ?

It is hard to predict the extent of a future pandemic because :

1. Significant details about past pandemics are disputed, the most precise predictions are based on the pandemic of 1968, but estimates of that death toll range from 1 – 4 million.
2. The world has changed greatly since the time of the last pandemic. Health care and nutrition have improved but this is countered by the explosion in global travel which facilitates the spread of the virus.
3. Nobody knows how pathogenic the future pandemic virus will be and which age groups are most likely to be affected.
4. The level of preparedness at the time of the pandemic will influence the death toll.

However, modelling studies suggest that its effect could be severe: up to 7 million deaths, 125 to 500 million ill people, up to 1600 million people requiring medical care and between 6 to 28 million hospitalisations worldwide according to Klaus Stöhr, head of the World Health Organisation Global Influenza Programme.

7. Are vaccines useful in averting an influenza pandemic ?

Vaccines will be the most important instrument to reduce mortality and morbidity. A mass-vaccination strategy will be required and all countries will need rapid and immediate access to vaccines. This need will not and cannot be met. Current manufacturing capacity can cover less than 5% of the



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world's population according to the WHO.

If a novel strain occurs without adequate warning, the optimistic scenario indicates that it will take at least 6 months to develop a vaccine and many more months for adequate production. In case of a pandemic, a monovalent vaccine would be produced, tackling only the pandemic strain. However, in order to boost the immunological response, adjuvants (chemical additives) can be added to the vaccine. If a monovalent adjuvanted vaccine is produced, annual production capacity could rise to an estimated 6 billion doses a year³. However, if adjuvants and the vaccine are not balanced, two doses of vaccines may be required to prove efficacy.

In addition, there are several major obstacles for vaccine production such as limited manufacturing capacity, technological challenges and higher bio-safety requirements. The vaccines cannot be stockpiled in advance because new vaccines need to be produced to match the genetic characteristics of the specific virus.

Fertilized chicken eggs are used as the growth medium for flu vaccines and this will continue to be the case in the near future. Most of the world's egg-driven influenza vaccines (90%) are produced in developed countries. "Reverse genetics" technology can also be used but this raises issues of intellectual property rights and in Europe, it is considered as a GMO, thus introducing additional biosafety requirements.

8. **Are there drugs available for prevention and treatment ?**

Because of the delays in developing and manufacturing an appropriate vaccine, the first line of defence will be provided by antivirals, although their efficacy and therapeutic benefits still need to be proven. However, they are not a substitute for vaccination.

They may play two different roles : help prevent infection, and if infection has already taken hold, their early administration may reduce the duration of symptoms. In the absence of vaccines, they will be the only medical intervention for providing both protection and therapeutic benefits. Therefore, stock-

³ Source of figures and estimates : [WHO consultation](#) on priority public health interventions before and during an influenza pandemic – 16-18 March 2004



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piling antivirals in advance is the only way to ensure that sufficient supplies are available at the start of a pandemic.

9. How can we get prepared ?

An influenza pandemic will affect medical services and other essential community services such as public transport, police, fire brigades, traffic control, teachers, petrol stations. It has the potential to ignite social and political disruption and cause considerable economic losses.

Adequate planning can greatly mitigate the impact through addressing five main components, as assessed by the WHO⁴ :

- Preparing and planning;
- Detection and surveillance;
- Case investigation and treatment;
- Preventing the spread of the disease throughout the countries;
- Maintaining essential services, including healthcare;
- Research and evaluation;
- Implementation, testing and revision on plans.

Those five key steps are to be implemented at national, EU and international level.

⁴ [WHO checklist](#) for influenza pandemic preparedness planning