

3 Planning assumptions and presumptions

3.1 Key planning assumptions

The precise characteristics and impact of an influenza pandemic will only become apparent as the virus emerges. Therefore, some assumptions about a pandemic's course – and presumptions as to the UK's likely response in a number of key areas – are necessary to describe the impact the Government is currently planning for. Although these are included in the relevant parts of this framework, they are summarised here for ease of reference. The use of common assumptions and presumptions across all public and private sector organisations avoids confusion and facilitates integrated preparation. Given the uncertainties, these should be regarded as working estimates rather than predictions. Response arrangements must be flexible enough to deal with a range of possibilities and be capable of adjustment as they are implemented. If the origin of a pandemic is outside the UK, emerging surveillance data might also allow the use of real-time modelling to confirm and/or refine these assumptions and presumptions.

3.1.1 Origins of a pandemic

- A pandemic will be caused by a new subtype of the influenza A virus.
- The emergence of new influenza A viruses is highly probable.
- The virus may be a re-emerging, previously known human subtype that has not recently been in circulation, or a new virus – most likely of avian origin – emerging either through stepwise adaptation conferring greater affinity for people or through a process of genetic re-assortment between the genes of an avian and a human virus.
- From time to time, avian influenza viruses will infect people directly exposed to infected poultry or animals but will not necessarily evolve into pandemic viruses.
- A new strain is likely to transmit more easily to people if it contains genetic material from a human influenza virus.
- Although an influenza virus with potential to cause a pandemic could develop anywhere, it is most likely to emerge from South East Asia, the Middle East or Africa.
- The close proximity of humans to poultry, pigs and domestic animals in many parts of the world facilitates mingling of human and animal viruses and increases the risk that these may then exchange genetic material, resulting in a new re-assorted human strain. The wide dissemination of the A/H5N1 virus in domestic poultry and waterfowl provides one seedbed for such re-assortment, but such viruses may also re-emerge from unrecognised or unsuspected reservoirs in other animal species.

- Whenever such a virus, or another new influenza virus, is isolated following human infection, its potential to spread directly from person to person and cause outbreaks of illness needs assessment.
- False alarms are likely but the pandemic potential of a new virus must remain under consideration until it can be determined whether person-to-person transmission has occurred. Such investigations will inevitably consume resources.

3.1.2 Timing and duration

- A future influenza pandemic could occur at any time. Intervals between the most recent pandemics have varied from about 10 to 40 years with no recognisable pattern, the last being in 1968/69.
- A new virus may emerge at any time of the year.
- Initially, pandemic influenza activity in the UK may last for three to five months, depending on the season. There may be subsequent waves, weeks or months apart.

3.1.3 Geographic spread

- Although it may be theoretically possible to contain the initial spread of a pandemic virus originating in rural parts of Asia, the Middle East or Africa, the measures required to do so are likely to prove difficult to implement.
- In the event of a new influenza virus causing significant outbreaks of human illness elsewhere in the world, it is unlikely that the UK could prevent importation except by closing all borders entirely – modelling suggests that even a 99.9% restriction on travel into the country could only be expected to delay importation of the virus by up to two months.
- Spread from the country of origin is likely to follow the main routes of travel and trade.
- Increasing use of routes where surveillance is not as well developed may result in the failure to document the early stages of a virus's spread.
- Spread from the source country to the UK through movement of people is likely to take two to four weeks. Experience of the dissemination of severe acute respiratory syndrome (SARS) from Hong Kong suggests modern travel may result in even more rapid international spread.
- From arrival in the UK, it will probably be a further one to two weeks until sporadic cases and small clusters that will act as initiators of local epidemics are occurring across the whole country.

3.1.4 Infectivity and mode of spread

- Influenza spreads through the respiratory route by droplets of infected respiratory secretions which are produced when an infected person talks, coughs or sneezes.
- It may also spread by hand-to-face contact after a person or surface contaminated with infectious respiratory droplets has been touched.
- Finer respiratory aerosols (which stay in the air for longer and are therefore more effective at spreading infection) may occur in some circumstances.
- The incubation period is in the range of one to four days (typically two to three).
- People are highly infectious for four to five days from the onset of symptoms (longer in children and those who are immunocompromised) and may be absent from work for up to ten days.
- Children have been shown to shed virus for longer and at higher levels than adults.
- Some people can be infected without showing symptoms, but nevertheless may shed the virus and therefore be able to pass on the infection.
- Without intervention, and with no significant immunity in the population, historical evidence suggests that one person infects about 1.4 to 1.8 people on average (the R_0 or 'basic reproduction number'). This number is likely to be higher in closed communities such as prisons, residential homes or boarding schools.

3.1.5 Clinical attack rate, severity of illness and deaths

- Important differences are likely in the incidence (clinical attack rate), age distribution and severity of illness – including the number of deaths attributable to influenza (case fatality rate) – compared with annual seasonal influenza. These will not become apparent until person-to-person transmission starts and epidemiological data become available.
- Most people will be susceptible but not all will develop clinical illness. Previous experience suggests that roughly equal numbers will be infected but have no symptoms (be asymptomatic) as will develop symptomatic infection.
- All ages are likely to be affected but children and otherwise fit adults could be at relatively greater risk as older people may have some residual immunity from previous exposure to a similar virus earlier in their lifetime.

- Any age-specific differential attack rate will affect the overall impact. If working-age adults are predominantly affected, this will have a more direct impact on provision of services and business continuity, whilst illness in very young children and older people is likely to have an indirect impact and will present a greater burden to health and social services.
- Although the potential for age-specific differences in the clinical attack rate should be noted, they are impossible to predict, and a uniform attack rate across all age groups is assumed for planning purposes.
- More severe illness than the usual seasonal influenza is likely in all population groups – rather than predominantly in high-risk groups as with seasonal influenza – with a higher number of people than usual developing severe prostration and rapidly fatal overwhelming viraemia, viral pneumonia or secondary complications. It is not possible to give numbers in advance.
- In previous pandemics, the overall UK clinical attack rate has been of the order of 25% to 35%, compared with the usual seasonal range of 5% to 15%.
- Cumulative clinical attack rates of up to 50% of the population in total are possible, spread over one or more waves of around 15 weeks, each some weeks or months apart. If they occur, a second or subsequent wave could possibly be more severe than the first.
- The actual incidence (clinical attack rate) of illness will only become evident as person-to-person transmission develops, but response plans should recognise the possibility of a clinical attack rate of up to 50% in a single-wave pandemic.
- Up to 4% of those who are symptomatic may require hospital admission if sufficient capacity were to be available.
- Mortality due to pandemic influenza is expected to be much higher than in inter-pandemic years, when an average of 12,000 influenza-related deaths are estimated to occur in England and Wales each year.
- The UK case fatality rate in previous pandemics was between 0.2% and 2%.
- The reported mortality for humans infected with the A/H5N1 avian virus is currently over 50% but it should be noted that this is primarily an avian virus with its own specific characteristics and treatment has often been delayed.
- Diverse views regarding the link between virulence and ability to transmit between humans have been published, although a majority of scientists currently believe virulence to be independent of transmission ability.

- The likelihood of the current (avian) A/H5N1, or any other virus, developing pandemic potential cannot be quantified. In the face of these uncertainties, most experts agree that accepting the evidence from previous influenza pandemics suggesting a maximum case fatality of 2.5% is a reasonable worst case scenario (as distinct from a worst case scenario) for planning purposes.
- To inform planning, the following table shows the potential impacts of a 25%, 35% and 50% clinical attack rate and overall case fatality rates of 0.4%, 1%, 1.5% and 2.5% of those with influenza symptoms.

Table 1: Range of possible excess deaths for various permutations of case fatality and clinical attack rates, based on UK population

Overall case fatality rate (%)	Range of possible excess deaths in the UK		
	25% clinical attack rate	35% clinical attack rate	50% clinical attack rate
0.4	55,500	77,700	111,000
1.0	150,000	210,000	300,000
1.5	225,000	315,000	450,000
2.5	375,000	525,000	750,000

3.2 UK planning presumptions

Table 2 outlines the UK's current planning presumptions for developing response plans and maintaining essential services during an influenza pandemic. These presumptions are based on provisional decisions by ministers and current planning across essential services, using information and planning assumptions published in previous versions of the *UK health departments' UK influenza pandemic contingency plan* (March and October 2005) and the Cabinet Office's *Guidance on contingency planning for a possible influenza pandemic* (February and July 2006), which included advice on peak staff absences based on a 50% clinical attack. These presumptions will be revised regularly and reviewed when the nature of any pandemic virus is known, and may be altered because of international actions or evolving advice from WHO.

The Cabinet Office's *Guidance on contingency planning for a possible influenza pandemic* is available at www.ukresilience.info

Table 2: UK planning presumptions

Area of policy response	WHO Phase 4	WHO Phase 5	WHO Phase 6	
	Small cluster of cases with limited person-to-person transmission	Large cluster(s) of cases with person-to-person transmission	Increased and sustained transmission in general population (pandemic confirmed)	
			UK alert level 1	UK alert levels 2–4
			Cases outside the UK	Outbreaks in the UK
Transport/travel				
Foreign and Commonwealth Office (FCO) travel advice for other countries	FCO travel advice will take as its starting point the advice issued by WHO at each stage of a developing pandemic. British missions overseas will consider a full range of options for informing British nationals of the developing situation and its associated risks. This will include ensuring that British nationals continue to monitor FCO travel advice. From WHO Phase 4, the FCO will recommend that British nationals in affected and neighbouring countries consider returning to the UK.			
	Advice against non-essential travel to affected and neighbouring countries.			
	If the situation in a country is judged severe enough to significantly affect British nationals (eg the healthcare system is unable to treat them or there has been a breakdown in law and order), a decision may be made to advise against all travel. Where possible, travellers will be given a timeframe for moving, from advising against all but essential travel to advising against all travel, based on the predicted spread of the pandemic. Such a decision would be subject to agreement between the FCO, the Department for Transport and the Department of Health and would be subject to ministerial clearance.			
International travel restrictions/Border closures	The possible health benefits that may accrue from international travel restrictions or border closures need to be considered in the context of the practicality, proportionality and potential effectiveness of imposing them, and balanced against their wider social and economic consequences. Given the complexity of this issue, the Government will keep under review the evidence on the benefits and disadvantages of various approaches.			
Airport closures	No imposed closures in the UK (subject to the above) but airports may find they have operational difficulties in Phase 6 if staff are absent and/or if airports or carriers overseas have operational difficulties or close.			
Health screening	Based on available evidence, no entry or exit screening will be imposed in the UK. If recommended by WHO, or if other countries impose requirements (such as requiring outgoing flights to undergo exit screening), the Government will consider screening on a case-by-case basis, bearing in mind the lack of evidence to support it.			

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Financial assistance to airlines/travel industry	No plans for government assistance. Subject to the extent of impacts, the Government may consider assistance at the time and/or during the recovery phase.			
Domestic travel restrictions	Business as usual.		Subject to the nature and spread of virus, the Government may advise against non-essential travel but will not impose restrictions.	
Hygiene measures on public transport	Public advice from the Department of Health and the HPA will encourage general good hygiene practice in reducing the spread of infectious diseases, eg regular hand washing.		Advice to keep using public transport whilst adopting good hygiene measures and staggering journeys where possible.	
International				
Repatriation issues	Subject to the extent of disruption to air travel, British nationals may be stranded overseas at any phase (although this is more likely at Phases 5 and 6). Given the potential scale and number of countries involved, the Government is unlikely to arrange repatriation. The FCO already advises British nationals, through its avian influenza fact sheet on its website and its missions overseas, that the Government will not be in a position to offer repatriation.			

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Repatriation of dead bodies	Normal arrangements will apply at airports to receive any dead British nationals who may be part of the early clusters. Family/insurance to meet costs.		Repatriation may be difficult due to circumstances at the time in other countries and possible flight disruption. Ports of entry will continue to provide normal arrangements for as long and as far as that is practical. Family/insurance to meet costs.	
Advice from British missions to British nationals overseas	Plan for Phase 6, including whether to stay or leave and local access to healthcare. Advise British nationals in affected or neighbouring countries to consider returning to the UK at Phases 4/5.		Plan for arrival of the virus in host country or, if it has already arrived, review local access to healthcare. Flights and/or consular support may be reduced.	
Medical assistance to British nationals overseas	British nationals will be advised to plan for a potential pandemic, including arranging for their own medical care and discussing whether they will have access to antiviral treatment during a pandemic with their healthcare provider. The FCO is already advising British nationals, through the avian influenza fact sheet on its website and through its missions overseas, that British diplomatic missions cannot provide medical treatment or antiviral medicines.			
Government liaison with other countries	The FCO will lead on liaison with governments in other countries to ensure full understanding			

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Assistance to foreign nationals in the UK	The current policy will apply during a pandemic, ie no assistance apart from emergency healthcare. For public health reasons, visitors who develop influenza symptoms whilst in the UK will be given emergency treatment with antiviral medicines if necessary.			
Essential services				
Healthcare	Normal service levels.		The NHS plans to care for large numbers of cases and will only provide essential care.	
Domestic travel/public transport	Normal service levels.		Business as usual for as long and as far as that is possible. Some disruption is expected at the peak of a pandemic. Relaxation of regulations on drivers' hours may be considered if required to maintain services.	
Essential repairs or maintenance of power lines, telecommunications, gas pipelines and energy supply	Normal service levels.		Essential repairs will continue. Routine repairs may be curtailed by staff shortfalls, particularly at the peak of the pandemic.	

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Capacity of telecommunications and level of service	Normal service levels.			Near-normal service levels expected. Staff shortfalls may result in a gradual increase in time taken to respond to customer calls and routine repairs. Those organisations planning to increase home working should discuss plans with their service provider at an early stage (see section 8.6.1).
Availability of fuel	Normal service levels.			Fuel supplies expected to be maintained. May be occasional short-lived local shortages if peak absences coincide with technical or weather-related supply difficulties.
Maintenance in the energy, telecommunications and fuel sectors	Maintenance programmes as normal.			Routine programmes may be disrupted if peak absences coincide with technical or weather-related supply difficulties.

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Provision of water and sewerage services	Normal service levels.			Near-normal service levels. Essential repairs to maintain water and sewerage pipe-work, but non-essential work may be curtailed.
Food/supplies	Normal service levels.			Near-normal service levels; may be reduced choice and localised short-term disruption to availability due to staff absences.
Finance – cash circulation, banking and payment systems	Normal service levels.			Near-normal service levels, but there may be some disruption to customer-facing services due to staff absence at peak. Demand for cash in circulation will be met, but there may be some short-lived disruption if bank branches are closed and cash machines take longer to restock.

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Postal services	Normal service levels.		May be some disruption due to staff absence at the peak of the pandemic, but daily deliveries and collections will be sustained as far as possible.	
Provision of local services, eg refuse collection	Normal service levels.		Subject to staff absences, particularly at the peak, there may be some short-lived disruption to essential services such as refuse collection.	
Education/social mixing				
School and early years/childcare settings closures	Business as usual.		Subject to the impact of the pandemic, the Government may recommend that schools and early years/childcare settings close to children when the first clinical cases are confirmed in the LRF area and that they remain closed until the local epidemic is over.	

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Further and higher education	Business as usual.			No plans to advise further/higher education establishments to close. Each institution to decide how it operates based on a risk assessment and its situation.

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Advice on social gatherings, such as attending UK sporting or arts events and conferences	Business as usual.			Business as usual for as long and as far as that is possible, subject to good hygiene precautions, including robust advice to customers that they should stay at home if they are ill or have influenza-like symptoms. If schools and early years childcare facilities are advised to close to children, information will be made available to parents and carers to enable them to assess the risks of infection associated with different out-of-school activities so that they can act appropriately to protect children. In the early stages of Phase 6, the Government may advise against holding international events in the UK if delegates, teams or performers are expected from affected countries.

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Advice on use of public places	Public health advice from the Department of Health, devolved administrations and the HPA will encourage general good hygiene practice to reduce the spread of infectious diseases, eg regular hand washing.			Business as usual for as long and as far as that is possible. The public will need to take good hygiene precautions.
Broadcasting				
Public service broadcasts	Business as usual.			Business as usual, for as long and as far as that is possible. May be some readjustment of services.
Sickness and other benefits				
Sickness absence policy, including statutory sick pay	Business as usual.			Business as usual for as long and as far as that is possible. Advice may be issued as pandemic develops.
Benefits payments	Business as usual.			Business as usual, for as long and as far as that is possible.
Pharmaceutical and medical interventions				
Antiviral medicines	<p>Initial allocations (two-week supply) from national stockpiles pre-distributed to PCT level.</p> <p>In Scotland, additional supply from its national stockpile will be distributed to NHS boards in addition to the supplies pre-distributed at Phase 3.</p> <p>Normal supplies may remain available in the pharmaceutical chain for seasonal influenza cases at Phases 4 and 5.</p>			For rapid treatment and limited initial containment efforts. Move to treatment only as a pandemic is established.

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Access to antiviral medicines	National stockpile allows for treatment of some 25% of the population in the pandemic period (UK alert levels 2–4).		All symptomatic patients treated if indicated, but stockpile consumption to be monitored and clinical prioritisation introduced if necessary.	
Face masks	Advice to public and business regarding government policy (face masks necessary for healthcare workers dealing with suspect cases or others at particular risk). Occupational risk assessments in other settings should be conducted jointly with staff. There is little evidence to support the routine wearing of face masks by the public and they will not generally be provided for those who are well.		Protection advised for health workers and should be considered for others in close/regular contact with infectious patients or at occupational risk.	
Antibiotics	Government reviewing available stock levels and options for enhancing.		Administered for secondary infection complications as per guidelines.	
Pre-pandemic vaccines	UK currently stockpiling around 3.3 million doses of A/H5N1 vaccine (primarily to protect health workers).		May offer limited protection if used as a pre-pandemic vaccine prior to cases in the UK, depending on match with pandemic virus, but stocks are limited.	
Pandemic-specific vaccine	A specific vaccine can only be produced once the pandemic virus has been isolated and the vaccine has been developed and manufactured (which will take four to six months).		The UK will secure sufficient vaccine to protect the population as soon as it is available (likely to be at least four to six months, ie well after the first wave strikes the UK). Delivery of supplies would make clinical prioritisation inevitable.	

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Other consumables and essential medicines	The Department of Health will consider options for enhancing stocks and supply of those essential medicines for which there is likely to be a greater demand.		Implement changes to medicines legislation or regulations where necessary, to ensure ease of access.	
The Government will consider the relaxation of medicines and NHS regulations where necessary to ensure ease and speed of access.				
Communications				
Isolation of cases/staying at home if ill	Possible implications for returning travellers with symptoms and their contacts, ie isolation of confirmed cases and voluntary quarantine at home of suspect cases and/or their close contacts.		Those who believe they are ill will be asked to stay at home in voluntary isolation. Voluntary home isolation may also be recommended for close contacts at early stages of the pandemic in the UK to contain/slow the spread.	
Health messages to the public	Increase in public information at Phase 4 – proportionate to levels of risk. Different communication products, such as leaflets and door drops, will be used during Phases 4 and 5, emphasising good hygiene measures and reassuring the public. Regional/local communications to be consistent with national messages.		Main messages to include: stay at home if ill; adopt good hygiene practices; and how to obtain help and antiviral medicines. Other messages may include information on face masks and health and safety advice on issues such as air conditioning in the workplace. Messages must be consistent.	

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Information to the public	<p>WHO advice and updates on location(s) and areas affected will be reflected in FCO travel advice.</p> <p>UK health departments (directorate in Scotland) will run a national door drop and advertising campaign in Phase 5, alerting the public to the heightened risk, emphasising the need for personal preparation and socially responsible behaviour. A public information film will demonstrate how to slow the spread of the virus, and the National Flu Line service (see 10.7) will be available. Information materials will also be available through primary care, pharmacies and on the Department of Health website.</p>		<p>WHO will provide the Department of Health with regular updates on countries affected. The Department of Health will cascade to other government departments, devolved administrations and the NHS.</p>	<p>Department of Health and each devolved administration will report the numbers ill on a regional basis to the Civil Contingencies Committee (CCC).</p> <p>This information may be made available via the National Flu Line service, websites and media briefings.</p>
			<p>A second wave of advertising will run in Phase 6 providing basic facts and advice on the measures people can take to help slow the spread. The dedicated information line will continue to operate and an updated public information film will be made.</p>	
Excess deaths				
Managing excess deaths	<p>Planning will continue in preparation for the arrival of the pandemic in the UK and the consequent additional deaths expected to occur (scale will be dependent upon the nature of the virus).</p>		<p>Planning is under way to minimise delays in burials or cremations. Further measures are being considered for the reasonable worst case scenario (750,000 deaths).</p>	