

BACKGROUND TO PANDEMIC INFLUENZA

Disease Definitions

Seasonal Influenza

Ordinary seasonal flu occurs every year, usually during the winter. For most people it is an unpleasant but relatively minor illness. As the virus causing ordinary seasonal flu circulates every year, most people build up some immunity to it, although the virus changes slightly every year. A vaccine is available against the currently circulating virus and this is routinely offered to the groups of people who are more at risk than others, including older people and people with long-term health conditions. It is important that these groups get their flu jabs every year, but the seasonal flu vaccine protects people from seasonal flu only.

Pandemic Influenza

Pandemic Influenza occurs when a completely new flu virus emerges somewhere in the world, which affects humans and can spread easily from person to person. As the strain is new, virtually no-one has any natural immunity to the virus. As a result, Pandemic Influenza is more serious than 'ordinary' winter flu and more people become ill. The symptoms are likely to be the same as those of ordinary flu but tend to be more severe because no-one has any natural protection.

What is The Probability of a Pandemic Influenza Outbreak in the UK?

For Planning Assumptions: ~100%

Previous worldwide Pandemics have occurred in the last century in 1918/19, 1957/58 and 1968/69. It is, therefore, 35 years since the last Influenza Pandemic.

Although Pandemic Influenzas are, chronologically, quite rare, the weight on the Department of Health and international expert opinion suggests, that it is "inevitable" that a new or novel Influenza viral strain will evolve and become Pandemic (including the UK) in the near future.

When it is Likely to Happen?

As stated, the probability, year on year, of a Pandemic Influenza is increasing.

There is unstoppable, continual genetic evolution of Influenza viruses within host species (of interest to humans, within birds and pigs), sometimes resulting in a particularly virulent strain, such as the virus that caused the 1918 Pandemic, which originated in birds. The Influenza strain A/H5N1 is currently spreading through wild birds and poultry in a number of countries worldwide and increasingly closer to the UK. Outbreaks in several countries in South Asia (causing high case fatality rates in humans in excess of 50%) and in poultry and wildfowl in China, Russia, Turkey, Greece, Croatia, Germany and Romania are giving experts major cause for concern.

Whilst A/H5N1 may never acquire the genetic ability to cause a Pandemic, the virus has shown the “ability” to adapt and jump between species and is increasingly showing signs of adapting specifically to humans. If it acquires the ability to travel from person-to-person, it may cause a global Pandemic (dependent upon disease virulence and the ability of Healthcare professionals to control disease outbreaks).

Who is Most at Risk?

Those most at risk from the usual winter related viruses are the elderly, the very young, people with chronic pulmonary disorders and immuno-suppressive illness. These groups will also be vulnerable to Pandemic Influenza. However, the exact attack characteristics of Pandemic Influenza disease within humans will be unknown until the Pandemic virus is identified and studied. Those people whose professions place them in direct contact with infected patients will also be at increased risk.

Are there any Drugs Available to Help?

There are two main medicinal aspects to a Pandemic Influenza outbreak of interest to Local Authorities, Vaccines and Antiviral Drugs.

Antivirals (Tamiflu)

Medical opinion, based upon the likely virus to cause the next Pandemic is that a drug called **Tamiflu**, produced by Roche and used to treat normal influenza, will be the most effective antiviral drug against the Pandemic strain. Antiviral drugs are designed to lower the viral load in the body. Medical evidence based on normal flu shows that it is effective in lessening the severity of symptoms (and therefore complications and hospitalisations) and shortening the illness (by about a day); it does not *cure* the illness. Those taking them may still be ill for around one week or more, and consequently absent from work. Antiviral drugs need to be taken as early as possible after symptoms first start, preferably within 48 hours of onset.

Tamiflu (medical name Oseltamivir) is a “neuraminidase inhibitor” used in the treatment and prophylaxis of both Influenza A and Influenza B type infections. How effective it will be against a novel virus will not be certain until the Pandemic virus is circulating.

The UK Government has ordered a stockpile of 14.6 million courses of Tamiflu which will be in place by September 2006. This is enough Tamiflu to treat 25% of the population with one course of treatment, in line with Department of Health estimates of the highest likely number of people who will become ill (this percentage is known as the Clinical Attack Rate (CAR)).

If a Pandemic were to emerge before the antiviral stockpile was complete, available supplies would be prioritised to treat health workers and the vulnerable (ie priority medical groups) first. As further drugs became available, they would be offered to treat those who became ill.

Vaccine

Standard influenza vaccines are manufactured specifically to develop immunity for a specific viral strain and therefore can only be made after the virus causing the Pandemic is identified. Alternative vaccine production methods may, once developed, shorten the lead-time for vaccine availability, but at this stage, for planning assumptions (and in all likelihood in reality), it is **very** unlikely that there will be a vaccine in the Pandemic first wave.

Vaccine, when it becomes available during the second wave of a Pandemic will in all likelihood be supplied in batches. It is, therefore, possible that the Local Authority might have the opportunity to use limited vaccine strategically in order to protect key mission critical functions (along with the utilisation of naturally immune workers who were infected in Wave 1).

Potential Impacts

Projected Absenteeism Rates

Using HPA Clinical Attack (CA) rate estimates, approximately 25% of Local Authority workers will present with clinical symptoms of disease. Another 25% will carry the virus but be asymptomatic. It should be assumed, given that at best, influenza is a severely debilitating (albeit short-term and self-limiting) illness, that this proportion will be almost entirely absent from their place of work.

As individual susceptibility to infection is totally unpredictable, it is prudent to make the assumption that *all* members of staff could potentially become ill at some stage throughout the Pandemic period (multiple waves). The HAP are working on the assumption of a 25% Clinical Attack Rate (CAR) is an educated estimate and cannot, therefore, be used to make any accurate estimates that impact that Pandemic Influenza will have in a particular department. Cabinet Office guidance emphasises the importance of flexibility for catering with a range of possible CAR scenarios (See Table 1).

It is theoretically entirely possible that *all* members of staff within (especially) small departments could become infected with Pandemic Influenza at the same time, even if measures are put in place to prevent this (such as remote working or staggered work-times).

Central Government guidance states that as a rough working guide, Local Authorities should have plans able to deal with up to 15% increase in absenteeism over the 2-3 week peak of a Pandemic. Small teams should plan for up to a 30% loss at the peak.

To provide maximum resilience within small mission critical teams, it would be prudent to plan for **100%** absenteeism over a 2-3 week period (this may be achieved by incorporating strategies such as job-shadowing, detailed written procedure guides etc.

For departmental planning assumptions it is, prudent for Local Authority departments to analyse the effects of a severe loss of staff at varying levels, from 10% to 40% at any one time and ensure that small, or highly vulnerable units are adequately protected through, for example, work-shadowing or through utilisation of other techniques.

Projected Mortality

It is not possible to accurately predict the level of excess mortality that will be experienced in the next Pandemic until the virus causing the Pandemic is identified and studied (this will be at the early stages of the Pandemic itself). For planning assumptions, however, the DoH have produced a table (below) illustrating the range of excess mortality that needs to be considered based on various combinations of case fatality rate and clinical attack rates.

Recent advice from DoH has recommended that the statistics of a Clinical Attack rate of 25% (a 50% Clinical Attack Rate is regarded as the worst case scenario) and a Case Fatality Rate of 2.5% (analogous to the 1918 Pandemic) are used as a planning assumption.

Overall Case Fatality Rate	Dton	Durham & Dton	Dton	Durham & Dton	Dton	Durham & Dton
	10%	10%	25%	25%	50%	50%
0.37%	26	219	90	548	181	1095
1.00%	98	592	245	1480	489	2960
1.5%	147	888	367	2220	734	4440
2.5%	245	1480	611	3700	1223	7400

*Table 1
Health Protection Agency Projected Case Fatality Estimates (HPA 2005)*